DB2 Maestro

User's guide

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1 Welcome to DB2 Maestro!

DB2 Maestro is the premier Windows GUI admin tool for DB2 development and management. It allows you to make all the database operations easy and fast.

Basic DB2 Maestro features

Support of the latest DB2 features

Use DB2 Maestro to work with DB2 8.x-10.x. Among other features and objects implemented in the latest versions of the server, our software supports materialized views, login mappings, triggers, functions, procedures, and a lot of other useful things.

Easy database management

Database profiles give you the opportunity to connect to databases in one touch and work with the selected databases only. See the Database Management 21 for details.

Powerful database object management

DB2 Maestro provides you with an ability to manage database objects in various ways. For example, you can perform operations with a group of objects as well as with a single object in Object Manager 54, sort, group and filter the database objects within Object Browser 52, copy an object from one database to another by a drag-and-drop operation inside the explorer tree, use Windows clipboard to copy a set of objects and so on. For details turn to the Database Object Management 57 section.

Working with tables and table subobjects

DB2 Maestro wizards and editors allow you to create, edit and drop tables as well as their *fields, indexes,* and *foreign keys* in a couple of simple operations. See the Tables 64 section to learn more.

Building and executing queries

DB2 Maestro provides two powerful tools which allow you either to edit query text directly with syntax highlighting and code completion or to build a query diagram visually selecting tables and fields, setting links between tables and so on. You can find the detailed description in the Queries 182 section.

Powerful data management tools

DB2 Maestro puts at your disposal a complete set of data management tools with viewing, editing, grouping, sorting and filtering abilities, lookup editors, master-detail data view, BLOB Viewer/Editor, data export, data import and SQL dump modules and more. See the Data Management 198 to learn the details.

Wide choice of additional tools

DB2 Maestro provides you with a number of tools for working with database metadata and SQL scripts, including Script Runner, SQL Script Editor with code folding and script explorer. Moreover, it gives such tools as Schema Designer, BLOB Viewer, Diagram Viewer, Data Analysis, Dependency Tracker, SQL Generator, Report Designer, and a lot of others. To learn more, see the Database Tools 232 section.

Security management

DB2 Maestro gives you a comfortable access to DB2 security features.

Full customization according to your preferences and needs

In DB2 Maestro you can customize the behavior of all its tools, select a user interface scheme and set a lot of other preferences. All the options and their meanings are listed within the Options 278 dialog description.

1.1 System Requirements

Client environment

- Pentium PC or higher;
- Windows NT4/2000/XP/Vista/Windows 7/Windows 8/Windows 10;
- 512 MB RAM (1 GB recommended);
- 25 MB of free hard disk space;
- SVGA-compatible video adapter;
- any DB2 client.

Server environment

- DB2 8.x-10.x.

1.2 Installation

To install **DB2 Maestro** for the first time on your PC:

- download the DB2 Maestro distribution package from the download page at our site;
- run setup.exe from the local folder and follow the instructions of the installation wizard;
- find the DB2 Maestro shortcut in the corresponding program group of the Windows Start menu after the installation is completed.

To upgrade the installed copy of DB2 Maestro to the latest version:

- download the DB2 Maestro executable file from the download page at our site;
- unzip downloaded file to any local folder, e.g. *c:\unzipped*;
- exit from DB2 Maestro if it is running;
- replace previous version of DB2 Maestro by copying unzipped files to the DB2 Maestro folder;
- run DB2 Maestro using its shortcut in the Windows Start menu.

You can also use the full distribution package to upgrade your current version of DB2 Maestro. In this case you should repeat the steps of the first-time installation. Note that the full distribution package is larger than a single executable file.

1.3 How can I purchase DB2 Maestro?

Thank you for your interest in purchasing **DB2 Maestro**!

You can select licensing options and register DB2 Maestro at its on-line order page. It is possible to purchase on-line, by fax, mail, toll-free phone call, or place a purchase order. We send the software activation key by email within 24 hours after completion of the order process. If you have not received the activation key within this period, please contact our sales department.

All our products and bundles are shipped with 12 months of free upgrades (minor and major ones) or with 36 months of free upgrades for a quite small additional fee. After this period you may renew your license for the next 12(36) months with a 50% discount.

DB2 Maestro has a free 30-day trial. Upon purchasing the product you confirm that you have tested it and you are completely satisfied with its current version.

To obtain technical support, please visit the appropriate section on our website or contact us by email to support@sqlmaestro.com.

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1.5 About SQL Maestro Group

SQL Maestro Group is a privately-held company producing high-quality software for database administrators and developers. The united team of eminently qualified developers is pleased to create new software products for commercial, academic and government customers worldwide. We do our best to design and develop products that remove complexity, improve productivity, compress time frames, and increase database performance and availability. We are glad to realize that our products take usual chores upon themselves, so that our customers could have more time left for their creative work.

The company was founded in 2002 as an essential partner for every business that is trying to harness the explosive growth in corporate data. SQL Maestro Group employs an international team concentrating their efforts on cutting-edge DBA tools development.

The slogan of our company is **The Shortest Path to SQL**. It is aimed to denote that we set to create easy-to-use products meant for those who appreciate comfort, friendly program interface and support when working with SQL servers.

- We are pleased to facilitate your job.
- We aim at being of considerable assistance to our clients.
- We feel contented doing our beloved work.

At present, our company offers a series of Windows GUI admin tools for SQL management, control and development of the following servers: **MySQL, Microsoft SQL Server, PostgreSQL, Oracle, SQL Anywhere, DB2, SQLite, Firebird,** and **MaxDB**. We also produce universal tools to be used for administering any database engine accessible via ODBC driver or OLE DB provider. Such products may be the clear-cut decision for those who constantly work with several database servers.

SQL Maestro is the premier Windows GUI admin tool for database development, management, and control.

It provides you with the ability to perform all the necessary database operations such as creating, editing, copying, extracting and dropping database objects; moreover, you can build queries visually, execute queries and SQL scripts, view and edit data including BLOBs, represent data as diagrams, export and import data to/from most popular file formats, manage users and their privileges (if possible), and use a lot of other tools designed for making your work with your server comfortable and efficient.

SQL PHP Generator is a powerful tool for creating database-driven web applications visually. It allows you to generate high-quality PHP scripts for working with tables, views and queries through the web. You needn't have any programming background to use it.	
SQL Data Wizard is a high-capacity Windows GUI utility for managing your data. It provides you with a number of easy-to-use wizards for performing the required data manipulation easily and quickly. The tool allows you to export data from DB2 tables and queries to most popular formats, import data into the tables, generate SQL dump of selected tables, and export/import BLOB fields from/to files.	
SQL Code Factory is a premier GUI tool aimed at the SQL queries and scripts development. It allows you to manage SQL queries and scripts using such useful features as code folding, code completion and syntax highlighting, build query visually, execute several queries at a time, execute scripts from files, view and edit result data with filtering, sorting and grouping abilities, export data to as many as 14 file formats including Excel, RTF and HTML, import data from Excel, CSV, XML and text files, view and edit BLOBs in various way, build diagrams based on Oracle data, and much more.	
Database Converter is a user friendly tool to migrate any local or remote ADO-compatible database to DB2. Such tools transfer database schema and data and are equipped with native support for the most popular database servers.	
Data Sync is a powerful and easy-to-use tool for database contents comparison and synchronization. Such tools can be useful for database administrators, developers and testers that need a quick, easy and reliable way to compare and synchronize their data.	

The software products are constantly optimized for the latest server versions support.

You can use the following contact information if necessary:

Our web-site	www.sqlmaestro.com
Postal address:	**SQL Maestro Group** 140 Broadway, Suite 706 New York City, New York 10005 United States

Thank you for your interest to our company!

1.6 What's new

Please find out the latest DB2 Maestro news at http://www.sqlmaestro.com/products/db2/maestro/news/

2 Getting Started

The topics in this section provide some basic information about DB2 Maestro, what it is for and what you can do with it.

How to get started:

- Connect to a database with DB2 Maestro 13
- Explaining user interface 15
- How DB2 Maestro looks when you start it for the first time 16
- Shortcut keys 20

Learning more:

- Study the **Overview of Database Object Management** 34 section for detailed instructions on using DB2 Maestro.
- See **Database Tools** 232 and **Queries** 182 sections for instructions on more advanced procedures!
- Find out more about **Working with Data in DB2 Maestro** 198.
- Customize the way DB2 Maestro works, see **Program Options** 278 for full details.

2.1 Connect to a database

To manage an existing database with DB2 Maestro, you have to create the according database profile 23 first. A profile stores database connection settings, and some additional options to customize the way the software works with the database. After the creation database profiles appear as nodes in the Explorer tree on the left (profile properties can be later changed with Database Profile Editor 25).

When the profile is created you can connect to the database. To do so, select the database in the Explorer tree 49, or either select the Database | Connect to Database main menu item or use the Connect to Database item of the popup menu. You can also double click the database node in the explorer tree. If connection succeeds, the database node expands displaying the tree of database objects (tables, views, procedures, etc). The database becomes ready for your activities.

How can I disconnect from a database?

In order to disconnect from a database you should first select the database in the explorer tree, then either

- select the Database | Disconnect from Database main menu item

or

- use the Disconnect from Database item of the popup menu.

See also: Connection parameters 14

2.2 Connection parameters

To setup a connection to a DB2 database stored on a remote server, you need:

1. Get any DB2 client with ODBC driver installed on your computer. We recommend to use clients with the DB2 Command Line Processor (CLP) tool. It seems that IBM Data Server Runtime Client is the best solution in this situation. It is free and is not overloaded with various drivers. To obtain this client, visit the publisher's site and download *IBM Data Server Runtime Client (Windows 32-bit AMD and Intel x86).*

2. Get this database catalogued by db2 on the client machine. The DB2 client can work only with catalogued databases assumed with cataloged nodes (servers). To work with a DB2 database with DB2 Maestro, you have to get this database catalogued on the client machine (the operation is accomplished only once) and to specify the *name of user* registered on DB2 server and the corresponding *password*. To catalogue a DB2 database, follow the steps below:

2.1 Catalog the node of server. To get all the catalogued nodes of the client machine, enter the following command to the DB2 Command Window or similar (It's time to use DB2 Command Line Processor ;)):

```
db2 list node directory
```

To catalog a new server node, use the following command:

```
db2 catalog tcpip node <nodename> remote <hostname or ip address>
server <db2servicename> [remote <instance_name> ostype <OSname>]
```

nodename – the node name to be used on your computer
hostname or ip address – hostname/ipaddress of server storing the DB2 database
db2servicename – ServiceName or port number of db2instance (db2 get dbm cfg | grep SVCENAME)
instance_name – instance name of db2 database.
OSname – Solaris,windows, AIX, Linux etc.

Example:

```
db2 catalog tcpipnode testnode remote testhost server 50000
db2 catalog tcpipnode testnode remote testhost server 50000 remote db2inst1
```

2.2 Catalog the necessary database on the corresponding node. To get the list of catalogued databases, use the following command:

```
db2 list db directory
```

To add the necessary database to the catalog, enter the following command:

```
db2 catalog database <dbname> as [<db_alias>] at node <nodename>
```

dbname – database name
db_alias – optional database alias, if you want database name different on client.
nodename – nodename you created on first step

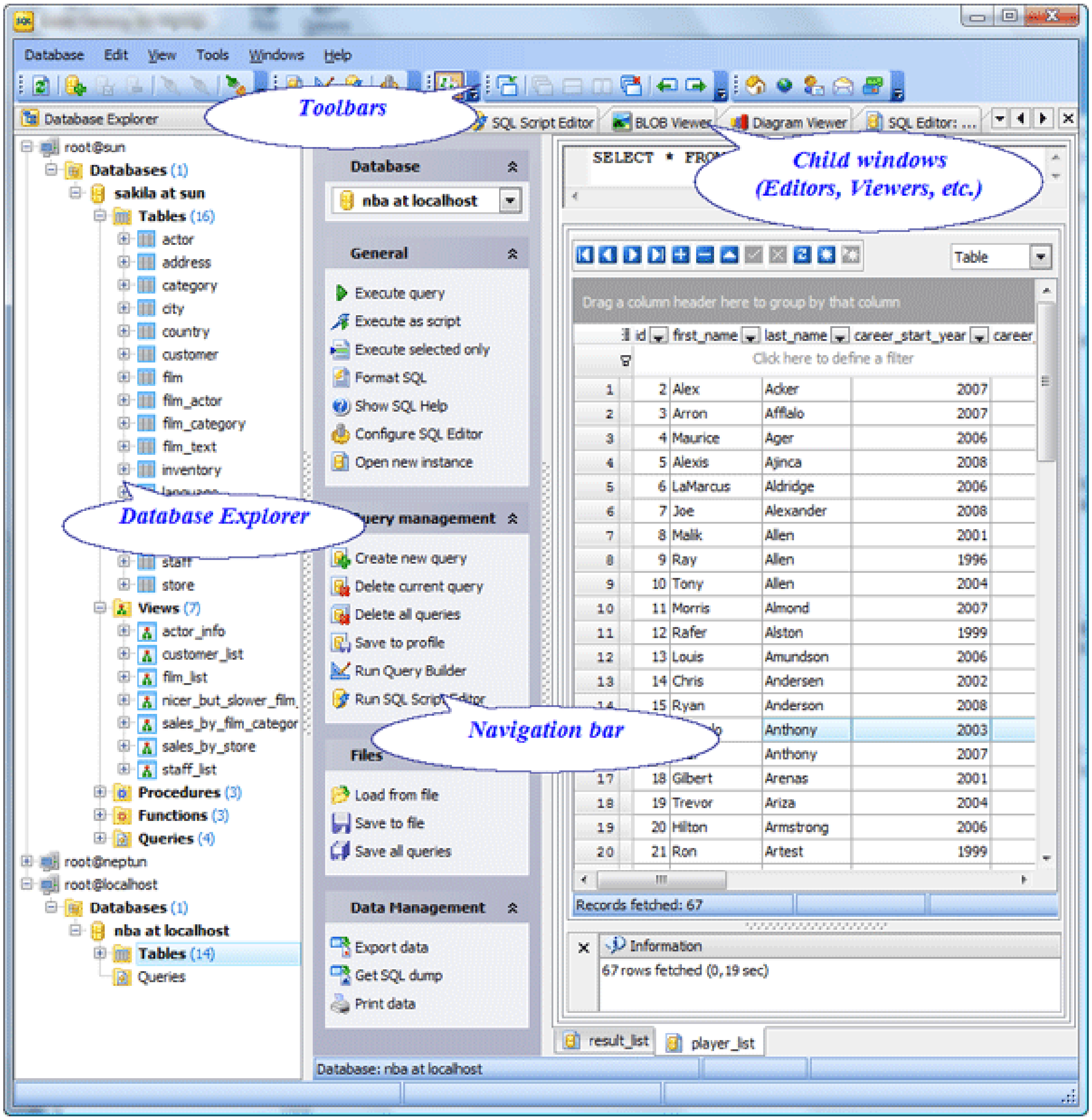
Example:

```
db2 catalog database testdb as testdb at node testnode
db2 catalog database sample at node testnode
```

2.3 Explaining user interface

The SQL Maestro Group products are famous for their clear and intuitive user interface. The programs are built around the three-pane workspace that includes the database explorer and child windows consisting of the navigation bar and work area.

This topic provides a brief guide to the components of DB2 Maestro's user interface. For detailed descriptions, see below.



```
SELECT * FRO
```

	id	first_name	last_name	career_start_year	career
1	2	Alex	Acker	2007	
2	3	Arron	Afflalo	2007	
3	4	Maurice	Ager	2006	
4	5	Alexis	Ajinca	2008	
5	6	LaMarcus	Aldridge	2006	
6	7	Joe	Alexander	2008	
7	8	Malik	Allen	2001	
8	9	Ray	Allen	1996	
9	10	Tony	Allen	2004	
10	11	Morris	Almond	2007	
11	12	Rafer	Alston	1999	
12	13	Louis	Amundson	2006	
13	14	Chris	Andersen	2002	
14	15	Ryan	Anderson	2008	
		lo	Anthony	2003	
			Anthony	2007	
17	18	Gilbert	Arenas	2001	
18	19	Trevor	Ariza	2004	
19	20	Hilton	Armstrong	2006	
20	21	Ron	Artest	1999	

67 rows fetched (0,19 sec)

Database Explorer

The Database Explorer 49 occupies the left side of DB2 Maestro main window. It represents all the connected databases objects including system objects 26.

The explorer provides the fastest way to reach the object properties, to perform the following operations with database profiles using the popup menu:

- create new objects (database profiles, database objects, table objects...);
- edit currently selected objects;
- remove currently selected objects from the explorer tree;
- duplicate objects;
- rename objects if available and edit object comments out of the object editor.

See also: Filtering explorer content 52

Editors and Viewers

According to the MDI style implementation the DB2 Maestro tools and editors are opened in appropriate windows. Each window consists of a navigation bar and work area. The software supports Classic and Tabbed MDI.

See also: Switching between windows 19, Tabbed MDI 17

Navigation bar

The Navigation Bar contains a set of logically grouped links provided to realize the corresponding actions. Just position the mouse over a link and wait for a second to display the appropriate action shortcut making it possible for experienced users to control the program almost entirely with the keyboard.

See also: Shortcut keys 20

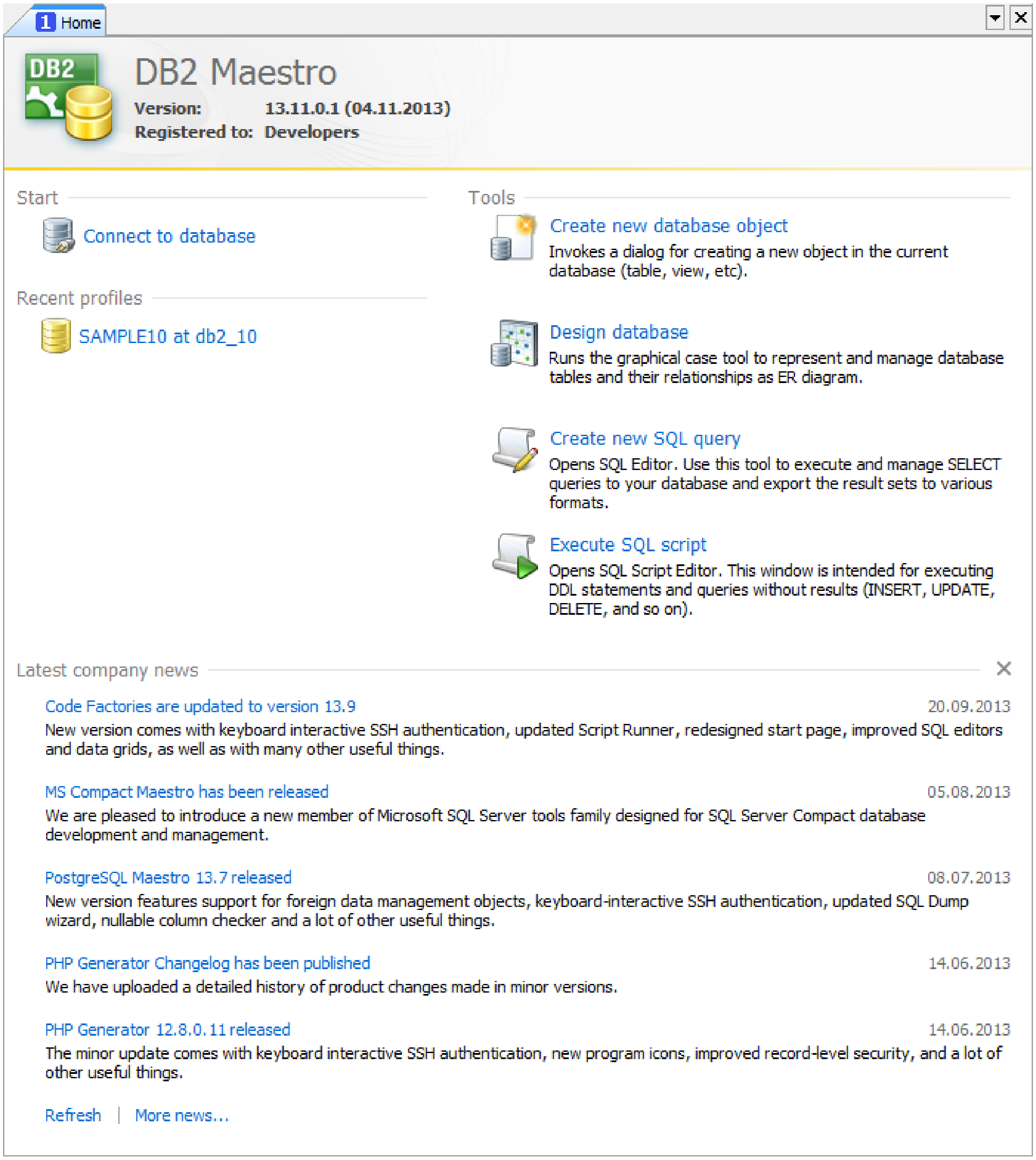
Toolbars

The bars occupy the top of the main window. The Toolbars provide quick access to the most frequently-used functions. Just position the mouse over a tool and wait for a second to display a brief text describing what it is for.

2.3.1 First time started

This is how DB2 Maestro looks when you run it for the first time. The Connect to database link allows you to start working with existing databases. Follow the link to open Create database profile 23

The window provides you with quick access to the Create Database Object 35 dialog, Schema Designer 260, SQL Editor 184, and SQL Script Editor 234 recently used database profiles. At the bottom of the page the latest company news and current discount programs are represented.



DB2 Maestro
Version: 13.11.0.1 (04.11.2013)
Registered to: Developers

Start

Connect to database

Recent profiles

SAMPLE10 at db2_10

Tools

Create new database object
Invokes a dialog for creating a new object in the current database (table, view, etc).

Design database
Runs the graphical case tool to represent and manage database tables and their relationships as ER diagram.

Create new SQL query
Opens SQL Editor. Use this tool to execute and manage SELECT queries to your database and export the result sets to various formats.

Execute SQL script
Opens SQL Script Editor. This window is intended for executing DDL statements and queries without results (INSERT, UPDATE, DELETE, and so on).

Latest company news

Code Factories are updated to version 13.9 — 20.09.2013
New version comes with keyboard interactive SSH authentication, updated Script Runner, redesigned start page, improved SQL editors and data grids, as well as with many other useful things.

MS Compact Maestro has been released — 05.08.2013
We are pleased to introduce a new member of Microsoft SQL Server tools family designed for SQL Server Compact database development and management.

PostgreSQL Maestro 13.7 released — 08.07.2013
New version features support for foreign data management objects, keyboard-interactive SSH authentication, updated SQL Dump wizard, nullable column checker and a lot of other useful things.

PHP Generator Changelog has been published — 14.06.2013
We have uploaded a detailed history of product changes made in minor versions.

PHP Generator 12.8.0.11 released — 14.06.2013
The minor update comes with keyboard interactive SSH authentication, new program icons, improved record-level security, and a lot of other useful things.

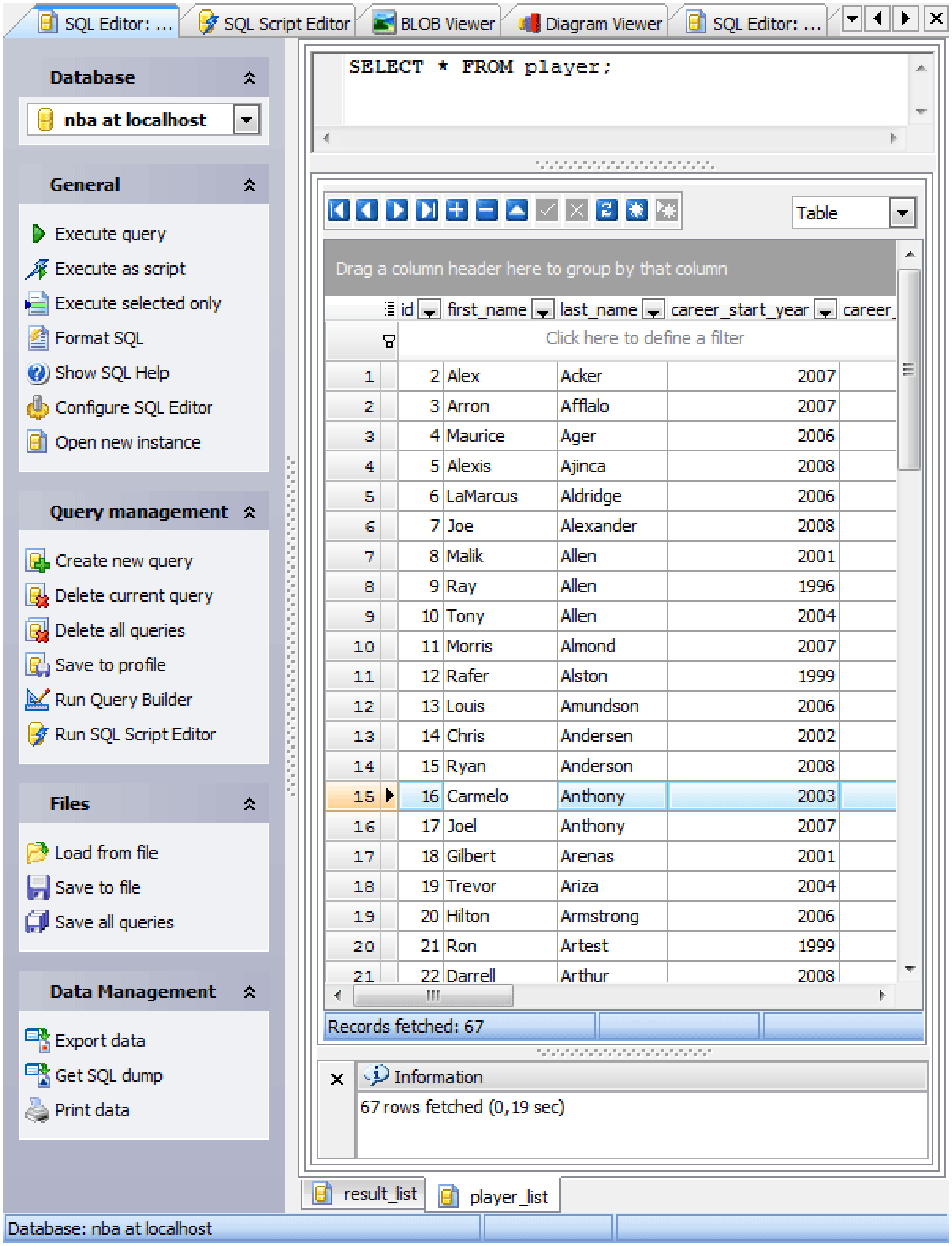
Refresh | More news...

2.3.2 Tabbed MDI

DB2 Maestro provides you with a possibility to choose (Options|Application) your favorite UI. Among the **classic MDI style** the **tabbed MDI style** is also available.

Applying the style you'll get all the objects editors opening on separate sheets. You can move from one sheet to another by clicking the sheet tabs at the bottom of the working area. The tab for the active sheet is underlined in the color you choose; tabs for inactive sheets are fully colored.

You can switch between the sheets with corresponding sheet tabs or using **Ctrl+Tab**. If you don't see the tool you want, click the tab scrolling buttons to display the tab, and then click the tab. You can also move the sheets.



nba at localhost

```
SELECT * FROM player;
```

	id	first_name	last_name	career_start_year
1	2	Alex	Acker	2007
2	3	Arron	Afflalo	2007
3	4	Maurice	Ager	2006
4	5	Alexis	Ajinca	2008
5	6	LaMarcus	Aldridge	2006
6	7	Joe	Alexander	2008
7	8	Malik	Allen	2001
8	9	Ray	Allen	1996
9	10	Tony	Allen	2004
10	11	Morris	Almond	2007
11	12	Rafer	Alston	1999
12	13	Louis	Amundson	2006
13	14	Chris	Andersen	2002
14	15	Ryan	Anderson	2008
15	16	Carmelo	Anthony	2003
16	17	Joel	Anthony	2007
17	18	Gilbert	Arenas	2001
18	19	Trevor	Ariza	2004
19	20	Hilton	Armstrong	2006
20	21	Ron	Artest	1999
21	22	Darrell	Arthur	2008

Records fetched: 67

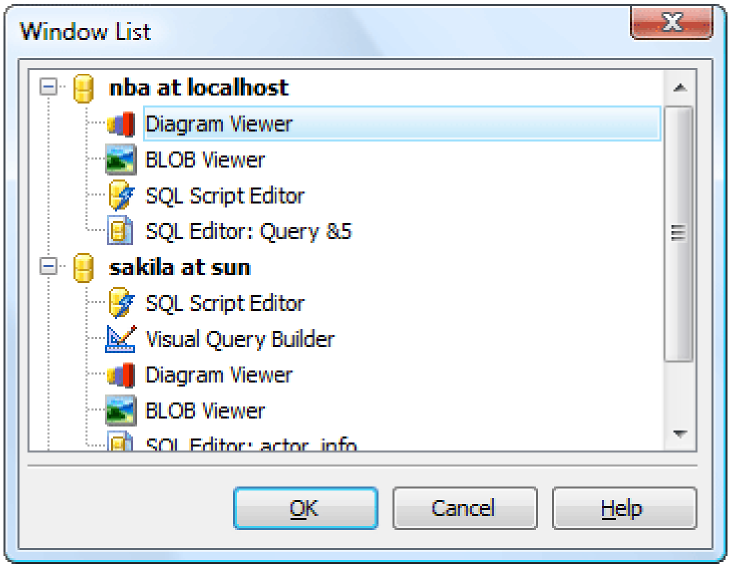
67 rows fetched (0,19 sec)

Database: nba at localhost

2.3.3 Switching between windows

The Window List dialog allows you to switch the child application windows quickly. To open the dialog select the Windows | Window List... item of the main menu or use the **Alt+0** hot keys combination.

Most of the windows are linked according to their active databases and displayed in the form of a tree, e.g. Table Editor, SQL Editor, Diagram Viewer, etc. Windows which are common for the entire program are shown as separate nodes of the tree.



To activate the window you need, select one of the window tree items and click the **OK** button.

2.4 Shortcut keys

The following table describes the default shortcut keys in DB2 Maestro.

Interface 15	
Window list	**Alt+0**
Previous Window	**F6**
Next Window	**Ctrl+F6**
Show Database Explorer	**F11**
Refresh	**F5**
Exit	**Alt+F4**
DB2 Maestro help	**F1**
Clipboard	
Cut	**Ctrl+X**
Copy	**Ctrl+C**
Paste	**Ctrl+V**
Select all	**Ctrl+A**
Find	**Ctrl+F**
Replace	**Ctrl+H**
Search again	**F3**
Undo	**Ctrl+Z**
Redo	**Shift+Ctrl+Z**
SQL Editors 184	
Open SQL Editor	**Ctrl+E**
Open SQL Script Editor	**Ctrl+R**
Open Visual Query Builder	**Ctrl+Q**
Execute query	**(F9) or (F8)**
Execute query as script	**(Shift+F9) or (Shift+F8)**
Execute selected only	**(Alt+F9) or (Alt +F8)**
Go to line	**Ctrl+G**
Format selected SQL	**Ctrl+Alt+F**
Create new query	**Ctrl+N**
Delete current query	**Ctrl+Alt+D**
Load script from file	**Ctrl+O**
Database management 21	
Create a new database profile	**Shift+Ctrl+P**
Edit an existing database profile	**Shift+Ctrl+E**
Rename a database profile (object)	**F2**
Remove database profile	**Shift+Ctrl+R**
Connect to the database	**Shift+Ctrl+C**
Disconnect from the database	**Shift+Ctrl+D**
Create a database object	**Shift+Ctrl+N**
Object Browser	**Shift+Ctrl+O**
Open BLOB Viewer	**Ctrl+B**

3 Databases and Database Profiles

DB2 Maestro allows you to manipulate databases by means of database profiles. Profile contains database connection settings and a set of options to automatize common manipulations with databases (a possibility to connect to the database at DB2 Maestro startup, login prompt before connection, etc.). To start working with databases in DB2 Maestro, you should create database profile(s) first.

Use the following links for details:

How can I create new database profiles?

In DB2 Maestro database profiles are created within Create Database Profiles Wizard 23. In order to run the wizard you should either

- select the Database | Create Database Profiles... main menu item

or

- use the Create Database Profiles... item of the popup menu.

Using Create Database Profiles Wizard set the necessary connection and authorization options and click the Ready button to complete the operation.

How can I edit existing database profile options?

Database connection properties and profile options are edited within the Database Profile Properties 25 dialog window. In order to open the dialog for the selected database profile you should either

- select the Database | Edit Database Profile... main menu item

or

- use the Edit Database Profile... item of the popup menu.

How can I remove database profiles?

In order to remove a database profile you should first select the database profile in the explorer tree, then either select the Database | Remove Database Profile main menu item, or use the Remove Database Profile item of the popup menu and confirm removing profile in the dialog window to complete the operation.

How can I connect to a database?

In order to connect to a database you should first select the database in the explorer tree, then either

- select the Database | Connect to Database main menu item

or

- use the Connect to Database item of the popup menu.

⊟ How can I disconnect from a database?

In order to disconnect from a database you should first select the database in the explorer tree, then either

- select the Database | Disconnect from Database main menu item

or

- use the Disconnect from Database item of the popup menu.

3.1 Creating Database Profiles

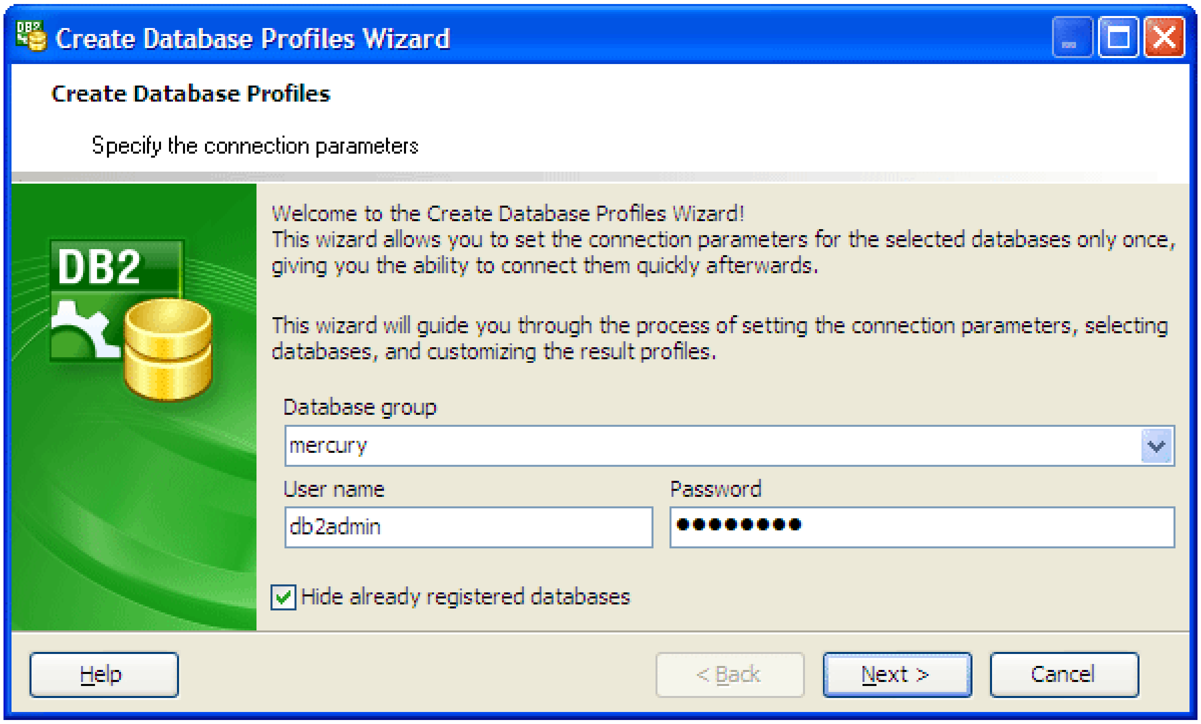
Create Database Profiles Wizard allows you to create a single database profile or several profiles from one host. To run the wizard, select the Database | Create Database Profiles... main menu item, or press the **Shift+Ctrl+P** hot keys combination. You can also use the Create Database Profiles button of the main toolbar.

- Set connection properties 23
- Specify database profile options 23

See also: Edit Database Profile Dialog 25

3.1.1 Setting connection properties

Specify DB2 connection properties 14 to be used on further connections.


Create Database Profiles Wizard
Create Database Profiles
Specify the connection parameters
DB2
Help
< Back
Next >
Cancel

Welcome to the Create Database Profiles Wizard!
This wizard allows you to set the connection parameters for the selected databases only once, giving you the ability to connect them quickly afterwards.

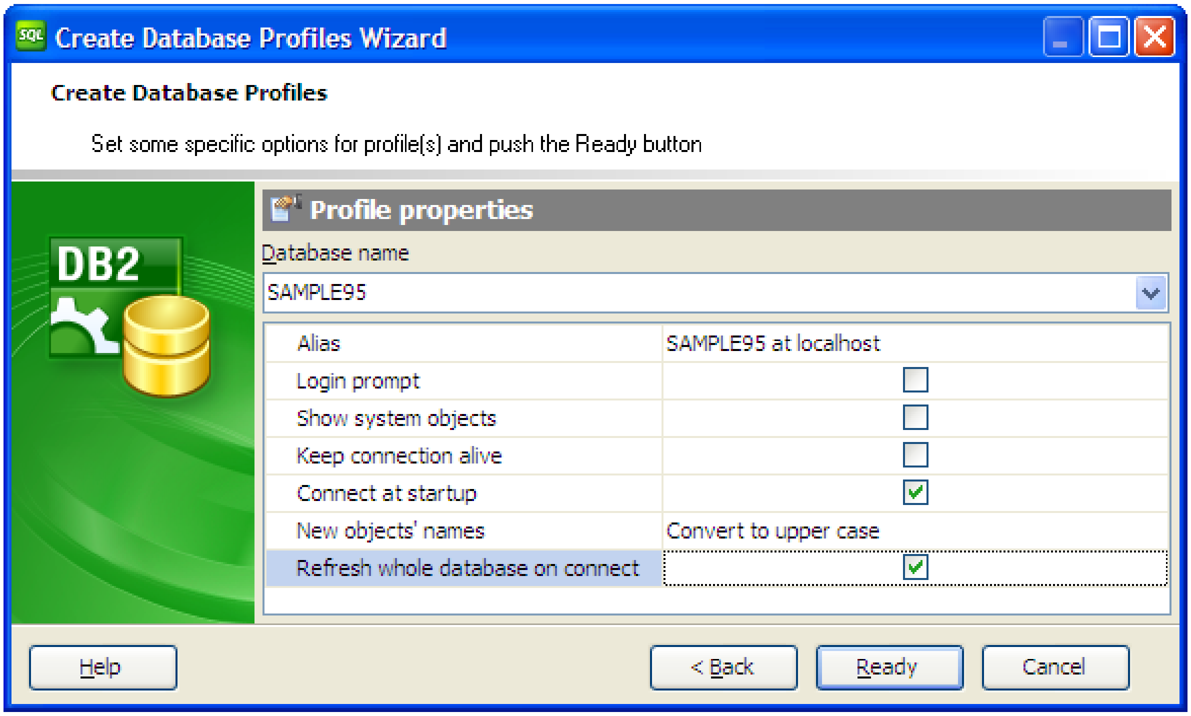
This wizard will guide you through the process of setting the connection parameters, selecting databases, and customizing the result profiles.

Database group: mercury
User name: db2admin
Password: ●●●●●●●●
☑ Hide already registered databases

☑ Hide already registered databases
Check the box to shorten the databases list on the next wizard step.

3.1.2 Setting profile options

To create a new profile,



Create Database Profiles

Set some specific options for profile(s) and push the Ready button

Database name: SAMPLE95

Alias	SAMPLE95 at localhost
Login prompt	☐
Show system objects	☐
Keep connection alive	☐
Connect at startup	☑
New objects' names	Convert to upper case
Refresh whole database on connect	☑

☑ Login prompt before connection
Use the option to enable DB2 Maestro to prompt for user name and password every time you connect to the database.

☑ Show system objects
Check the box to make system objects visible.

☑ Keep connection alive
Check the box for pinging server before each query execution.

☑ Connect at startup
With this option on connection to the profile database is automatically established at the application startup.

New objects' names (Don't change case, Convert to upper case, Convert to lower case)
The option allows you to specify the newly created objects case.

☑ Refresh whole database on connect
Use the option along with the Show empty schemas explorer options to hide/show empty schemas in the explorer tree.

Profile text color
Select the color to be used to represent the database profile name at the Explorer tree. For example this option may be useful to mark development and production databases in different colors in order to prevent casual metadata or data changes in the production.

Click the Ready button when done to start working with the selected databases in DB2 Maestro.

3.2 Editing Database Profile

Use the Edit Database Profile dialog to edit the profile properties set on its creation. To open the dialog, select the database in the explorer tree, then select the Database | Edit Database Profile... main menu item or press the **Shift+Ctrl+E** hot key combination. You can also use the Edit Database Profile button of the main toolbar.

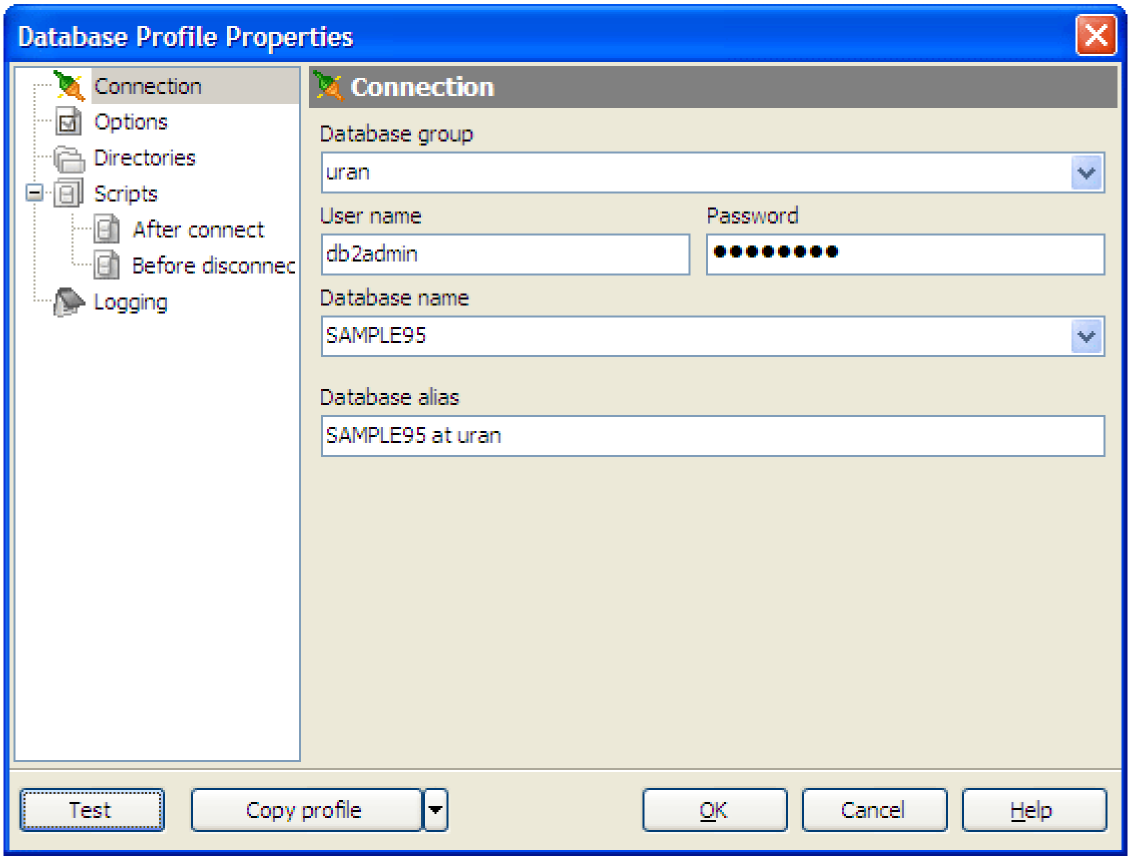
Instead of manual profile options editing you can copy all the options from the another existing profile with the Copy profile button.

- Editing database connection properties 25
- Settings database options 26
- Setting default directories for database tools 28
- Editing obligatory scripts to execute 28
- Setting log options and file names 30

See also: Create Database Profile Wizard 23

3.2.1 Editing connection properties

The tab allows you to change connection properties 14 of an existing database profile. Here you can change the database group, database info and edit the database alias, an optional name to display the database in the Explorer tree and in all the application tools.



Database group: uran

User name: db2admin

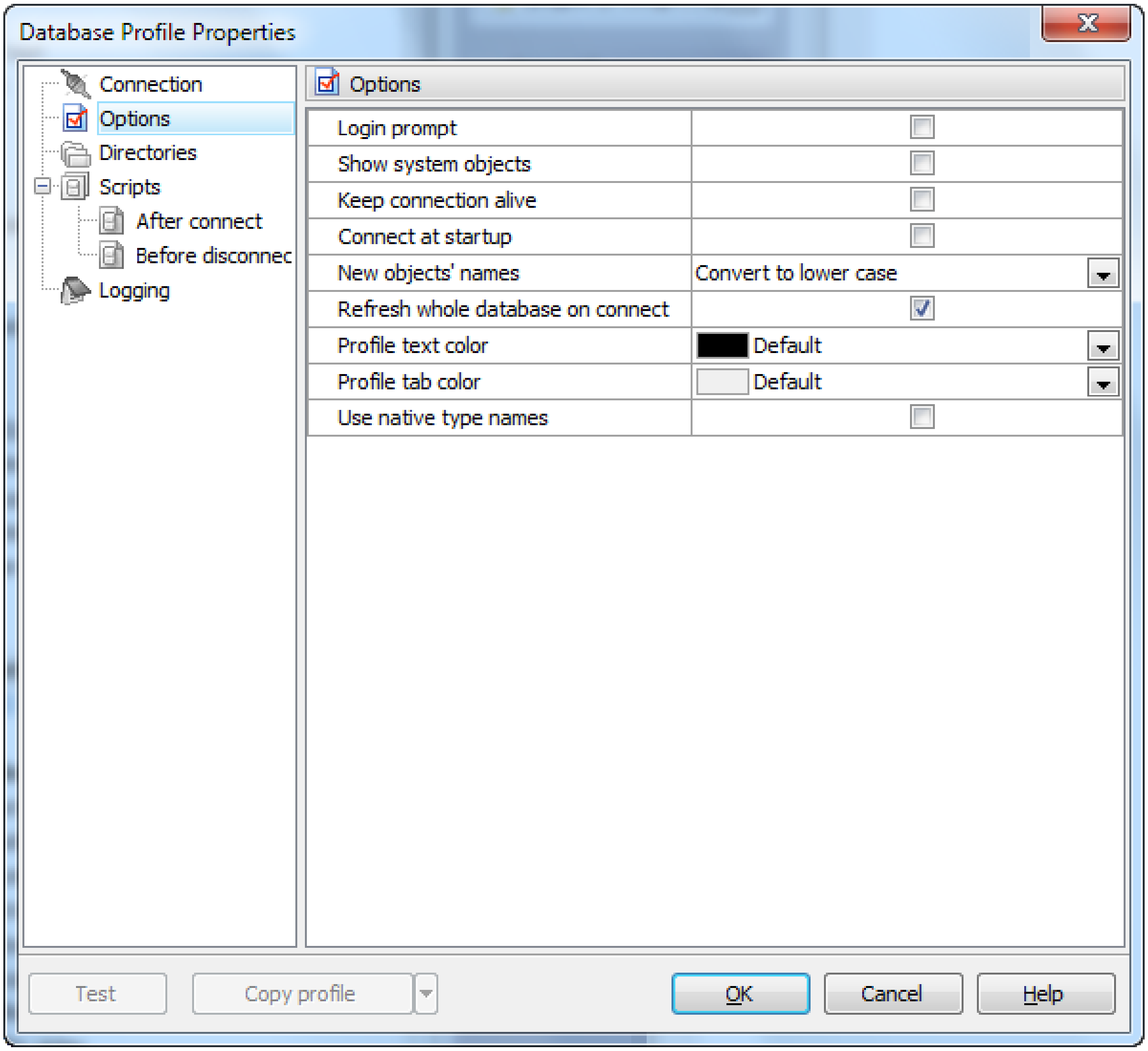
Password: ●●●●●●●●●

Database name: SAMPLE95

Database alias: SAMPLE95 at uran

3.2.2 Setting profile options

Customize database options according to your needs. The detailed description is given below.



Login prompt	☐
Show system objects	☐
Keep connection alive	☐
Connect at startup	☐
New objects' names	Convert to lower case
Refresh whole database on connect	☑
Profile text color	⬛ Default
Profile tab color	⬜ Default
Use native type names	☐

☑ Login prompt

Use the option to enable DB2 Maestro to prompt for user name and password every time you connect to the database.

☑ Show system objects

Check the option to make system objects visible.

☑ Keep connection alive

Check the box for pinging server before each query execution.

☑ Connect at startup

With this option on connection to the profile database is automatically established at the application startup.

New objects' names (Don't change case, Convert to upper case, Convert to lower case)

Use the option to change the case for newly created objects.

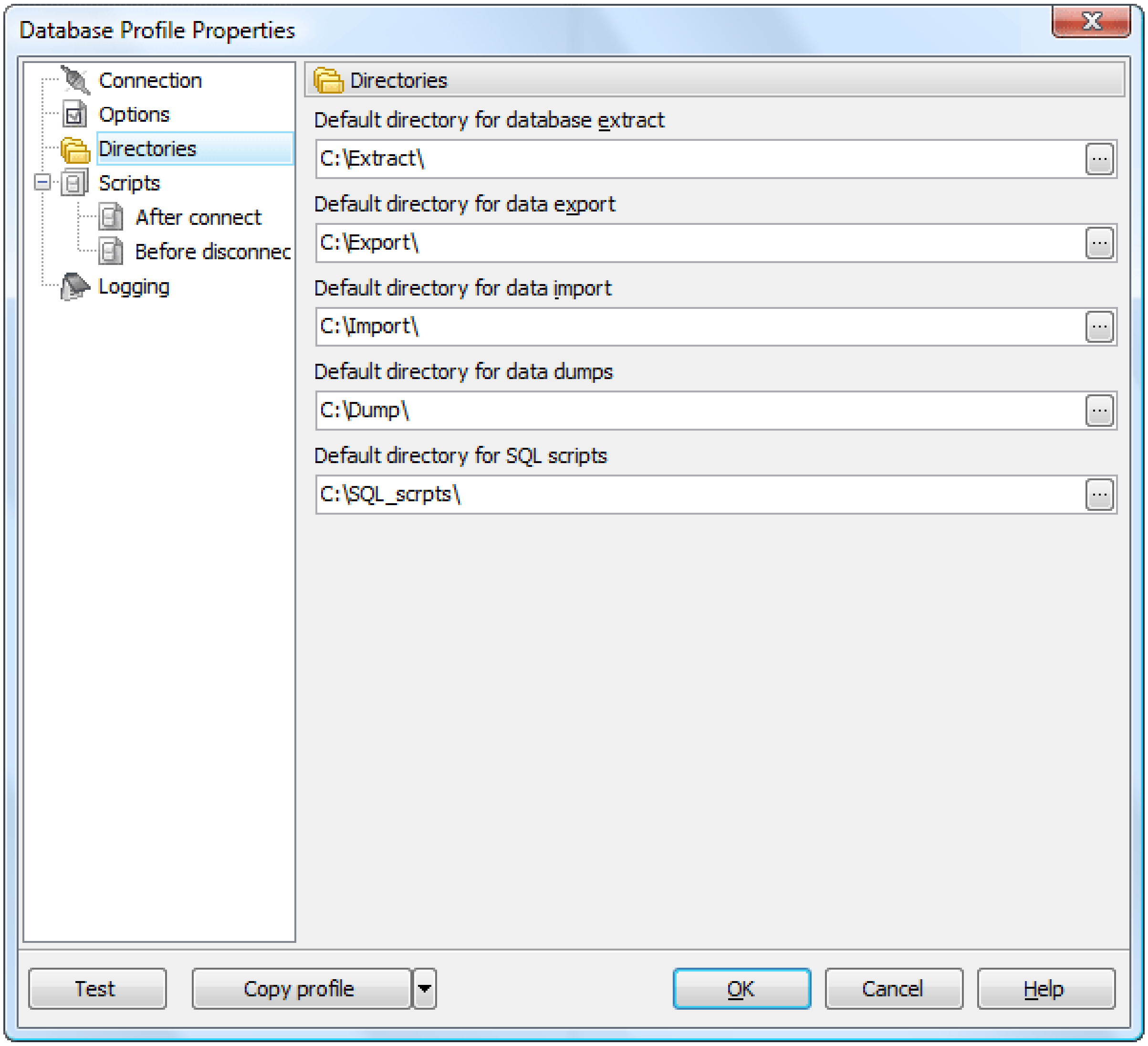
☑ Refresh whole database on connect

Use the option along with the Show empty schemas 284 explorer options to hide/show empty schemas in the explorer tree.

You can also change here the font color the profile name is represented at the Explorer tree.

3.2.3 Setting default directories

Use the tab to specify the default directories respectively for database extract, data export, data import, and data dump.



Default directory for database extract: C:\Extract\

Default directory for data export: C:\Export\

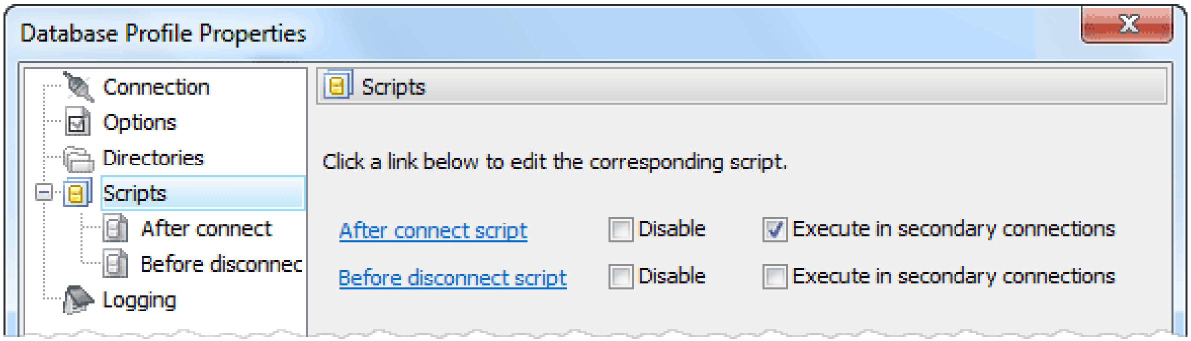
Default directory for data import: C:\Import\

Default directory for data dumps: C:\Dump\

Default directory for SQL scripts: C:\SQL_scrpts\

3.2.4 Editing obligatory scripts to execute

Use the tab to specify the obligatory scripts to execute in all database connections established by the software (on executing queries, browsing objects data, etc.). There is a possibility to enable/disable a written script.

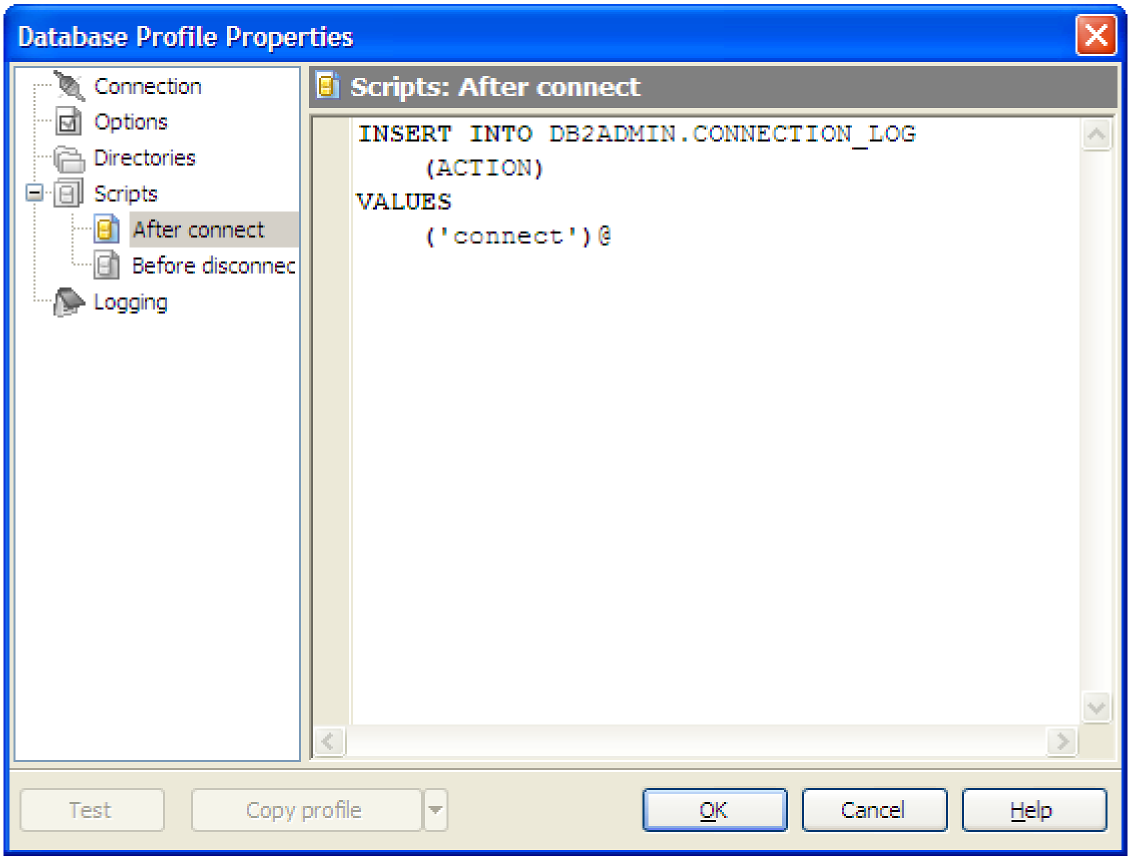


Click a link below to edit the corresponding script.

After connect script ☐ Disable ☑ Execute in secondary connections

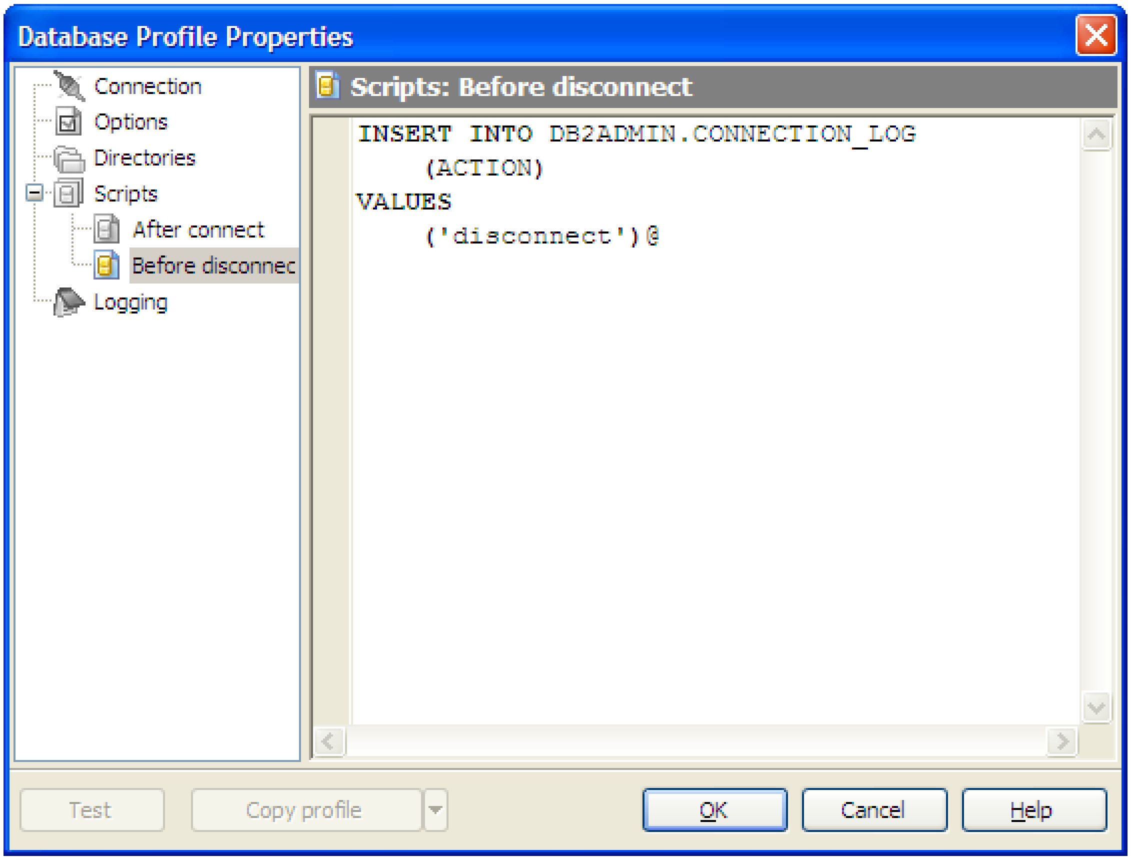
Before disconnect script ☐ Disable ☐ Execute in secondary connections

Below you can find an example of an obligatory script to execute after DB2 Maestro will connect to the database. The script writes a connect time to the log table.



```
INSERT INTO DB2ADMIN.CONNECTION_LOG
     (ACTION)
VALUES
     ('connect')@
```

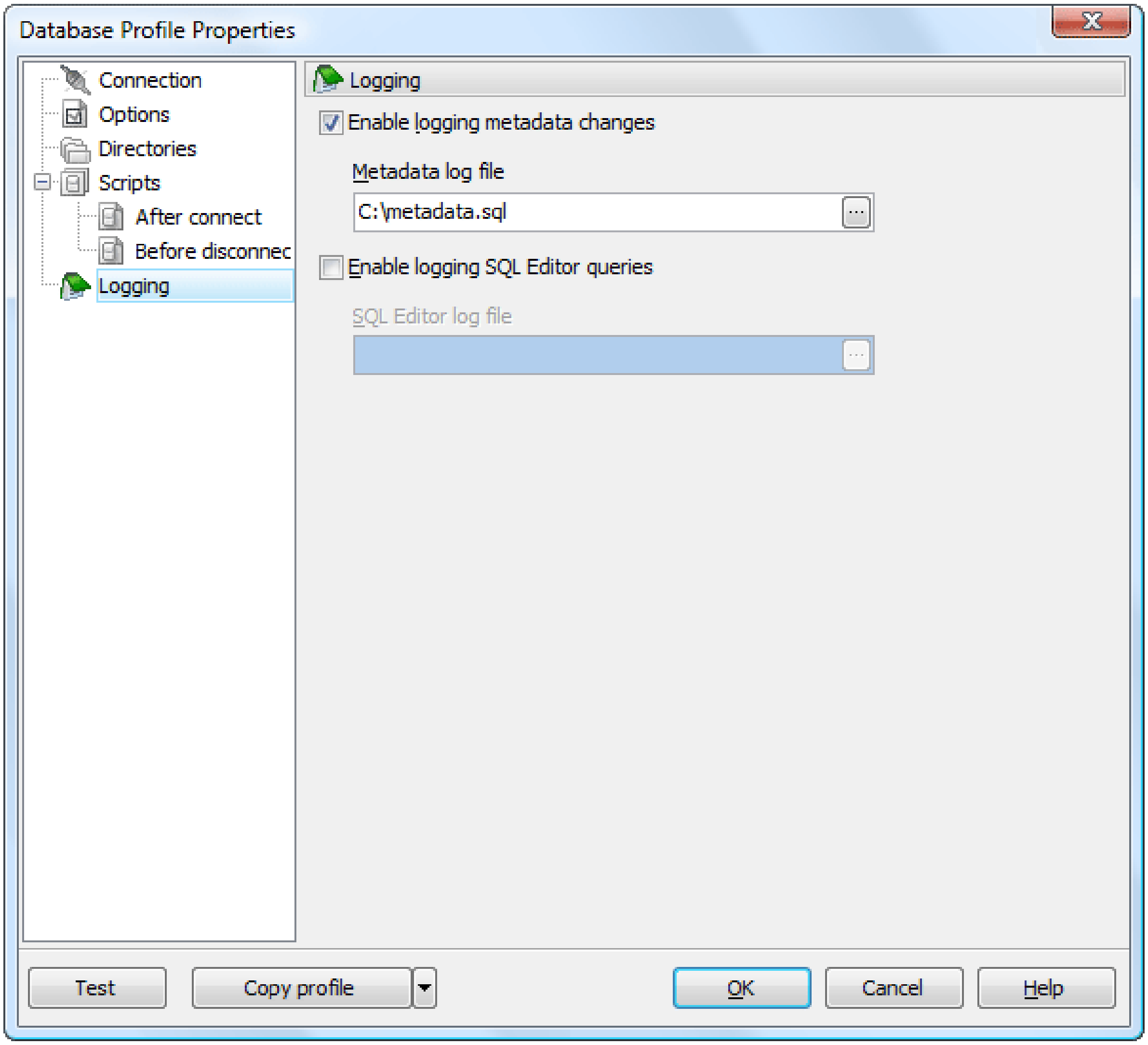
The next screen represents the example of an obligatory script to execute before DB2 Maestro will disconnect from the database. The script writes a disconnect time to the log table.



```
INSERT INTO DB2ADMIN.CONNECTION_LOG
     (ACTION)
VALUES
     ('disconnect')@
```

3.2.5 Setting log options

Enable/disable metadata changes logging and SQL query logging and specify the corresponding log file names if necessary.



☑ Enable logging metadata changes

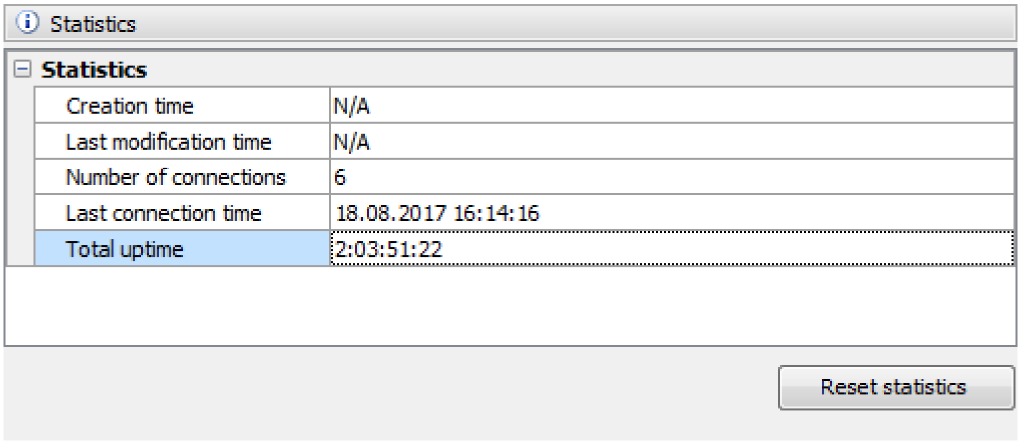
Metadata log file: C:\metadata.sql

☐ Enable logging SQL Editor queries

SQL Editor log file

3.2.6 Statisitcs

This tab allows you to view usage statistics for the current profile. Click the **Reset Statistics** button to clear all the displayed values.



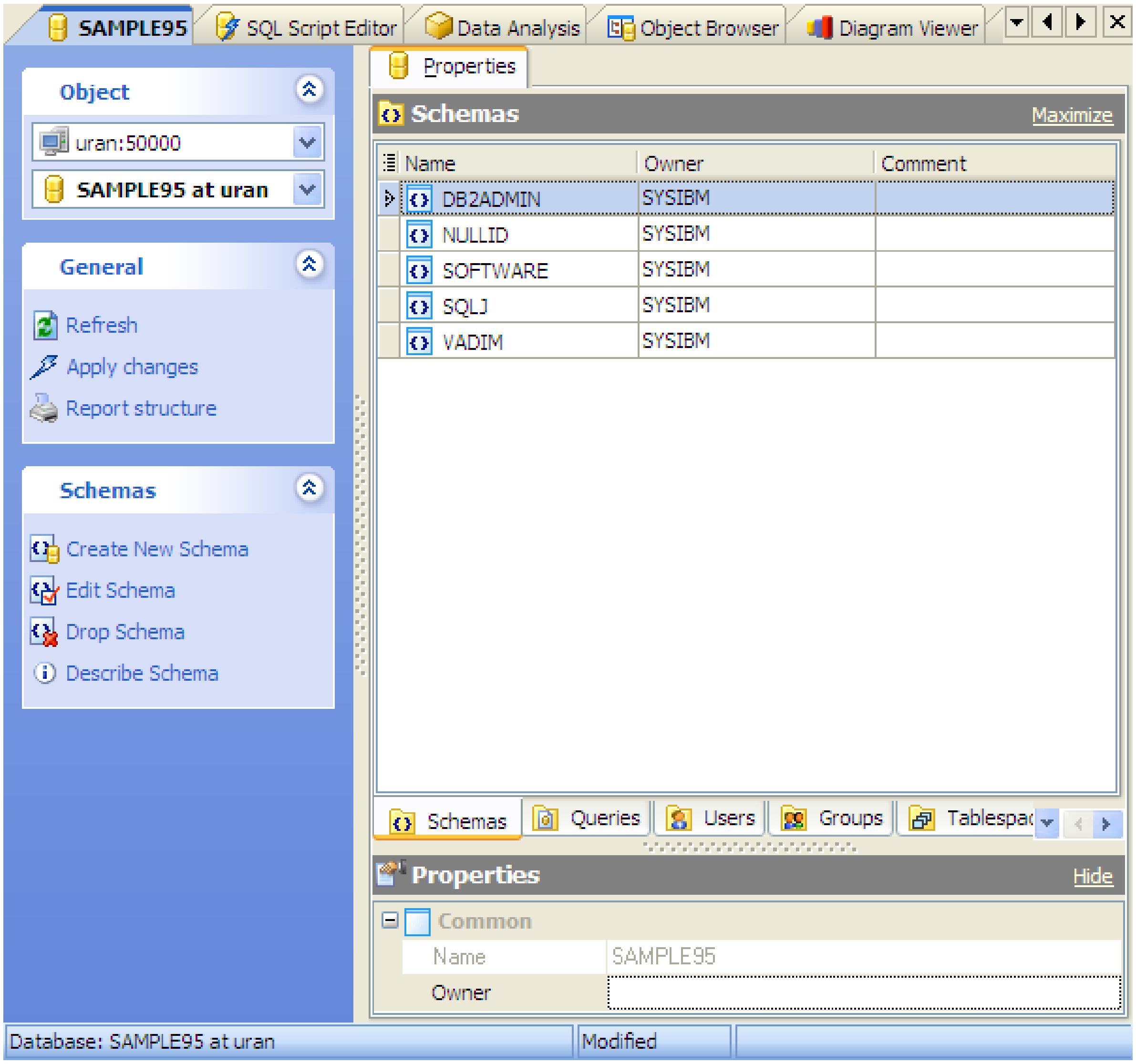
Statistics

Creation time	N/A
Last modification time	N/A
Number of connections	6
Last connection time	18.08.2017 16:14:16
Total uptime	2:03:51:22

3.3 Database Editor

Database Editor allows you to browse, add, edit and delete all objects of the selected database and its main properties.

To open the editor, use popup menu of the database node at the Explorer tree.



Name	Owner	Comment
DB2ADMIN	SYSIBM	
NULLID	SYSIBM	
SOFTWARE	SYSIBM	
SQLJ	SYSIBM	
VADIM	SYSIBM	

Name: SAMPLE95
Owner:

Database: SAMPLE95 at uran
Modified

Subitems

Every tab is intended for managing corresponding database objects (e.g. *tables, views, queries*, etc.). Open the object in its editor by double-clicking or pressing the **Enter** key. The popup menu allows you to create new, edit or drop the selected database objects. Using this menu you can also create a copy of the object.

You can operate on several objects at a time. For this you have to select database objects with the **Shift** or the **Ctrl** key pressed. After the group of objects is selected, you can operate on it, e.g. delete several objects at once, as it was a single object.

4 Database Object Management

DB2 Maestro provides you with several tools to manage and navigate DB2 objects. To browse and modify objects, at least one connection to a database should be established.

- Browse Database Objects 49
- Create New Objects 35
- Edit Existing Objects 38
- Duplicate Objects 44

The options to create or edit an object in DB2 Maestro follow the parameters defined by DB2. If you need clarification on what an option means or how it should be used, see DB2's documentation for more information. The documentation provides detailed description of objects, including their purpose, properties, and restrictions. The DB2 Maestro manual provides you with only brief review of DB2 objects.

4.1 Create Objects

DB2 Maestro provides a number of Create Object Wizards 35 to accomplish the most facile DB2 object creation.

There are several ways to invoke the necessary Create Object Wizard:

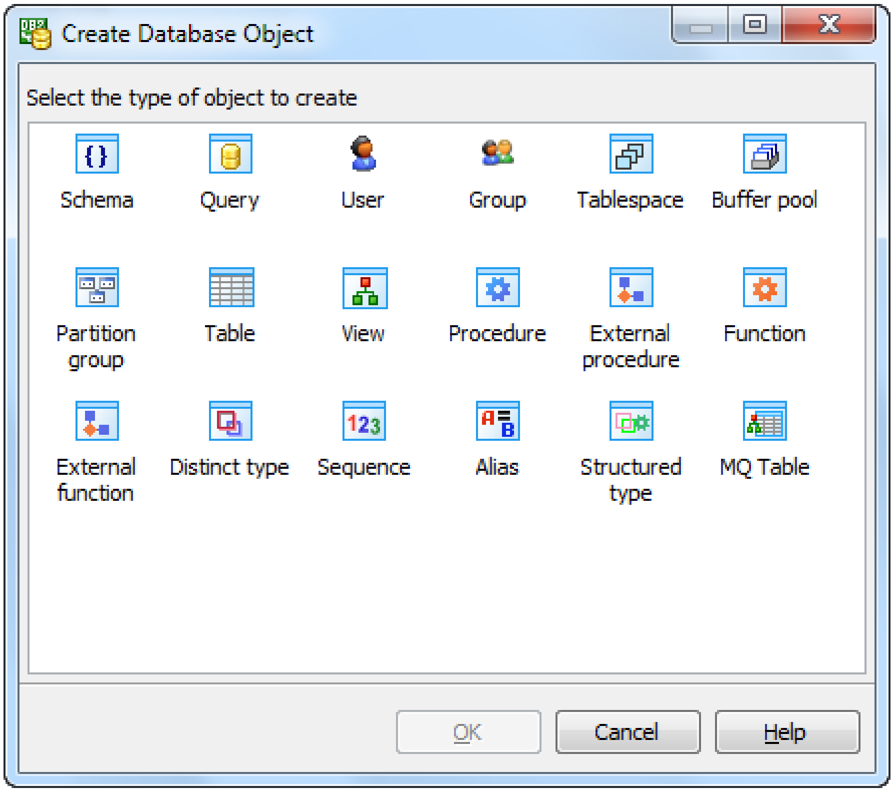
- select the Object | Create Database Object... main menu item;
- select the necessary icon (table, query, view, trigger, etc.) in the Create Database Object 35 dialog

or

- select the object list (Tables, Views, Triggers, etc.) or any object from that list in the Explorer tree (Object Manager and Object Browser);
- select the Create New Table (View, Trigger, etc.)... item from the popup menu or press **Insert**.

4.1.1 Create Database Object Dialog

The Create Database Object dialog allows you to create any type of database object supported by DB2 Maestro. To open the dialog select the Object | Create Database Object... main menu item or use the **Shift+Ctrl+N** hot keys combination. Select an object type icon and click the OK button to invoke the corresponding wizard or dialog.



4.1.2 Overview of Create Objects Wizards

Several steps of Create Object Wizards are common for all of them. This part purpose is the formulation of the basic principles for the Create Object Wizard organization.

- On the first wizard step 36 you need to specify the new object name.
- On the second one you have to define all the object properties. To clear up the object properties meanings see the appropriate topic of the respective Create Object Wizard section.
- Some objects has subitems (e.g. each table contains fields, indexes, procedures have parameters, etc). In this case the next step allows you to manage such subobjects of the object being created. We recommend you to store the following shortcuts in order to speed your work: the Ins key adds a new subobject, the Enter key displays the subobject's editor, and the Del key drops the subobject.
- The next wizard step 37 is final. It is provided to sum up the Create Object Wizard operation.

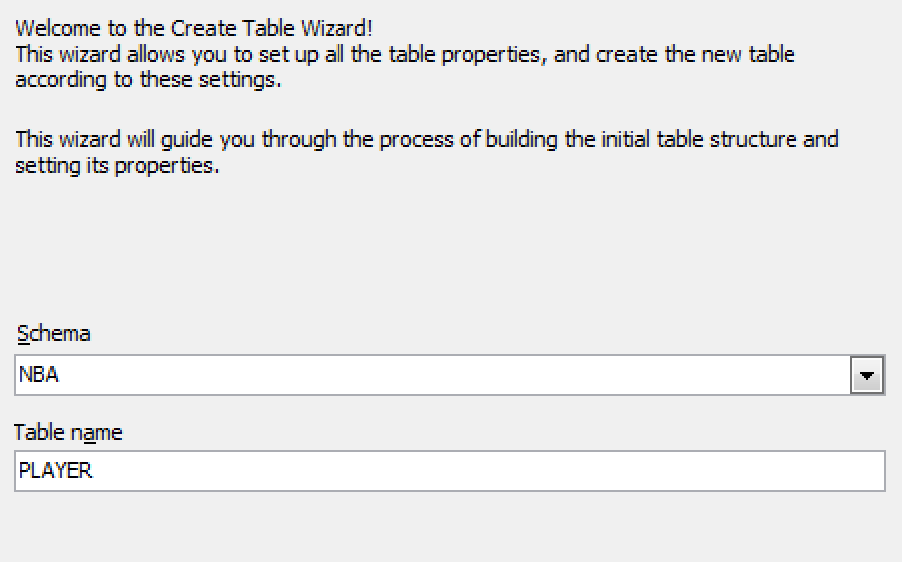
Note: There are some objects to have an additional Create Object Wizard steps. The detailed description of the steps you can find at the appropriate topic of the corresponding section.

See also:
- Create Schema Wizard 59
- Create Table Wizard 65
- Create View Wizard 90
- Create Function Wizard 113
- Create Distinct Type Wizard 120
- Create Sequence Wizard 132
- Creation of a New Query 182
- Create Procedure Wizard 99
- Creation of External Functions and Procedures 107
- Create Structured Type Wizard 137
- Creation of a Materialized Query Table 153

4.1.2.1 Setting object name

Select the container (table, schema, database, etc.) for the new object from the list of available containers and enter the new object name in the respective box.

Note: the name of the object must be unique among all the object names in its container. Moreover, all the objects that are source of data need unique names among themselves. You can use any identifier that is allowed by DB2 server.



Welcome to the Create Table Wizard!
This wizard allows you to set up all the table properties, and create the new table according to these settings.

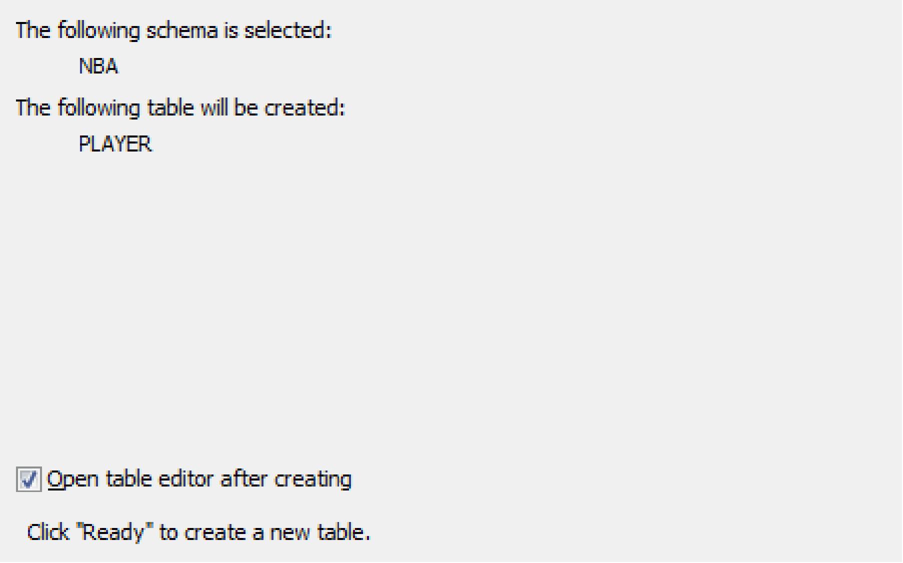
This wizard will guide you through the process of building the initial table structure and setting its properties.

Schema: NBA

Table name: PLAYER

4.1.2.2 Viewing common information

At this step common information about the object to be created is displayed. Select the Open object editor after creating option to open the appropriate Object Editor after the new object is created. Click the Ready button to complete creation of the object.



The following schema is selected:
NBA
The following table will be created:
PLAYER

☑ Open table editor after creating

Click "Ready" to create a new table.

4.2 Edit Objects

DB2 Maestro allows you to view and modify existing database objects in several ways:

- edit object comment with the Describe Object 43 dialog;
- briefly view and modify object properties 43;
- view and modify the object including subitems within the object editor.

To open an Object Editor 38, just double click its node in the Database Explorer tree. Of course this action is also available through popup menus, navigation bars, and so on.

4.2.1 Overview of Object Editors

Database Object Editors are the basic DB2 Maestro tools for working with existing objects. The proper editor can be opened automatically after the object is created. You can also open the necessary object editor with the corresponding items of popup menus of the Explorer Tree 49, Object Manager 54 or Object Browser 52.

The editors consist of a several tabs. Some tabs are similar for all editors. This part purpose is to formulate the basic principles of all Object Editors in DB2 Maestro.

- To edit object options such as name, owner, etc. use the Properties tab. To understand an option, see the appropriate topic of the corresponding Object Editor manual section and DB2 documentation.

  This tab also allows you to manage objects belonging to the selected one. To reset any tab to default settings, open it when holding the **Ctrl** key.

- Use the Permissions 39 tab to manage access privileges (grants) of the corresponding object.

- In a similar manner, some objects called grantees (e.g. users or roles) can have rights to do something with other objects (e.g. a user can read data from a table). This relationship can be set up at the Grants 39 tab.

- Most of objects have a possibility to be created from an SQL script (SQL definition). If so, the corresponding script is available at the SQL 41 tab of the editor.

- There is a Result tab in editors of such routines as functions and procedures that can take parameters, perform calculations or other actions, and return a result. You can execute 42 any routine directly from its editor.

Note: Some object editors have additional tabs. The detailed description of them you can find at the appropriate topic of the corresponding section.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

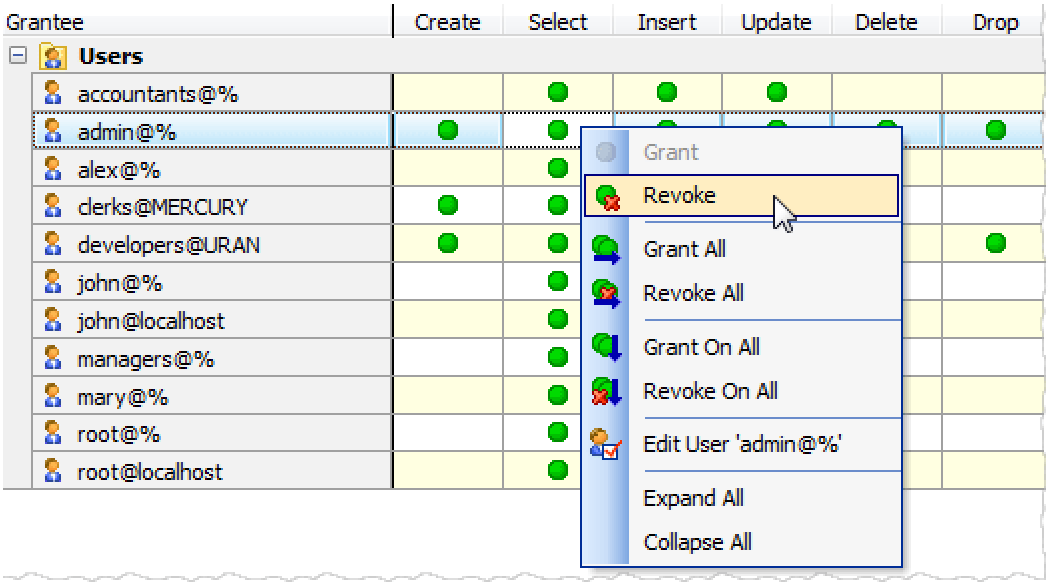
See also:

- Schema Editor 61
- Table Editor 67
- View Editor 94
- Function Editor 115
- Distinct Type Editor 121
- Sequence Editor 133
- Procedure Editor 103
- Editing of External Functions and Procedures 109
- Structured Type Editor 141
- Editing of a Materialized Query Table 158

4.2.1.1 Permissions of the Object

The Permissions grid allows you to manage access privileges (grants) of users.

Grants give specific privileges for an object to one or more users.



Using the grid you can grant/revoke privileges as well as sort and filter displayed grantees.

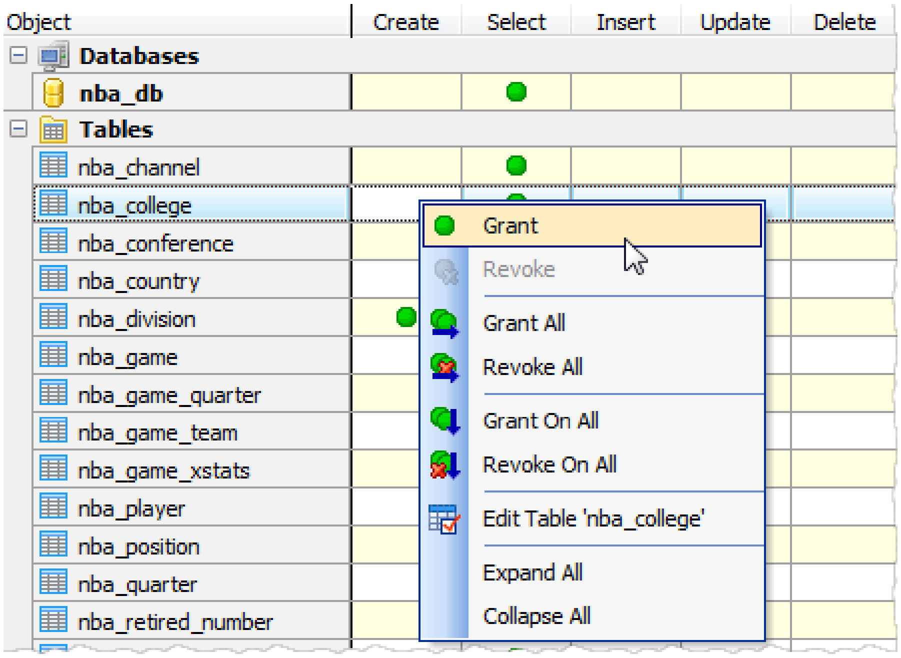
See also:

4.2.1.2 Object grants

The Grants grid allows you to manage access privileges (grants) of the current object.

A grant gives specific privileges on an object (*table, view, procedure*) to the current one.

All objects are grouped by kind. Filter the object kinds using the checkboxes at the bottom of the window. Using the grid you may sort and filter data.



To grant the subject privilege on the object double-click an empty field; to revoke the privilege double-click a grant with grant option.

Use grid's popup menu to *grant, grant all, grant with grant option, grant all with grant option, grant on all, grant on all with grant option, revoke, revoke all* and *revoke on all*:

- select the Grant item to grant the subject privilege on the object;
- select the Grant All item to grant all the privileges on the object;
- if the Grant With Grant Option item is selected, the recipient of the privilege may in turn grant it to others (without a grant option specified, the recipient cannot do that; at present, grant options can only be granted to individual subject, not to groups or Public);
- select the Grant All With Grant Option item to grant with grant options the privilege on all the objects of the kind;
- select Grant On All or Grant On All With Grant Option to grant or grant with grant options respectively the subject privilege on all the objects;
- to revoke the privilege, all the privileges on the object or the privileges on all the server objects select the Revoke, Revoke All or Revoke On All items respectively.

Using the popup menu you can also collapse or expand all the object kinds.

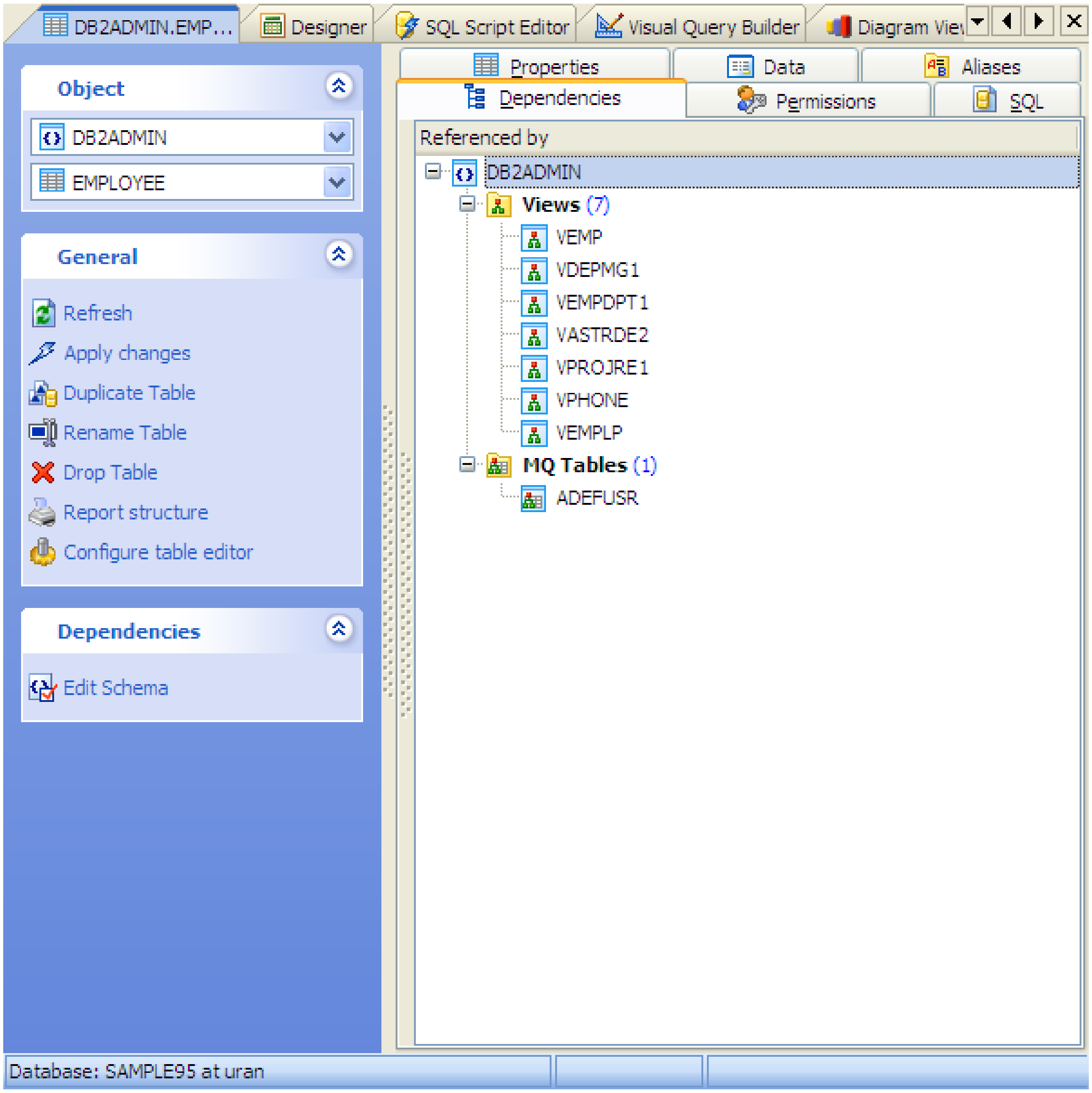
4.2.1.3 Object Dependencies

When you create complex database structures involving many tables with foreign key constraints, views, triggers, Functions, etc. you will implicitly create a net of dependencies between the objects. For instance, a table with a foreign key constraint depends on the table it references. We tried to create a software to make your work easier, i.e. to give you the tools for efficient database objects management. The Dependencies tab allows you to control the correlation of objects efficiently.

The Depends on window represents all the objects the current object depends on.

The Referenced by window contains the tree of database objects constituting the dependency relationship on the current object.

Use items of the popup menu to edit the selected object in Object Editor or to drop the object.



4.2.1.4 SQL Definition

The SQL tab displays the SQL definition for the object with all its properties. Bear in mind that this text is read-only. If you want to change the object definition, use the appropriate editor tabs instead, or copy the text to the Windows Clipboard to paste it in SQL Editor or SQL Script Editor.

The SQL definition window allows you to browse the text effectively. The popup menu and the extensive system of hot keys give you the opportunity to search expressions within the text, to select the whole text for copying it to the Windows Clipboard, to save the definition to the *.sql* or *.txt* files, to print the document, etc.

You can customize the displayed definition using the Editors & Viewers 301 options.

The Properties item of the popup menu displays the Options dialog in which you can establish optional settings concerning the current database.

The Code Folding item group makes it possible to view either the whole text or its logical parts (regions). Each region can be collapsed and extended.

In extended mode the whole text is displayed (set by default)

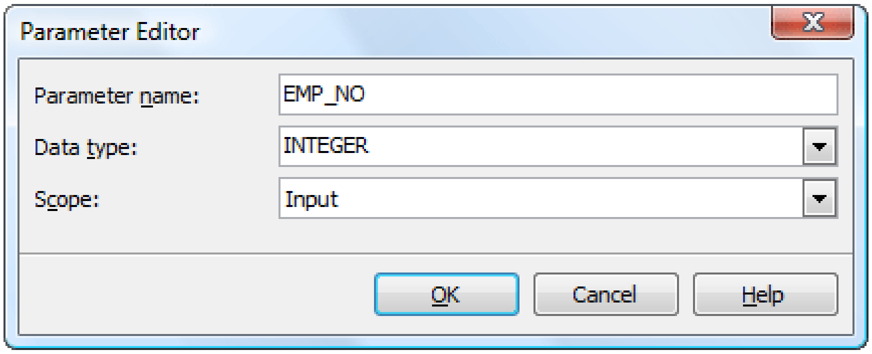
In collapsed mode the text is hidden behind one text line denoting the first line of the collapsed region.

Navigation Bar on the SQL tab allows you to copy the object's SQL definition (DDL) to the SQL Script Editor for future modifications.

4.2.1.5 Parameter Editor

The editor allows you to change the Parameter name, Data type.

Use the Scope box to set whether parameter is *Input, or Output,* or *Input-Output*.

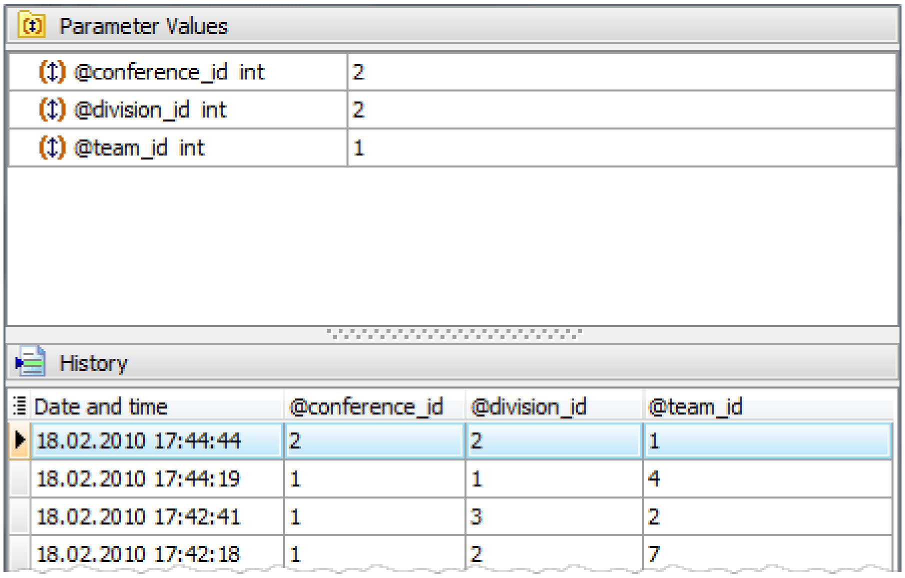


Parameter name: EMP_NO
Data type: INTEGER
Scope: Input

4.2.1.6 Executing functions and procedures

Editor provides an opportunity to execute current routine by opening the Results tab, by clicking the Execute item of the Navigation Bar, or by pressing the **F9** key.

If the has parameters, DB2 Maestro will ask you to specify the values for these parameters in the Input parameters dialog which appears before the procedure execution. Input parameters dialog allows you to specify the values for all input parameters. After changes are made, click the OK button to execute the Function, or the Cancel button to abort the execution.



Parameter Values

@conference_id int	2
@division_id int	2
@team_id int	1

History

Date and time	@conference_id	@division_id	@team_id
18.02.2010 17:44:44	2	2	1
18.02.2010 17:44:19	1	1	4
18.02.2010 17:42:41	1	3	2
18.02.2010 17:42:18	1	2	7

DB2 Maestro supports Parameter History. Values that have been set previously as the routine parameters are represented in the History tab of the Input Parameter dialog with a date and time of their last using. Double click a necessary set of values to set them as the routine parameters. You can manage the Parameter History with Delete history item and Clear history links.

The result of the successfully executed routine can be found within the Results tab of Editor.

Note: If any unsaved changes are applied to the routine being currently edited, the execution of the routine is impossible until changes are saved by the Compile procedure item of the Navigation Bar.

4.2.2 Modify Object Properties

You can rename all objects those can be renamed with the corresponding option of the popup menu of the object at the Explorer tree. To edit other properties of the selected object without opening its editor, use the Object Properties dialog. To open this dialog, select the according item of the same popup menu. To clear up the object properties meanings, see the appropriate topic of the respective Object Editor section.

4.2.3 Describe Objects

Essentially a comment is the most often altered object property. To simplify it's editing, the DB2 Maestro provides an ability to Describe the object within the Database Explorer immediately without opening of the object's editor.

Step-by-step:

- Select the necessary object in the explorer tree;
- Choose the Describe Object... item in the popup menu;
- Edit object comments within the Describe Object window;
- To commit the changes, push OK button.

4.3 Duplicate Objects

DB2 Maestro offers several ways of objects duplicating.

1. **Duplicate Object Wizard.** The wizard is the most flexible tool of the coping. Along with a possibility to adjust the new object definition it allows you to copy data (for tables). But it consists of several steps 44 and takes more time than other manners.

2. **Duplicate Object** window allows you to attune new object's SQL definition. It is preferred for creation a copy of selected object. Here 46 you can find some additional info.

3. By **Drag-n-Drop** 47 **operation.**

4.3.1 Duplicate Object Wizard

The Duplicate Object Wizard allows you to create a new database object with the same properties as the existing one. It is the most flexible tool of copying objects provided by DB2 Maestro. It also allows you to copy data of the selected table to the new one.

To run the wizard select the Object | Duplicate Database Object... main menu item.

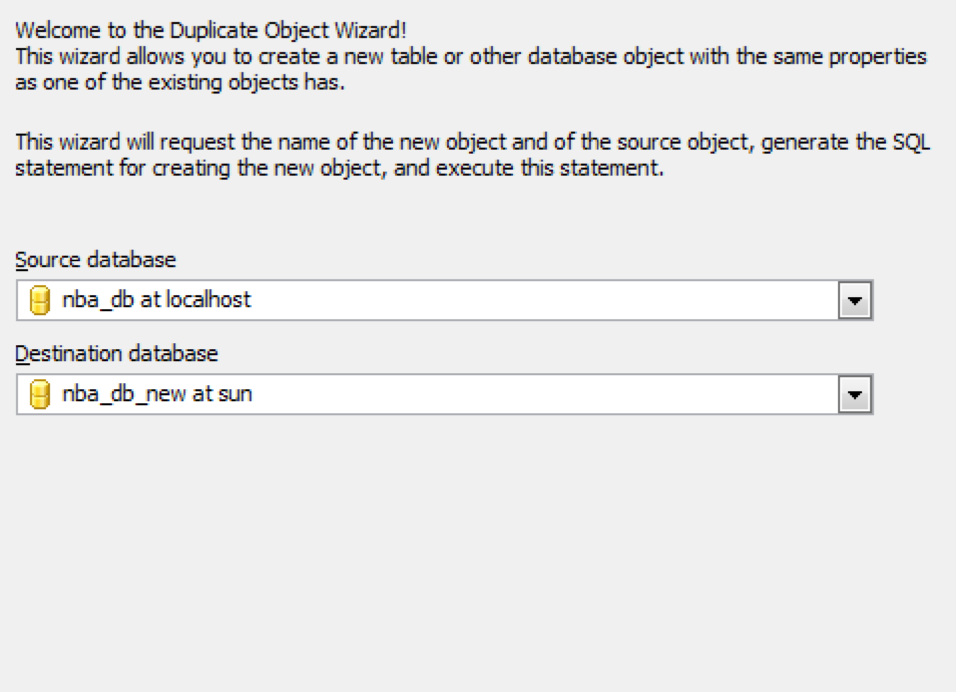
- Selecting source and destination databases 44
- Selecting object to duplicate 45
- Modifying definition of a new object 46

See also: Create Database Object 35

4.3.1.1 Selecting source and destination databases

Select the database containing a source object from the list of connected databases, and then specify the database for the duplicated object.

You should connect to the destination database beforehand (see Database Management 21).



Welcome to the Duplicate Object Wizard!
This wizard allows you to create a new table or other database object with the same properties as one of the existing objects has.

This wizard will request the name of the new object and of the source object, generate the SQL statement for creating the new object, and execute this statement.

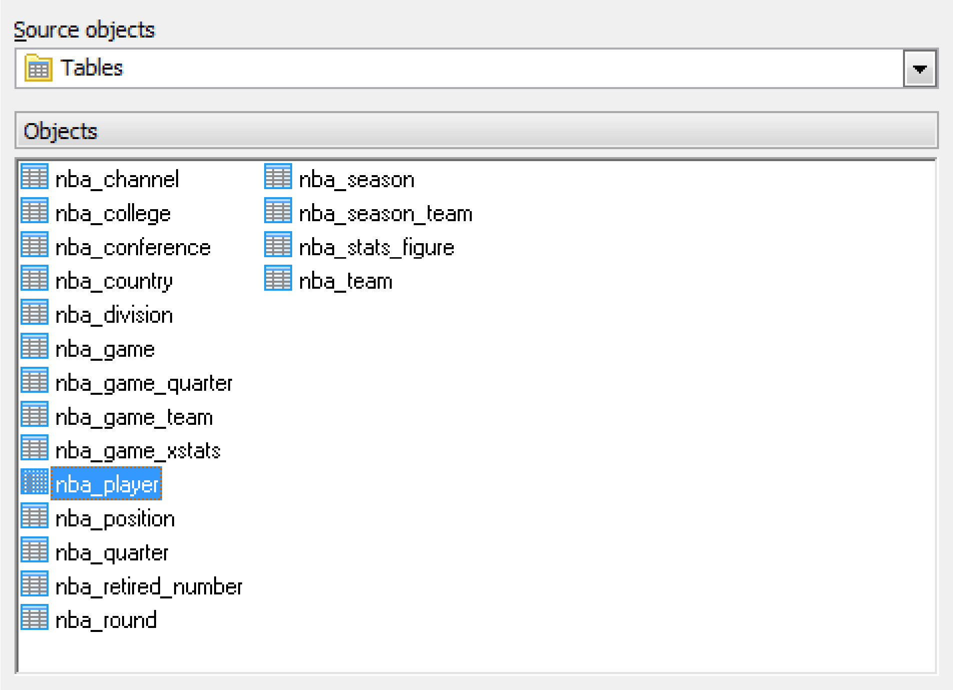
Source database: nba_db at localhost

Destination database: nba_db_new at sun

4.3.1.2 Selecting object to duplicate

Specify a database object to create the new one with the same properties.

1. Select the type of the object to duplicate from the Source objects drop-down list.
2. Pick up the necessary object from the list.



Source objects: Tables

Objects

nba_channel
nba_college
nba_conference
nba_country
nba_division
nba_game
nba_game_quarter
nba_game_team
nba_game_xstats
nba_player
nba_position
nba_quarter
nba_retired_number
nba_round
nba_season
nba_season_team
nba_stats_figure
nba_team

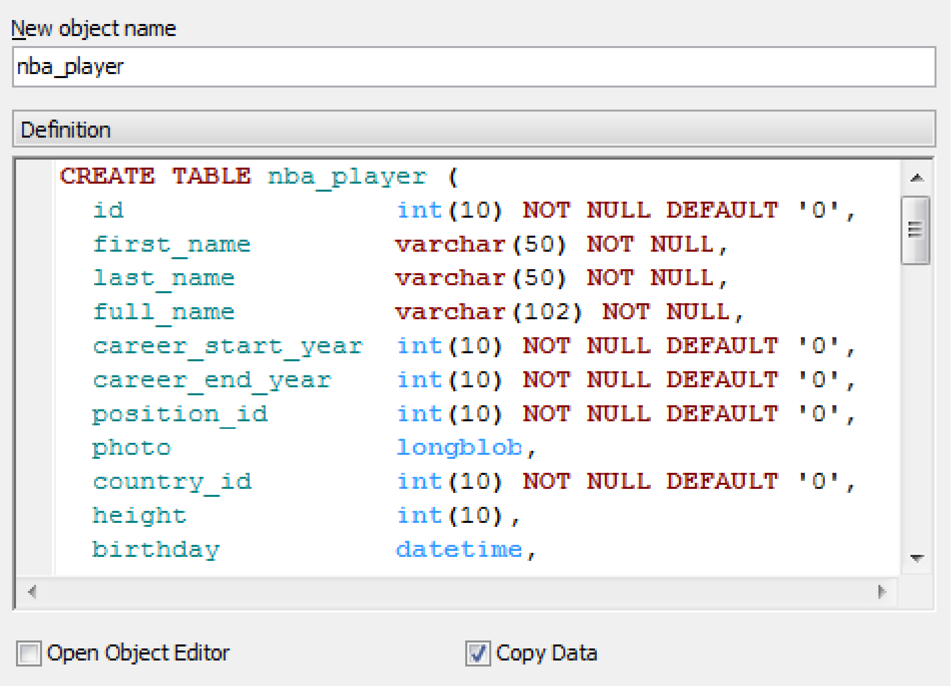
4.3.1.3 Modifying new object definition

The last wizard step allows you to edit the new object definition directly.

Use this step to edit the name of object been creating (New Object Name). By default DB2 Maestro generates the new object definition with the same name if the duplicating is to the source database, or like "%SOURCE_OBJECT_NAME%01" otherwise.

Note: the name of the object must be unique among all the object names in its container. Moreover, all the objects that are source of data need unique names among themselves. You can use any identifier that is allowed by DB2 server.

You can edit the result SQL statement manually, add or remove fields, change field types, using the New object definition text area. Click the Ready button to complete the operation.
Check the according boxes to Copy Data (only for tables) and to Open Object Editor after the duplicating.



New object name: nba_player

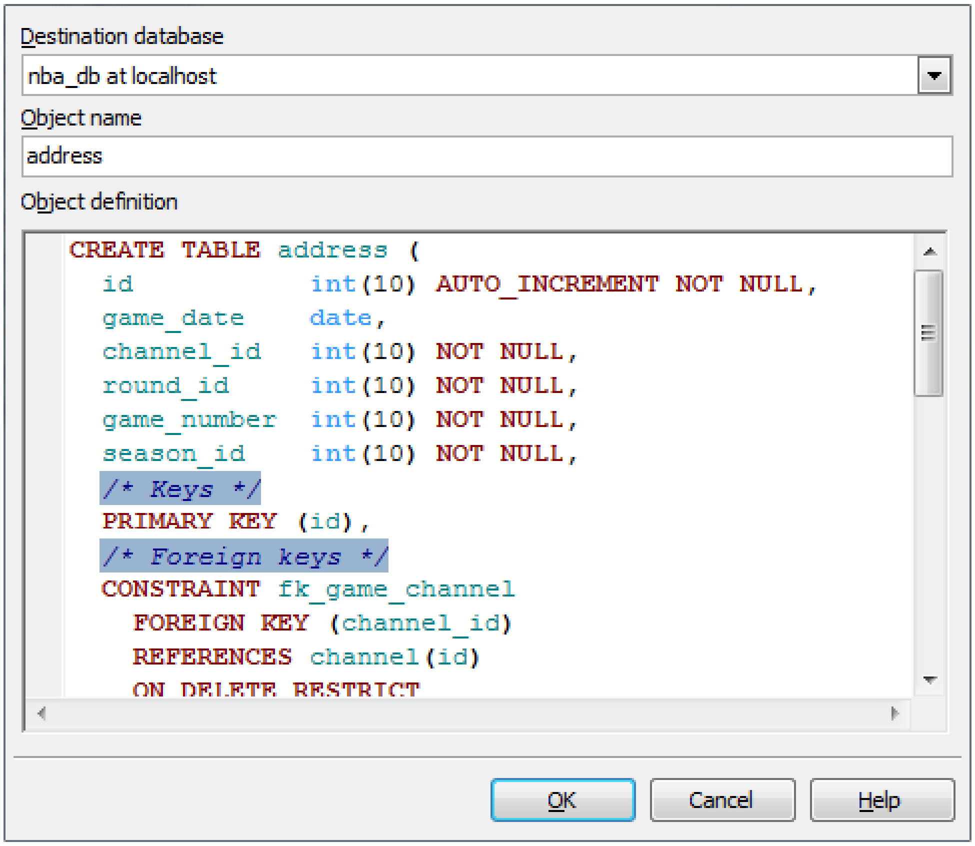
```
CREATE TABLE nba_player (
  id                  int(10) NOT NULL DEFAULT '0',
  first_name          varchar(50) NOT NULL,
  last_name           varchar(50) NOT NULL,
  full_name           varchar(102) NOT NULL,
  career_start_year   int(10) NOT NULL DEFAULT '0',
  career_end_year     int(10) NOT NULL DEFAULT '0',
  position_id         int(10) NOT NULL DEFAULT '0',
  photo               longblob,
  country_id          int(10) NOT NULL DEFAULT '0',
  height              int(10),
  birthday            datetime,
```

☐ Open Object Editor ☑ Copy Data

4.3.2 Duplicate Selected Object

Within the Duplicate Object window you can duplicate a selected object fast and with some modifications.

It is available from the corresponding link of the object's popup menu at the Database Explorer.



nba_db at localhost

address

```
CREATE TABLE address (
  id            int(10) AUTO_INCREMENT NOT NULL,
  game_date     date,
  channel_id    int(10) NOT NULL,
  round_id      int(10) NOT NULL,
  game_number   int(10) NOT NULL,
  season_id     int(10) NOT NULL,
  /* Keys */
  PRIMARY KEY (id),
  /* Foreign keys */
  CONSTRAINT fk_game_channel
    FOREIGN KEY (channel_id)
    REFERENCES channel(id)
    ON DELETE RESTRICT
```

Select the database for a new object from the list of connected databases first.

Enter the name for the new object.

> **Note:** the name of the object must be unique among all the object names in its container. Moreover, all the objects that are source of data need unique names among themselves. You can use any identifier that is allowed by DB2 server.

You can also edit the SQL definition of the object if necessary (add or remove fields, change field types, etc.).

4.3.3 Copy, Paste and Drag-n-Drop features

DB2 Maestro provides you with an ability of copying database objects within the database or even from one database to another (in this case you should connect to both the source and the destination databases first).

To copy an object, just drag the object in a source window (such as Database Explorer, Object Manager, Object Browser) and drop it to the target container in another window. You also can use the Edit | Copy and the Edit | Paste main menu items or the **Ctrl+C**/**Ctrl+V** hot keys combinations respectively. Copying several objects at a time is also available.

It is also possible to drag and drop objects between Database Explorer, Object Manager, Object Browser and SQL Editor or SQL Script Editor. This works as follows:

SQL Editor: after dropping the object you will get a query to retrieve object data (e.g. SELECT * FROM table_name) or the full name of the object if it doesn't contain data (domains, indexes, etc.).

SQL Script Editor: after dropping the object you will get its SQL definition if applicable.

See also: Database Explorer, Object Manager, and Object Browser

4.4 Browse Objects

DB2 Maestro allows to browse objects stored in a Remote Server database in several ways:

- Database Explorer 49: objects are represented as a hierarchy (grouped by kind and listed under the according DB2 database node, provided with subobjects if exist)
- Object Browser 52: an extension of explorer with ability to sort, group, filter and multiple select objects.
- Object Manager 54: an extension of the explorer with ability to select several objects at a time (to copy, drop, etc.)

All tool allows you to drag-and-drop between them and to perform all necessary operations upon database objects.

4.4.1 Database Explorer

Database Explorer is the basic feature of DB2 Maestro which allows you to perform practically all necessary operations upon databases and their objects. The Database Explorer area occupies the left side of the DB2 Maestro main window. All the objects at the Explorer tree are grouped by kind and listed under the according DB2 database node.

To start working with a database you need to create its profile first. The conception of database profiles gives you an opportunity to connect to databases in one touch and work with the selected databases only.

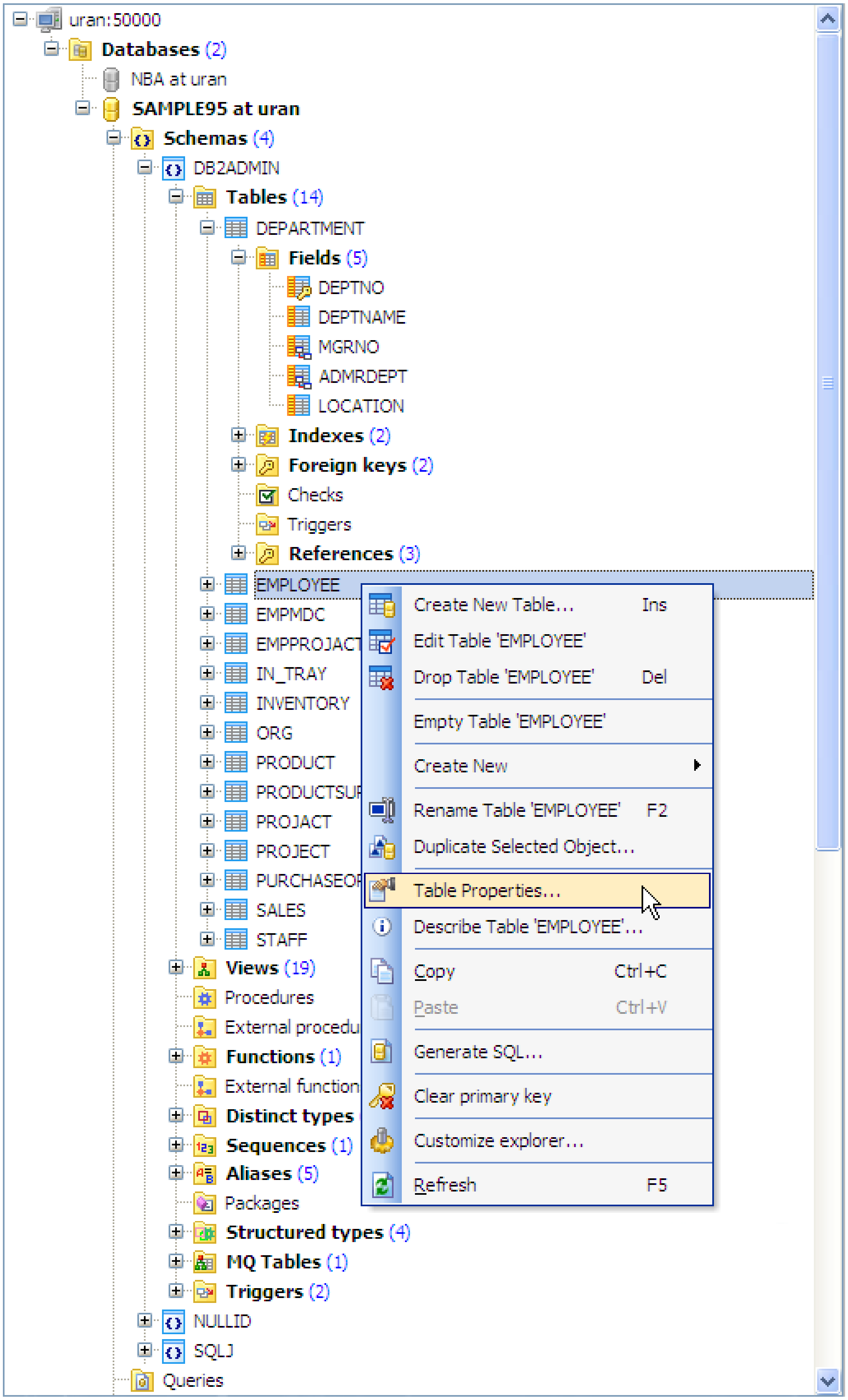
See also: Object Manager 54, Object Browser 52

Note: In case your databases have a large quantity of objects you can speed up the object search by typing first letters of the object name in the explorer area.

Note: Explorer options 284 allow you to hide/display table subobjects, represent system objects in different color, etc.

The sections below describe each of these actions in detail.

- What operation can I accomplish upon database profiles within the Explorer Tree? 51
- How can I connect to a database? 49
- How can I disconnect from a database? 51
- What operations can I accomplish upon database objects within the Explorer Tree? 51
- Can I copy a database object from one database to another? 51
- Can I filter Explorer content? 52


uran:50000
Databases (2)
NBA at uran
SAMPLE95 at uran
Schemas (4)
DB2ADMIN
Tables (14)
DEPARTMENT
Fields (5)
DEPTNO
DEPTNAME
MGRNO
ADMRDEPT
LOCATION
Indexes (2)
Foreign keys (2)
Checks
Triggers
References (3)
EMPLOYEE
EMPMDC
EMPPROJACT
IN_TRAY
INVENTORY
ORG
PRODUCT
PRODUCTSUF
PROJACT
PROJECT
PURCHASEOR
SALES
STAFF
Views (19)
Procedures
External procedu
Functions (1)
External function
Distinct types
Sequences (1)
Aliases (5)
Packages
Structured types (4)
MQ Tables (1)
Triggers (2)
NULLID
SQLJ
Queries
Create New Table... Ins
Edit Table 'EMPLOYEE'
Drop Table 'EMPLOYEE' Del
Empty Table 'EMPLOYEE'
Create New
Rename Table 'EMPLOYEE' F2
Duplicate Selected Object...
Table Properties...
Describe Table 'EMPLOYEE'...
Copy Ctrl+C
Paste Ctrl+V
Generate SQL...
Clear primary key
Customize explorer...
Refresh F5

Operations upon database profiles in the Explorer Tree
Using popup menu of the Explorer area you can realize the following operations:

- create new database profiles 23 (the Create Database Profiles... item);
- rename currently selected database profile (the Rename Database Profile... item);
- edit currently selected database profile 25 (the Edit Database Profile... item);
- reorder existing database profiles (the Reorder Databases...item of Databases node's popup menu or using drag-n-drop);
- reorder servers (the Reorder Servers...item of a server's popup menu);
- remove currently selected database profile from the explorer tree (the Remove Database Profile item);
- remove all profiles of selected server (the Remove all Profiles item of Databases node's popup menu).

In addition to these operations, Database Explorer gives you an ability to reorder existing profiles by performing drag-and-drop operations within the explorer tree.

How can I connect to a database?
You can establish connection to a database in Database Explorer by selecting the database profile and double-clicking it or pressing the Enter key (alternatively, you may use the Shift+Ctrl+C hot key combination). The same operation is also available through the Connect to Database item from the explorer popup menu, or through the Database | Connect to Database main menu item.

How can I disconnect from a database?
You can abort connection from a database in Database Explorer by selecting the database profile and pressing the Shift+Ctrl+D hot key combination. The same operation is also available through the Disconnect from Database item from the explorer popup menu, or through the Database | Disconnect from Database main menu item.

Operations upon database objects
Database Explorer allows you to perform the following operations with database objects using its popup menu (note that the popup menu contains object-specific items only when some database object is currently selected in the explorer tree):

- create a new database object (the Create New Object... item);
- edit currently selected database object (using the Edit Object... item, pressing the Enter key or double-clicking the database object);
- drop the selected object from the database (the Drop Object... item);
- rename the selected database object (the Rename Object... item);
- edit the database object properties (the Object properties ... item);
- duplicate the selected object (the Duplicate Object... item).
- run the Object Browser tool (the Browse ... item).

Can I copy a database object from one database to another?
Database Explorer provides you with an ability of copying database objects from one database to another. To perform this operation, you should connect to both the source

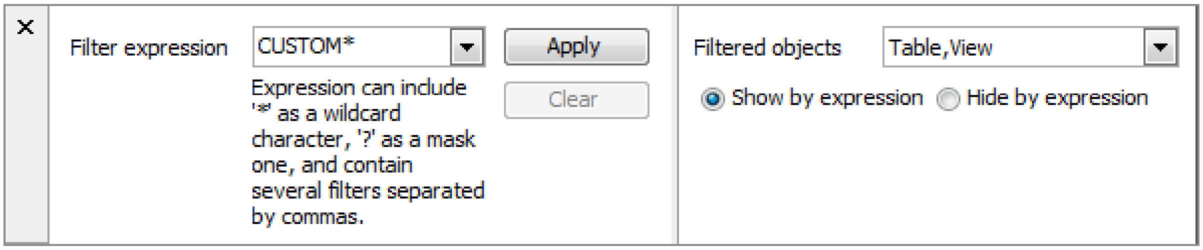
and the destination databases first. After the connection is established, simply drag and drop an object to copy from the source database to the corresponding node (Tables, Queries, etc.) of the destination database.

Note: You also can use the Edit | Copy and the Edit | Paste main menu items to copy/paste a database object using Windows clipboard (alternatively, you may use the Ctrl+C/Ctrl+V hot keys combinations respectively).

4.4.1.1 Filtering explorer content

DB2 Maestro allows you to reduce the number of represented objects in the explorer tree. To hide seldom usable objects, filter your explorer content.

Filter Panel is available through the View | Show Filter Panel main menu item.



Expression can include '*' as a wildcard character, '?' as a mask one, and contain several filters separated by commas.

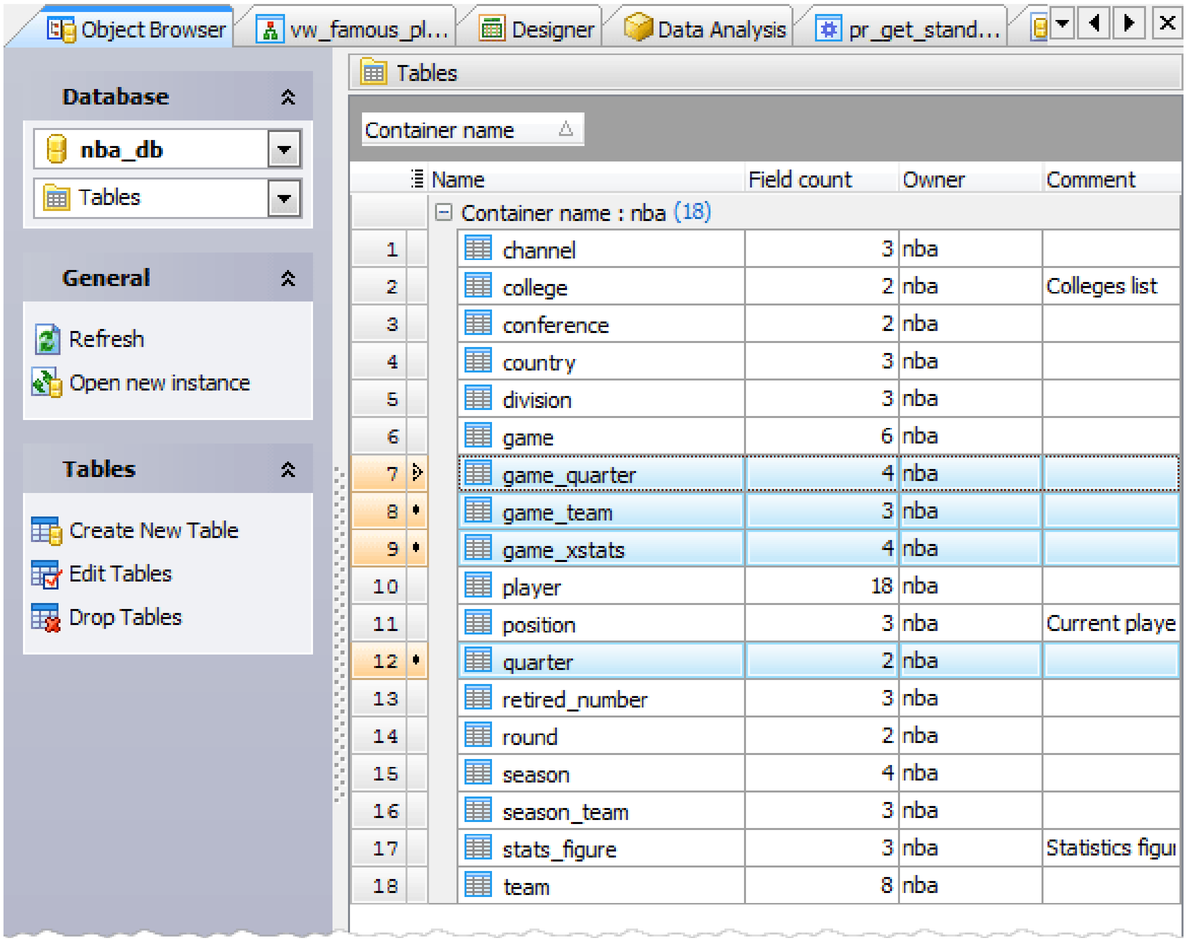
- Specify the Filter expression. The expression can contain any part of object name combined with an asterisk ('*') as a wildcard character and a question-mark ('?') as a mask character.
- Define the Filtered objects, object types for filtering in the explorer tree.
- Check the according radio button (Show by expression, Hide by expression) to define whether database objects will be shown or hidden in accordance with the filter expression.
- Click Apply button.

Note: A filter expression, if applied to the content of Database Explorer, is applied to the content of Object Manager 54 and Object Browser 52 as well.

4.4.2 Object Browser

Object Browser is a tool for operating on database objects designed as an extension of Database Explorer 49 with ability to *sort*, *group* and *filter* the database objects. It also provides such operation as multiple selecting of objects (for *copying*, *dropping*, etc.) and the ability of using drag-and-drop operations between Object Browser and Database Explorer. To open Object Browser select the Object | Object Browser main menu item.

Note: At least one connection to a database should be established to make Object Browser available.



Container name : nba (18)

	Name	Field count	Owner	Comment
1	channel	3	nba	
2	college	2	nba	Colleges list
3	conference	2	nba	
4	country	3	nba	
5	division	3	nba	
6	game	6	nba	
7	game_quarter	4	nba	
8	game_team	3	nba	
9	game_xstats	4	nba	
10	player	18	nba	
11	position	3	nba	Current playe
12	quarter	2	nba	
13	retired_number	3	nba	
14	round	2	nba	
15	season	4	nba	
16	season_team	3	nba	
17	stats_figure	3	nba	Statistics figu
18	team	8	nba	

Sorting database objects

Object Browser represents database objects in a grid. The object kind to display is defined on the top of the Navigation bar. The columns correspond to the objects properties and rows correspond to the objects. Click the column caption to sort objects by the values of this column in the ascending or descending mode. The navigation buttons allow you to open current object editor, create new or drop the existing one.

As Object Manager the browser allows you to operate on several objects at a time. You have an opportunity to select a batch of objects and after the object group is selected, you can operate on it (e.g. *drop several objects at once*) as if it were a single object.

The unique feature of the DB2 Maestro is an opportunity of drag-and-drop operations between Object Browser and SQL Editor, SQL Script Editor. After the action objects are represented in SQL Editor as SQL queries (if they contain data) or as their full name in the database otherwise. SQL Script Editor displays the objects as SQL definition.

Grouping database objects

You can group grid objects by any of the columns by dragging the column header to the destination area. Now all the records are displayed as subnodes to the grouping row value as shown in the picture. To reverse grouping, just drag the column name from the upper area back.

Filtering database objects

You can filter objects in the grid using one of the following methods:

- use the drop-down button in the column caption area to filter objects by the value of the selected column
- click the drop-down button in the column caption area, then select the Custom item and build a simple filter within the dialog in the following way: select a logical operator for checking the column values (like is less than, is greater than, etc) and set the value to be checked by this operator in the neighboring box; then set the second condition if necessary in the following way and set the relation between these two conditions, whether both of them should be matched or just one of them; use the '_' character to represent any single symbol in the condition and the '%' character to represent any series of symbols in the condition

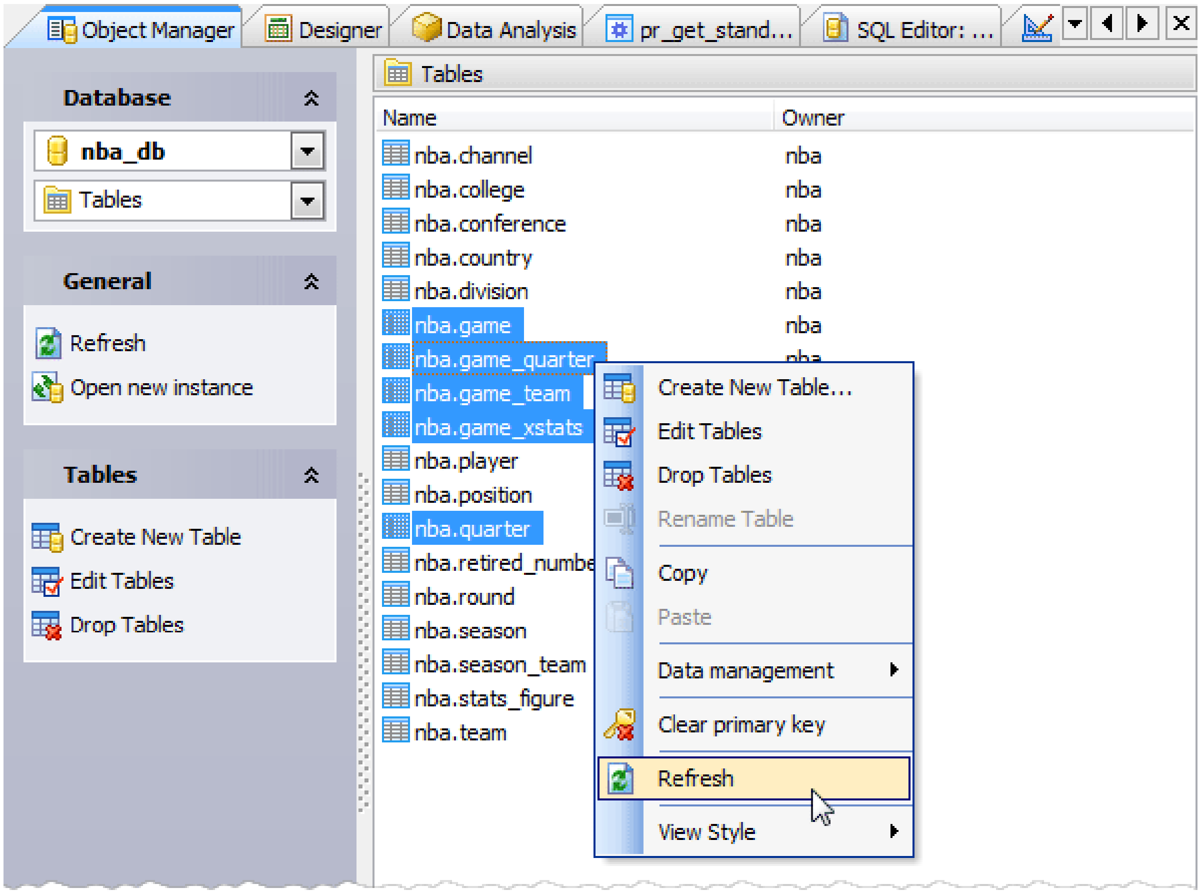
After you set a filter, the filtering panel becomes visible at the bottom of the grid where you can see the active filtering condition and easily enable or disable it by clicking the check box on the left. Using this panel you can also customize your filter in a more complicated way by clicking the Customize button and building your filter within the Filter Builder dialog.

See also: Object Manager 54, Data View 199

4.4.3 Object Manager

Object Manager is a tool for operating on database objects designed as an extension of the Database Explorer 49 with advanced features, such as multiple selecting of objects (for *copying*, *dropping*, etc.) and the ability of using drag-and-drop operations between Object Manager and Database Explorer as well as between two instances of the Object Manager. To open Object Manager select the Object | Object Manager main menu item.

Note: At least one connection to a database should be established to make Object Manager available.



Using popup menu
The popup menu of Object Manager may have different content depending on the current selection. The common menu items allow you to switch the object list view between four standard modes *(large icons, small icons, list* and *report*), refresh the current view, and select all the objects in the view. If none of objects are currently selected, other menu items are unavailable to use, except of the one for creating a new object. If one or more objects are selected, clipboard operations (such as copy and paste) become available as well as the items for editing and dropping selected object(s). If the current object type of the Object Manager is *"Tables"*, the *Empty Table(s)* menu item is also available.

Multiple selecting of database objects
Object Manager allows you to operate on several objects at a time. You have an opportunity to select a batch of objects and after the object group is selected, you can operate on it (e.g. *drop several objects at once*) as if it were a single object.

See also: Object Browser 52

4.4.4 Filter Builder Dialog

Filter Builder Dialog allows to limit represented objects according to specified conditions. It may be useful for filtering records in data grids of Table Editors, SQL Editor or Visual Query Builder as well as to filter database objects in Object Browser, and on setting a condition on anew view creating. All these cases are similar, see how it works on the following example.

5 Database Objects

The following list contains database objects supported by DB2 Maestro. To work with database objects you should connect to the database 13 first.

- Schemas 58
- Tables 64
- Views 89
- Functions 112
- Distinct Types 119
- Sequences 131
- Procedures 98
- External Functions and Procedures 106
- Structured Types 136
- Materialized Query Tables 152

5.1 Schemas

A schema is a collection of named objects; it provides a way to group those objects logically. A schema is also a name qualifier; it provides a way to use the same natural name for several objects, and to prevent ambiguous references to those objects; for example, the schema names 'INTERNAL' and 'EXTERNAL' make it easy to distinguish two different SALES tables (INTERNAL.SALES, EXTERNAL.SALES).

Schemas also enable multiple applications to store data in a single database without encountering namespace collisions.

How can I add a new schema?

New schemas are created within Create Schema Wizard 59. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Schema icon in the Create Database Object dialog

or

- select the Schemas list or any object from that list in the explorer tree;
- select the Create New Schema... item from the popup menu

or

- open the database in Database Editor and the Schemas tab there;
- press the **Insert** key or select the Create New Schema item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new schema with the same properties as one of the existing schemas has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

How can I edit an existing schema?

Schemas are edited within Schema Editor 61. In order to run the editor you should either

- select the schema for editing in the explorer tree (type the first letters of the schema name for quick search);
- select the Edit Schema... item from the popup menu

or

- open the database in Database Editor and the Schemas tab there;
- select the schema to edit;
- press the **Enter** key or select the Edit Schema item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can change the name of the schema using the Rename Schema dialog. To open the dialog you should either

- select the schema to rename in the explorer tree;
- select the Rename Schema item from the popup menu

or

- open the database in Database Editor and the Schemas tab there;
- select the schema to rename;
- select the Rename Schema item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I drop an existing schema?

To drop a schema:

- select the schema to drop in the explorer tree;
- select the Drop Schema item from popup menu

or

- open the database in Database Editor and the Schemas tab there;
- select the schema to drop;
- press the **Delete** key or select the Drop Schema item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

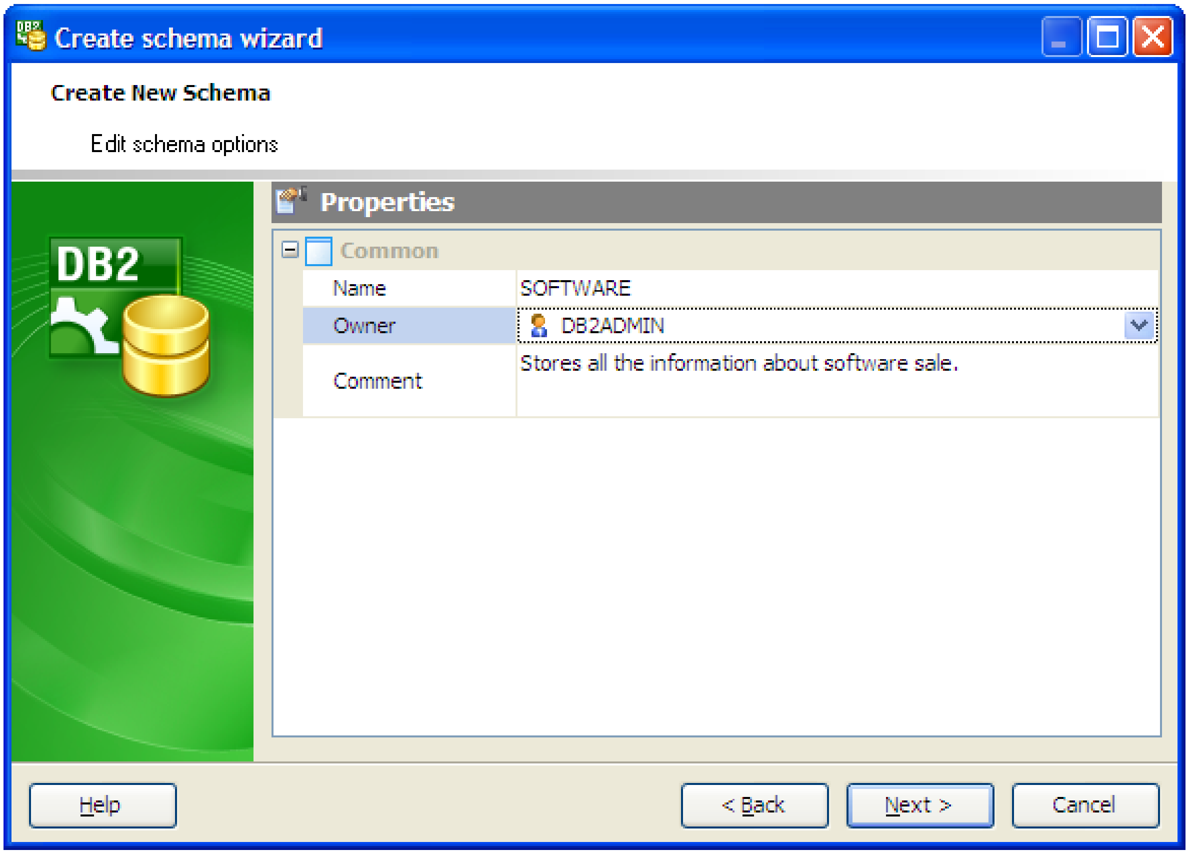
and confirm dropping in the dialog window.

5.1.1 Create Schema Wizard

Create Schema Wizard guides you through the process of creating a new database schema.
The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

Schema options
Owner
Use the field to specify the owner of the new schema. The default owner is the user who have created the schema. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment
The box allows you to set optional text describing the new schema.

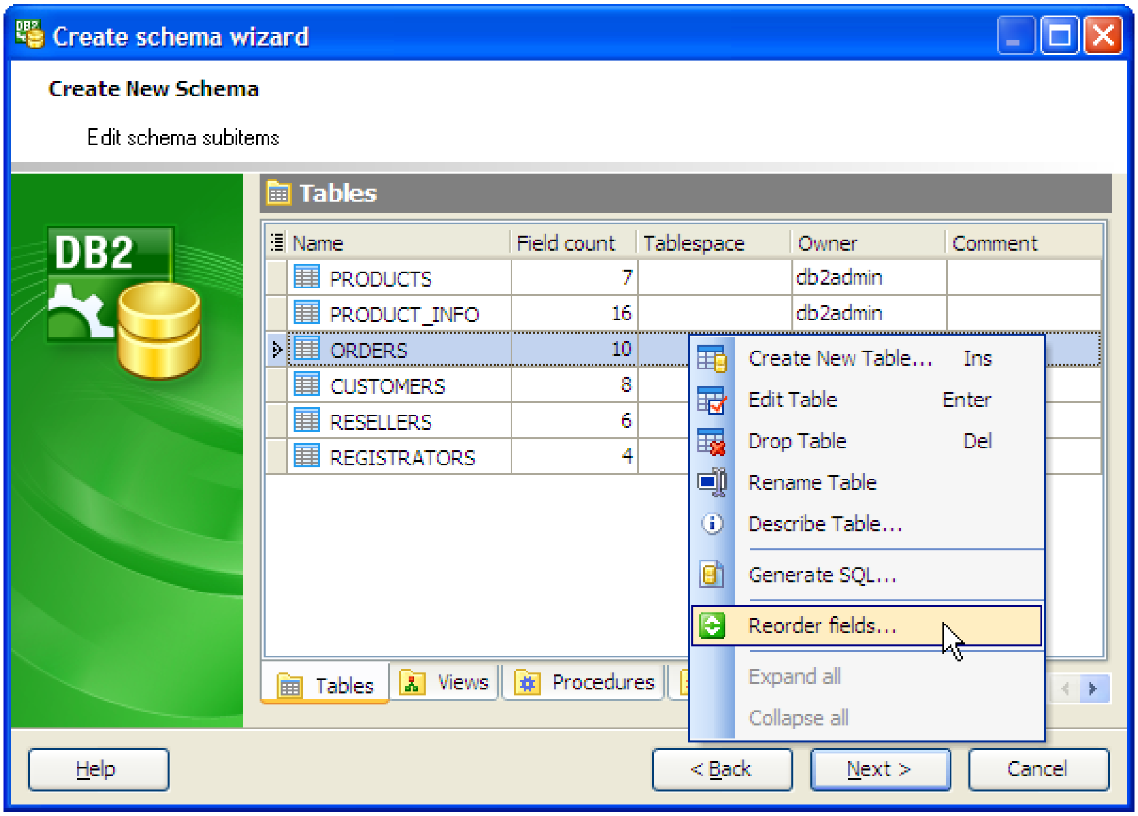


Name: SOFTWARE
Owner: DB2ADMIN
Comment: Stores all the information about software sale.

Adding schema content
This wizard step allows you to create the new schema along with schema content. To add an object to the new schema:

- Open the corresponding tab (Tables - to manage schema tables, Views - to manage schema views, and so on);
- Use the Create Object Wizard link of the tab's pop-up menu or press **Insert**;
- Complete the corresponding create object wizard. To find out the wizards description, read the corresponding topics:

Create Table Wizard 65
Create Procedure Wizard 99
Create Function Wizard 113
Create Domain Wizard 120
Create Distinct Type Wizard 120
Create Sequence Wizard 132
Create Alias Wizard 125
Create View Wizard 90

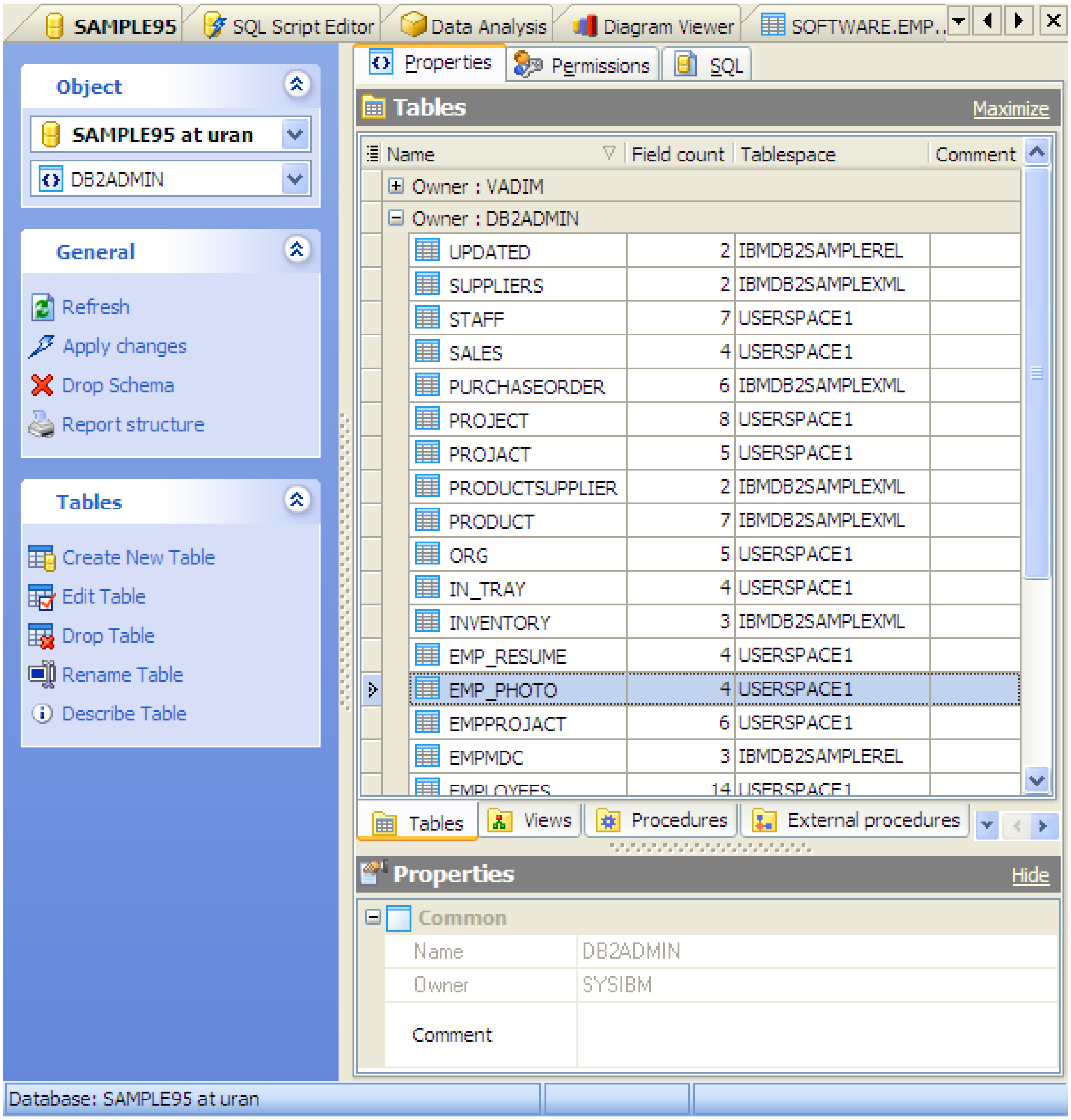


Name	Field count	Tablespace	Owner	Comment
PRODUCTS	7		db2admin	
PRODUCT_INFO	16		db2admin	
ORDERS	10			
CUSTOMERS	8			
RESELLERS	6			
REGISTRATORS	4			

5.1.2 Schema Editor

Schema Editor allows you to browse schema content, manage users permissions on the schema objects, and see the SQL definition of this schema. To open the editor, use the corresponding items of popup menus of the Explorer Tree 49, Object Manager 54 or Object Browser 52.

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.



Name	Field count	Tablespace	Comment
Owner : VADIM			
Owner : DB2ADMIN			
UPDATED	2	IBMDB2SAMPLEREL	
SUPPLIERS	2	IBMDB2SAMPLEXML	
STAFF	7	USERSPACE1	
SALES	4	USERSPACE1	
PURCHASEORDER	6	IBMDB2SAMPLEXML	
PROJECT	8	USERSPACE1	
PROJACT	5	USERSPACE1	
PRODUCTSUPPLIER	2	IBMDB2SAMPLEXML	
PRODUCT	7	IBMDB2SAMPLEXML	
ORG	5	USERSPACE1	
IN_TRAY	4	USERSPACE1	
INVENTORY	3	IBMDB2SAMPLEXML	
EMP_RESUME	4	USERSPACE1	
EMP_PHOTO	4	USERSPACE1	
EMPPROJACT	6	USERSPACE1	
EMPMDC	3	IBMDB2SAMPLEREL	
EMPLOYEES	14	USERSPACE1	

Common

Name	DB2ADMIN
Owner	SYSIBM
Comment	

The Properties tab allows you to view schema options and to browse schema content divided into groups according to their types (*tables, views, functions,* etc.). The popup menu of each tab allows you to create new, edit, copy or drop the appropriate schema object. The grid allows you to operate with several objects at a time. For this purpose select objects with the **Shift** or the **Ctrl** key pressed. After a group of objects is selected you can operate with them, e.g. *delete several objects* at once, as if it is a single object.

Name
Here you can view the schema name.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl +F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.2 Tables

DB2 Maestro allows you to manipulate tables with easy: add new tables to the database, modify existing ones, browse table options and data. The sections below describe each of these actions in detail.

How can I add a new table?

New tables are created within Create Table Wizard[65]. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Table icon in the Create Database Object dialog

or

- select the Tables list or any object from that list in the explorer tree;
- select the Create New Table... item from the popup menu.

To create a new table with the same properties as one of the existing tables has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

How can I work with an existing table?

Tables can be edited within Table Editor[67]. In order to run the editor you should either

- select the table for editing in the explorer tree (type the first letters of the table name for quick search);
- select the Edit Table... item from the popup menu

or

- open Schema (Database) Editor and the Tables tab there;
- select the table to edit;
- press the **Enter** key or select the Edit Table item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can also view and edit table properties without launching Table Editor:

- select the table for editing in the explorer tree (type the first letters of the table name for quick search);
- select the Table Properties... item from the popup menu;
- edit table properties within the Table Properties dialog.

You can change the name of the table using the Rename Table dialog. To open the dialog you should either

- select the table to rename in the explorer tree;

- select the Rename Table item from the popup menu

or

- open Schema (Database) Editor and the Tables tab there;
- select the table to rename;
- select the Rename Table item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I drop the existing table?

To drop a table:

- select the table to drop in the explorer tree;
- select the Drop Table item from the popup menu

or

- open Schema (Database) Editor and the Tables tab there;
- select the table to drop;
- press the **Delete** key or select the Drop Table item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

Table Editor allows you to work with table data including master-detail views 69, generate simple SQL statements 266, CRUD procedures 267 to work with this table, and split the table 270 into two separate tables.

5.2.1 Create Table Wizard

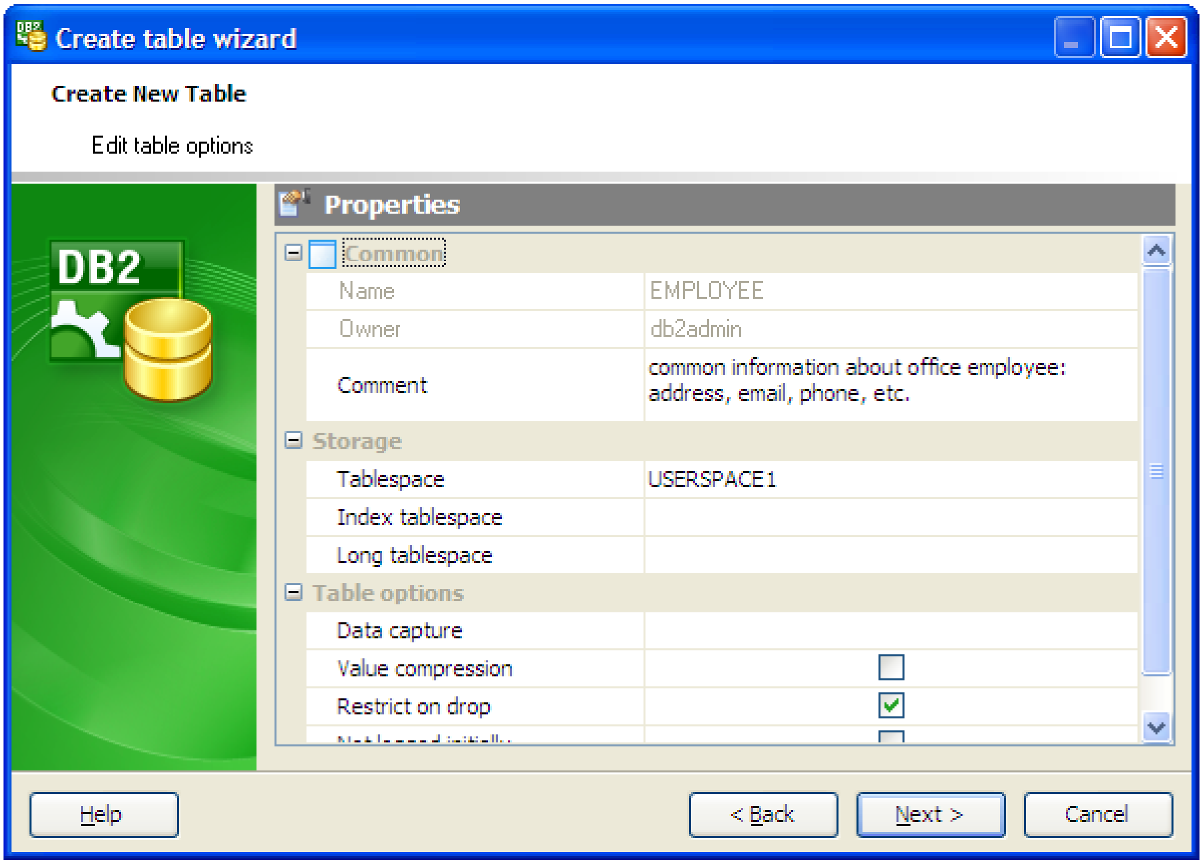
Create Table Wizard guides you through the process of creating a new database table. The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

Name
The name of the table being created as it was specified at the previous step.

Owner
You can view here the name of the DB2 server user that will own the new table, or leave this field blank to use the default user (namely, the user executing the command). By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment
Set the optional text to describe the new table.

This step also allows to set table storage options (tablespaces) and others. For more information use DB2 manuals at http://www-1.ibm.com/support/docview.wss?rs=71&uid=swg27009552.



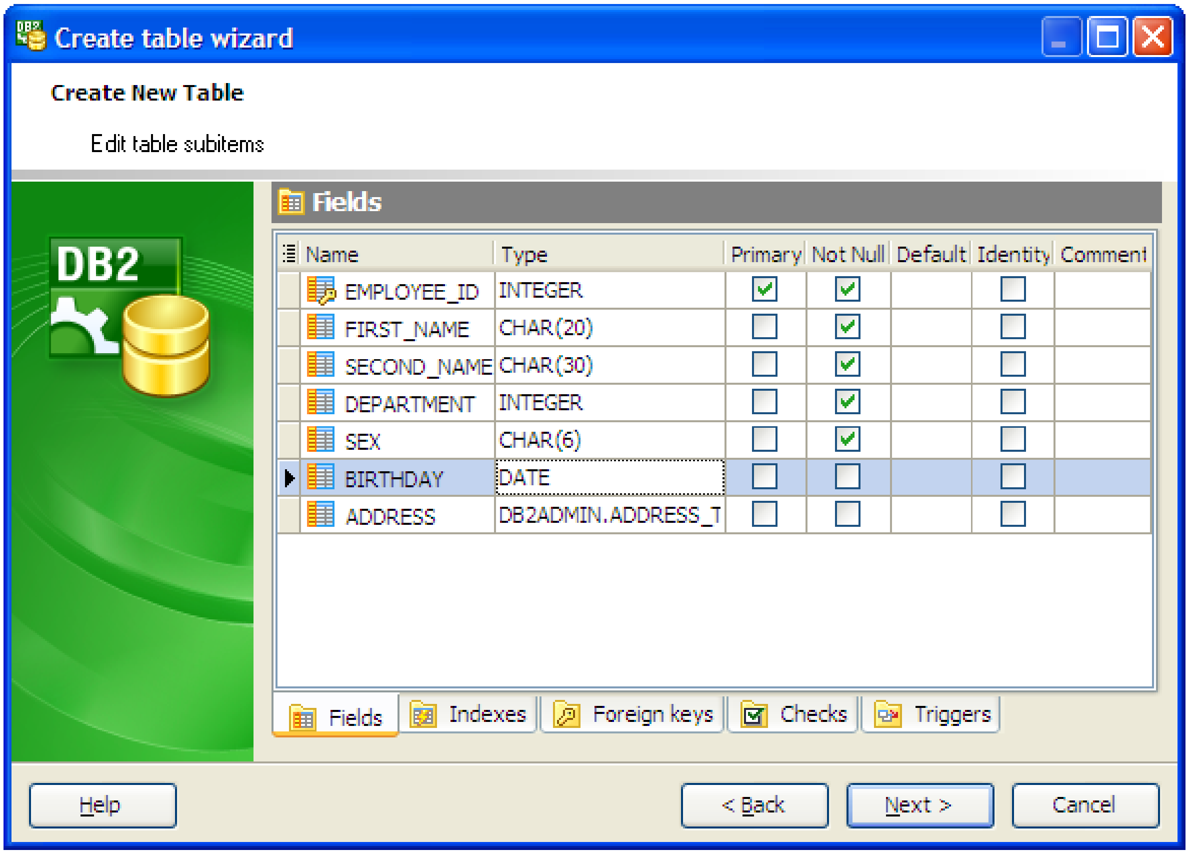
Common
Name: EMPLOYEE
Owner: db2admin
Comment: common information about office employee: address, email, phone, etc.
Storage
Tablespace: USERSPACE1
Index tablespace:
Long tablespace:
Table options
Data capture:
Value compression: ☐
Restrict on drop: ☑

Adding table subitems

On this step of the wizard you can fullfill the new table with fields, indexes, and foreign keys. To add a new object:

- Choose the necessary page (Fields - to add table fields, Indexes - table indexes, and so on);
- Follow the corresponding link of the tab's pop-up menu;
- Specify properties of the new object. To find the description of field 71, foreign key 76, check 79, trigger 82, and index 74, follow the according link.

The popup menu of each tab allows to edit, drop, reorder, and rename specified objects, etc.



Name	Type	Primary	Not Null	Default	Identity	Comment
EMPLOYEE_ID	INTEGER	☑	☑		☐	
FIRST_NAME	CHAR(20)	☐	☑		☐	
SECOND_NAME	CHAR(30)	☐	☑		☐	
DEPARTMENT	INTEGER	☐	☑		☐	
SEX	CHAR(6)	☐	☑		☐	
BIRTHDAY	DATE	☐	☐		☐	
ADDRESS	DB2ADMIN.ADDRESS_T	☐	☐		☐	

Click Add All or Add to include table(s) to table definition. Use the Remove or Remove All items to exclude table(s) from the list.

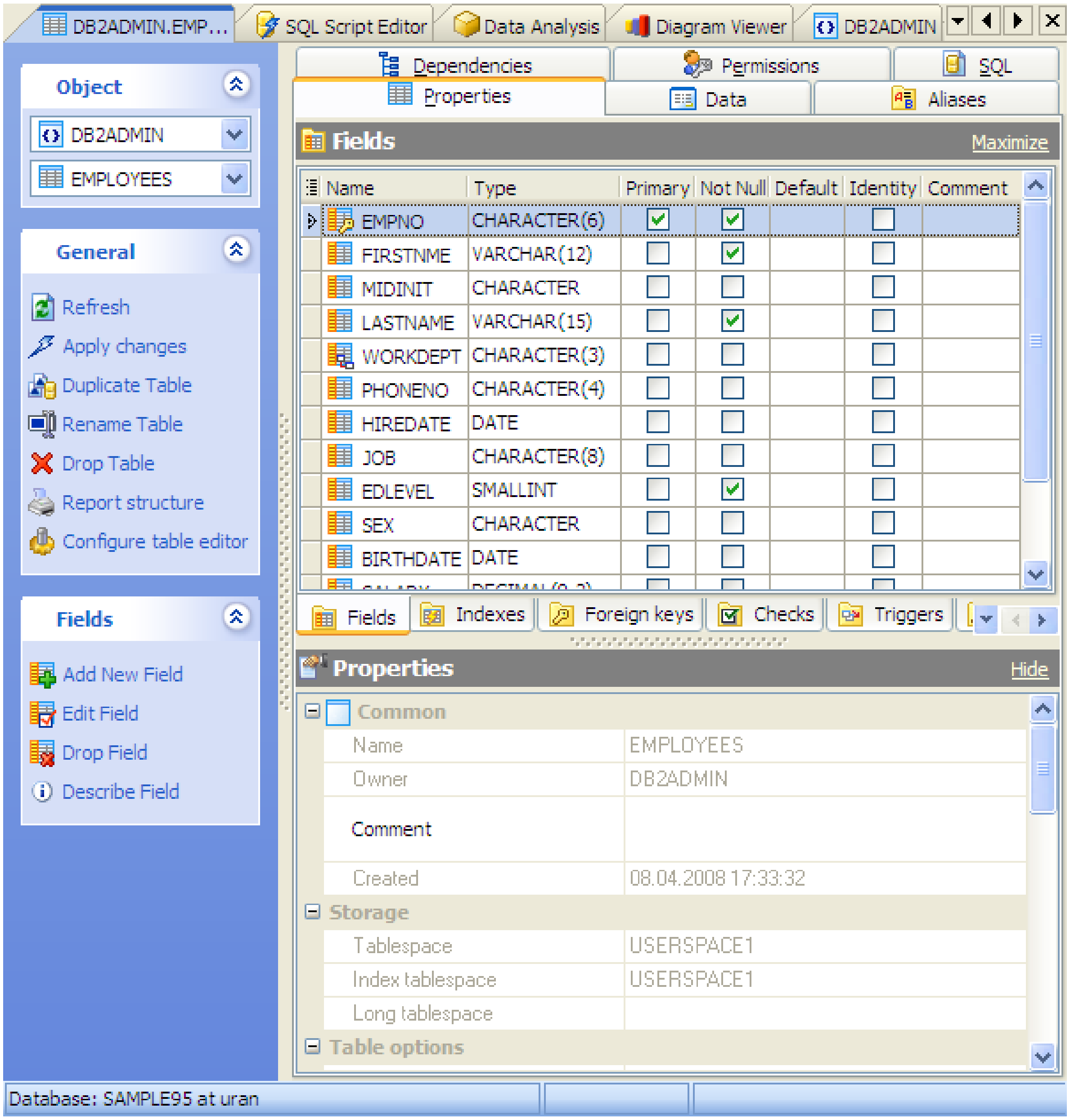
5.2.2 Table Editor

Table Editor allows you to create, edit and drop table fields, indexes, manage table data and other table subobjects. It can be opened automatically after the table is created and is available on editing the table. To open Table Editor, double-click the corresponding node at the Explorer Tree or Object Manager.
The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38 . Below you will find a description of editor tabs that are unique for the current object.

- Editing table properties 67
- Viewing table data 69

5.2.2.1 Editing table properties

The Properties section allows you to view general table properties and also to modify .



Name	Type	Primary	Not Null	Default	Identity	Comment
EMPNO	CHARACTER(6)	☑	☑		☐	
FIRSTNME	VARCHAR(12)	☐	☑		☐	
MIDINIT	CHARACTER	☐	☐		☐	
LASTNAME	VARCHAR(15)	☐	☑		☐	
WORKDEPT	CHARACTER(3)	☐	☐		☐	
PHONENO	CHARACTER(4)	☐	☐		☐	
HIREDATE	DATE	☐	☐		☐	
JOB	CHARACTER(8)	☐	☐		☐	
EDLEVEL	SMALLINT	☐	☑		☐	
SEX	CHARACTER	☐	☐		☐	
BIRTHDATE	DATE	☐	☐		☐	

Common
Name: EMPLOYEES
Owner: DB2ADMIN
Comment:
Created: 08.04.2008 17:33:32

Storage
Tablespace: USERSPACE1
Index tablespace: USERSPACE1
Long tablespace:

Table options

Database: SAMPLE95 at uran

Subitems

Every tab is intended for work with defined objects (*fields*, *indexes*, etc.). To modify any object, double click it or use grid's popup menu. The menu also allows you to add new, rename, describe, copy/paste, and drop selected objects. To operate with several objects at a time, select them with the **Shift** or the **Ctrl** key pressed. After a group of objects is selected you can operate with it, e.g. *delete several objects at once*, as if it is a single object.

See also: Fields 71, Triggers 84, and Indexes 74.

The tab also allows to change table storage options (tablespaces) and others. For more information use DB2 manuals athttp://www-1.ibm.com/support/docview.wss?rs=71&uid=swg27009552.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

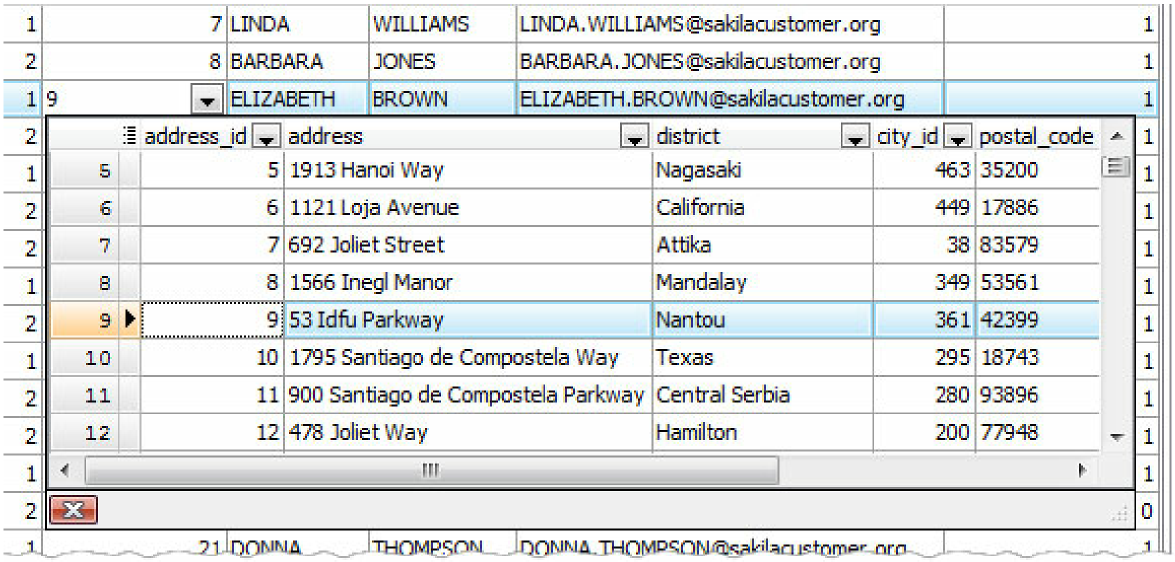
It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.2.2.2 Managing table data

The Data tab displays the table data as a grid or as info cards (see Data View 199 for details). To edit/add a table record, use Data Input Form or type the new data directly in the grid (card). To export/import/get SQL dump of the table data, invoke corresponding modules from the grid's popup menu. To view and edit the content of BLOB columns, run BLOB Editor 210.

Lookup editors

Lookup editor displays the content of parent table's columns within the drop-down window. DB2 Maestro enables a lookup editor for a column linked by a foreign key with a single column from another table. To get the corresponding data, double click the field or use **F2** shortcut and press **Alt+Down Arrow Key**.

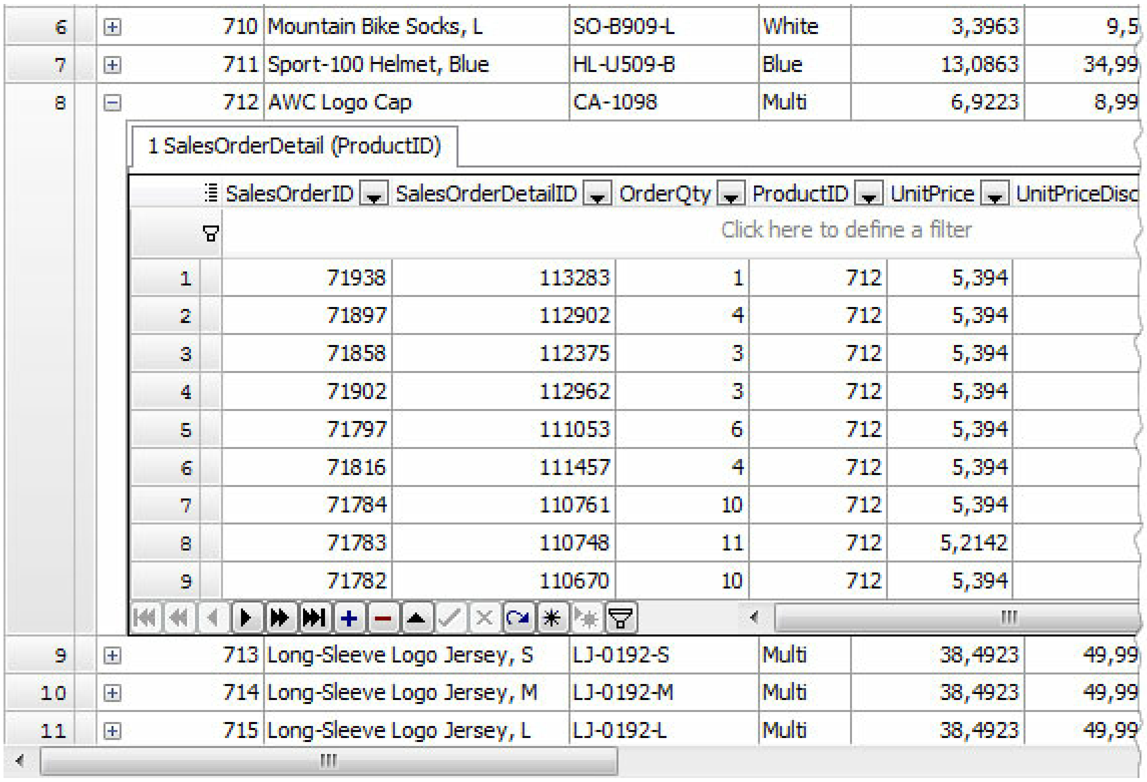


1	7	LINDA	WILLIAMS	LINDA.WILLIAMS@sakilacustomer.org		1
2	8	BARBARA	JONES	BARBARA.JONES@sakilacustomer.org		1
1	9	ELIZABETH	BROWN	ELIZABETH.BROWN@sakilacustomer.org		1
1	21	DONNA	THOMPSON	DONNA.THOMPSON@sakilacustomer.org		1

	address_id	address	district	city_id	postal_code
5	5	1913 Hanoi Way	Nagasaki	463	35200
6	6	1121 Loja Avenue	California	449	17886
7	7	692 Joliet Street	Attika	38	83579
8	8	1566 Inegl Manor	Mandalay	349	53561
9	9	53 Idfu Parkway	Nantou	361	42399
10	10	1795 Santiago de Compostela Way	Texas	295	18743
11	11	900 Santiago de Compostela Parkway	Central Serbia	280	93896
12	12	478 Joliet Way	Hamilton	200	77948

Master-Detail Data View

To get data in the master-detail view mode (multiple detail pages are displayed for a single master row), use the Show/Hide details link at the editor's navigation bar. This mode allows you add/edit/delete data of detail pages. To open/close the appropriate detail page click the +/- icon or use **+/-** shortcuts.



6	⊞	710	Mountain Bike Socks, L	SO-B909-L	White	3,3963	9,5
7	⊞	711	Sport-100 Helmet, Blue	HL-U509-B	Blue	13,0863	34,99
8	⊟	712	AWC Logo Cap	CA-1098	Multi	6,9223	8,99

1 SalesOrderDetail (ProductID)

Click here to define a filter

	SalesOrderID	SalesOrderDetailID	OrderQty	ProductID	UnitPrice	UnitPriceDisc
1	71938	113283	1	712	5,394	
2	71897	112902	4	712	5,394	
3	71858	112375	3	712	5,394	
4	71902	112962	3	712	5,394	
5	71797	111053	6	712	5,394	
6	71816	111457	4	712	5,394	
7	71784	110761	10	712	5,394	
8	71783	110748	11	712	5,2142	
9	71782	110670	10	712	5,394	

9	⊞	713	Long-Sleeve Logo Jersey, S	LJ-0192-S	Multi	38,4923	49,99
10	⊞	714	Long-Sleeve Logo Jersey, M	LJ-0192-M	Multi	38,4923	49,99
11	⊞	715	Long-Sleeve Logo Jersey, L	LJ-0192-L	Multi	38,4923	49,99

Import from Clipboard

DB2 Maestro supports data import from clipboard. It is supposed that columns within the data block are separated by the tabulation symbol, records are separated by newlines and the first line of the data block contains column headers.

Example:

ColHeader1	ColHeader2
R1C1	R1C2
R2C1	R2C2

The same data format is supported by a lot of other applications, so the ability allows you to copy data from MS Excel, another table or view, or even from a data set from a different DBMS especially if it is opened with an appropriate our product.

Uploading files as BLOBs

DB2 Maestro allows you to upload files as BLOBs into a table. For this purpose the file names must contain the information on the record they need to be placed to: the files need to be named in the same manner and include content of one or several table columns that can uniquely identify each row. To import files, specify the file name template using filed name tags (i.e. %id%, %user%, where 'id' and 'user' are the fact table columns). You can also set the default file to be uploaded to NULL fields.

Example:

Suppose we have a table 'employee' with Non-Blob data as follows:

Id	User
1	Max
2	July

And we need to import the 1.jpg and 2.jpg files to a BLOB column of the table. The files are stored in the "D:\Images" directory. In this case we need to specify the "D:\Images\%Id%.jpg" file name template.

5.2.3 Fields

Table columns are created and edited within the Field Editor.

How to add a new column to a table?

To add a new table column, you should either:

- open the table in Table Editor and the Fields tab there;
- press the **Insert** key or select the Add New Field... item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the table in the explorer tree and use the Create New Field popup menu item

or

- select the table Fields node or any field within the table in the explorer tree and use the Add New Field... popup menu item.

How to edit an existing table field?

Table fields are edited within the Field Editor 71 dialog window. In order to open the dialog you should either

- open the table in Table Editor and the Fields tab there;
- press the **Enter** key or select the Edit Field item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the field to edit in the explorer tree and use the Edit Field popup menu item.

You can change the name of the field using the Rename Field dialog. To open the dialog you should either

- select the field to rename in the explorer tree;
- select the Rename Field item from the popup menu

or

- open the table in Table Editor and the Fields tab there;
- select the field to rename;
- select the Rename Field item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

How to drop an existing table field?

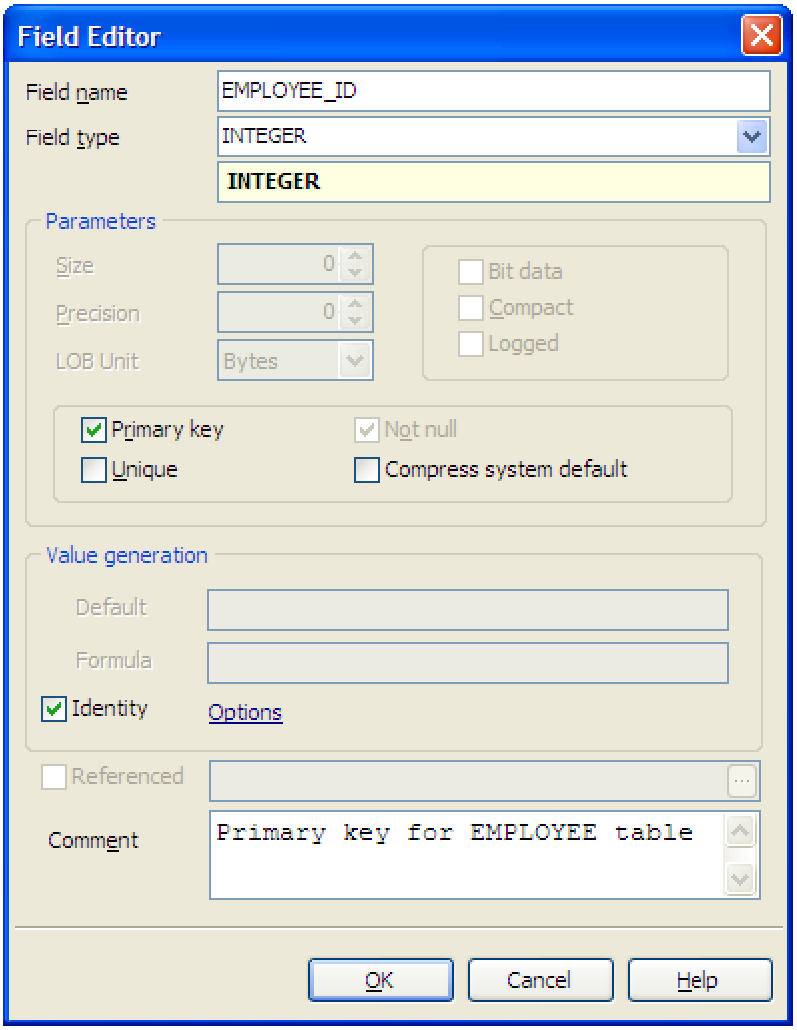
To drop the table field:

- select the field to drop in the explorer tree;
- select the Drop Field item from the popup menu

or

- open the table in Table Editor and the Fields tab there;
- press the **Delete** key or select the Drop Field item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.



Field name: EMPLOYEE_ID

Field type: INTEGER

INTEGER

Size: 0

Precision: 0

LOB Unit: Bytes

☐ Bit data
☐ Compact
☐ Logged

☑ Primary key
☑ Not null
☐ Unique
☐ Compress system default

Default:

Formula:

☑ Identity Options

☐ Referenced

Comment: Primary key for EMPLOYEE table

To specify the Data Type, select it from the drop-down list.

Note: the name of the object must be unique among all the object names in the table. You can use any identifier that is allowed by DB2 server.

Parameters
Use the Size edit box to define the length of the field value for integer, float, char and other data types and use Precision to define the precision of the field value, e.g. for *float* data type.

Precision
The first integer is the precision of the number; that is, the total number of digits; it may range from 1 to 31.

BIT data
Specifies that the contents of the column are to be treated as bit (binary) data. During data exchange with other systems, code
page conversions are not performed. Comparisons are done in binary, irrespective of the database collating sequence.

Compact
Specifies that the values in the LOB column should take up minimal disk space (free any extra disk pages in the last group used by the LOB value), rather than leave any leftover space at the end of the LOB storage area that might facilitate subsequent append operations. Note that storing data in this way may cause a performance penalty in any append (length-increasing) operations on the column.

Logged
Specifies that changes made to the column are to be written to the log. The data in such columns is then recoverable with database utilities (such as RESTORE DATABASE).

LOBs greater than 1 gigabyte cannot be logged and LOBs greater than 10 megabytes should probably not be logged.

Field flags

☑ Not Null
Forbids the NULL values for the field.

☑ Unique
Includes the field into the unique key (index).

☑ Primary Key
With this option checked the field becomes the only field with a primary key. If you check this field, you will not be able to set this attribute for any other field in the table. Hence if you want to create a compound primary key, do not check this field but create a primary key through the Indexes tab of Table Editor 67 or the appropriate step of Create Table Wizard 65.

Note: To set a new primary key you need to define a field default value

Formula
Indicates that DB2 will always generate a value for the column when a row is inserted into the table or whenever the result value of the generation-expression may change. The result of the expression is stored in the table. It is the recommended value unless you are using data propagation, or doing unload and reload operations.

Referenced
This provides a shorthand method of defining a foreign key composed of a single column. Thus, if a references-clause is specified in the definition of column C, the effect is the same as if that references-clause were specified as part of a FOREIGN KEY clause in which C is the only identified column.

Default value
Within the box you can assign a default value for the field column. The action is optional. If the default value was specified during the new row created and no values is specified for some of the columns, the columns will be filled with their respective default values.

The Comment box allows you to set optional text describing the field.

Check the Identity option to indicate that the new column is an identity column.

Start value
Specifies the first value for the identity column. This value can be any positive or negative value that could be assigned to this column as long as there are no non-zero digits to the right of the decimal point. The default is 1.

Increment by
Specifies the interval between consecutive values of the identity column. This value can be any positive or negative value that could be assigned to this column. This value cannot be zero and cannot exceed the value of a large integer constant, provided that there are no non-zero digits to the right of the decimal point. If this value is negative, then the sequence of values for this identity column descends. If this value is positive, then the sequence of values for this identity column ascends. The default is 1.

Cache size
Specifies how many values of the identity sequence that DB2 pre-allocates and keeps in memory. Pre-allocating and storing values in the cache reduces logging when values are generated for the identity column. If a new value is needed for the identity column and there are none available in the cache, then the allocation of the value involves waiting for the log. However, when a new value is needed for the identity column and there is an unused value in the cache, the allocation of that identity value can be made quicker by not performing the logging.

You can also use the window to set Minimum value, Maximum value, Cycle, and Order.

Note: A table can only have a single IDENTITY column.

5.2.4 Indexes

Indexes are primarily used to enhance database performance (though inappropriate use may result in slower performance). The key field(s) for the index are specified as column names. Multiple fields can be specified if the index method supports multicolumn indexes.

⊟ How can I create a table index?

Table indexes are created within the Index Properties 74 dialog window. In order to open the dialog you should either

- open the table in Table Editor and the Indexes tab there;
- press the **Insert** key or select the Add New Index... item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the table in the explorer tree and use the Create New Index popup menu item

or

- select the table Indexes node or any index within the table in the explorer tree and use the Add New Index... popup menu item.

⊟ How can I edit an existing index?

Table indexes are edited within the Index Properties 74 dialog window. In order to open the dialog you should either

- open the table in Table Editor and the Indexes tab there;
- press the **Enter** key or select the Edit Index item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the index to edit in the explorer tree and use the Edit Index popup menu item.

You can change the name of the index using the Rename Index dialog. To open the dialog you should either

- select the index to rename in the explorer tree;
- select the Rename Index item from the popup menu

or

- open the table in Table Editor and the Indexes tab there;
- select the index to rename;
- select the Rename Index item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I drop a table index?

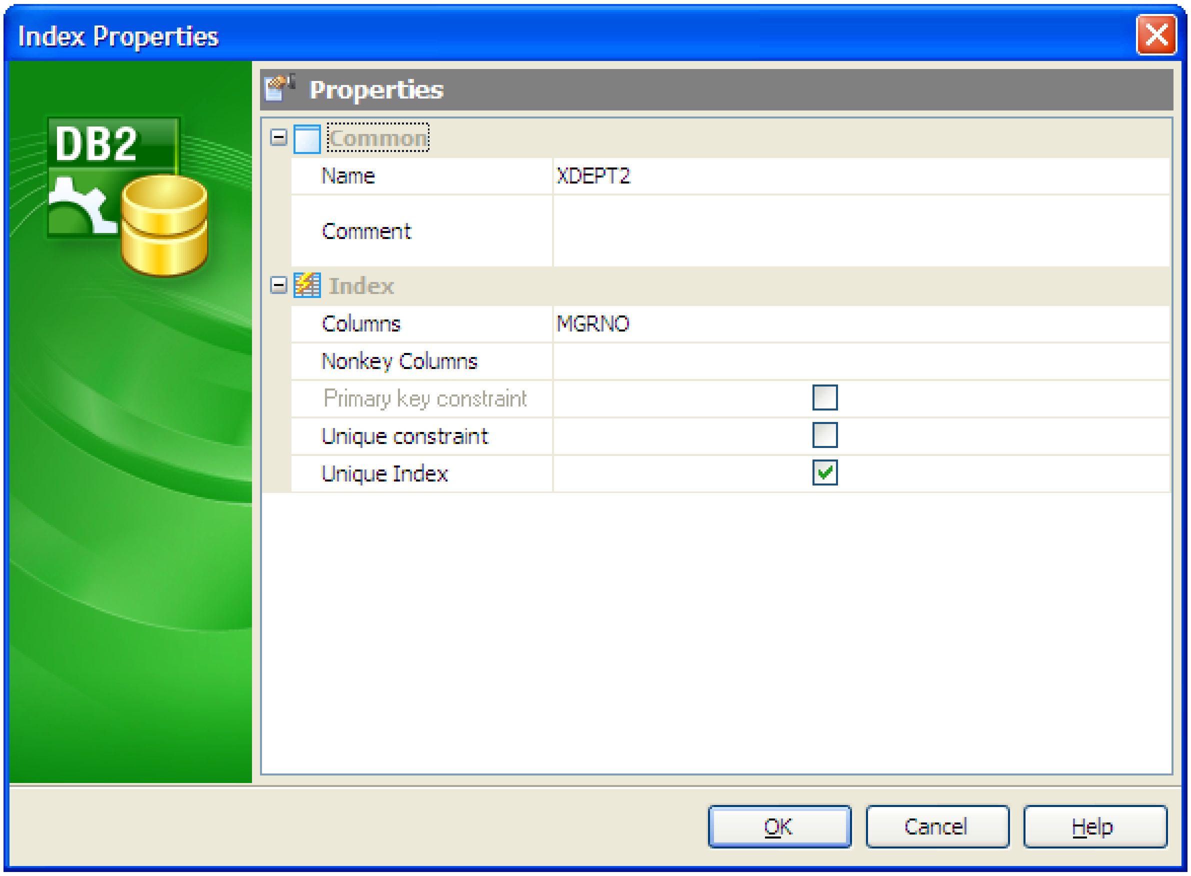
To drop the table index:

- select the index to drop in the explorer tree;
- select the Drop Index item from the popup menu

or

- open the table in Table Editor and the Indexes tab there;
- press the **Delete** key or select the Drop Index item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.



Name	XDEPT2
Comment	
Columns	MGRNO
Nonkey Columns	
Primary key constraint	☐
Unique constraint	☐
Unique Index	☑

Use the Columns drop-down list to select a key field(s) for the index.

☑ Primary key constraint
With this option checked this field becomes a compound primary key. It is useful in case the table has more than one primary key.

☑ Unique Index
If checked, creates a unique index for the table, i.e. the database system ensures that no two rows of the specified table have the same values in the indexed columns. In this way, if two rows both contain the NULL value for all columns of an index, the two index values are not considered to be identical. If at least one column does not contain the NULL value, two rows that have the same value in all non-NULL columns are considered to be identical.

5.2.5 Foreign Keys

A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table. In other words, a foreign key is a column or a combination of columns that is used to establish and enforce a link between the data in two tables.

Note: To create a foreign key constraint, it is necessary to have this privilege for both the referencing and referenced tables.

How can I add a new foreign key?

Foreign keys are created within the Foreign Key Properties 76 dialog window. In order to open the dialog you should either

- open the table in Table Editor and the Foreign Keys tab there;
- press the **Insert** key or select the Add New Foreign Key... item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the table in the explorer tree and use the Create New Foreign Key popup menu item

or

- select the table Foreign Keys node or any foreign key within the table in the explorer tree and use the Add New Foreign Key... popup menu item.

How can I edit an existing foreign key?

Foreign Keys are edited within the Foreign Key Properties 76 dialog window. In order to open the dialog you should either

- open the table in Table Editor and the Foreign Keys tab there;
- press the **Enter** key or select the Edit Foreign Key item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the foreign key to edit in the explorer tree and use the Edit Foreign Key popup menu item.

You can change the name of the foreign key using the Rename Foreign Key dialog. To open the dialog you should either

- select the foreign key to rename in the explorer tree;
- select the Rename Foreign Key item from the popup menu

or

- open the table in Table Editor and the Foreign Keys tab there;
- select the foreign key to rename;
- select the Rename Foreign Key item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

How can I drop a foreign key?

To drop the foreign key:

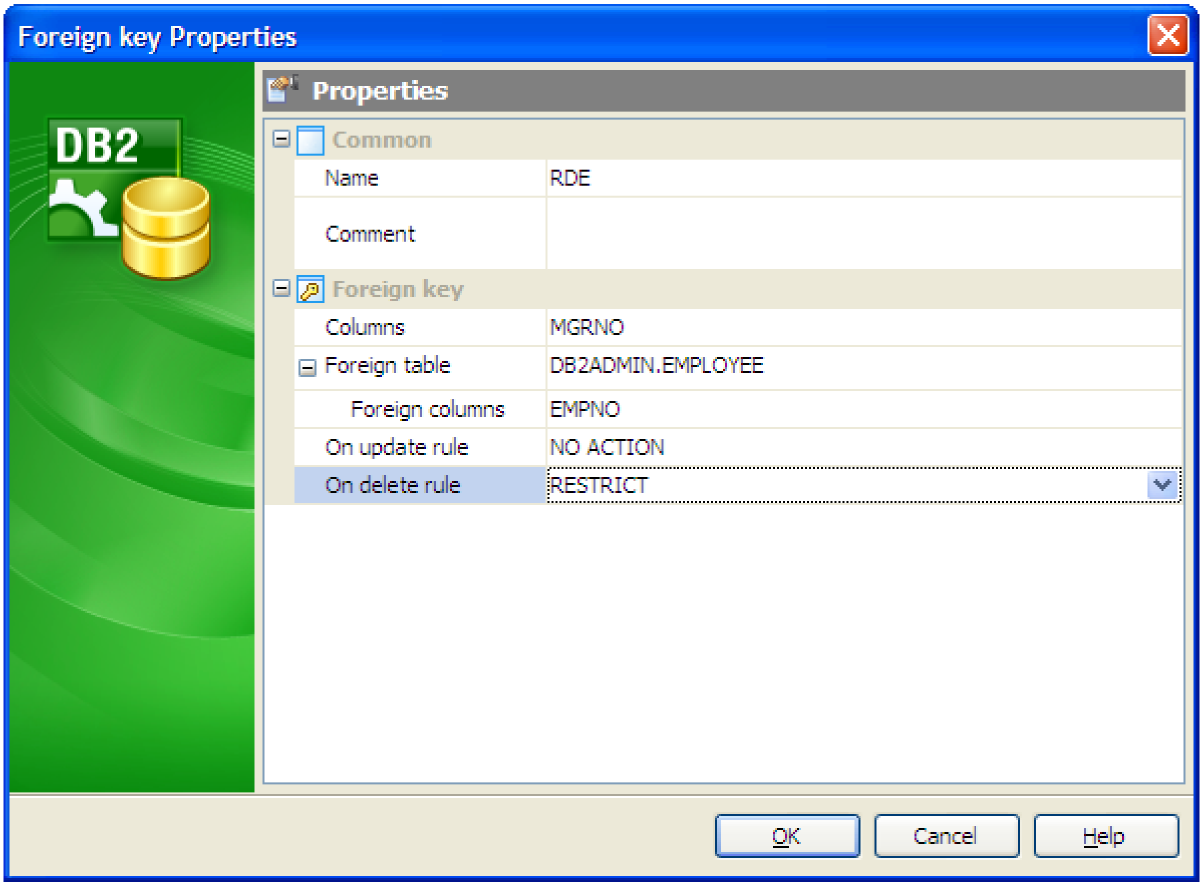
- select the foreign key to drop in the explorer tree;
- select the Drop Foreign Key item from the popup menu

or

- open the table in Table Editor and the Foreign Keys tab there;
- press the **Delete** key or select the Drop Foreign Key item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

Set the Foreign Key Name, select Columns from the Available Fields list to include into the foreign key, select the Foreign Table Name from the drop-down list and its fields from the list to include, set other foreign key properties and apply the changes by clicking the OK button.



Name	RDE
Comment	
Columns	MGRNO
Foreign table	DB2ADMIN.EMPLOYEE
Foreign columns	EMPNO
On update rule	NO ACTION
On delete rule	RESTRICT

All the fields which are included into the Foreign Key must be included into indexes as well. See Indexes 74 for details.

Set rule ON DELETE.

- *CASCADE* Delete any rows referencing the deleted row, or update the value of the referencing column to the new value of the referenced column, respectively.
- *SET NULL* Set the referencing column(s) to null.
- *SET DEFAULT* Set the referencing column(s) to their default values.

5.2.6 Checks

A check constraint is the most generic constraint type. It allows you to specify that the value in a certain column must satisfy a Boolean (truth-value) expression.

The Check Properties editor allows you to add a new check constraint or edit an existing one. This dialog can be invoked from Table Editor[67], or via the popup menu of the corresponding nodes of the explorer tree.

⊟ How can I add a new check?

Checks are created within Check Properties[79]. In order to run the wizard you should either

- open the table in Table Editor and the Checks tab there;
- press the **Insert** key or select the Add New Check... item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the table in the explorer tree and use the Create New Check... popup menu item

or

- select the table Checks node or any check within the table in the explorer tree and use the Add New Check... popup menu item.

⊟ How can I edit an existing check?

Checks are edited within the Check Properties[79] dialog window. In order to open the dialog you should either

- open the table in Table Editor the Checks tab there;
- press the **Enter** key or select the Edit Check item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the check to edit in the explorer tree and use the Edit Check popup menu item.

You can change the name of the check using the Rename Check dialog. To open the dialog you should either

- select the check to rename in the explorer tree;
- select the Rename Check item from the popup menu

or

- open the table in Table Editor and the Checks tab there;
- select the check to rename;
- select the Rename Check item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I drop a check?

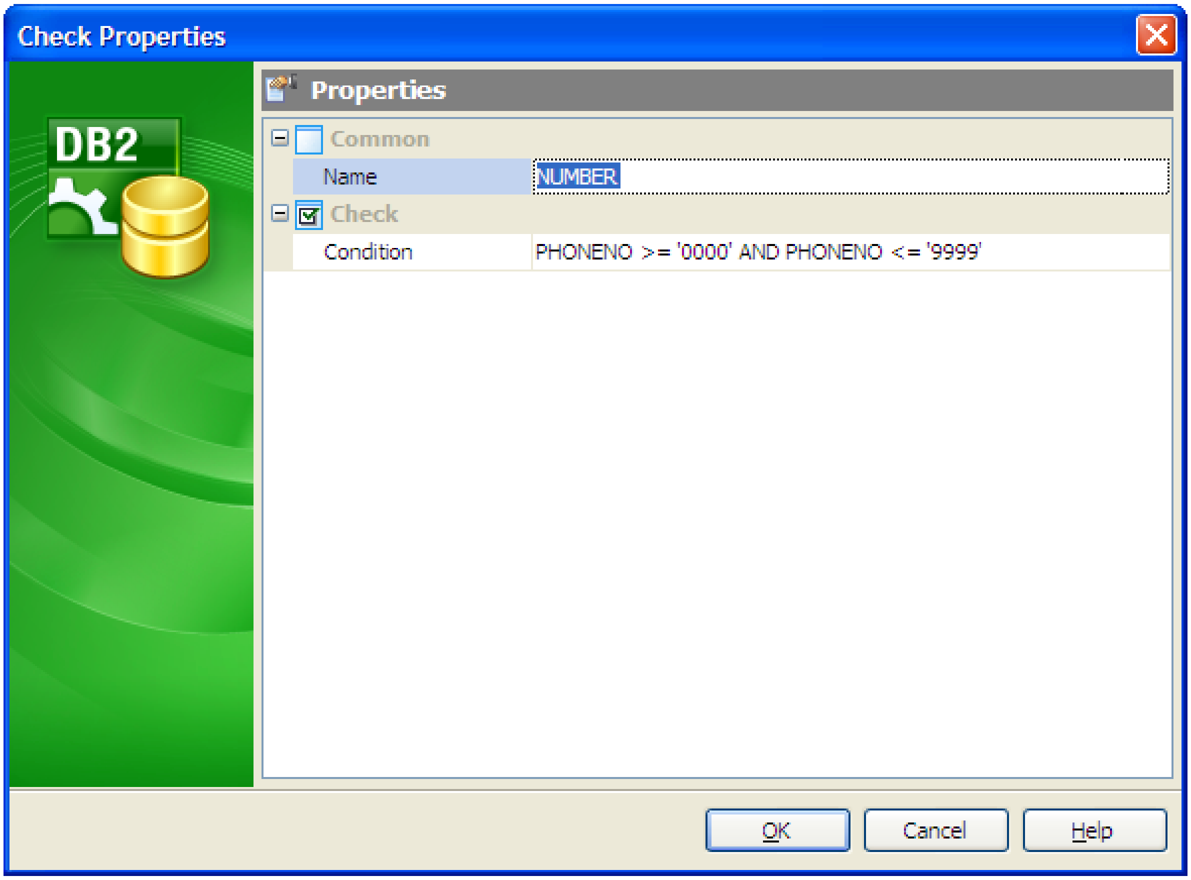
To drop the check:

- select the check to drop in the explorer tree;
- select the Drop Check item from the popup menu

or

- open the table in Table Editor and the Checks tab there;
- press the **Delete** key or select the Drop Check item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.



⊟ Common

Name: NUMBER

⊟ ☑ Check

Condition: PHONENO >= '0000' AND PHONENO <= '9999'

Name
The name of the check constraint.

Condition
Specify an expression producing a Boolean result which new or updated rows must satisfy for an insert or update operation to succeed. Expressions evaluating to True or Unknown succeed. In case any row of an insert or update operation produce a FALSE result an error exception is raised and the insert or update does not alter the database.

5.2.7 Triggers

A trigger is a specification that the database should automatically execute a particular function whenever a certain type of operation is performed. A trigger can be defined to execute before or after an INSERT, UPDATE, or DELETE operation, either once per modified row, or once per SQL statement. If a trigger event occurs, the trigger fires.

How can I add a new trigger?

Triggers are created within Create Trigger Wizard 82. In order to run the wizard you should either

- open the table in Table Editor and the Triggers tab there;
- press the **Insert** key or select the Add New Trigger... item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the table in the explorer tree and use the Create New Trigger... popup menu item

or

- select the table Triggers node or any trigger within the table in the explorer tree and use the Add New Trigger... popup menu item.

How can I edit an existing trigger?

Triggers are edited within the Trigger Editor 84 dialog window. In order to open the dialog you should either

- open the table in Table Editor and the Triggers tab there;
- press the **Enter** key or select the Edit Trigger item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

or

- select the trigger to edit in the explorer tree and use the Edit Trigger popup menu item.

You can change the name of the trigger using the Rename Trigger dialog. To open the dialog you should either

- select the trigger to rename in the explorer tree;
- select the Rename Trigger item from the popup menu

or

- open the table in Table Editor and the Triggers tab there;
- select the trigger to rename;
- select the Rename Trigger item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

How can I drop a trigger?

To drop the trigger:

- select the trigger to drop in the explorer tree;
- select the Drop Trigger item from the popup menu

or

- open the table in Table Editor and the Triggers tab there;
- press the **Delete** key or select the Drop Trigger item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

5.2.7.1 Create Trigger Wizard

Create Trigger Wizard guides you through the process of creating of a new table trigger.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

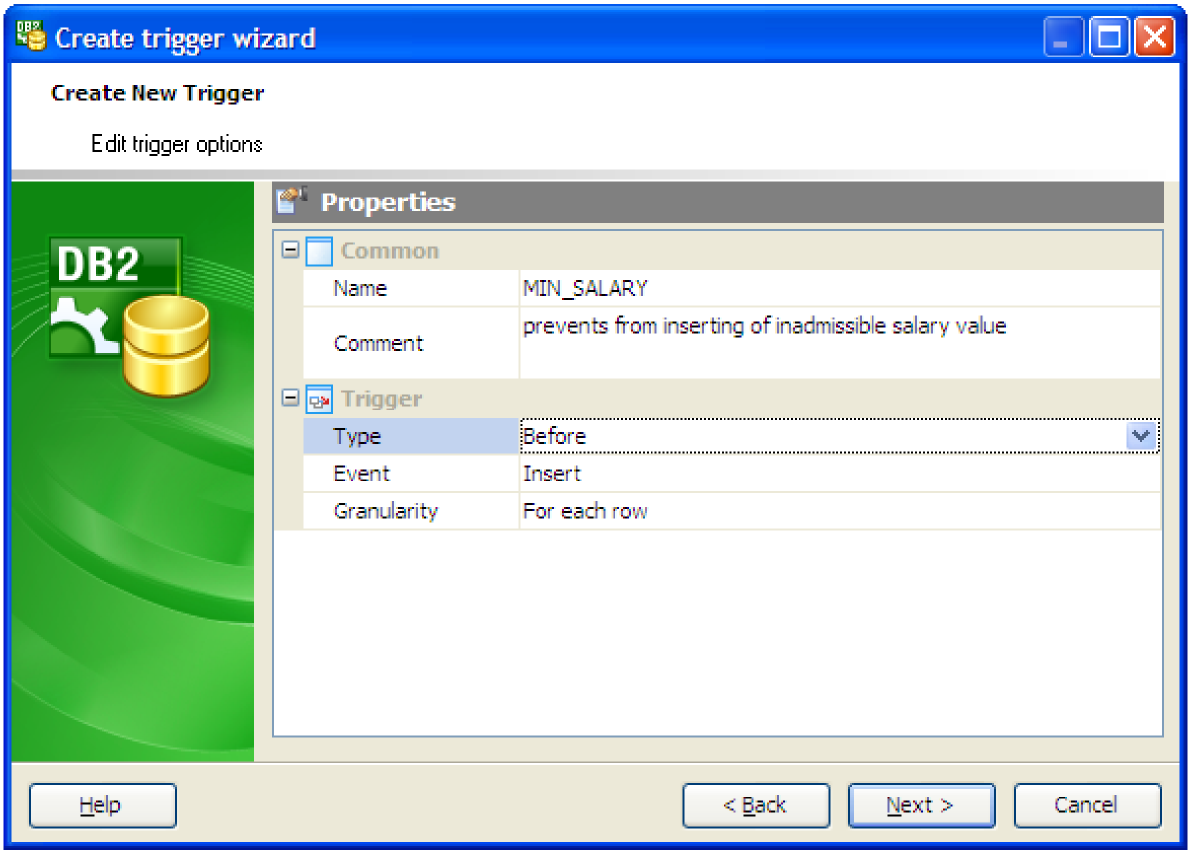
Specifying trigger properties

To define a new trigger, you need to set its Name, Type *(Before, After).* This option determines whether the function is called before or after the event.

Comment
This field contains a comment to the table trigger.

Event
One of *Insert, Update,* or *Delete*; this specifies the event that will fire the trigger.

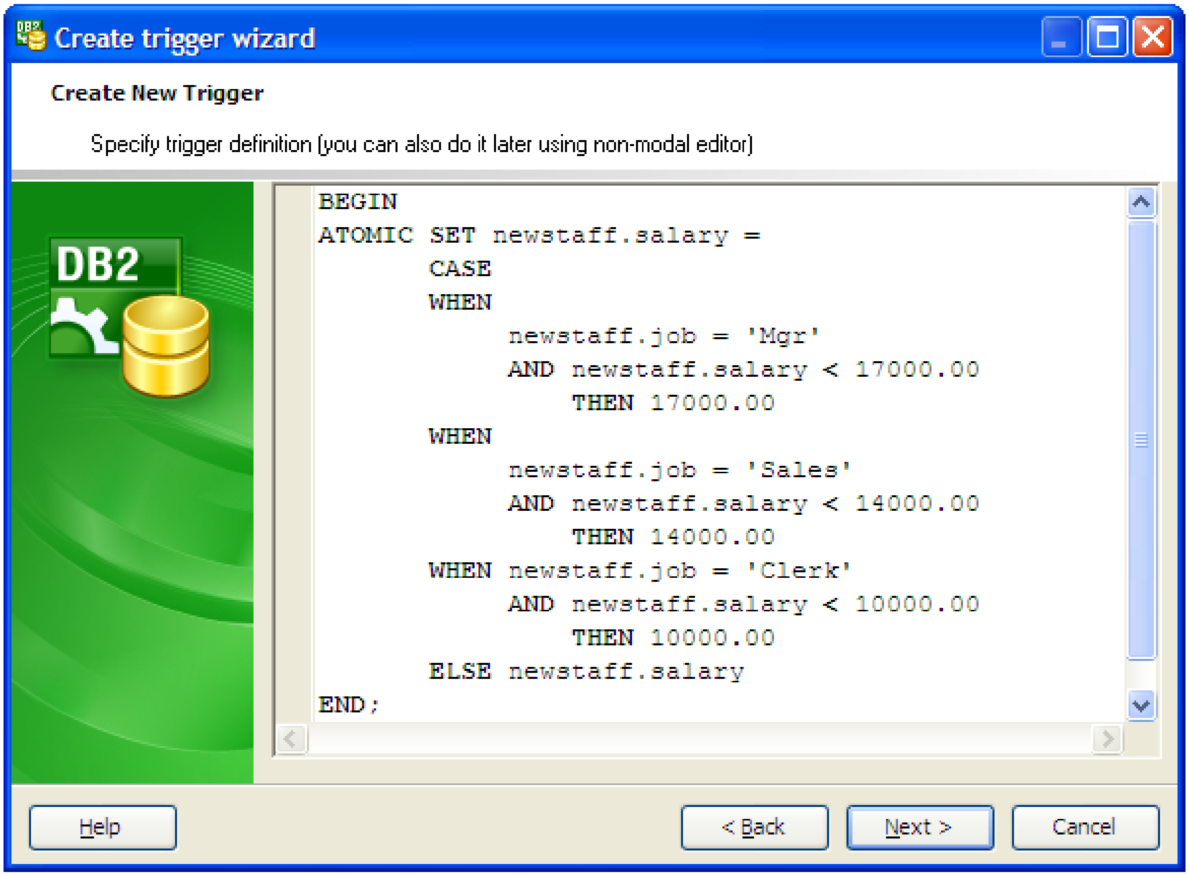
For Each *(Row, Statement)*
This specifies whether the trigger procedure should be fired once for every row affected by the trigger event, or just once per SQL statement.



Name: MIN_SALARY
Comment: prevents from inserting of inadmissible salary value
Type: Before
Event: Insert
Granularity: For each row

Specifying trigger definition

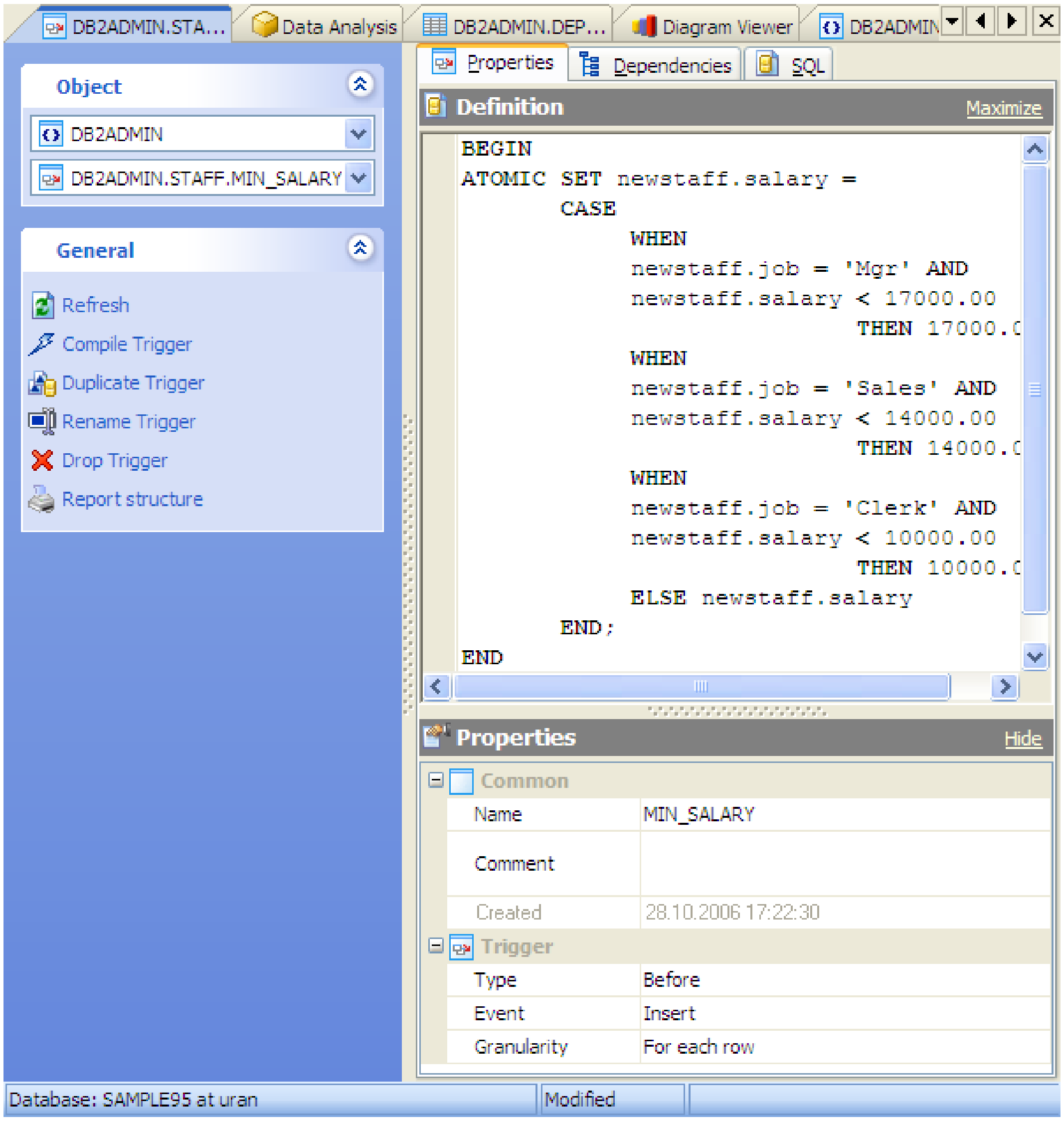
Here you can specify the trigger definition. Specify the trigger steps to be executed when the trigger fires. The step is optional: you can do it later using a non-modal editor.


Create trigger wizard
Create New Trigger
Specify trigger definition (you can also do it later using non-modal editor)
DB2
Help
< Back
Next >
Cancel

```
BEGIN
ATOMIC SET newstaff.salary =
       CASE
       WHEN
            newstaff.job = 'Mgr'
            AND newstaff.salary < 17000.00
                THEN 17000.00
       WHEN
            newstaff.job = 'Sales'
            AND newstaff.salary < 14000.00
                THEN 14000.00
       WHEN newstaff.job = 'Clerk'
            AND newstaff.salary < 10000.00
                THEN 10000.00
       ELSE newstaff.salary
END;
```

5.2.7.2 Trigger Editor

Trigger Editor can be opened automatically after the trigger is created and is available on editing the trigger.
The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.



```
BEGIN
ATOMIC SET newstaff.salary =
       CASE
            WHEN
            newstaff.job = 'Mgr' AND
            newstaff.salary < 17000.00
                            THEN 17000.0
            WHEN
            newstaff.job = 'Sales' AND
            newstaff.salary < 14000.00
                            THEN 14000.0
            WHEN
            newstaff.job = 'Clerk' AND
            newstaff.salary < 10000.00
                            THEN 10000.0
            ELSE newstaff.salary
       END;
END
```

Name	MIN_SALARY
Comment	
Created	28.10.2006 17:22:30
Type	Before
Event	Insert
Granularity	For each row

Database: SAMPLE95 at uran | Modified

The main tab of the editor consists of several parts:, trigger definition, and trigger properties.

Definition
Defines the trigger conditions and actions.

Properties
Name
Here you can view and change the trigger name.

> **Note:** the name of the object must be unique among all the object names in its container. Moreover, all the objects that are source of data need unique names among themselves. You can use any identifier that is allowed by DB2 server.

Comment
This field contains a comment to the trigger.

For Each *(Row, Statement)*
This specifies whether the trigger procedure should be fired once for every row affected by the trigger event, or just once per SQL statement.

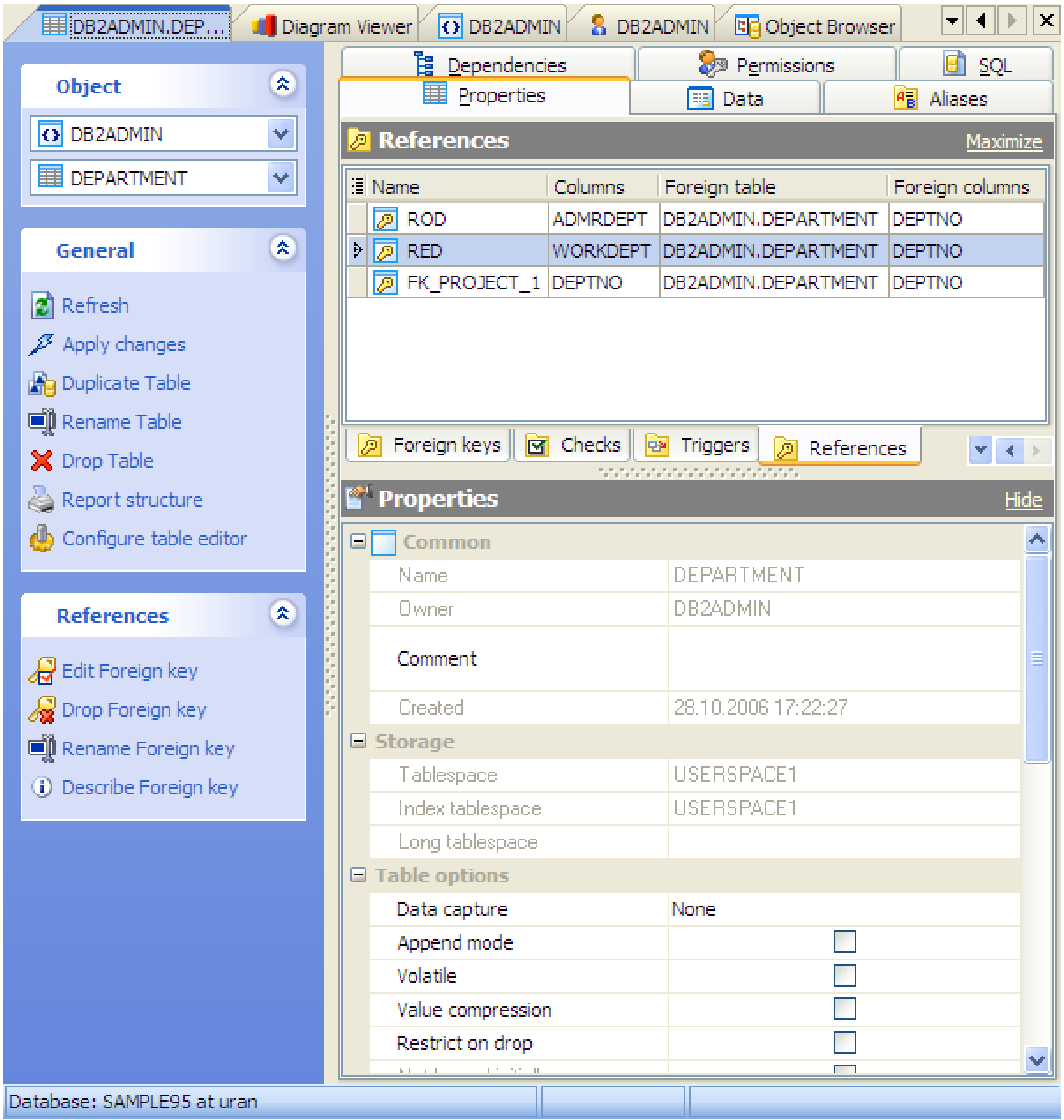
Type*(Before, After)*
Determines whether the function is called before or after the event.

Event (*Insert, Update,* or *Delete)*
Specifies the event that will fire the trigger.
To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.2.8 Foreign Key References

A foreign key specifies that the values in a column (or a group of columns) must match the values appearing in some row of another table. The Foreign Key References tab allows you to manage foreign keys created in other tables and reference for columns of the current one. Table objects are managed within the corresponding tab of Table Editor 67. Unlike *tables* or *views,* Foreign Key References are actually not database objects. These are only references to foreign keys. They are designed specially for easy foreign keys management.



Name	Columns	Foreign table	Foreign columns
ROD	ADMRDEPT	DB2ADMIN.DEPARTMENT	DEPTNO
RED	WORKDEPT	DB2ADMIN.DEPARTMENT	DEPTNO
FK_PROJECT_1	DEPTNO	DB2ADMIN.DEPARTMENT	DEPTNO

Common	
Name	DEPARTMENT
Owner	DB2ADMIN
Comment	
Created	28.10.2006 17:22:27
Storage	
Tablespace	USERSPACE1
Index tablespace	USERSPACE1
Long tablespace	
Table options	
Data capture	None
Append mode	☐
Volatile	☐
Value compression	☐
Restrict on drop	☐

See also: Foreign Keys 76

How can I add a new foreign key reference?

Table foreign key references are edited within the Foreign Key Editor 76 dialog window. In order to open the dialog you should either

- open the table in Table Editor;
- open the Subitems item and the Foreign Keys References tab there;
- press **Enter** key or select the Edit Foreign Key item from the popup menu

or

- select the foreign key to edit in the appropriate table group of the explorer tree and use the Edit Foreign Key popup menu item.

How can I edit an existing foreign key reference?

Table foreign key references are edited within the Foreign Key Editor 76 dialog window. In order to open the dialog you should either

- open the table in Table Editor;
- open the Subitems item and the Foreign Keys References tab there;
- press **Enter** key or select the Edit Foreign Key item from the popup menu

or

- select the foreign key to edit in the appropriate table group of the explorer tree and use the Edit Foreign Key popup menu item.

How can I drop a foreign key reference?

To drop the foreign key reference:

- open the table in Table Editor;
- open the Subitems item and the Foreign Keys References tab there;
- press **Delete** key or select the Drop Foreign Key item from the popup menu;

or

- select the foreign key to drop in the appropriate table group of the explorer tree and use the Drop Foreign Key popup menu item.

and confirm dropping in the dialog window.

5.3 Views

Views are useful for allowing users to access a set of relations (tables) as if it were a single table, and limiting their access to just that. Views can also be used to restrict access to rows (a subset of a particular table).

⊟ How can I create a new view?

New views are created within Create View Wizard 90. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the View icon in the Create Database Object dialog

or

- select the Views list or any object from that list in the explorer tree;
- select the Create New View... item from the popup menu

or

- open Schema (Database) Editor and the Views tab there;
- press the **Insert** key or select the Create New View item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new view with the same properties as one of the existing views has:

- select the Object | Duplicate Database Object... main menu item.
- follow the instructions of Duplicate Object Wizard.

⊟ How can I edit an existing view definition?

Views can be edited within View Editor 94. In order to run the editor you should either

- select the view for editing in the explorer tree (type the first letters of the view name for quick search);
- select the Edit View... item from the popup menu

or

- open Schema (Database) Editor and the Views tab there;
- select the view to edit;
- press the **Enter** key or select the Edit View item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can change the name of the view using the Rename View dialog. To open the dialog you should either

- select the view to rename in the explorer tree;
- select the Rename View item from the popup menu

or

- open Schema (Database) Editor and the Views tab there;

- select the view to rename;
- select the Rename View item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I drop a view?

To drop a view:

- select the view to drop in the explorer tree;
- select the Drop View item from the popup menu

or

- open Schema (Database) Editor and the Views tab there;
- select the view to drop;
- press the **Delete** key or select the Drop View item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

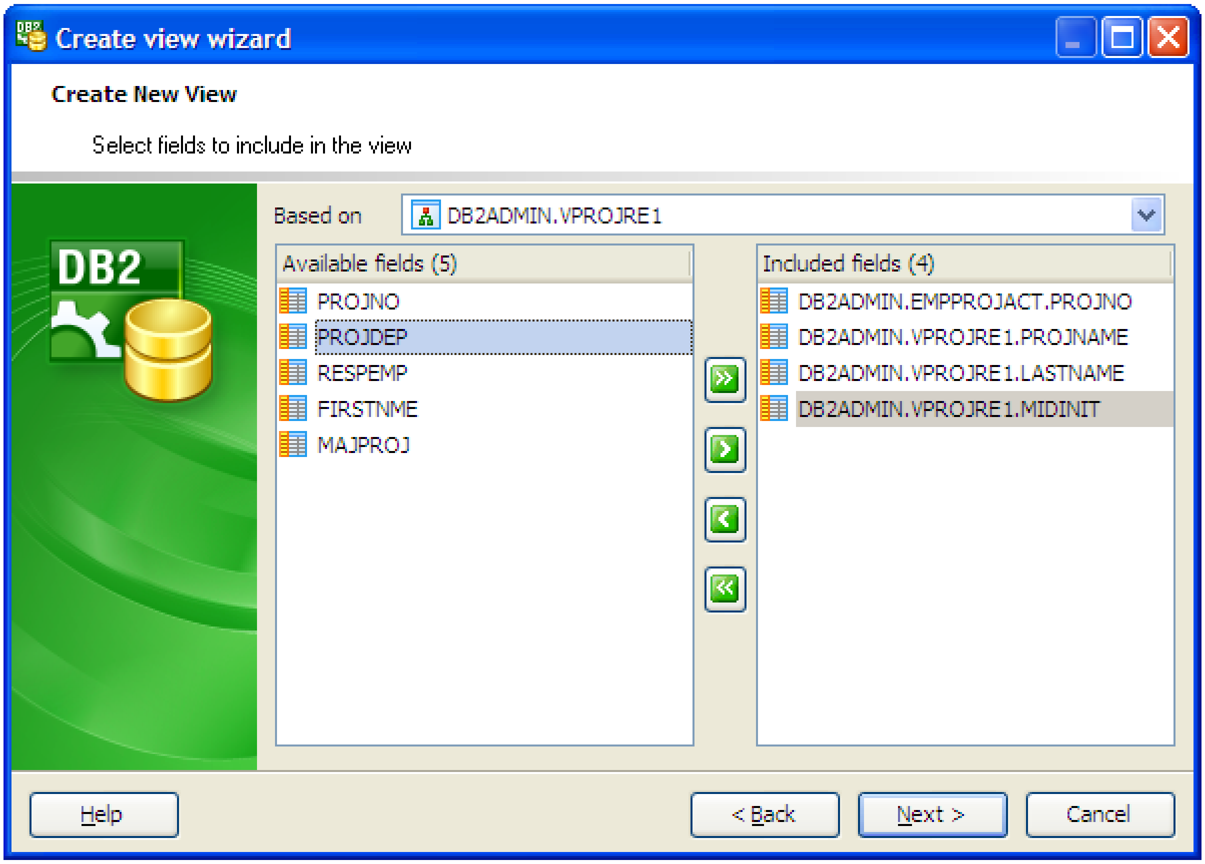
and confirm dropping in the dialog window.

5.3.1 Create View Wizard

Create View Wizard guides you through the process of creating a new view. See How To Create View 89 to learn how to run this wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

Selecting fields for a new view
Select a table or a view from the Based on drop-down menu. Then specify which fields will be used in the new view. Use Add All or Add Selected buttons to include field(s) into view definition. Use the Remove Selected or Remove All items to exclude field(s) from the view's field list. Click the Next button to proceed.



Specifying view options

Name

You may specify here the name of the view being created.

Owner

Defines the owner of the new view. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment

The box allows you to set optional text describing the view.

Check Option

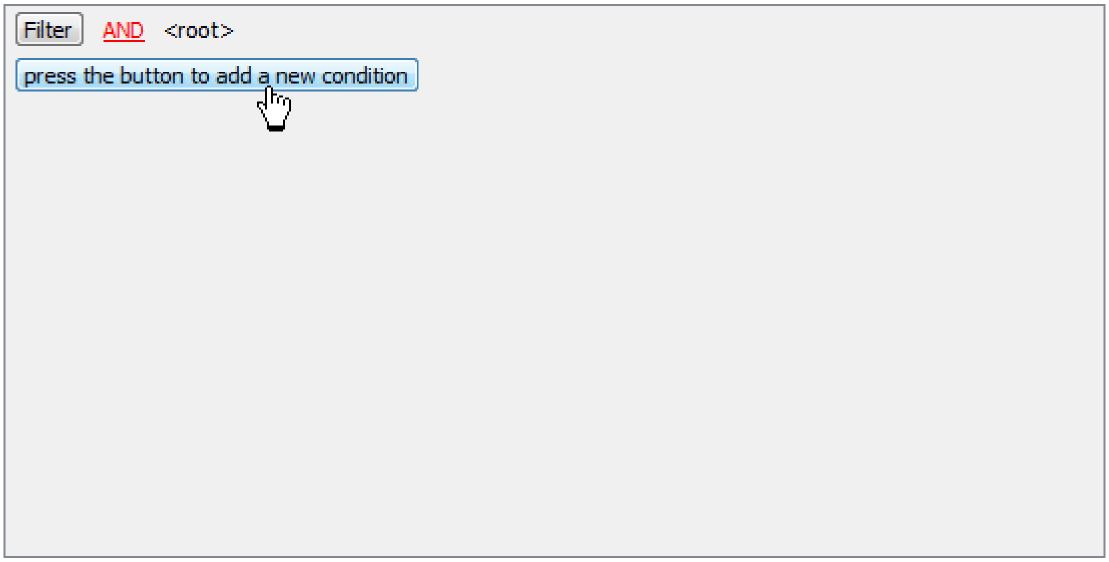
Check the option for an updatable view to prevent inserts or updates to rows except those for which the WHERE clause in the select statement is true. *Cascaded check option and Local check option* allow you to determine the scope of check testing when the view is defined in terms of another view. The *Local* restricts the Check option only to the view being defined. *Cascaded* causes the checks for underlying views to be evaluated as well.

Specifying the WHERE condition

DB2 Maestro provides the Filter Builder dialog to facilitate a creating of the WHERE condition.

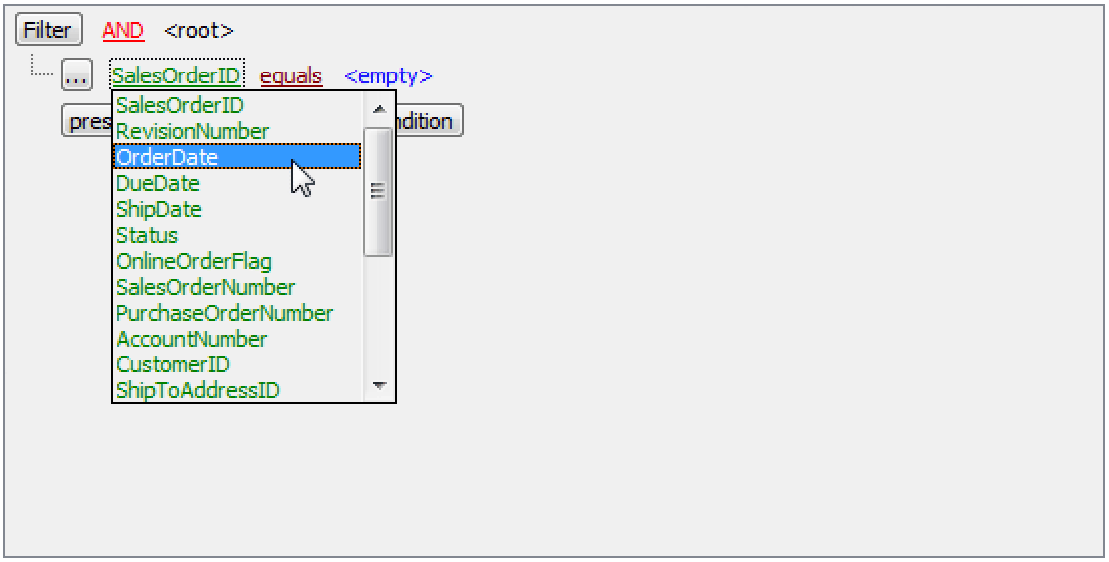
Adding a new condition to the filter

Suppose we need to select orders from the sample table *Orders* made between 01.02.2010 and 10.02.2010. These criteria are applied to the *OrderDate* column. Press the button to add this condition. Alternatively, you can use the Filter button and select the Add Condition option from the drop-down menu.



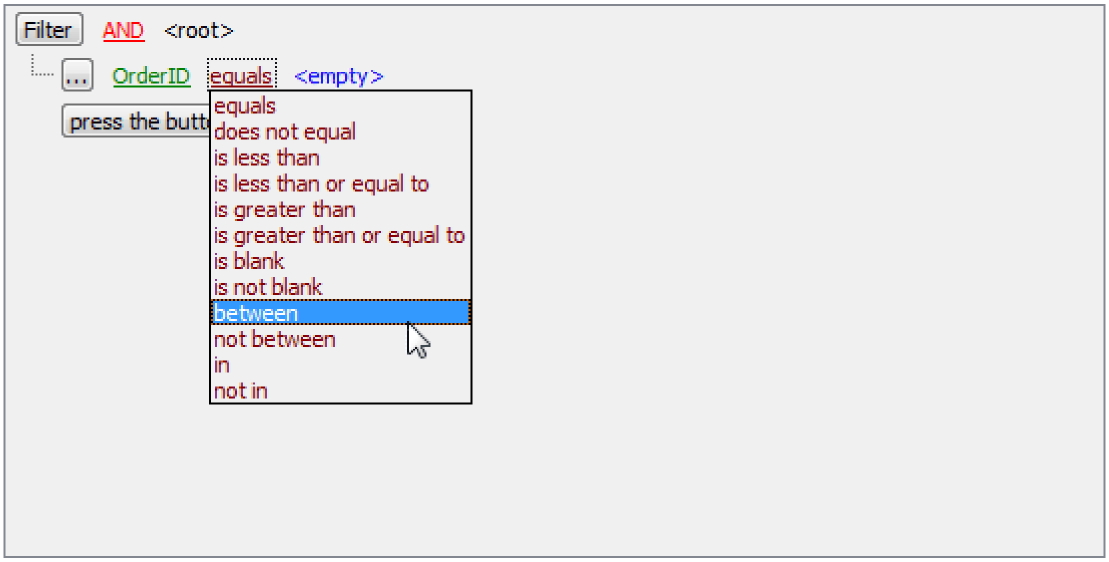
Setting a filter criteria in the condition

Select the *OrderDate* column in the drop-down list of the available columns.



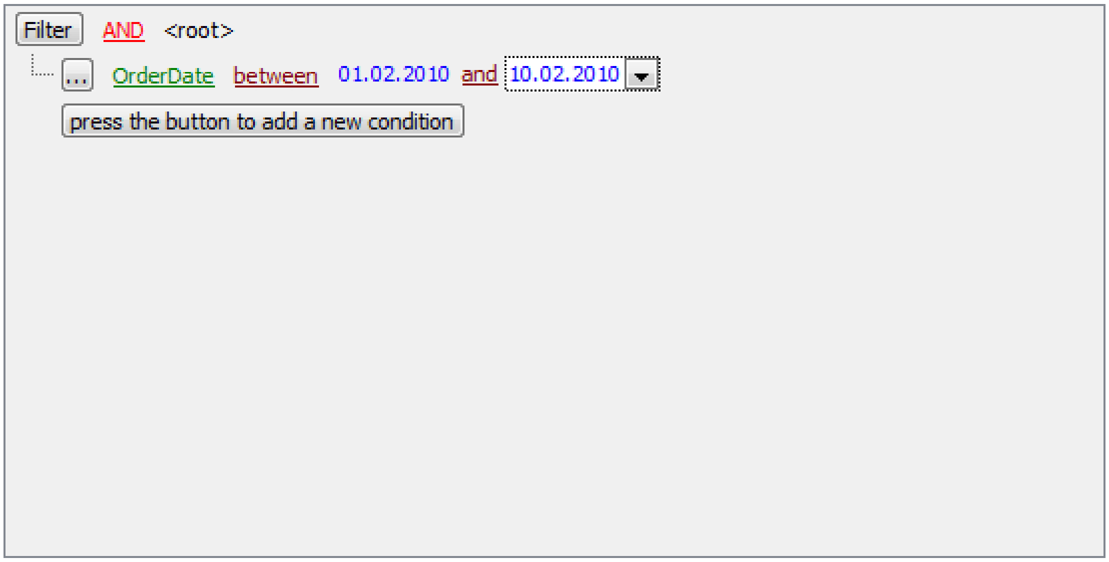
Setting an operator in the condition

Set the proper operator. In our example it is BETWEEN.



Setting criteria values in the condition

Next, you need to specify the range values for the selected operator. The editor used in value boxes is determined by the editor type assigned to the corresponding column.

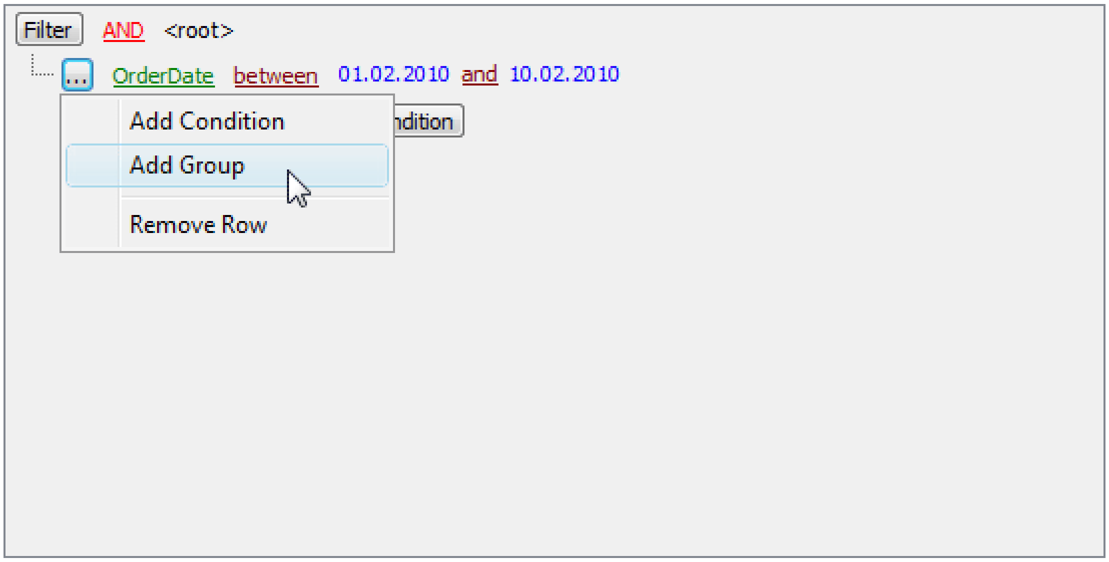


Now use the Apply button to see the filter result.

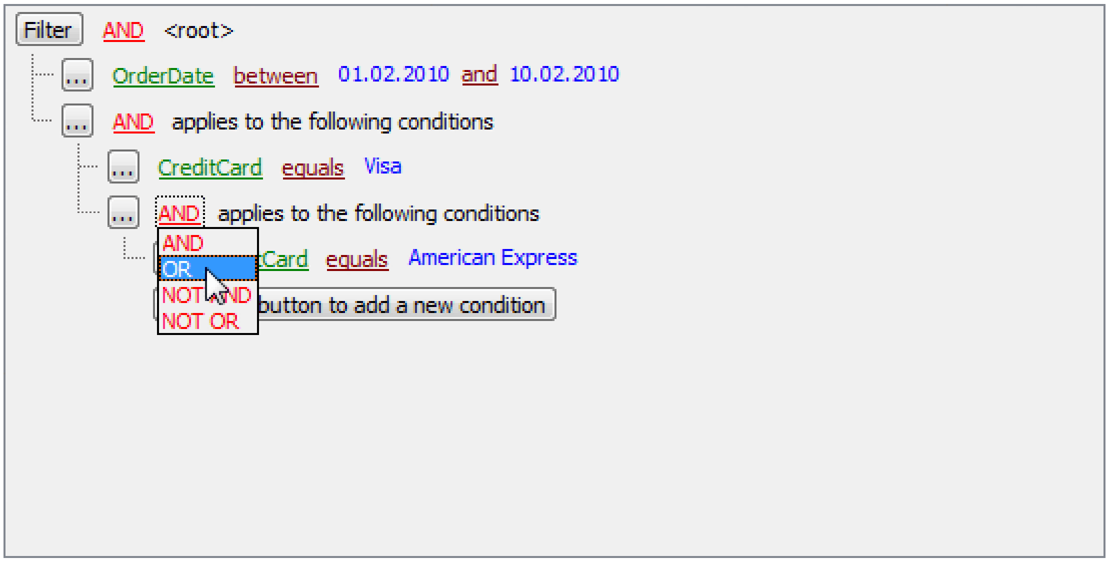
You can add additional conditions to the same root level to be combined by the AND operator.

Adding a new group

Suppose we need to select orders made between 01.02.2010 and 10.02.2010 and payed via 'Visa' or 'American Express'. This is a complex filter condition combining two simple conditions with the OR operator. Conditions from the same root level are combined by the AND operator. To add a condition combined with the previous one with the OR (NOT AND, NOT OR) operator, use a new group of conditions.



The next screen represents the finished filter conditions for this example.



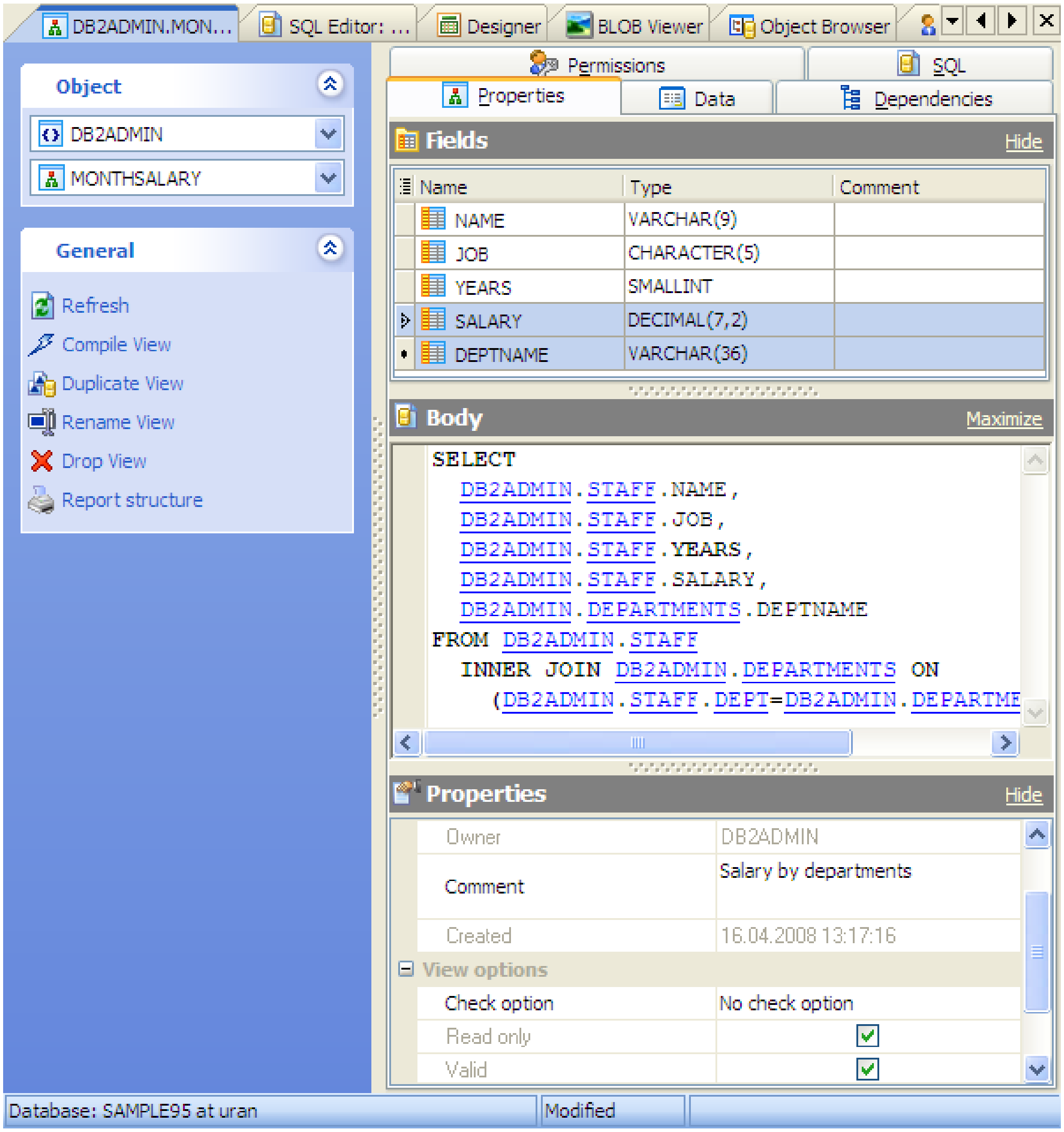
5.3.2 View Editor

View Editor allows you to edit the existing view definition (view name and the SELECT statement it implements).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38 . Below you will find a description of editor tabs that are unique for the current object.

- Editing view properties 95
- Viewing data 96

See also: Create View Wizard 90



Name	Type	Comment
NAME	VARCHAR(9)	
JOB	CHARACTER(5)	
YEARS	SMALLINT	
SALARY	DECIMAL(7,2)	
DEPTNAME	VARCHAR(36)	

```
SELECT
  DB2ADMIN.STAFF.NAME,
  DB2ADMIN.STAFF.JOB,
  DB2ADMIN.STAFF.YEARS,
  DB2ADMIN.STAFF.SALARY,
  DB2ADMIN.DEPARTMENTS.DEPTNAME
FROM DB2ADMIN.STAFF
  INNER JOIN DB2ADMIN.DEPARTMENTS ON
    (DB2ADMIN.STAFF.DEPT=DB2ADMIN.DEPARTME
```

Owner	DB2ADMIN
Comment	Salary by departments
Created	16.04.2008 13:17:16
View options	
Check option	No check option
Read only	☑
Valid	☑

5.3.2.1 Editing view properties

View Editor provides you with an ability to edit view properties. The Properties tab allows you to change the view name, view definition.

Subitems
Every tab is intended for managing some view subitems (e.g. *fields*). Each object can be opened in its editor. Use grid's popup menu to create new, edit or drop the selected view subitems. Using the popup menu you can also copy the selected objects to clipboard or paste previously copied objects.
You can operate on several objects at a time. For this you have to select view objects with the **Shift** or the **Ctrl** key pressed. After a group of objects is selected you can operate on it, e.g. *delete several objects at once*, as if it were a single object.

See also: Fields 71

Body
You can edit the view definition in this box.

Use the Name field to specify the view name.

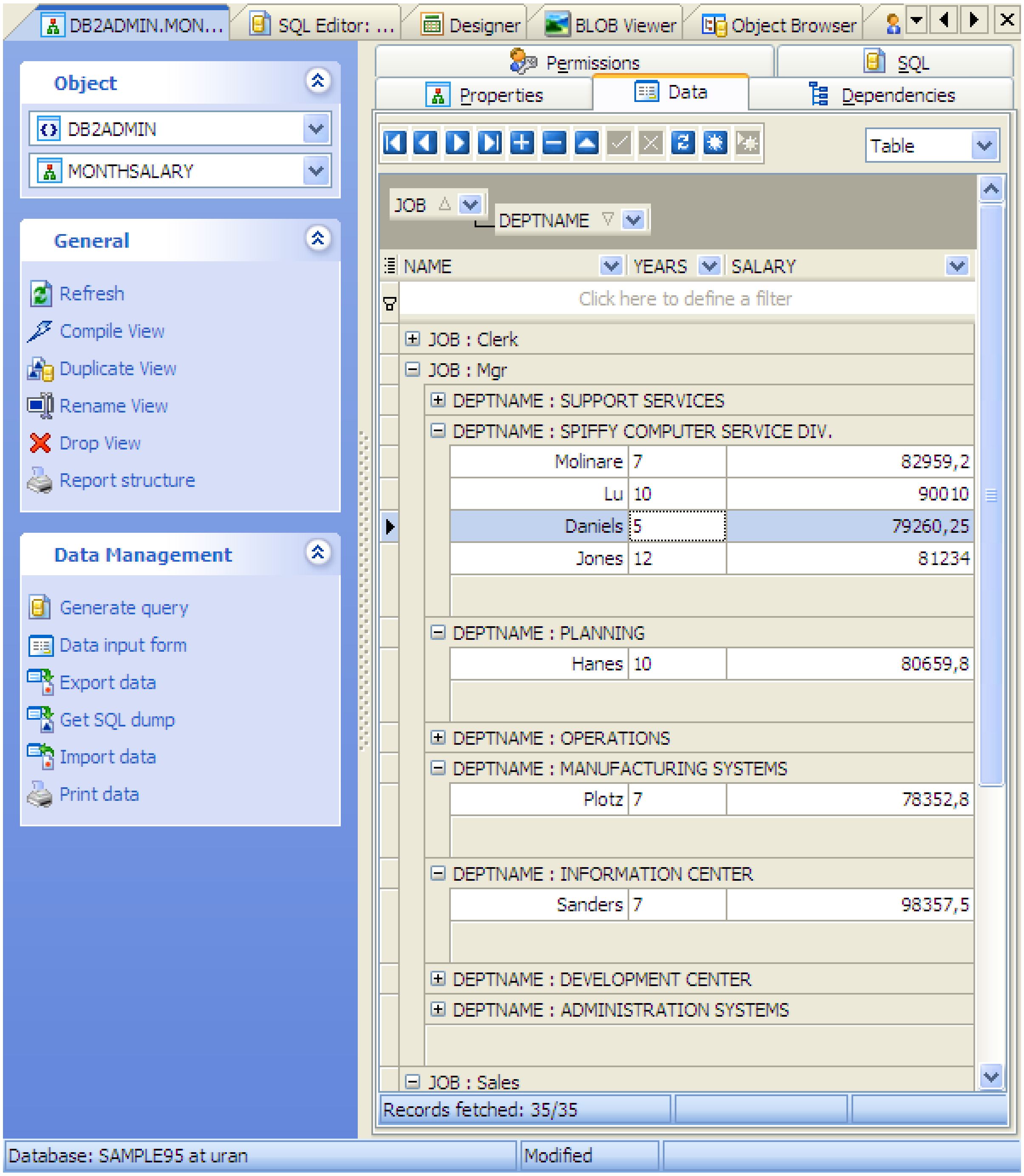
Note: the name of the object must be unique among all the object names in its container. Moreover, all the objects that are source of data need unique names among themselves. You can use any identifier that is allowed by DB2 server.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl +F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.3.2.2 Viewing data

The Data tab displays the data represented in the view as a grid (see Data View for details). The popup menu of this tab and the Data Management navigation bar allow you to export data, get SQL dump, set the value of the selected record to *Null* or to *Now* (for Date values). In tables with BLOB fields you can also call BLOB Editor to view and edit the BLOB fields.



JOB : Clerk
JOB : Mgr
DEPTNAME : SUPPORT SERVICES
DEPTNAME : SPIFFY COMPUTER SERVICE DIV.

NAME	YEARS	SALARY
Molinare	7	82959,2
Lu	10	90010
Daniels	5	79260,25
Jones	12	81234

DEPTNAME : PLANNING

NAME	YEARS	SALARY
Hanes	10	80659,8

DEPTNAME : OPERATIONS
DEPTNAME : MANUFACTURING SYSTEMS

NAME	YEARS	SALARY
Plotz	7	78352,8

DEPTNAME : INFORMATION CENTER

NAME	YEARS	SALARY
Sanders	7	98357,5

DEPTNAME : DEVELOPMENT CENTER
DEPTNAME : ADMINISTRATION SYSTEMS
JOB : Sales

Records fetched: 35/35

Database: SAMPLE95 at uran
Modified

5.4 Procedures

A procedure is an application program that you can call by name. The argument or arguments of a procedure are individual scalar values, which can be of different types and can have different meanings. The arguments can be used to pass values into the procedure, receive return values from the procedure, or both.

⊟ How can I create a new procedure?

New procedures are created within Create Procedure Wizard 99. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Procedure icon in the Create Database Object dialog

or

- select the Procedures list or any object from that list in the explorer tree;
- select the Create New Procedure... item from the popup menu

or

- open Schema Editor and the Procedures tab there;
- press the **Insert** key or select the Create New Procedure item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new procedure with the same properties as one of the existing procedures has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

⊟ How can I edit an existing procedure definition?

Procedures can be edited within Procedure Editor 103. In order to run the editor you should either

- select the procedure for editing in the explorer tree (type the first letters of the procedure name for quick search);
- select the Edit Procedure... item from the popup menu

or

- open Schema Editor and the Procedures tab there;
- select the procedure to edit;
- press the **Enter** key or select the Edit Procedure item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can change the name of the procedure using the Rename Procedure dialog. To open the dialog you should either

- select the procedure to rename in the explorer tree;
- select the Rename Procedure item from the popup menu

or

- open Schema Editor and the Procedures tab there;

- select the procedure to rename;
- select the Rename Procedure item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I execute a procedure?

To execute a procedure:

- select the procedure in the explorer tree (type the first letters of the procedure name for quick search);
- select the Edit Procedure... item from the popup menu;
- execute the procedure using the Execute link of the Navigation Bar

or

open Schema Editor and the Procedures tab there;

- select the procedure to execute;
- press the **Enter** key or select the Edit Procedure item from the popup menu, or use the corresponding link of the Navigation Bar;
- execute the procedure using the Execute link of the Navigation bar.

⊟ How can I drop a procedure?

To drop a procedure:

- select the procedure to drop in the explorer tree;
- select the Drop Procedure item from the popup menu

or

- open Schema Editor and the Procedures tab there;
- select the procedure to drop;
- press the **Delete** key or select the Drop Procedure item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

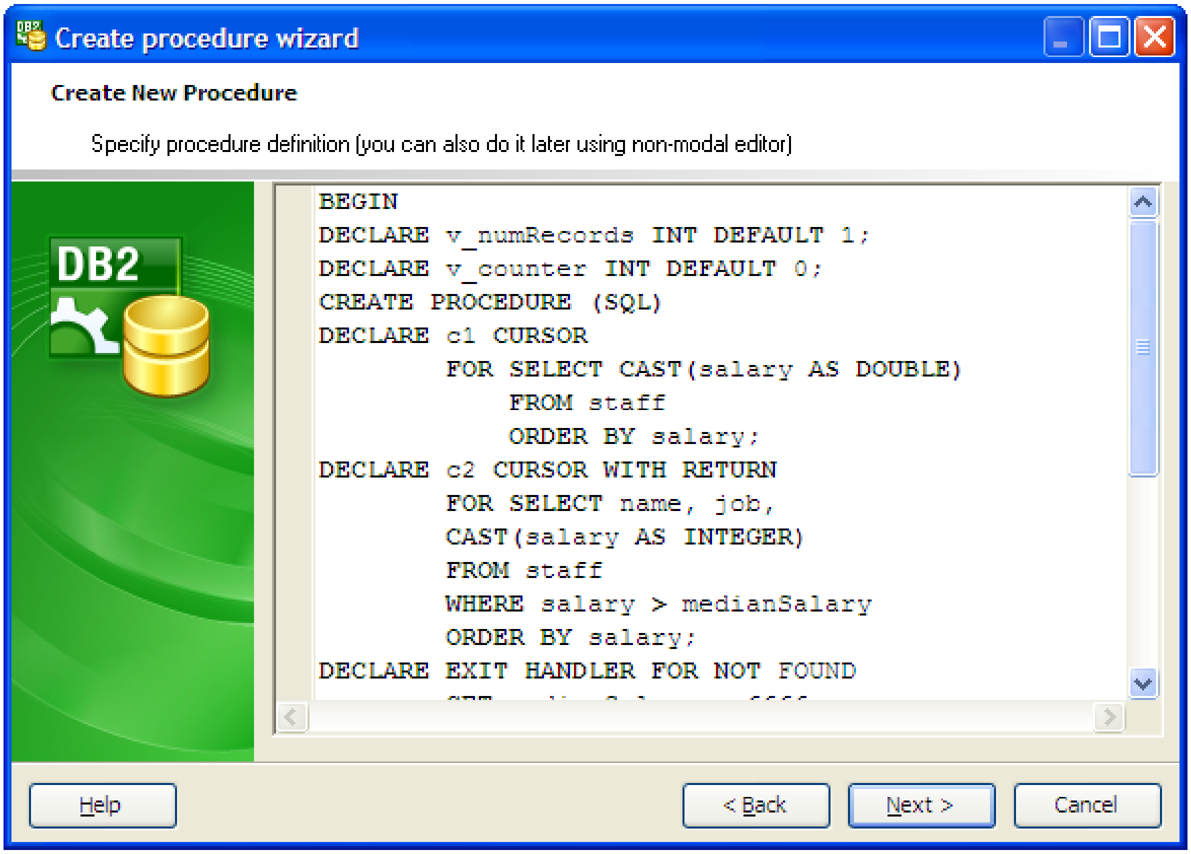
5.4.1 Create Procedure Wizard

Create Procedure Wizard guides you through the process of creating a new procedure. See How To Create Procedure 98 for instructions on running this wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

- Specifying procedure options 100
- Managing parameters of a new procedure 102
- Specifying procedure definition 102

See also: Procedure Editor 103



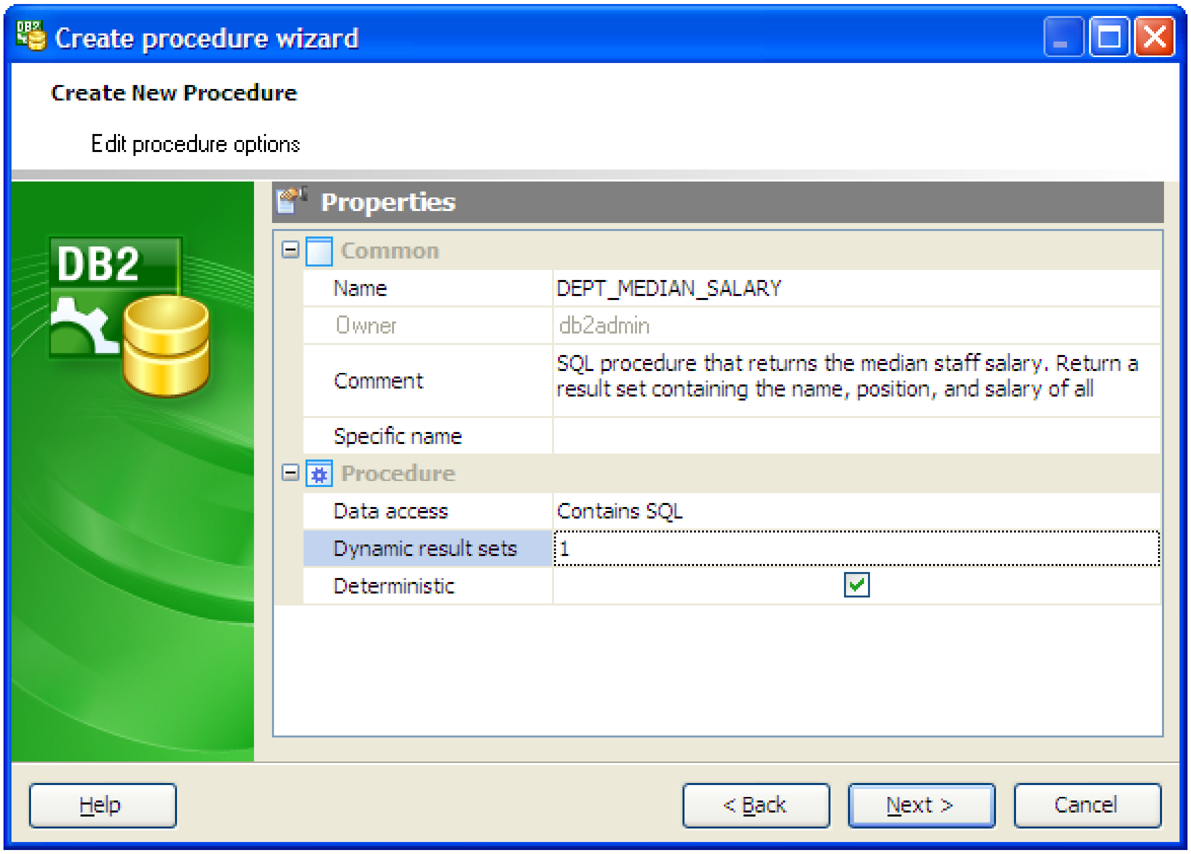
Create New Procedure

Specify procedure definition (you can also do it later using non-modal editor)

```
BEGIN
DECLARE v_numRecords INT DEFAULT 1;
DECLARE v_counter INT DEFAULT 0;
CREATE PROCEDURE (SQL)
DECLARE c1 CURSOR
        FOR SELECT CAST(salary AS DOUBLE)
            FROM staff
            ORDER BY salary;
DECLARE c2 CURSOR WITH RETURN
        FOR SELECT name, job,
        CAST(salary AS INTEGER)
        FROM staff
        WHERE salary > medianSalary
        ORDER BY salary;
DECLARE EXIT HANDLER FOR NOT FOUND
```

5.4.1.1 Specifying procedure options

Specify procedure options according to your needs. The detailed description is given below.



Common	
Name	DEPT_MEDIAN_SALARY
Owner	db2admin
Comment	SQL procedure that returns the median staff salary. Return a result set containing the name, position, and salary of all
Specific name	
Procedure	
Data access	Contains SQL
Dynamic result sets	1
Deterministic	☑

Name
The new procedure name as it was set on the previous step.

Owner
Defines the owner for the procedure. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment
Specify a comment for the procedure.

☑ **Deterministic**
Check the option if the procedure always produces the same result for the same input parameters, and uncheck otherwise.

Specific name
Provides a unique name for the instance of the procedure that is being defined. This specific name can be used when dropping the procedure or commenting on the procedure. It can never be used to invoke the procedure.

Data access *(Contains SQL, Reads SQL data, Modifies SQL data)*
Indicates the level of data access for SQL statements included in the procedure.

Contains SQL indicates that SQL statements that neither read nor modify SQL data can be executed by the procedure. Statements that are not supported in procedures might return a different error.

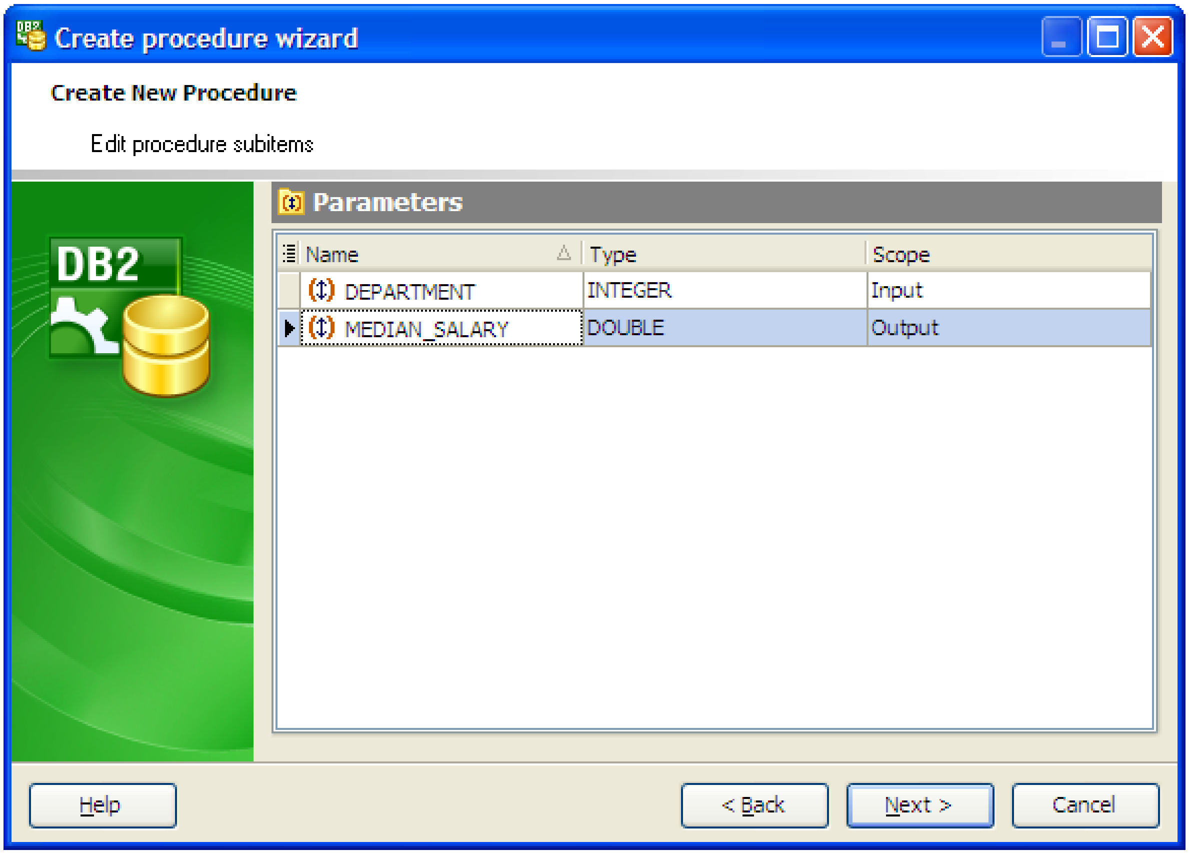
Reads SQL data Indicates that some SQL statements that do not modify SQL data can be included in the procedure.

Modifies SQL data indicates that the procedure can execute any SQL statement except statements that are not supported in procedures.

Dynamic result sets
Indicates the estimated upper bound of returned result sets for the procedure.

5.4.1.2 Managing parameters

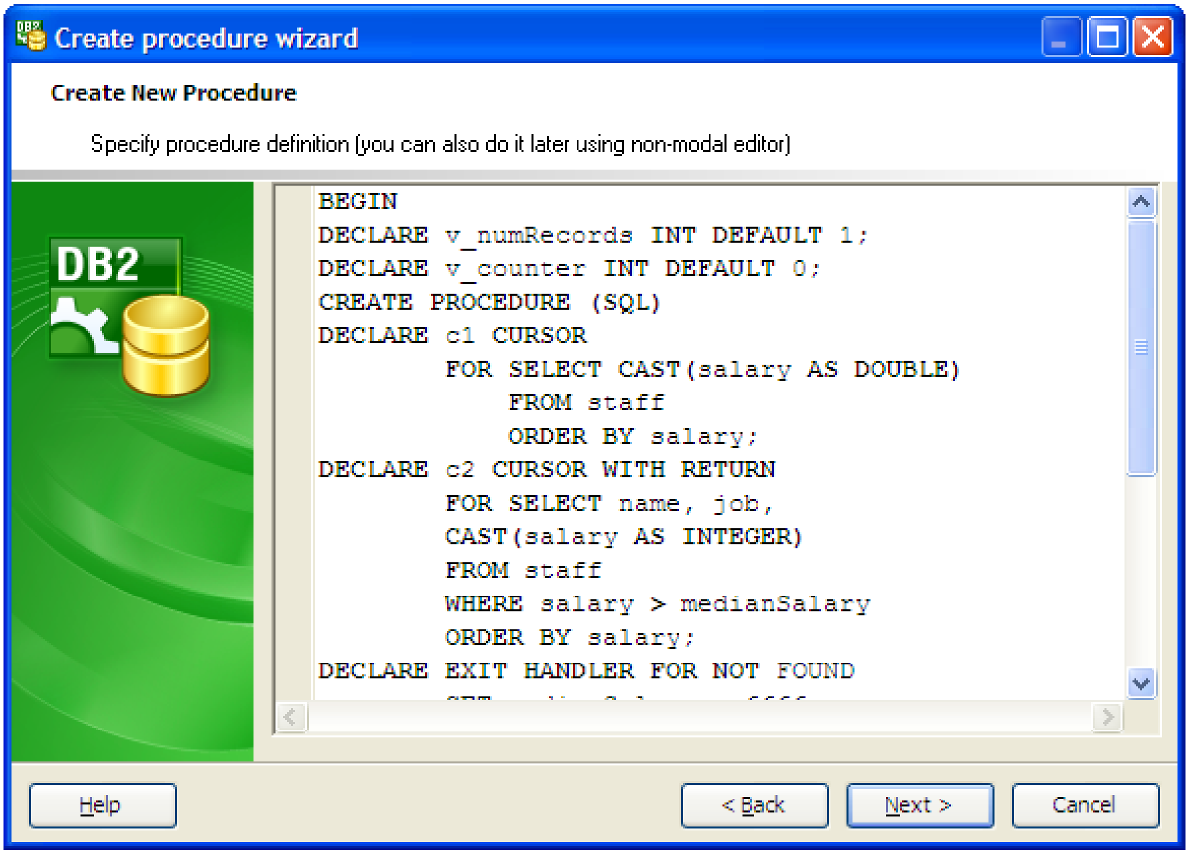
Use the pop-up menu or press **Insert** to add a new parameter and set its properties in Parameter Editor 42. Press **Enter** or use the appropriate pop-up menu item to edit the selected parameter, or the Delete to delete one.



Name	Type	Scope
DEPARTMENT	INTEGER	Input
MEDIAN_SALARY	DOUBLE	Output

5.4.1.3 Specifying procedure definition

At this step you can specify the SQL definition for the new procedure. The step is optional: you can do it later using a non-modal editor.


Create procedure wizard
Create New Procedure
Specify procedure definition (you can also do it later using non-modal editor)
DB2
Help
< Back
Next >
Cancel

```
BEGIN
DECLARE v_numRecords INT DEFAULT 1;
DECLARE v_counter INT DEFAULT 0;
CREATE PROCEDURE (SQL)
DECLARE c1 CURSOR
        FOR SELECT CAST(salary AS DOUBLE)
            FROM staff
            ORDER BY salary;
DECLARE c2 CURSOR WITH RETURN
        FOR SELECT name, job,
        CAST(salary AS INTEGER)
        FROM staff
        WHERE salary > medianSalary
        ORDER BY salary;
DECLARE EXIT HANDLER FOR NOT FOUND
```

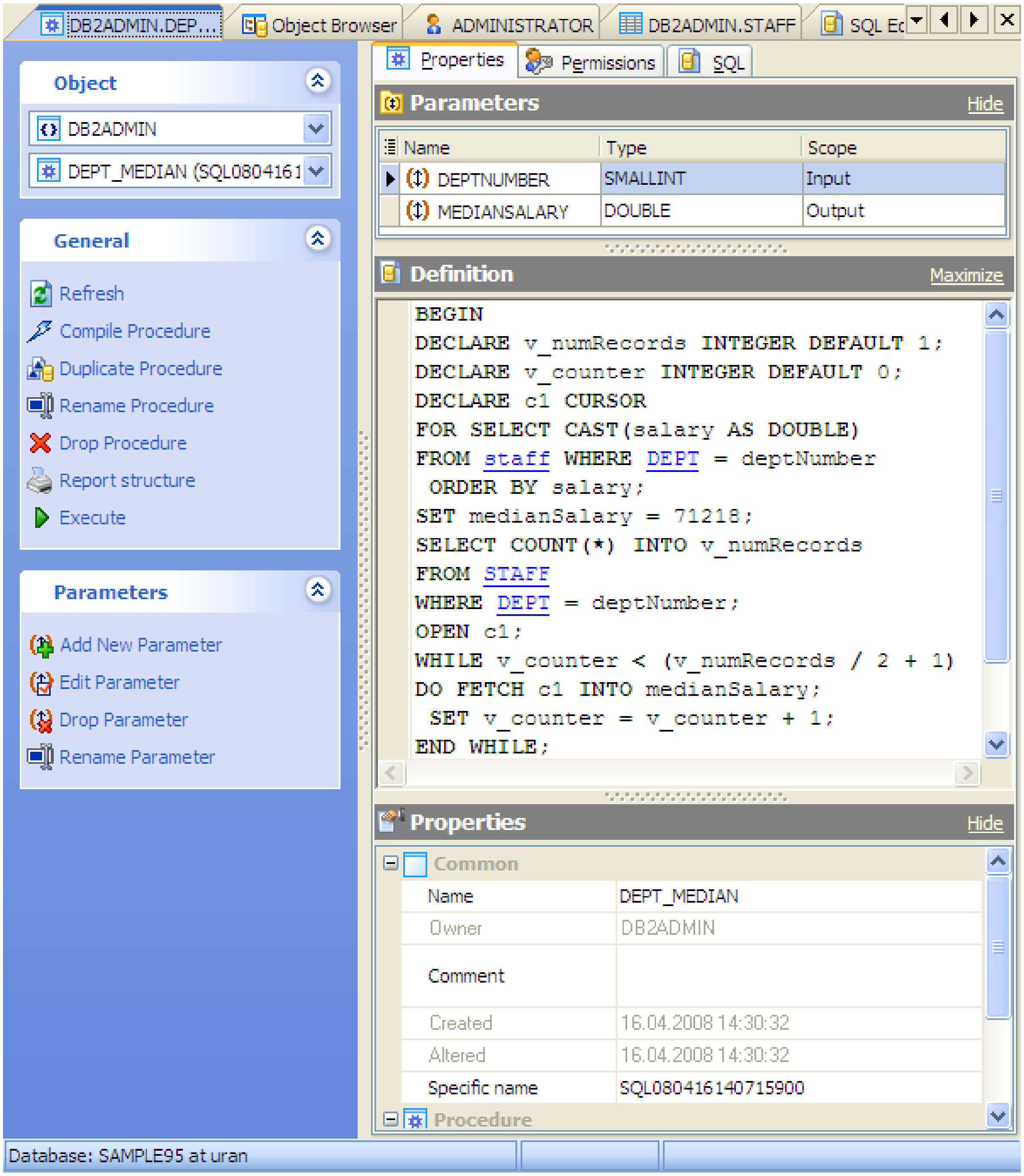
5.4.2 Procedure Editor

Procedure Editor allows you to edit its definition (*procedure name, parameter list, procedure body,* etc.). It opens when you create a new procedure or edit the existing one (see How to edit procedure 98 for details).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.

- Editing procedure properties 104

See also: Create Procedure Wizard 99



Name	Type	Scope
DEPTNUMBER	SMALLINT	Input
MEDIANSALARY	DOUBLE	Output

```
BEGIN
DECLARE v_numRecords INTEGER DEFAULT 1;
DECLARE v_counter INTEGER DEFAULT 0;
DECLARE c1 CURSOR
FOR SELECT CAST(salary AS DOUBLE)
FROM staff WHERE DEPT = deptNumber
 ORDER BY salary;
SET medianSalary = 71218;
SELECT COUNT(*) INTO v_numRecords
FROM STAFF
WHERE DEPT = deptNumber;
OPEN c1;
WHILE v_counter < (v_numRecords / 2 + 1)
DO FETCH c1 INTO medianSalary;
 SET v_counter = v_counter + 1;
END WHILE;
```

Common	
Name	DEPT_MEDIAN
Owner	DB2ADMIN
Comment	
Created	16.04.2008 14:30:32
Altered	16.04.2008 14:30:32
Specific name	SQL080416140715900
Procedure	

5.4.2.1 Editing properties

Parameters can be edited within the Parameter Editor dialog window. In order to open the dialog you should

- open the object in its editor and the Parameters tab there;
- select the parameter to edit;
- press the **Enter** key or select the Edit Parameter item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

Name
Defines the procedure name.

Note: the name of the object must be unique among all the object names in its container. Moreover, all the objects that are source of data need unique names among themselves. You can use any identifier that is allowed by DB2 server.

Owner
There is the owner for the procedure. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment
This field contains a comment to the procedure.

Deterministic
Check the option if the procedure always produces the same result for the same input parameters, and uncheck otherwise.

Specific name
Provides a unique name for the instance of the procedure that is being defined. This specific name can be used when dropping the procedure or commenting on the procedure. It can never be used to invoke the procedure.

Data access *(Contains SQL, Reads SQL data, Modifies SQL data)*
Indicates the level of data access for SQL statements included in the procedure.

Contains SQL indicates that SQL statements that neither read nor modify SQL data can be executed by the procedure. Statements that are not supported in procedures might return a different error.

Reads SQL data Indicates that some SQL statements that do not modify SQL data can be included in the procedure.

Modifies SQL data indicates that the procedure can execute any SQL statement except statements that are not supported in procedures.

Dynamic result sets
Indicates the estimated upper bound of returned result sets for the procedure.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.5 External Procedures and Functions

An external procedure/function is a user-defined function which is determined to the database with a reference to an object code library, and a function within that library that will be executed when the function is invoked. External functions cannot be column functions.

How can I create a new external procedure?

New External Procedures are created within Create External Procedure Wizard 107. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the External Procedure icon in the Create Database Object dialog

or

- select the External Procedures list or any object from that list in the explorer tree;
- select the Create New External Procedure... item from the popup menu

or

- open the database in Database Editor and the External Procedures tab there;
- press the **Insert** key or select the Create New External Procedure... item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new External Procedure with the same properties as one of the existing External Procedure has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

How can I edit an external procedure definition?

External Procedures can be edited within External Procedure Editor 109. In order to run the editor you should either

- select the External Procedure for editing in the explorer tree (type the first letters of the External Procedure name for quick search);
- select the Edit External Procedure ... item from the popup menu

or

- open the database in Database Editor and the External Procedures tab there;
- select the External Procedure to edit;
- press the **Enter** key or select the Edit External Procedure item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can change the name of the External Procedure using the

Rename External Procedure dialog. To open the dialog you should either

- select the External Procedure to rename in the explorer tree;
- select the Rename External Procedure item from the popup menu

or

- open the database in Database Editor and the External Procedures tab there;
- select the External Procedure to rename;
- select the Rename External Procedure item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

How can I drop an external procedure?

To drop a External Procedure:

- select the External Procedure to drop in the explorer tree;
- select the Drop External Procedure item from the popup menu

or

- open the database in Database Editor and the External Procedures tab there;
- select the External Procedure to drop;
- press the **Delete** key or select the Drop External Procedure item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

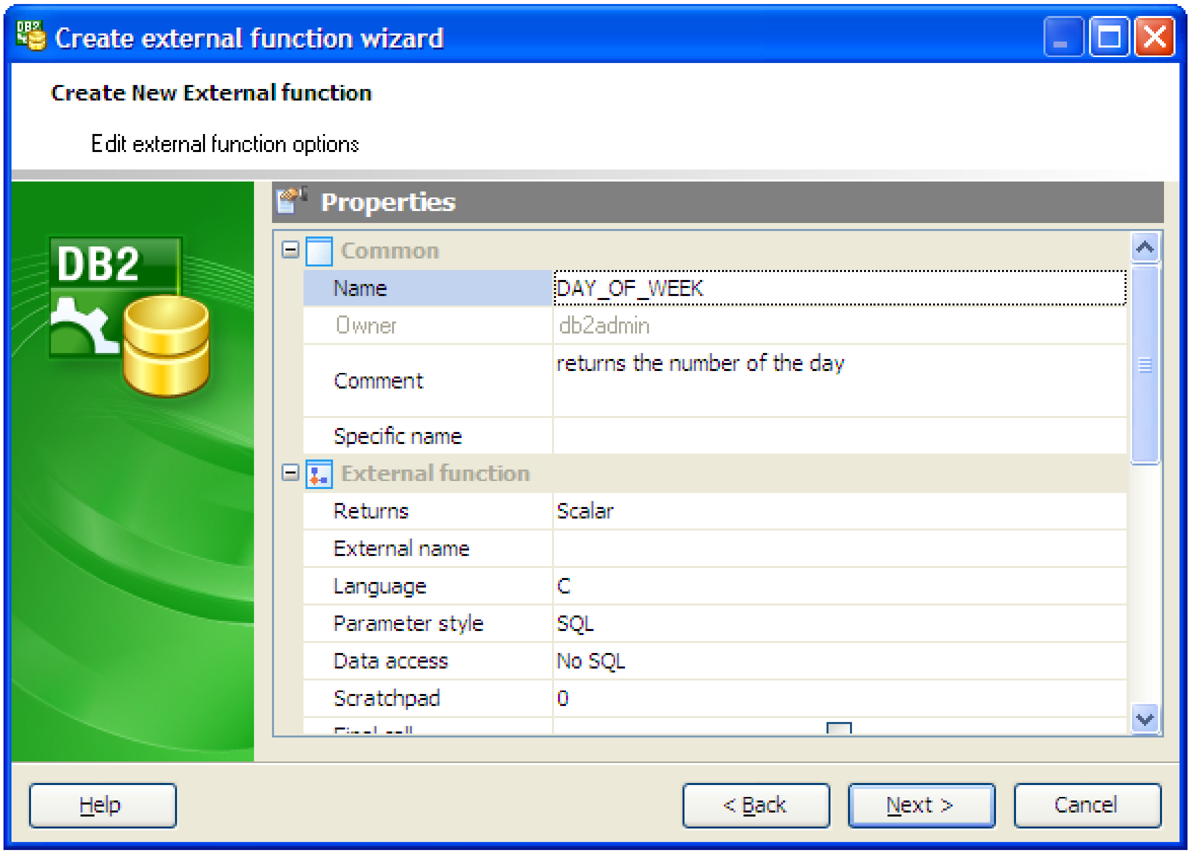
5.5.1 Create External Procedure Wizard

Create External Procedure/Function Wizard guides you through the process of creating a new procedure/function. See How To Create Procedure 106 for instructions on running this wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

See also: External Procedure/Function Editor 109

First wizard step allows to set procedure options according to your needs.


Create external function wizard
Create New External function
Edit external function options
DB2
Properties
Common
External function
Help
< Back
Next >
Cancel

Name: DAY_OF_WEEK
Owner: db2admin
Comment: returns the number of the day
Specific name:
Returns: Scalar
External name:
Language: C
Parameter style: SQL
Data access: No SQL
Scratchpad: 0

Name
The new procedure name as it was set on the previous step.

Owner
Defines the owner for the procedure. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment
Specify a comment for the procedure.

Parameter style
This clause is used to specify the conventions used for passing parameters to and returning the value from procedures.

Specific name
Provides a unique name for the instance of the procedure that is being defined. This specific name can be used when dropping the procedure or commenting on the procedure. It can never be used to invoke the procedure.

Data access *(Contains SQL, Reads SQL data, Modifies SQL data)*
Indicates the level of data access for SQL statements included in the procedure.

Contains SQL indicates that SQL statements that neither read nor modify SQL data can be executed by the procedure. Statements that are not supported in procedures might return a different error.

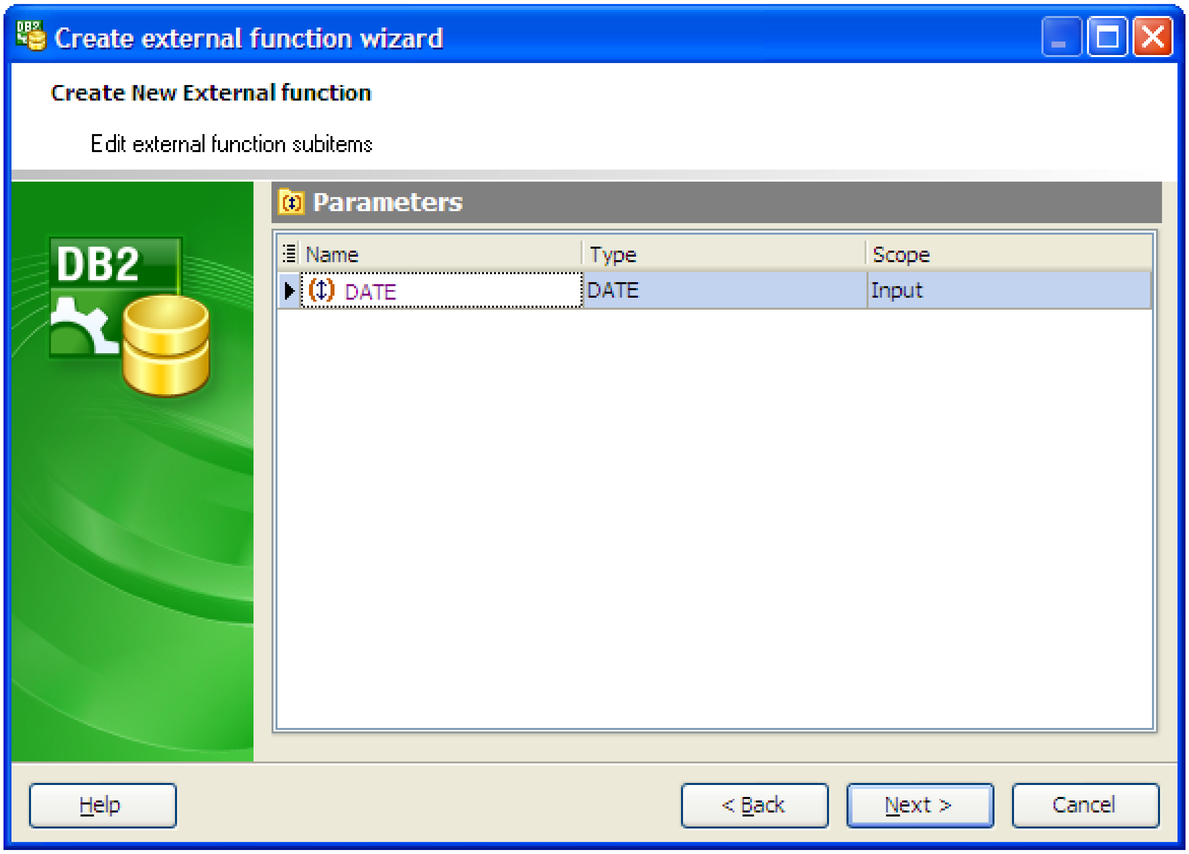
Reads SQL data Indicates that some SQL statements that do not modify SQL data can be included in the procedure.

Modifies SQL data indicates that the procedure can execute any SQL statement except statements that are not supported in procedures.

Dynamic result sets
Indicates the estimated upper bound of returned result sets for the procedure.

The description of the other External Function properties you can find in DB2 SQL Reference Volume 2.

On the second step you can easily specify the procedure parameters. Use the pop-up menu or press **Insert** to add a new parameter and set its properties in Parameter Editor 42. Press **Enter** or use the appropriate pop-up menu item to edit the selected parameter, or the Delete to delete one.

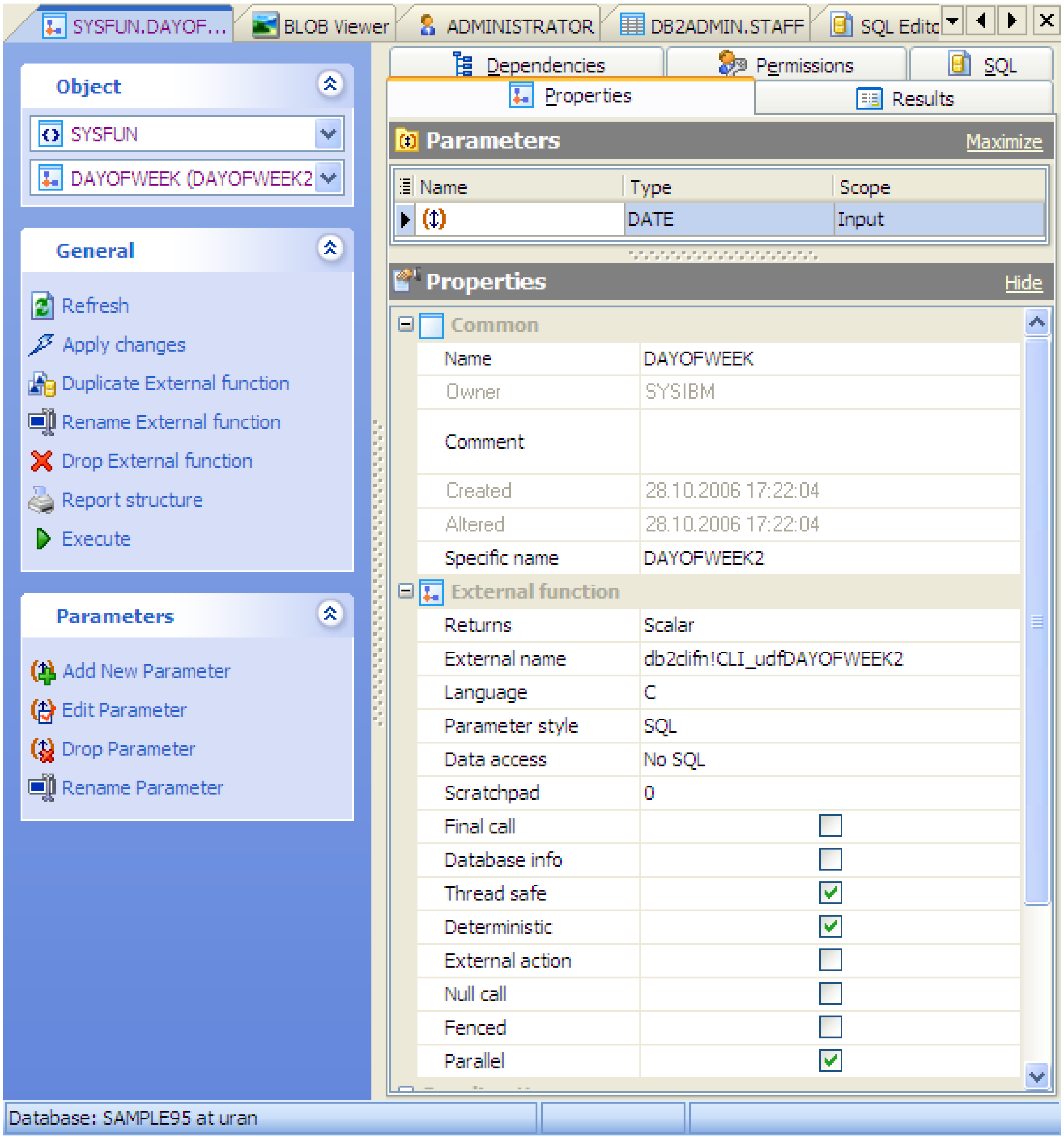

Create external function wizard
Create New External function
Edit external function subitems
DB2
Parameters
Help
< Back
Next >
Cancel

Name	Type	Scope
DATE	DATE	Input

5.5.2 External Procedure Editor

External Procedure/Function Editor allows you to edit its definition (*procedure name, parameter list, procedure body,* etc.). It opens when you create a new procedure or edit the existing one (see How to edit procedure 106 for details).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38 . Below you will find a description of editor tabs that are unique for the current object.
See also: Create External Procedure Wizard 107



Name	Type	Scope
	DATE	Input

Common	
Name	DAYOFWEEK
Owner	SYSIBM
Comment	
Created	28.10.2006 17:22:04
Altered	28.10.2006 17:22:04
Specific name	DAYOFWEEK2
External function	
Returns	Scalar
External name	db2clifn!CLI_udfDAYOFWEEK2
Language	C
Parameter style	SQL
Data access	No SQL
Scratchpad	0
Final call	☐
Database info	☐
Thread safe	☑
Deterministic	☑
External action	☐
Null call	☐
Fenced	☐
Parallel	☑

Name

The new procedure name as it was set on the previous step.

Owner

Defines the owner for the procedure. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment

Specify a comment for the procedure.

Parameter style

This clause is used to specify the conventions used for passing parameters to and returning the value from procedures.

Specific name

Provides a unique name for the instance of the procedure that is being defined. This specific name can be used when dropping the procedure or commenting on the procedure. It can never be used to invoke the procedure.

Data access *(Contains SQL, Reads SQL data, Modifies SQL data)*

Indicates the level of data access for SQL statements included in the procedure.

Contains SQL indicates that SQL statements that neither read nor modify SQL data can be executed by the procedure. Statements that are not supported in procedures might return a different error.

Reads SQL data Indicates that some SQL statements that do not modify SQL data can be included in the procedure.

Modifies SQL data indicates that the procedure can execute any SQL statement except statements that are not supported in procedures.

Dynamic result sets

Indicates the estimated upper bound of returned result sets for the procedure.

The description of the other External Function properties you can find in DB2 SQL Reference Volume 2.

5.6 Functions

A function is an operation that is denoted by a function name followed by a pair of parentheses enclosing the specification of arguments (there may be no arguments). SQL Anywhere allows to define user-specific database functions. In an SQL statement, you can then use these user-defined database functions in the same way as any other predefined functions.

How can I create a new Function?

New Functions are created within Create Function Wizard 113. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Function icon in the Create Database Object dialog

or

- select the Functions list or any object from that list in the explorer tree;
- select the Create New Function... item from the popup menu

or

- open and the Functions tab there;
- press the **Insert** key or select the Create New Function item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new Function with the same properties as one of the existing Functions has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

How can I edit an existing Function definition?

Functions can be edited within FunctionEditor 115. In order to open the editor you should either

- select the Function for editing in the explorer tree (type the first letters of the Function name for quick search);
- select the Edit Function item from the popup menu

or

- open and the Functions tab there;
- select the Function to edit;
- press the **Enter** key or select the Edit Function item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can change the name of the Function using the Rename Function dialog:

- select the Function to rename in the explorer tree;
- select the Rename Function item from the popup menu.

How can I execute a Function?

To execute the Function:

- select the Function in the explorer tree (type the first letters of the Function name for quick search);
- select the Edit Function... item from the popup menu;
- execute the Function using the Execute link of the Navigation Bar

or

- open Schema Editor and the Functions tab there;
- select the Function to execute;
- press the **Enter** key or select the Edit Function item from the popup menu, or use the corresponding link of the Navigation Bar;
- execute the Function using the Execute link of the Navigation bar.

How can I drop a Function?

To drop a Function:

- select the Function to drop in the explorer tree;
- select the Drop Function item from the popup menu

or

- open and the Functions tab there;
- select the Function to drop;
- press the **Delete** key or select the Drop Function item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

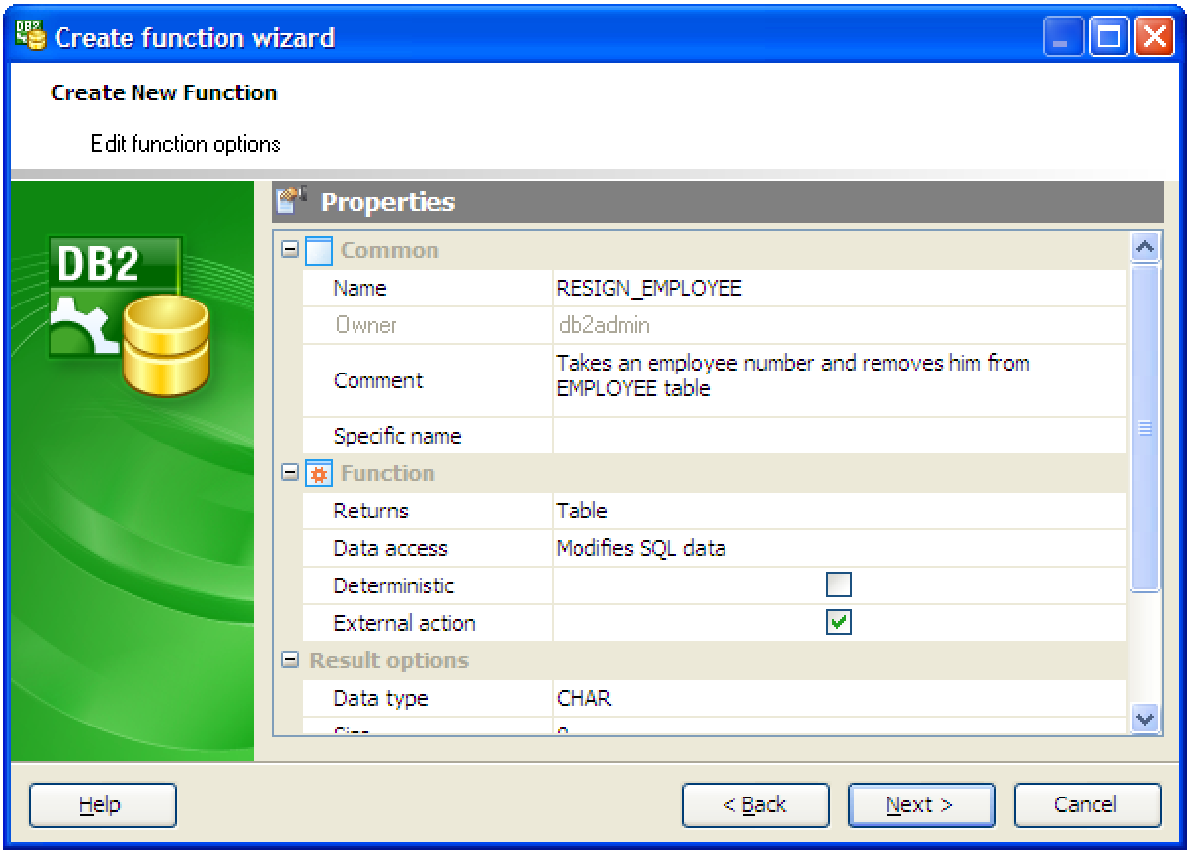
and confirm dropping in the dialog window.

5.6.1 Create Function Wizard

Create Function Wizard guides you through the process of creating a new Function. See How To create Function 112 for instructions on running this wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

Specify the properties for the new Function according to your needs. The detailed description is given below.



Common	
Name	RESIGN_EMPLOYEE
Owner	db2admin
Comment	Takes an employee number and removes him from EMPLOYEE table
Specific name	
Function	
Returns	Table
Data access	Modifies SQL data
Deterministic	☐
External action	☑
Result options	
Data type	CHAR

Specifying Function properties

Name

Specify a name for the function.

Owner

The field displays the owner of the new function. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment

Supply a comment to the Function if necessary.

☑ Deterministic

Check the box to indicate that the function returns the same result value whenever it is called with the same values for its arguments

Specific name

Provides a unique name for the instance of the procedure that is being defined. This specific name can be used when dropping the procedure or commenting on the procedure. It can never be used to invoke the procedure.

Data access *(Contains SQL, Reads SQL data, Modifies SQL data)*

Indicates the level of data access for SQL statements included in the procedure.

Contains SQL indicates that SQL statements that neither read nor modify SQL data can be executed by the procedure. Statements that are not supported in procedures might return a different error.

Reads SQL data Indicates that some SQL statements that do not modify SQL data can be included in the procedure.

Modifies SQL data indicates that the procedure can execute any SQL statement except statements that are not supported in procedures.

Dynamic result sets
Indicates the estimated upper bound of returned result sets for the procedure.

The description of the other Function properties you can find in DB2 SQL Reference Volume 2.

Managing parameters of a new Function
Use popup menu Add New Parameter... item to add a new parameter and set its properties in Parameter Editor 42. Use the Edit and Delete items to manage Function parameters.

5.6.2 Function Editor

Function Editor allows you to execute the existing Function, and edit its definition (Function name, parameter list, etc.). In order to open the editor you should either

- select the Function for editing in the explorer tree (type the first letters of the Function name for quick search);
- select the Edit Function item from the popup menu

or

- open and the Functions tab there;
- select the Function to edit;
- press the **Enter** key or select the Edit Function item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.

- Editing Function properties 115
- Viewing Function results 117

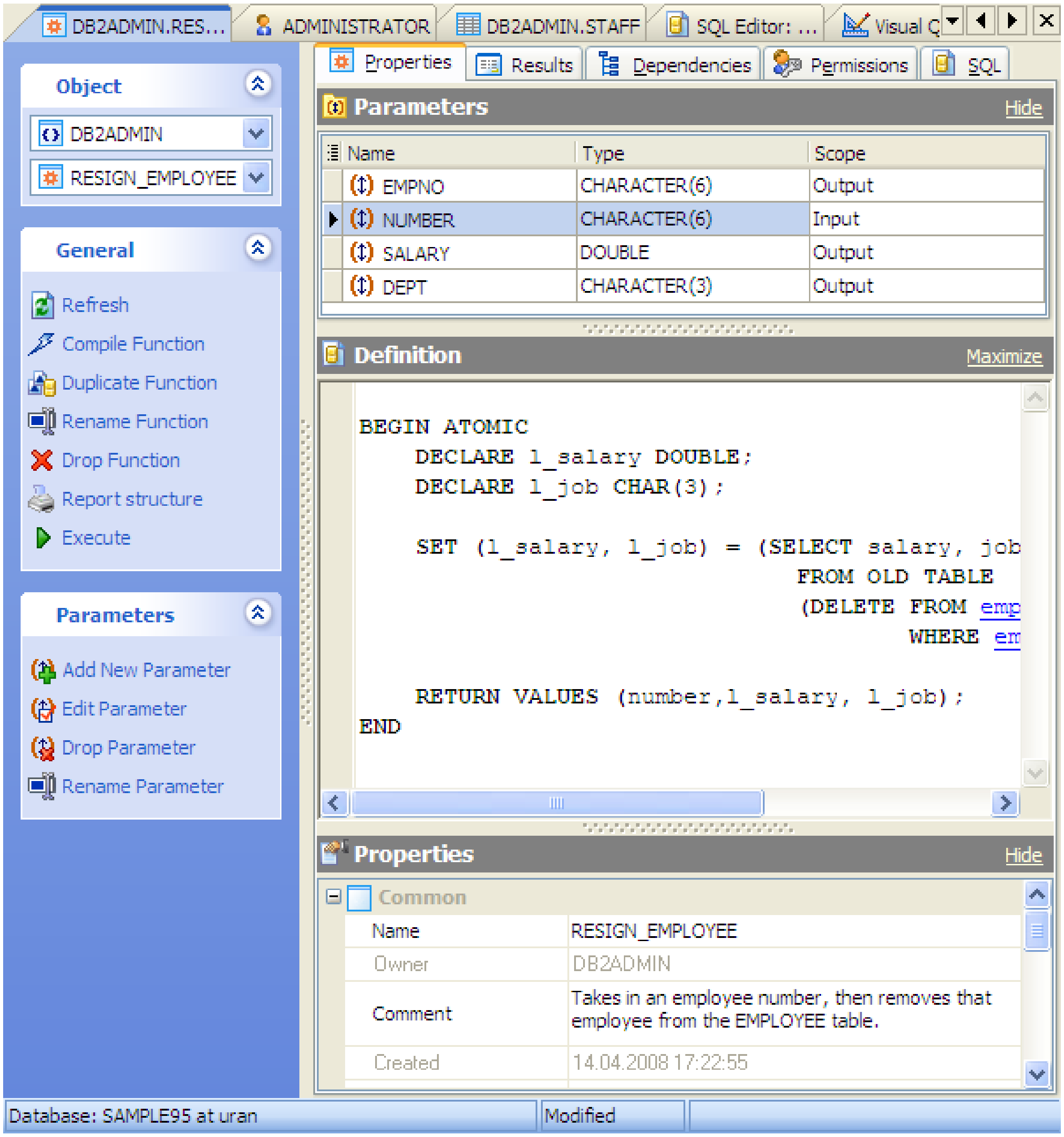
5.6.2.1 Editing properties

The Parameters tab contains the list of the current Function parameters with its options. Here you can view the Name and the Type of each Function parameter and also supply a Comment for the parameter.

Parameters can be edited within the Parameter Editor dialog window. In order to open the dialog you should

- open the object in its editor and the Parameters tab there;
- select the parameter to edit;

- press the **Enter** key or select the Edit Parameter item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).
  The Definition field contains the definition of the Function. Specify a string constant defining the Function here; the meaning depends on the language. It may be an internal Function name, the path to an object file, an SQL command or text in a procedural language.



Name	Type	Scope
EMPNO	CHARACTER(6)	Output
NUMBER	CHARACTER(6)	Input
SALARY	DOUBLE	Output
DEPT	CHARACTER(3)	Output

```
BEGIN ATOMIC
    DECLARE l_salary DOUBLE;
    DECLARE l_job CHAR(3);

    SET (l_salary, l_job) = (SELECT salary, job
                            FROM OLD TABLE
                            (DELETE FROM emp
                                    WHERE em

    RETURN VALUES (number,l_salary, l_job);
END
```

Name	RESIGN_EMPLOYEE
Owner	DB2ADMIN
Comment	Takes in an employee number, then removes that employee from the EMPLOYEE table.
Created	14.04.2008 17:22:55

Name

You can edit the Function name here. The name of the Function must be unique among all the Function names in the database.

Owner

The field contains the owner of the Function. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment
Specify a comment to the Function if necessary.

☑ Deterministic
Check the box to indicate that the function returns the same result value whenever it is called with the same values for its arguments

Specific name
Provides a unique name for the instance of the procedure that is being defined. This specific name can be used when dropping the procedure or commenting on the procedure. It can never be used to invoke the procedure.

Data access *(Contains SQL, Reads SQL data, Modifies SQL data)*
Indicates the level of data access for SQL statements included in the procedure.

Contains SQL indicates that SQL statements that neither read nor modify SQL data can be executed by the procedure. Statements that are not supported in procedures might return a different error.

Reads SQL data Indicates that some SQL statements that do not modify SQL data can be included in the procedure.

Modifies SQL data indicates that the procedure can execute any SQL statement except statements that are not supported in procedures.

Dynamic result sets
Indicates the estimated upper bound of returned result sets for the procedure.

The description of the other External Function properties you can find in DB2 SQL Reference Volume 2.

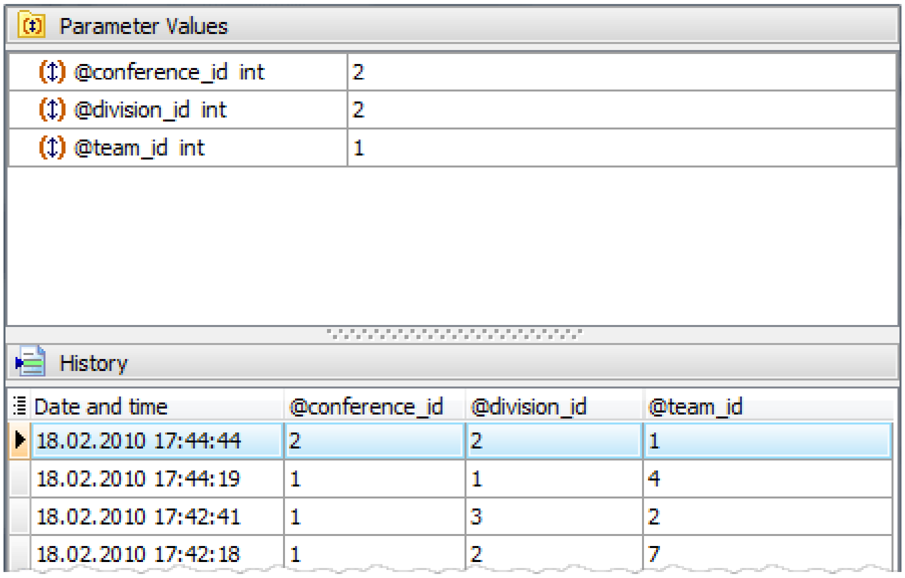
To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.6.2.2 Viewing Function results

Editor provides an opportunity to execute current routine by opening the Results tab, by clicking the Execute item of the Navigation Bar, or by pressing the **F9** key.

If the has parameters, DB2 Maestro will ask you to specify the values for these parameters in the Input parameters dialog which appears before the procedure execution. Input parameters dialog allows you to specify the values for all input parameters. After changes are made, click the OK button to execute the Function, or the Cancel button to abort the execution.



@conference_id int	2
@division_id int	2
@team_id int	1

Date and time	@conference_id	@division_id	@team_id
18.02.2010 17:44:44	2	2	1
18.02.2010 17:44:19	1	1	4
18.02.2010 17:42:41	1	3	2
18.02.2010 17:42:18	1	2	7

DB2 Maestro supports Parameter History. Values that have been set previously as the routine parameters are represented in the History tab of the Input Parameter dialog with a date and time of their last using. Double click a necessary set of values to set them as the routine parameters. You can manage the Parameter History with Delete history item and Clear history links.

The result of the successfully executed routine can be found within the Results tab of Editor.

Note*:* If any unsaved changes are applied to the routine being currently edited, the execution of the routine is impossible until changes are saved by the Compile procedure item of the Navigation Bar.

5.7 Distinct Types

A **distinct type** is a user-defined data type that is based on existing built-in DB2® data types. A distinct type is internally the same as a built-in data type, but DB2 treats them as a separate and incompatible type for semantic purposes. Defining your own distinct type ensures that only functions that are explicitly defined on a distinct type can be applied to its instances.

⊟ How can I create a new Distinct Type?

New Distinct Types are created within Create Distinct Type Wizard.
In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Distinct Type icon in the Create Database Object dialog

or

- select the Distinct Types list or any object from that list in the explorer tree;
- select the Create New Distinct Type... item from the popup menu

or

- open and the Distinct Types tab there;
- press the **Insert** key or select the Create New Distinct Type item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new Distinct Type with the same properties as one of the existing Distinct Types has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

⊟ How can I edit an existing Distinct Type?

Distinct Types can be edited within Distinct Type Editor 121. In order to run the editor you should either

- select the Distinct Type for editing in the explorer tree (type the first letters of the Distinct Type name for quick search);
- select the Edit Distinct Type... item from the popup menu

or

- open and the Distinct Types tab there;
- select the Distinct Type to edit;
- press the **Enter** key or select the Edit Distinct Type item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can change the name of the Distinct Type using the Rename Distinct Type dialog. To open the dialog you should either

- select the Distinct Type to rename in the explorer tree;

- select the Rename Distinct Type item from the popup menu

or

- open Schema Editor and the Distinct Types tab there;
- select the Distinct Type to rename;
- select the Rename Distinct Type item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I drop a Distinct Type?

To drop a Distinct Type:

- select the Distinct Type to drop in the explorer tree;
- select the Drop Distinct Type item from the popup menu

or

- open Schema Editor and the Distinct Types tab there;
- select the Distinct Type to drop;
- press the **Delete** key or select the Drop Distinct Type item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

5.7.1 Create Distinct Type Wizard

New Distinct Types are created within Create Distinct Type Wizard. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Distinct Type icon in the Create Database Object dialog

or

- select the Distinct Types list or any object from that list in the explorer tree;
- select the Create New Distinct Type... item from the popup menu

or

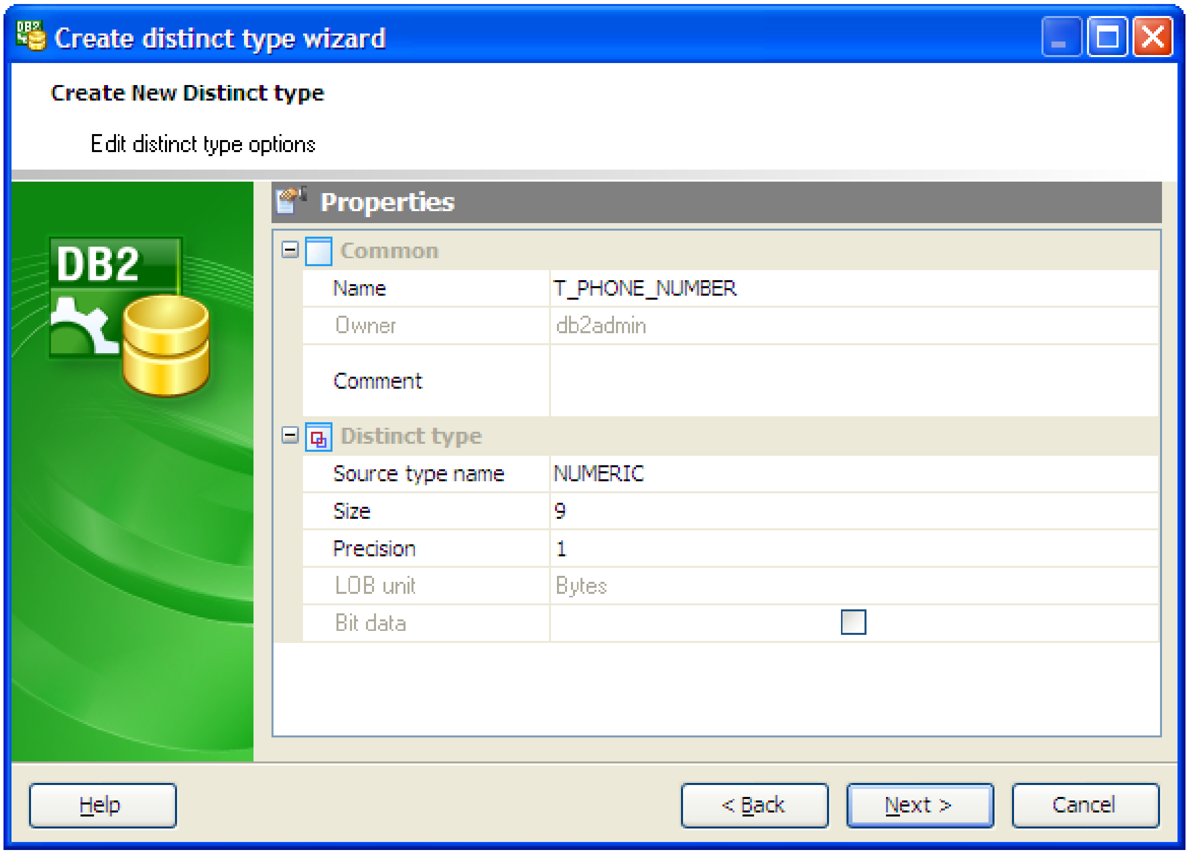
- open and the Distinct Types tab there;
- press the **Insert** key or select the Create New Distinct Type item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new Distinct Type with the same properties as one of the existing Distinct Types has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

Specify the properties for the new Distinct Type according to your needs. The detailed description is given below.



Name	T_PHONE_NUMBER
Owner	db2admin
Comment	
Source type name	NUMERIC
Size	9
Precision	1
LOB unit	Bytes
Bit data	☐

Comment
Supply a comment to the Distinct Type if necessary.

Source type name
Specifies the data type used as the basis for the internal representation of the distinct type. The source data type cannot be of type XML.

Precision
The first integer is the precision of the number; that is, the total number of digits; it may range from 1 to 31.

BIT data
Specifies that the contents of the column are to be treated as bit (binary) data. During data exchange with other systems, code
page conversions are not performed. Comparisons are done in binary, irrespective of the database collating sequence.

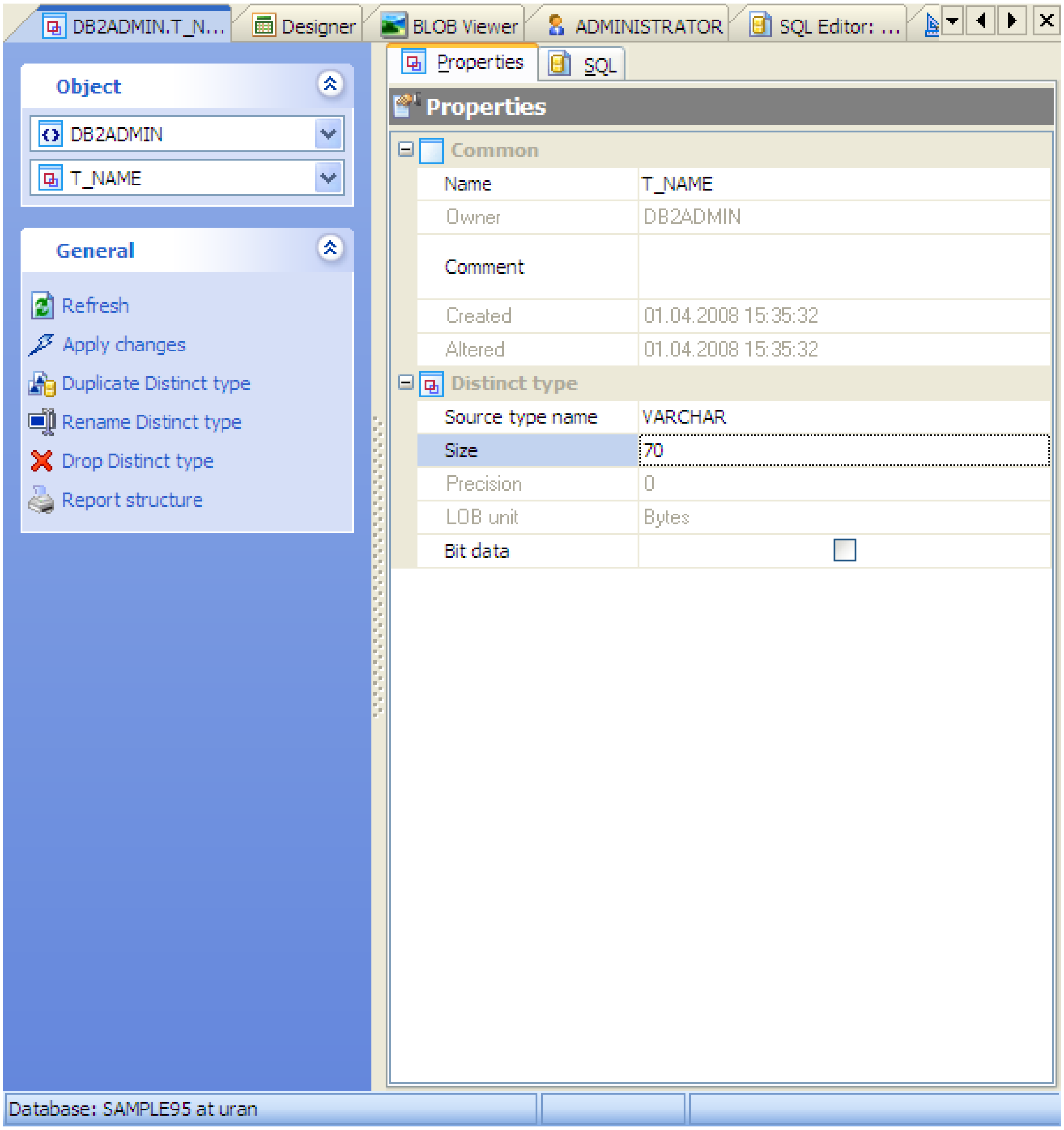
LOBs greater than 1 gigabyte cannot be logged and LOBs greater than 10 megabytes should probably not be logged.

5.7.2 Distinct Type Editor

Distinct Type Editor is opened automatically after a new Distinct Type is created and is available on editing the existing one (see Edit Distinct Type 119 for details).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.

Distinct Type Editor provides you with an ability to edit Distinct Type properties. The Properties tab allows you to change the Distinct Type name, the Distinct Type owner, etc.



Name	T_NAME
Owner	DB2ADMIN
Comment	
Created	01.04.2008 15:35:32
Altered	01.04.2008 15:35:32
Source type name	VARCHAR
Size	70
Precision	0
LOB unit	Bytes
Bit data	☐

Name

Here you can view and edit the Distinct Type name. The name of the Distinct Type must be unique among all the Distinct Type names in the schema.

Comment
This field stores a comment to the Distinct Type.

Source type name
Specifies the data type used as the basis for the internal representation of the distinct type. The source data type cannot be of type XML.

Precision
The first integer is the precision of the number; that is, the total number of digits; it may range from 1 to 31.

BIT data
Specifies that the contents of the column are to be treated as bit (binary) data. During data exchange with other systems, code
page conversions are not performed. Comparisons are done in binary, irrespective of the database collating sequence.

LOBs greater than 1 gigabyte cannot be logged and LOBs greater than 10 megabytes should probably not be logged.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.8 Aliases

An alias is an alternative name for a table or a view. It can be used to reference a table or a view if an existing table or view can be referenced. An alias cannot be used in all contexts; for example, it cannot be used in the check condition of a check constraint. An alias cannot reference a declared temporary table.

Like tables or views, an alias can be created, dropped, and have comments associated with it. However, unlike tables, aliases can refer to each other in a process called chaining. Aliases are publicly referenced names, so no special authority or privilege is required to use them. Access to the table or the view referred to by an alias, however, does require the authorization associated with these objects.

How can I create a new alias?

New aliases are created within Create Alias Wizard 125. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Alias icon in the Create Database Object dialog

or

- select the Aliases list or any object from that list in the explorer tree;
- select the Create New Alias... item from the popup menu

or

- open the schema in Schema Editor and the Aliases tab there;
- press the **Insert** key or select the Create New Alias... item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new alias with the same properties as one of the existing aliases has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

How can I edit an existing alias?

Aliases can be edited within Alias Editor 127. In order to run the editor you should either

- select the alias for editing in the explorer tree (type the first letters of the alias name for quick search);
- select the Edit Alias ... item from the popup menu

or

- open the schema in Schema Editor and the Aliases tab there;
- select the alias to edit;
- press the **Enter** key or select the Edit Alias item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can change the name of the alias using the Rename Alias dialog.
To open the dialog you should either

- select the alias to rename in the explorer tree;
- select the Rename Alias item from the popup menu

or

- open the schema in Schema Editor and the Aliases tab there;
- select the alias to rename;
- select the Rename Alias item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I drop an alias?

To drop a alias:

- select the alias to drop in the explorer tree;
- select the Drop Alias item from the popup menu

or

- open the schema in Schema Editor and the Aliases tab there;
- select the alias to drop;
- press the **Delete** key or select the Drop Alias item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

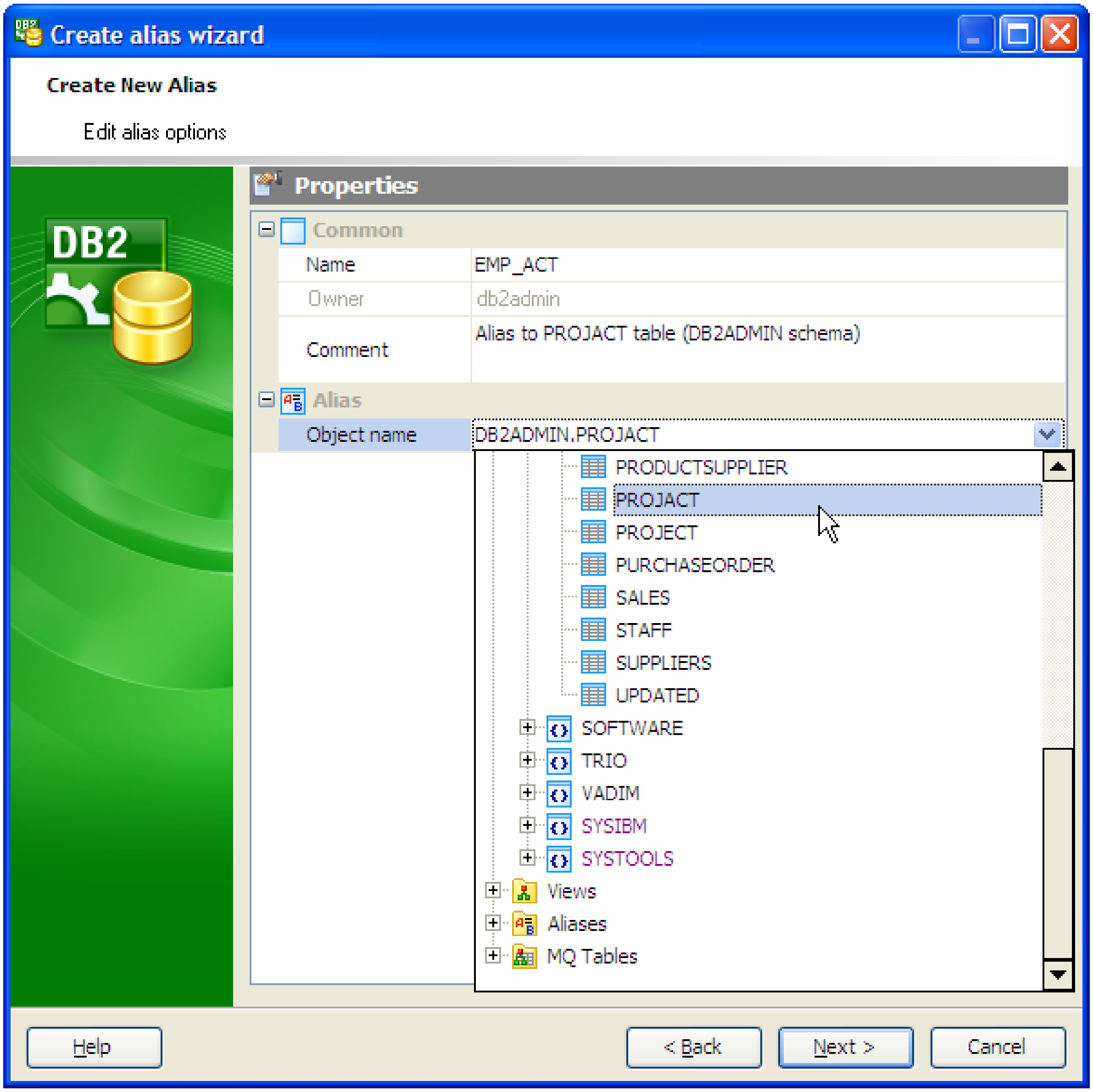
5.8.1 Create Alias Wizard

Create Alias Wizard guides you through the process of creating a new Alias. See How To Create Alias 124 for instructions on running this wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

- Specifying Alias options 126

See also: Alias Editor 127



Name EMP_ACT

Owner db2admin

Comment Alias to PROJACT table (DB2ADMIN schema)

Object name DB2ADMIN.PROJACT

5.8.1.1 Specifying alias options

Specify alias options according to your needs.

Name

Specify a name for the alias. The name must not identify a table, view, nickname, or alias that exists in the current database. If a two-part name is specified, the schema name cannot begin with 'SYS'. The rules for defining an alias name are the same as those used for defining a table name.

Comment

Specify a comment to the alias or leave the field blanc.

Object name

Specify the base object that the alias references. Select from drop-down list a table, view, nickname, or alias for which alias-name is defined. If another alias name is supplied (alias-name2), then it must not be the same as the new alias-name being defined (in its fully-qualified form). The table-name cannot be a declared temporary table.

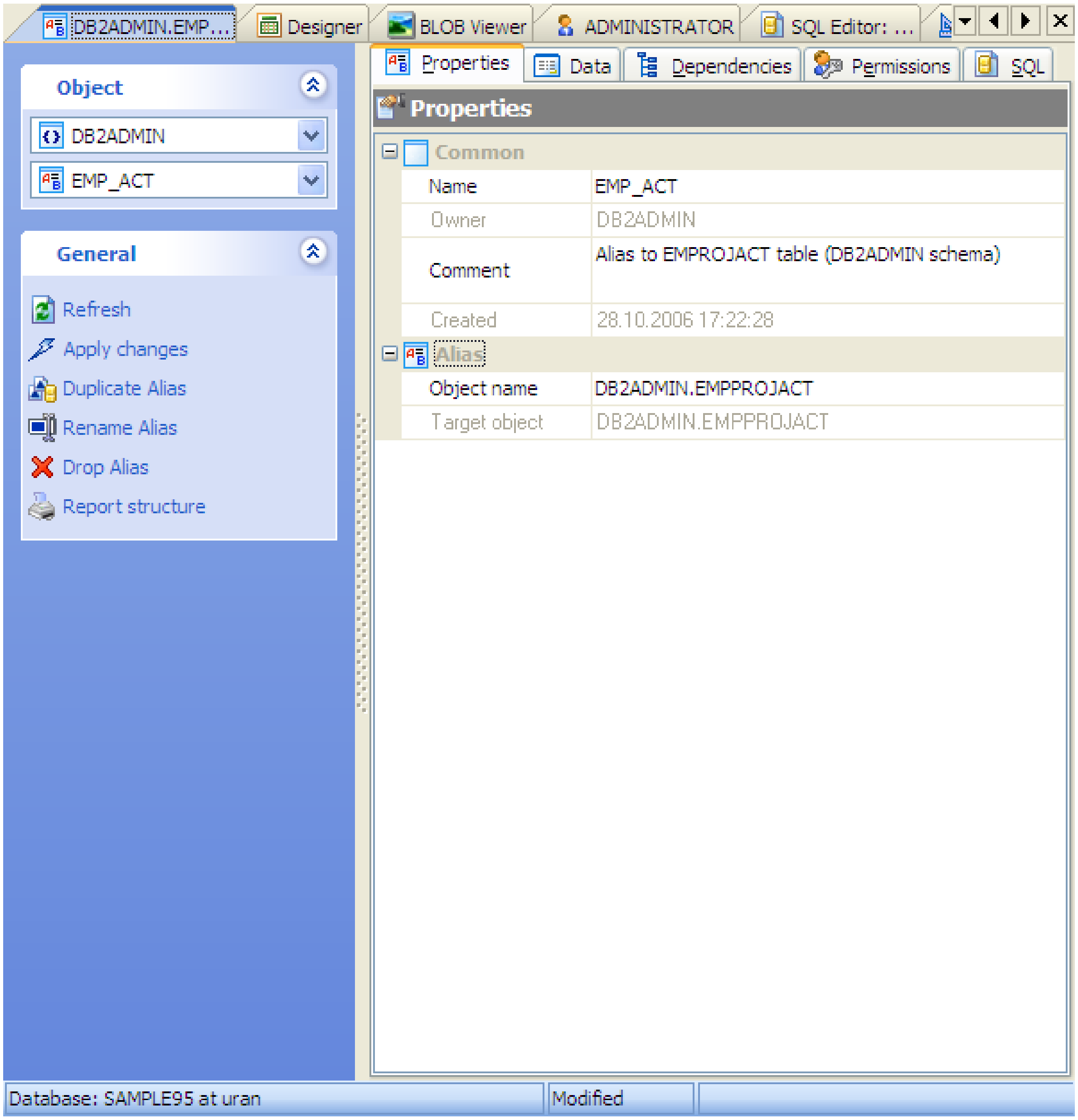
5.8.2 Alias Editor

Alias Editor allows you edit Alias properties. It opens when you create a new Alias or edit the existing one (see How to edit Alias 124 for details).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.

- Editing Alias properties 128
- Managing Alias data 128

See also: Create Alias Wizard 125



Name	EMP_ACT
Owner	DB2ADMIN
Comment	Alias to EMPROJACT table (DB2ADMIN schema)
Created	28.10.2006 17:22:28
Object name	DB2ADMIN.EMPPROJACT
Target object	DB2ADMIN.EMPPROJACT

Database: SAMPLE95 at uran
Modified

5.8.2.1 Editing alias properties

Specify alias options according to your needs. The detailed description is given below.

Name
You can edit the alias name here.

Owner
Here you can view the owner for the alias. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment
Specify a comment to the alias.

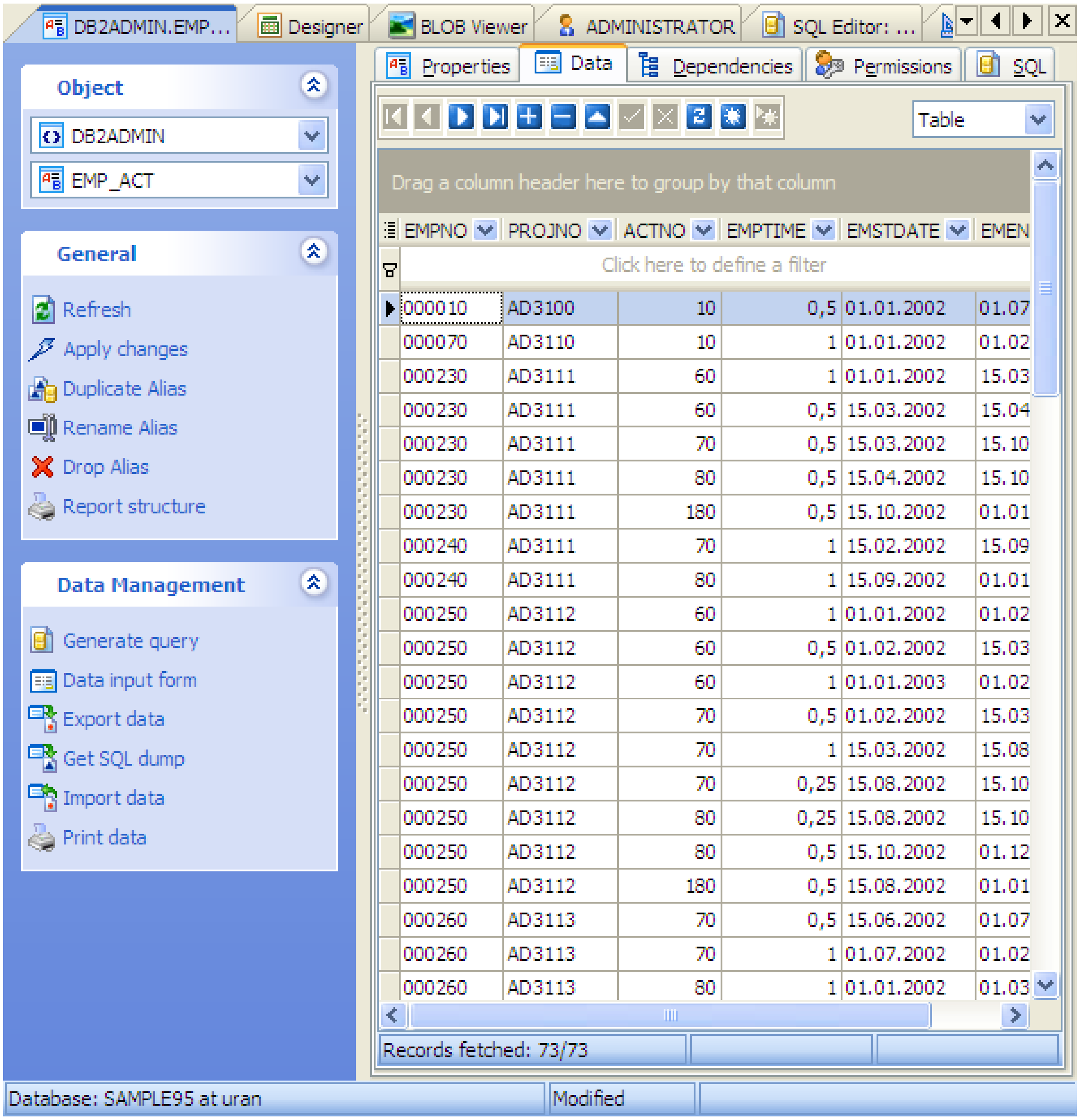
Create Date
Stores the date when the alias was created.

Modify Date
Stores the date when the alias was last modified.

Object name
Here you can change the base object that the alias references. Just select from drop-down list a new table, view, nickname, or alias for which alias-name is defined.

5.8.2.2 Managing alias data

The Data tab displays the Alias data as a grid (see Data View for details). Use grid's popup menu to open Data Input Form, to invoke the Export Data, and Get SQL Dump modules, to set the value of the selected record to *NULL* or to *Now* (for *Date* values).



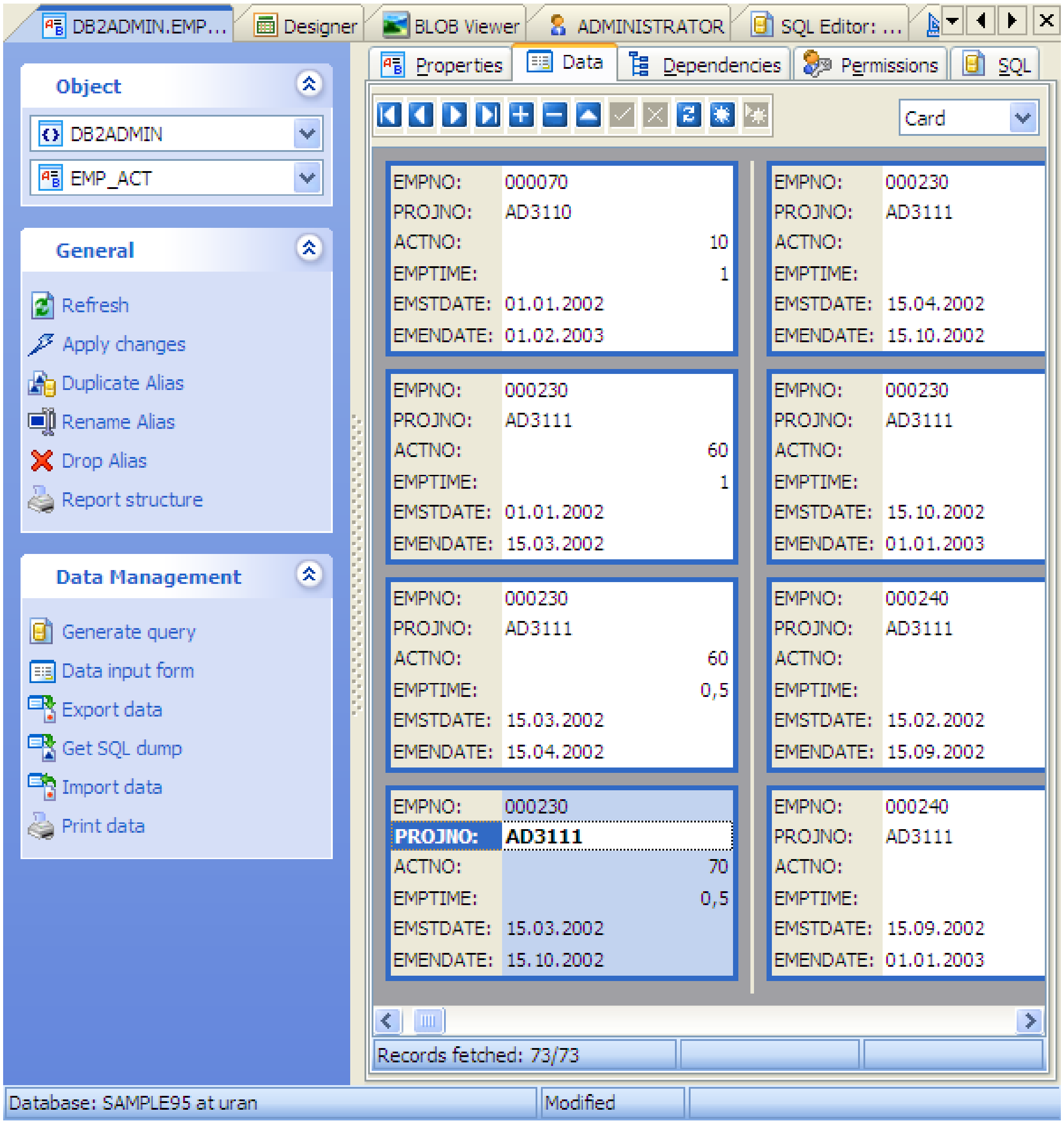
EMPNO	PROJNO	ACTNO	EMPTIME	EMSTDATE	EMEN
000010	AD3100	10	0,5	01.01.2002	01.07
000070	AD3110	10	1	01.01.2002	01.02
000230	AD3111	60	1	01.01.2002	15.03
000230	AD3111	60	0,5	15.03.2002	15.04
000230	AD3111	70	0,5	15.03.2002	15.10
000230	AD3111	80	0,5	15.04.2002	15.10
000230	AD3111	180	0,5	15.10.2002	01.01
000240	AD3111	70	1	15.02.2002	15.09
000240	AD3111	80	1	15.09.2002	01.01
000250	AD3112	60	1	01.01.2002	01.02
000250	AD3112	60	0,5	01.02.2002	15.03
000250	AD3112	60	1	01.01.2003	01.02
000250	AD3112	70	0,5	01.02.2002	15.03
000250	AD3112	70	1	15.03.2002	15.08
000250	AD3112	70	0,25	15.08.2002	15.10
000250	AD3112	80	0,25	15.08.2002	15.10
000250	AD3112	80	0,5	15.10.2002	01.12
000250	AD3112	180	0,5	15.08.2002	01.01
000260	AD3113	70	0,5	15.06.2002	01.07
000260	AD3113	70	1	01.07.2002	01.02
000260	AD3113	80	1	01.01.2002	01.03

Records fetched: 73/73

Database: SAMPLE95 at uran

Modified

For your convenience it was implemented two modes of viewing data: as table and as info cards.



EMPNO: 000070
PROJNO: AD3110
ACTNO: 10
EMPTIME: 1
EMSTDATE: 01.01.2002
EMENDATE: 01.02.2003

EMPNO: 000230
PROJNO: AD3111
ACTNO: 60
EMPTIME: 1
EMSTDATE: 01.01.2002
EMENDATE: 15.03.2002

EMPNO: 000230
PROJNO: AD3111
ACTNO: 60
EMPTIME: 0,5
EMSTDATE: 15.03.2002
EMENDATE: 15.04.2002

EMPNO: 000230
PROJNO: AD3111
ACTNO: 70
EMPTIME: 0,5
EMSTDATE: 15.03.2002
EMENDATE: 15.10.2002

EMPNO: 000230
PROJNO: AD3111
ACTNO:
EMPTIME:
EMSTDATE: 15.04.2002
EMENDATE: 15.10.2002

EMPNO: 000230
PROJNO: AD3111
ACTNO:
EMPTIME:
EMSTDATE: 15.10.2002
EMENDATE: 01.01.2003

EMPNO: 000240
PROJNO: AD3111
ACTNO:
EMPTIME:
EMSTDATE: 15.02.2002
EMENDATE: 15.09.2002

EMPNO: 000240
PROJNO: AD3111
ACTNO:
EMPTIME:
EMSTDATE: 15.09.2002
EMENDATE: 01.01.2003

Records fetched: 73/73

Database: SAMPLE95 at uran

Modified

5.9 Sequences

Sequence is a database object from which multiple users may generate unique integers. You can use sequences to automatically generate primary key values.

When a sequence number is generated, the sequence is incremented, independent of the transaction committing or rolling back. If two users concurrently increment the same sequence, then the sequence numbers each user acquires may have gaps, because sequence numbers are being generated by the other user. One user can never acquire the sequence number generated by another user. Once a sequence value is generated by one user, that user can continue to access that value regardless of whether the sequence is incremented by another user.

⊟ How can I create a new sequence?

New sequences are created within Create Sequence Wizard 132. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Sequence icon in the Create Database Object dialog

or

- select the Sequences list or any object from that list in the explorer tree;
- select the Create New Sequence... item from the popup menu

or

- open the schema in Schema Editor and the Sequences tab there;
- press the **Insert** key or select the Create New Sequence item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new sequence with the same properties as one of the existing sequences has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

⊟ How can I edit an existing sequence?

Sequences can be edited within Sequence Editor 133. In order to run the editor you should either

- select the sequence for editing in the explorer tree (type the first letters of the sequence name for quick search);
- select the Edit Sequence ... item from the popup menu

or

- open the schema in Schema Editor and the Sequences tab there;
- select the sequence to edit;
- press the **Enter** key or select the Edit Sequence item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

How can I drop a sequence

To drop a sequence:

- select the sequence to drop in the explorer tree;
- select the Drop Sequence item from the popup menu

or

- open the schema in Schema Editor and the Sequences tab there;
- select the sequence to drop;
- press the **Delete** key or select the Drop Sequence item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

5.9.1 Create Sequence Wizard

Sequences may be created with Create Sequence Wizard. Just specify the wizard options according to your needs.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

Name
The field allows you to specify the new sequence name being set on the previous wizard step.

Owner
Defines the owner of the new sequence.Start Value
Specify the starting sequence value here. The default starting value is *minvalue* for ascending sequences and *maxvalue* for descending ones.

Increment by
Specify which value is added to the current sequence value to create a new value. A positive value will make an ascending sequence, a negative one a descending sequence. The default value is 1.

Maximum Value
Determine the maximum value for the sequence. If this clause is not supplied or NO MAXVALUE is specified, then default values will be used. The defaults are 2^63-1 and -1 for ascending and descending sequences, respectively.

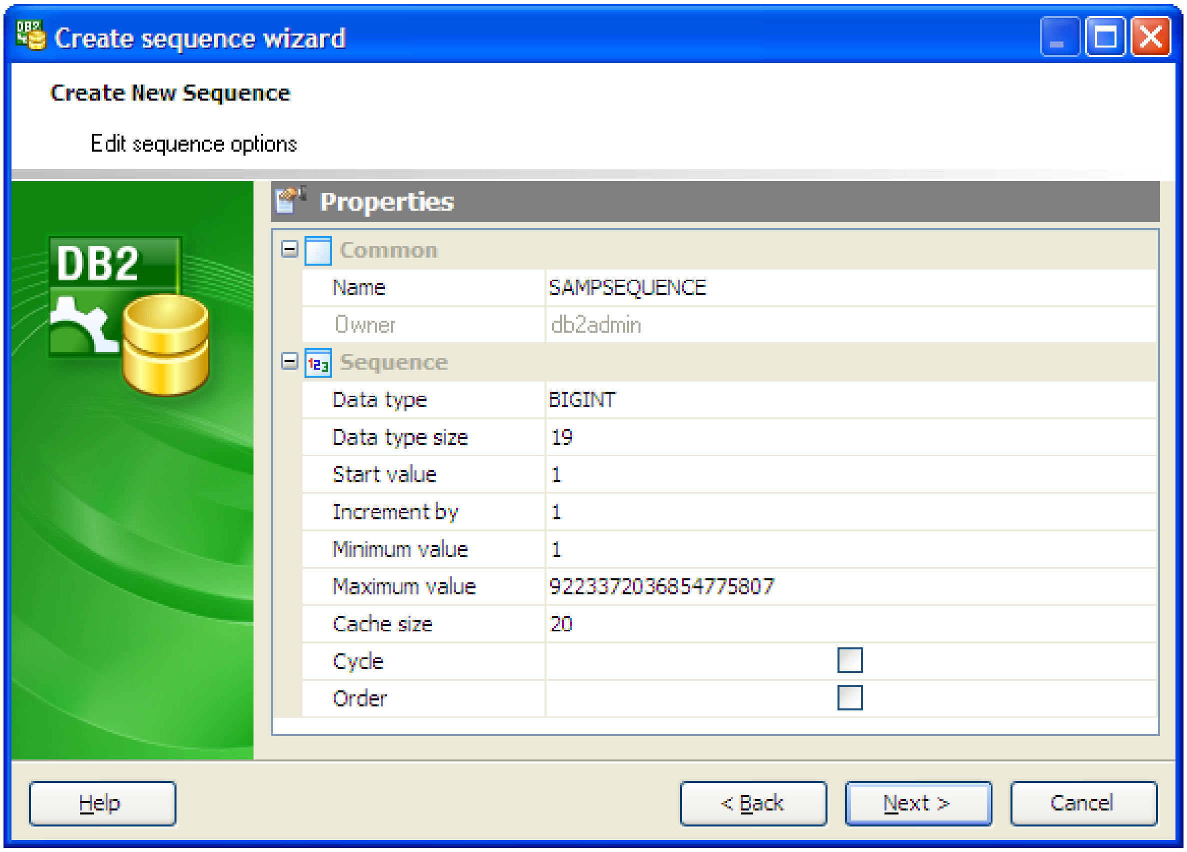
Minimum Value
Determine the minimum value a sequence can generate. If this clause is not supplied or NO MINVALUE is specified, then defaults will be used. The defaults are 1 and -263-1 for ascending and descending sequences, respectively.

Cashe size
Specify how many sequence numbers are to be preallocated and stored in memory for faster access. The minimum value is 1 (only one value can be generated at a time, i.e.,

no cache), and this is also the default.

☑ Order
Specify the option to guarantee that sequence numbers are generated in order of request. This clause is useful if you are using the sequence numbers as timestamps. Guaranteeing order is usually not important for sequences used to generate primary keys.

☑ Cycle
The CYCLE option allows the sequence to wrap around when the *maxvalue* or *minvalue* has been reached by an ascending or descending sequence respectively. If the limit is reached, the next number generated will be the minvalue or maxvalue, respectively.

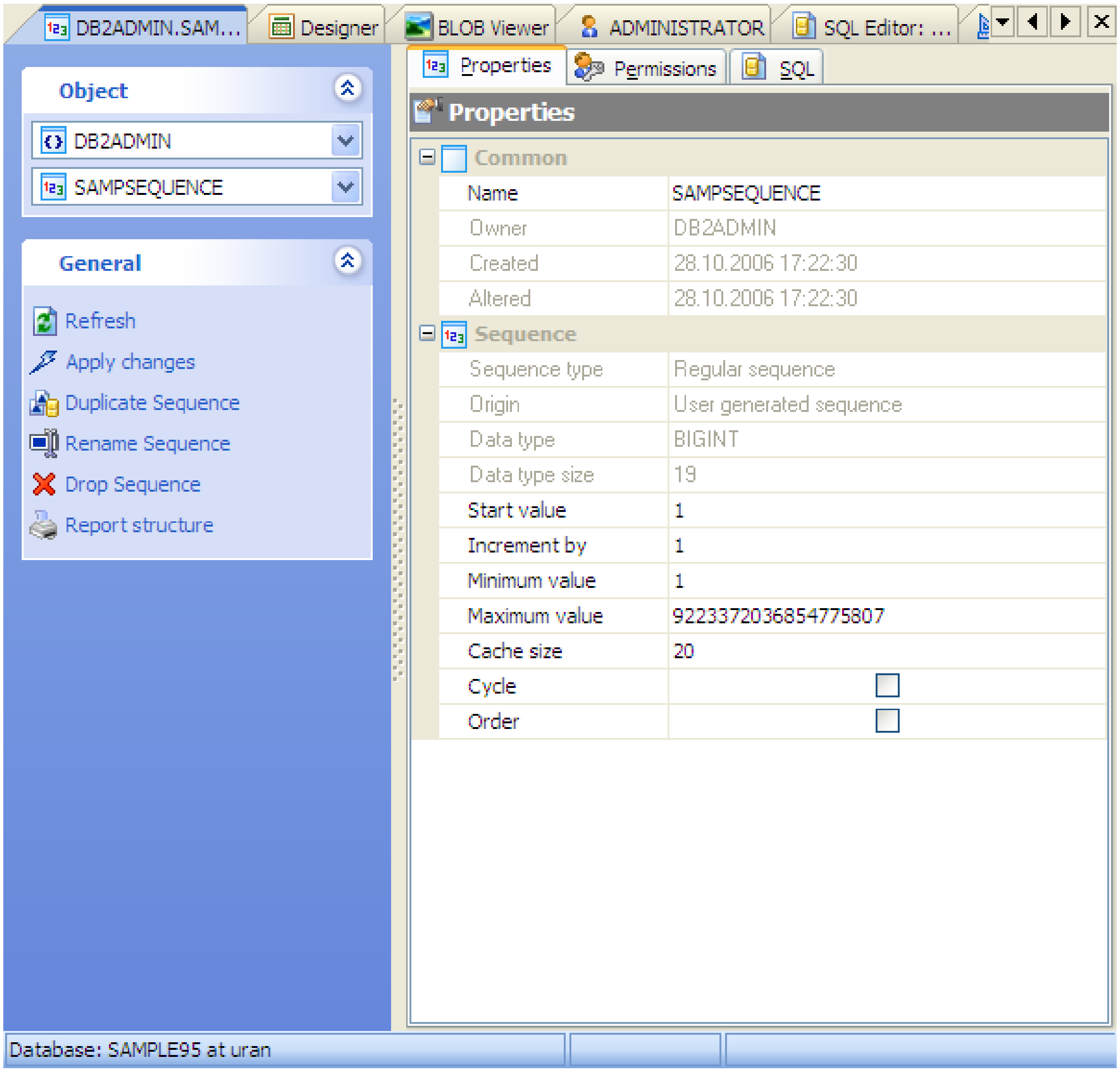


Common	
Name	SAMPSEQUENCE
Owner	db2admin
Sequence	
Data type	BIGINT
Data type size	19
Start value	1
Increment by	1
Minimum value	1
Maximum value	9223372036854775807
Cache size	20
Cycle	☐
Order	☐

5.9.2 Sequence Editor

Use Sequence Editor to change properties of existing sequences. The editor can be opened automatically after the sequence is created 132 or from the Explorer Tree and Object Manager.

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38 . Below you will find a description of editor tabs that are unique for the current object.



Name	SAMPSEQUENCE
Owner	DB2ADMIN
Created	28.10.2006 17:22:30
Altered	28.10.2006 17:22:30
Sequence type	Regular sequence
Origin	User generated sequence
Data type	BIGINT
Data type size	19
Start value	1
Increment by	1
Minimum value	1
Maximum value	9223372036854775807
Cache size	20
Cycle	☐
Order	☐

Database: SAMPLE95 at uran

Name
Here you can rename the sequence.

Owner
Shows the owner of the sequence. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.) Start Value contains the starting sequence value here.

Increment by
Here you can edit the value which is added to the current sequence value to create a new value.

The Maximum Value and the Minimum Value contain the maximum and the minimum values for the sequence.

Cashe size

Specify how many sequence numbers are to be preallocated and stored in memory for faster access.

☑ Order
Specify the option to guarantee that sequence numbers are generated in order of request. This clause is useful if you are using the sequence numbers as timestamps. Guaranteeing order is usually not important for sequences used to generate primary keys.

☑ Cycle
The checkbox represents whether the sequence is cycle.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.10 Structured Types

A structured type is a user-defined data type that contains one or more named attributes. Each attribute has a name and a data type of its own. Attributes are properties that describe an instance of a type. A structured type can serve as the type of a table, in which each column of the table derives its name and data type from one of the attributes of the structured type.

How can I create a new structured type?

New Structured types are created within Create Structured Type Wizard 137. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the Structured Type icon in the Create Database Object dialog

or

- select the Structured Types list or any object from that list in the explorer tree;
- select the Create New Structured Type... item from the popup menu

or

- open the schema in Schema Editor and the Structured Types tab there;
- press the **Insert** key or select the Create New Structured Type item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new type with the same properties as one of the existing types has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

How can I edit an existing structured type?

Structured Types can be edited within Structured Type Editor 141. In order to run the editor you should either

- select the type for editing in the explorer tree (type the first letters of the type name for quick search);
- select the Edit Structured Type ... item from the popup menu

or

- open the schema in Schema Editor 61 and the Structured Types tab there;
- select the type to edit;
- press the **Enter** key or select the Edit Structured Type item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

⊟ How can I drop a structured type?

To drop a structured type:

- select the type to drop in the explorer tree;
- select the Drop Structured Type item from the popup menu

or

- open the schema in Schema Editor and the Structured Types tab there;
- select the type to drop;
- press the **Delete** key or select the Drop Structured Type item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

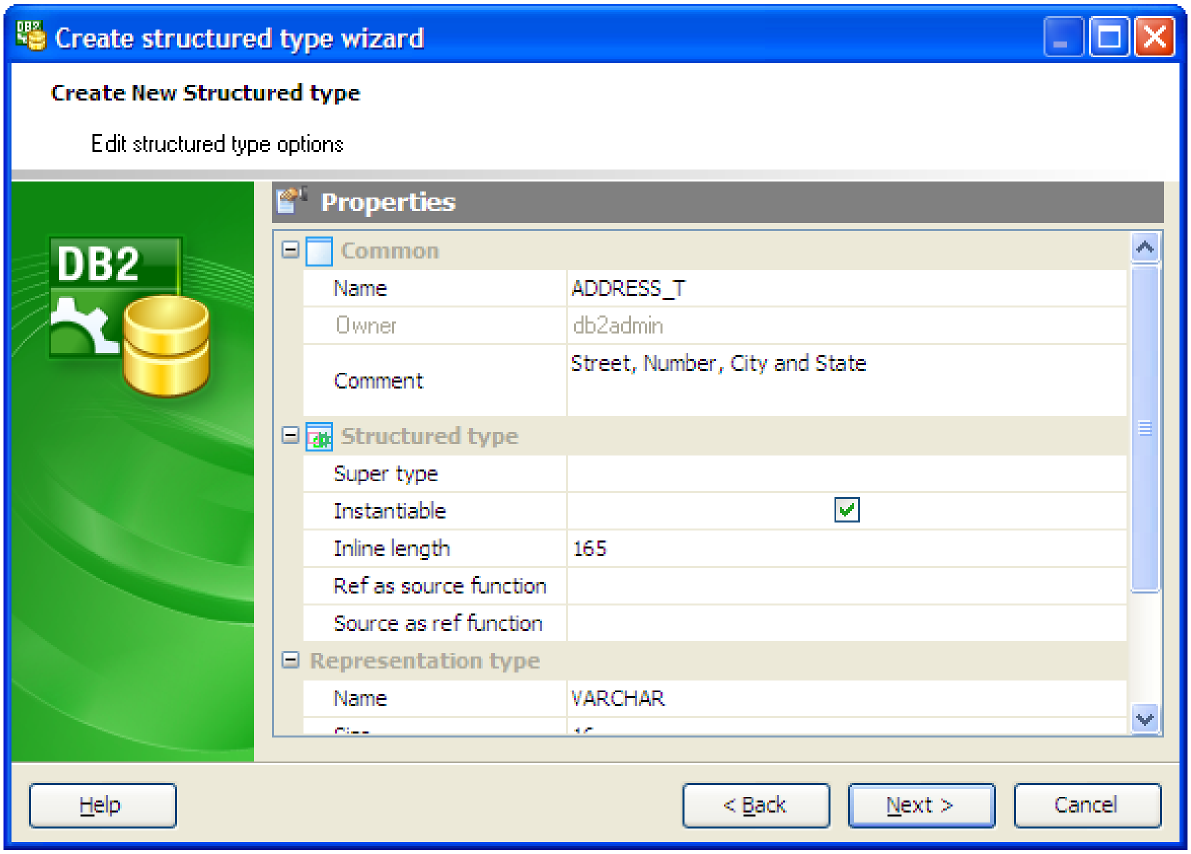
5.10.1 Create Structured Type Wizard

Create Structured Type Wizard guides you through the process of creating a new user-defined type. See How To Create Structured Type 136 for instructions on running this wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

- Specifying type properties 138
- Setting type subitems 140

See also: Structured Type Editor 141



Create New Structured type

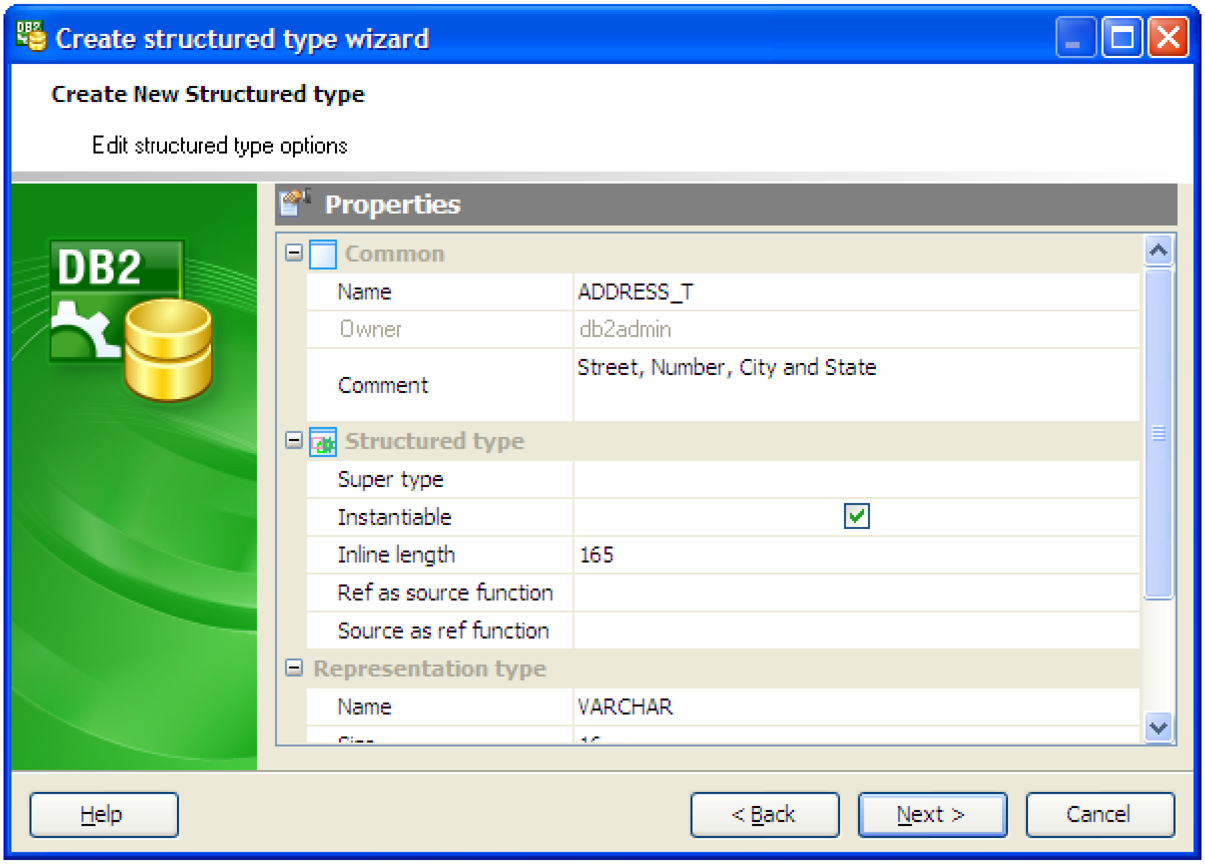
Edit structured type options

Properties

Common	
Name	ADDRESS_T
Owner	db2admin
Comment	Street, Number, City and State
Structured type	
Super type	
Instantiable	☑
Inline length	165
Ref as source function	
Source as ref function	
Representation type	
Name	VARCHAR

5.10.1.1 Specifying type properties

The wizard step was supplied to define common structured type properties. The detailed description of the properties you can find below.


Create structured type wizard
Create New Structured type
Edit structured type options
DB2
Properties
Common
Structured type
Representation type
Help
< Back
Next >
Cancel

Name: ADDRESS_T
Owner: db2admin
Comment: Street, Number, City and State
Super type:
Instantiable: ☑
Inline length: 165
Ref as source function:
Source as ref function:
Name: VARCHAR

Name

The field represents the new type name as it was set on the previous wizard step. The name, including the implicit or explicit qualifier, must not identify any other type (built-in, structured, or distinct) already described in the catalog. The unqualified name must not be the same as the name of a built-in data type, *BINARY*, *VARBINARY*, or *BOOLEAN*.

Owner

Here you can see the owner of the new structured type. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment

Use the field to describe the structured type or leave it blank.

Super type

You can specify here that this structured type is a subtype under the specified supertype-name. The supertype-name must identify an existing structured type. If supertype-name is specified without a schema name, the type is resolved by searching the schemas on the SQL path. This field is not required.

Instantiable

Determines whether an instance of the structured type can be created. Implications of not instantiable structured types are:

- no constructor function is generated for a non-instantiable type

- a non-instantiable type cannot be used as the type of a table or view
- a non-instantiable type can be used as the type of a column (only null values or instances of instantiable subtypes can be inserted into the column.

Inline length
This option indicates the maximum size (in bytes) of a structured type column instance to store inline with the rest of the values in the row of a table. Instances of a structured type or its subtypes, that are larger than the specified inline length, are stored separately from the base table row, similar to the way that LOB values are handled.

Ref as source function
Defines the name of the system-generated function that casts a reference type value for this structured type to the data type rep-type. A schema name must not be specified as part of the function. The cast function is created in the same schema as the structured type. If the clause is not specified, the default value is rep-type (the name of the representation type).

Source as ref function
Defines the name of the system-generated function that casts a value with the data type rep-type to the reference type of this structured type. A schema name must not be specified as part of the function. The cast function is created in the same schema as the structured type. If the clause is not specified, the default value is type-name (the name of the structured type).

Representation type properties:

Source type name
Specifies the data type used as the basis for the internal representation of the distinct type. The source data type cannot be of type XML.

Precision
The first integer is the precision of the number; that is, the total number of digits; it may range from 1 to 31.

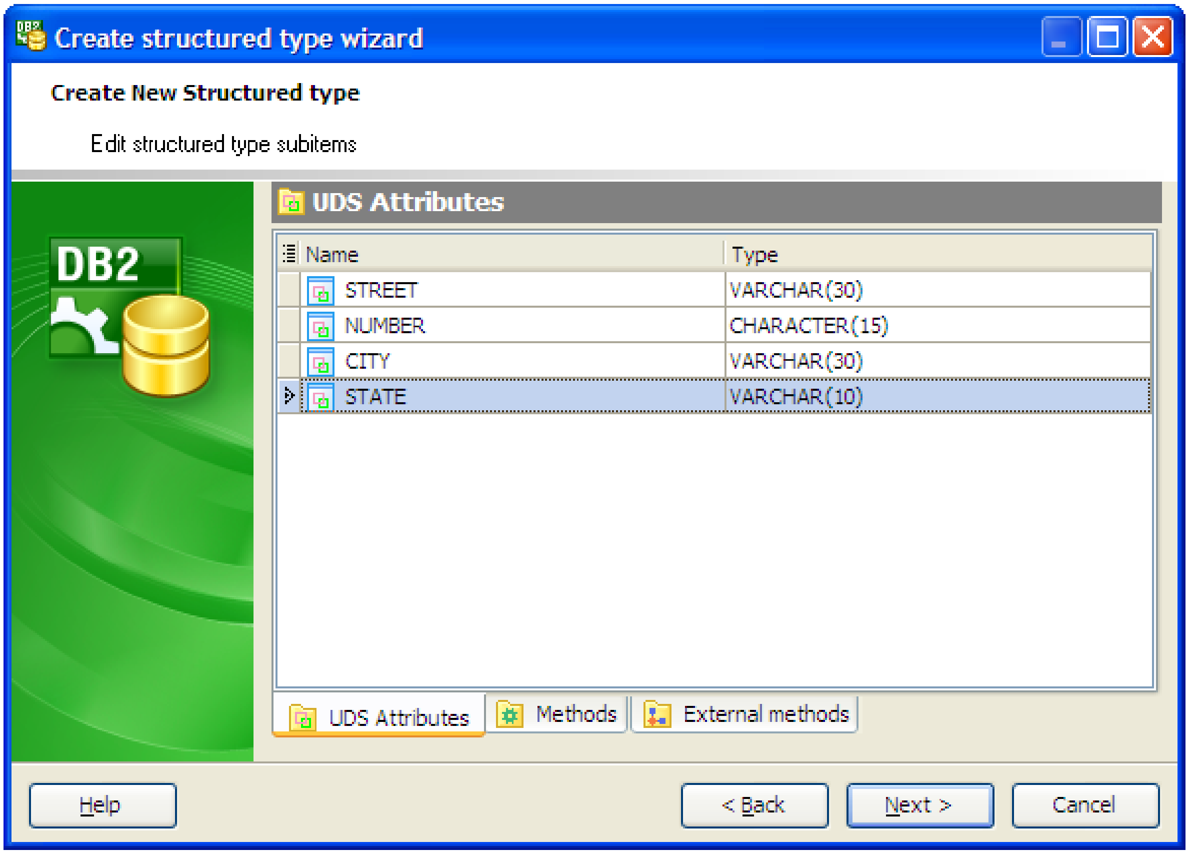
BIT data
Specifies that the contents of the column are to be treated as bit (binary) data. During data exchange with other systems, code
page conversions are not performed. Comparisons are done in binary, irrespective of the database collating sequence.

LOBs greater than 1 gigabyte cannot be logged and LOBs greater than 10 megabytes should probably not be logged.

5.10.1.2 Setting type subitems

The wizard step allows to define type UDS Attributes, Methods and External methods. Just open the corresponding tab and manage corresponding objects within the popup menu.

For corresponding information see:
- UDS Attributes 145,
- Methods 146,
- Extended methods 149.



Create New Structured type

Edit structured type subitems

Name	Type
STREET	VARCHAR(30)
NUMBER	CHARACTER(15)
CITY	VARCHAR(30)
STATE	VARCHAR(10)

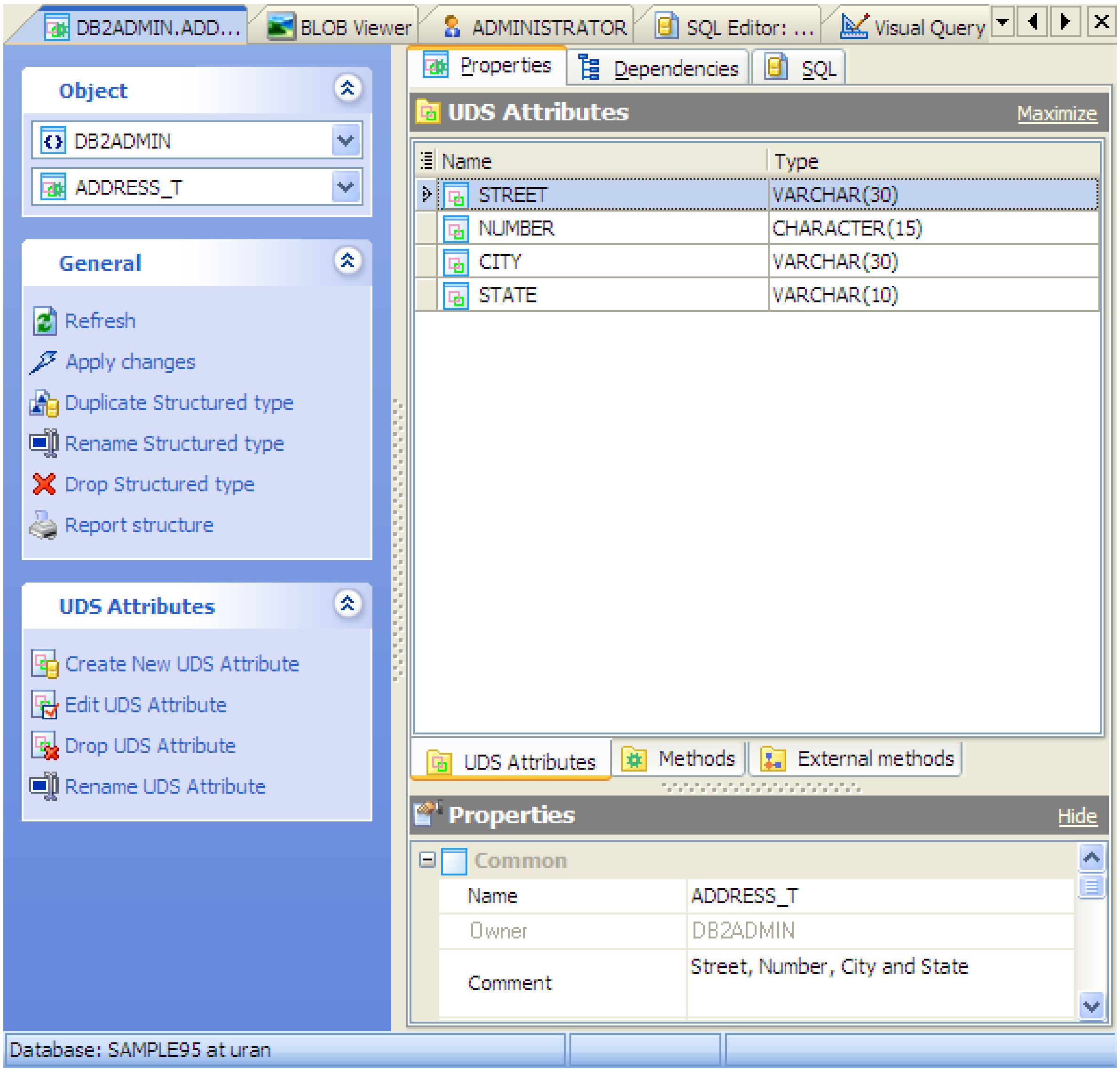
5.10.2 Structured Type Editor

Structured Type Editor can be opened automatically after the type is created and is available on editing (see Editing Structured Type 136 for details).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38 . Below you will find a description of editor tabs that are unique for the current object.

- Editing type properties 142

See also: Create Structured Type Wizard 137



DB2ADMIN

ADDRESS_T

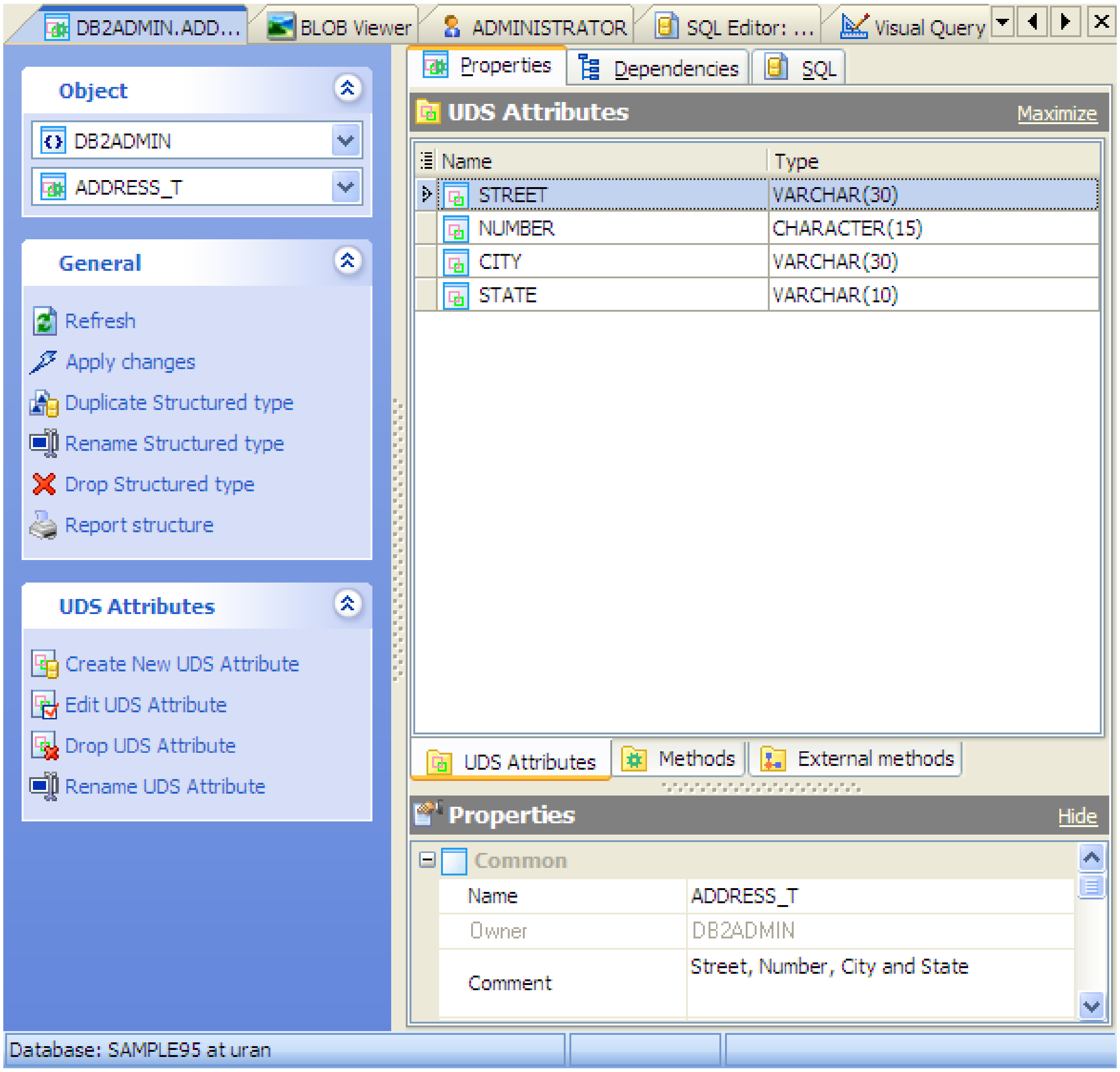
Name	Type
STREET	VARCHAR(30)
NUMBER	CHARACTER(15)
CITY	VARCHAR(30)
STATE	VARCHAR(10)

Name	ADDRESS_T
Owner	DB2ADMIN
Comment	Street, Number, City and State

Database: SAMPLE95 at uran

5.10.2.1 Editing type properties

Public Synonym Editor provides you with an ability to edit synonym properties fast and easy.



Name	Type
STREET	VARCHAR(30)
NUMBER	CHARACTER(15)
CITY	VARCHAR(30)
STATE	VARCHAR(10)

Name	ADDRESS_T
Owner	DB2ADMIN
Comment	Street, Number, City and State

Name

The field represents the new type name as it was set on the previous wizard step. The name, including the implicit or explicit qualifier, must not identify any other type (built-in, structured, or distinct) already described in the catalog. The unqualified name must not be the same as the name of a built-in data type, *BINARY*, *VARBINARY*, or *BOOLEAN*.

Owner

Here you can see the owner of the new structured type. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Comment

Use the field to describe the structured type or leave it blank.

Super type

You can specify here that this structured type is a subtype under the specified supertype-name. The supertype-name must identify an existing structured type. If supertype-name is specified without a schema name, the type is resolved by searching the schemas on the SQL path. This field is not required.

Instantiable

Determines whether an instance of the structured type can be created. Implications of not instantiable structured types are:

- no constructor function is generated for a non-instantiable type
- a non-instantiable type cannot be used as the type of a table or view
- a non-instantiable type can be used as the type of a column (only null values or instances of instantiable subtypes can be inserted into the column.

Inline length

This option indicates the maximum size (in bytes) of a structured type column instance to store inline with the rest of the values in the row of a table. Instances of a structured type or its subtypes, that are larger than the specified inline length, are stored separately from the base table row, similar to the way that LOB values are handled.

Ref as source function

Defines the name of the system-generated function that casts a reference type value for this structured type to the data type rep-type. A schema name must not be specified as part of the function. The cast function is created in the same schema as the structured type. If the clause is not specified, the default value is rep-type (the name of the representation type).

Source as ref function

Defines the name of the system-generated function that casts a value with the data type rep-type to the reference type of this structured type. A schema name must not be specified as part of the function. The cast function is created in the same schema as the structured type. If the clause is not specified, the default value is type-name (the name of the structured type).

Representation type properties:

Source type name

Specifies the data type used as the basis for the internal representation of the distinct type. The source data type cannot be of type XML.

Precision

The first integer is the precision of the number; that is, the total number of digits; it may range from 1 to 31.

BIT data

Specifies that the contents of the column are to be treated as bit (binary) data. During data exchange with other systems, code
page conversions are not performed. Comparisons are done in binary, irrespective of the database collating sequence.

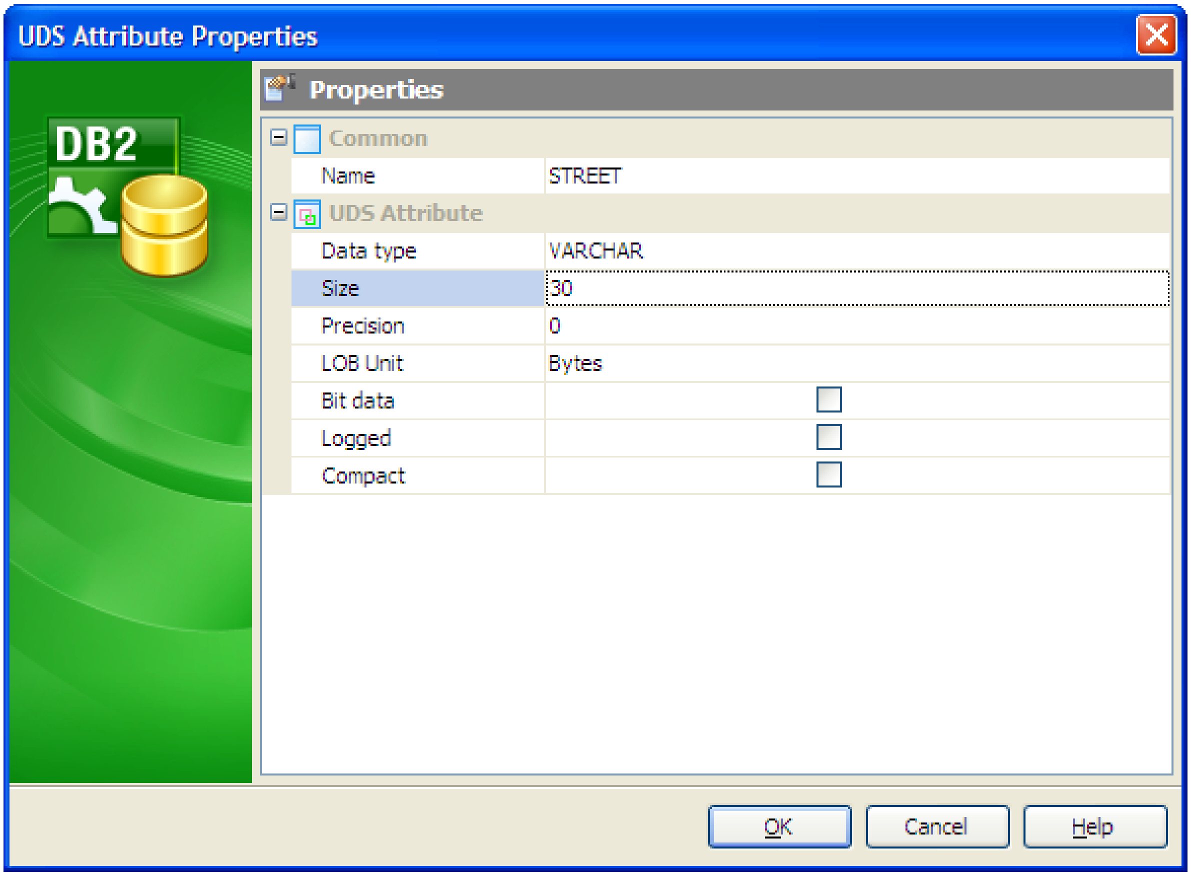
LOBs greater than 1 gigabyte cannot be logged and LOBs greater than 10 megabytes should probably not be logged.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.10.2.2 UDS Attributes

Set UDS Attributes within the Properties window. Note, the attribute-name cannot be the same as any other attribute of this structured type or any supertype of this structured type.



Name	STREET
Data type	VARCHAR
Size	30
Precision	0
LOB Unit	Bytes
Bit data	☐
Logged	☐
Compact	☐

Data type
The data type of the attribute. It is one of the standard data types, other than LONG VARCHAR, LONG VARGRAPHIC, XML, or a distinct type based on LONG VARCHAR or LONG VARGRAPHIC.

Use the Size edit box to define the length of the field value for integer, float, char and other data types and use Precision to define the precision of the field value, e.g. for float data type.
Precision

Precision
The first integer is the precision of the number; that is, the total number of digits; it

may range from 1 to 31.

LOB Unit
Specifies the options associated with LOB types.

Bit data
Specifies that the contents of the column are to be treated as bit (binary) data. During data exchange with other systems, code
page conversions are not performed. Comparisons are done in binary, irrespective of the database collating sequence.

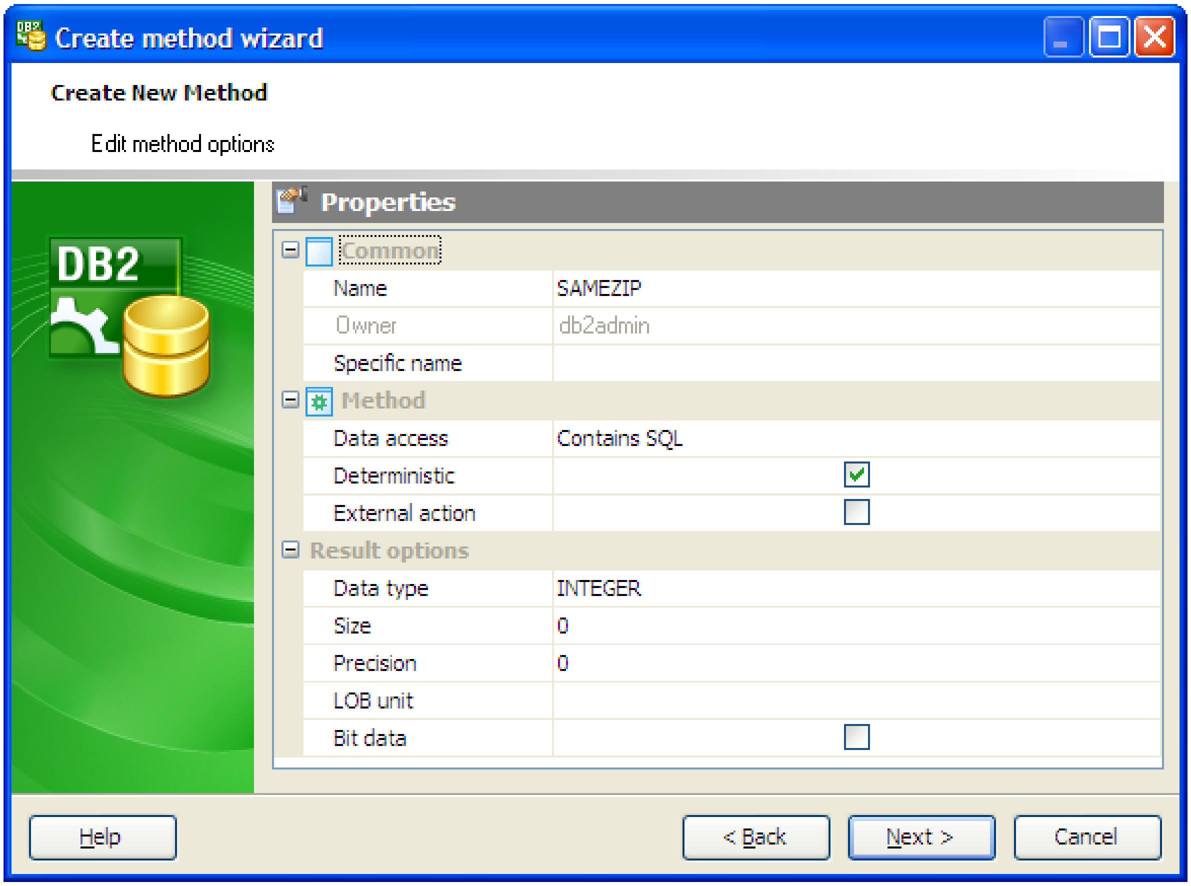
Logged
Specifies that changes made to the column are to be written to the log. The data in such columns is then recoverable with database utilities (such as RESTORE DATABASE).

Compact
Specifies that the values in the LOB column should take up minimal disk space (free any extra disk pages in the last group used by the LOB value), rather than leave any leftover space at the end of the LOB storage area that might facilitate subsequent append operations. Note that storing data in this way may cause a performance penalty in any append (length-increasing) operations on the column.

5.10.2.3 Methods

Use the wizard to define a method of the new structured type.

Name
It must be an unqualified SQL identifier. A number of names used as keywords in predicates are reserved for system use, and cannot be used as a method-name. The names are SOME, ANY, ALL, NOT, AND, OR, BETWEEN, NULL, LIKE, EXISTS, IN, UNIQUE, OVERLAPS, SIMILAR, MATCH, and the comparison operators. In general, the same name can be used for more than one method if there is some difference in their signatures.



Common	
Name	SAMEZIP
Owner	db2admin
Specific name	
Method	
Data access	Contains SQL
Deterministic	☑
External action	☐
Result options	
Data type	INTEGER
Size	0
Precision	0
LOB unit	
Bit data	☐

Data Access

Indicates what type of SQL statements can be executed. Because the SQL statement supported is the RETURN statement, the distinction has to do with whether or not the expression is a subquery.

Deterministic

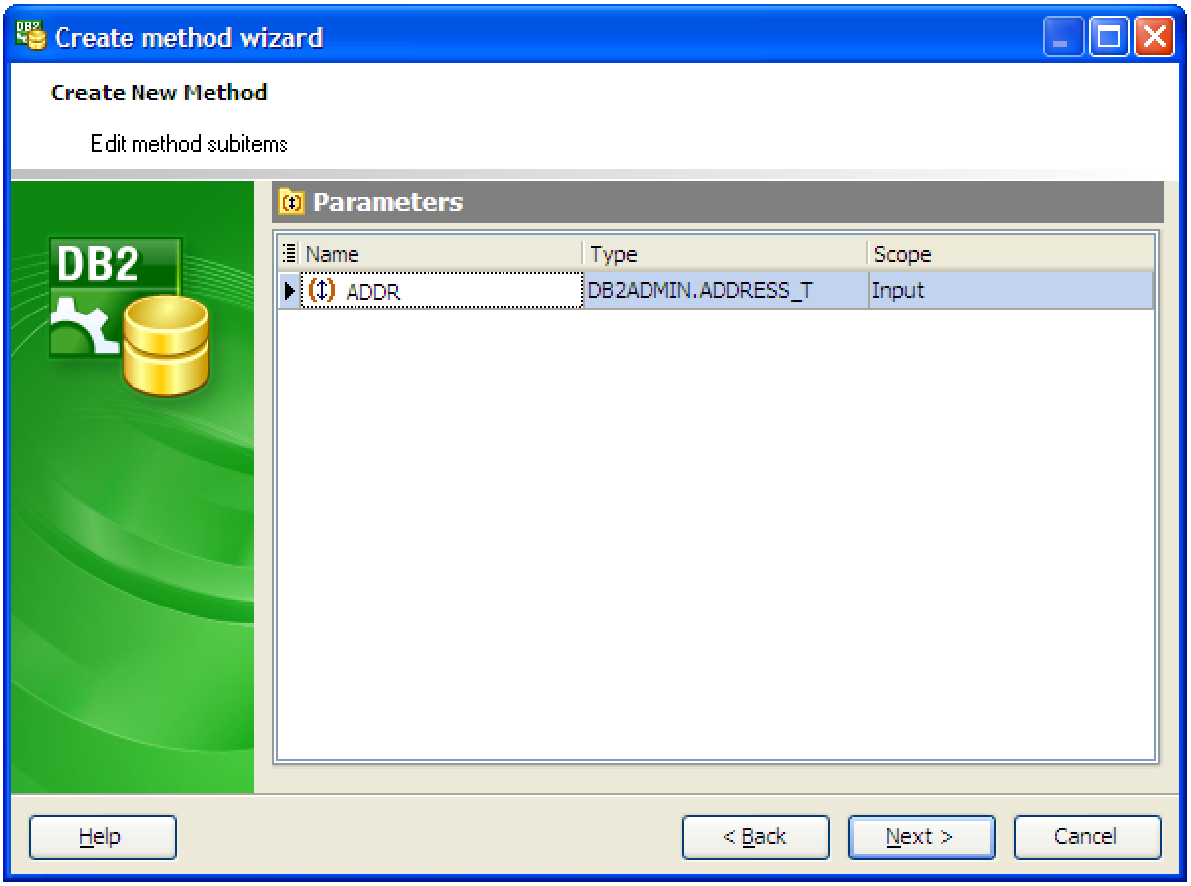
Check the option to specify whether the method always returns the same results for given argument values (ON) or whether the method depends on some state values that affect the results (OFF). That is, a deterministic method must always return the same result from successive invocations with identical inputs.

External action

This optional clause specifies whether or not the method takes some action that changes the state of an object not managed by the database manager.

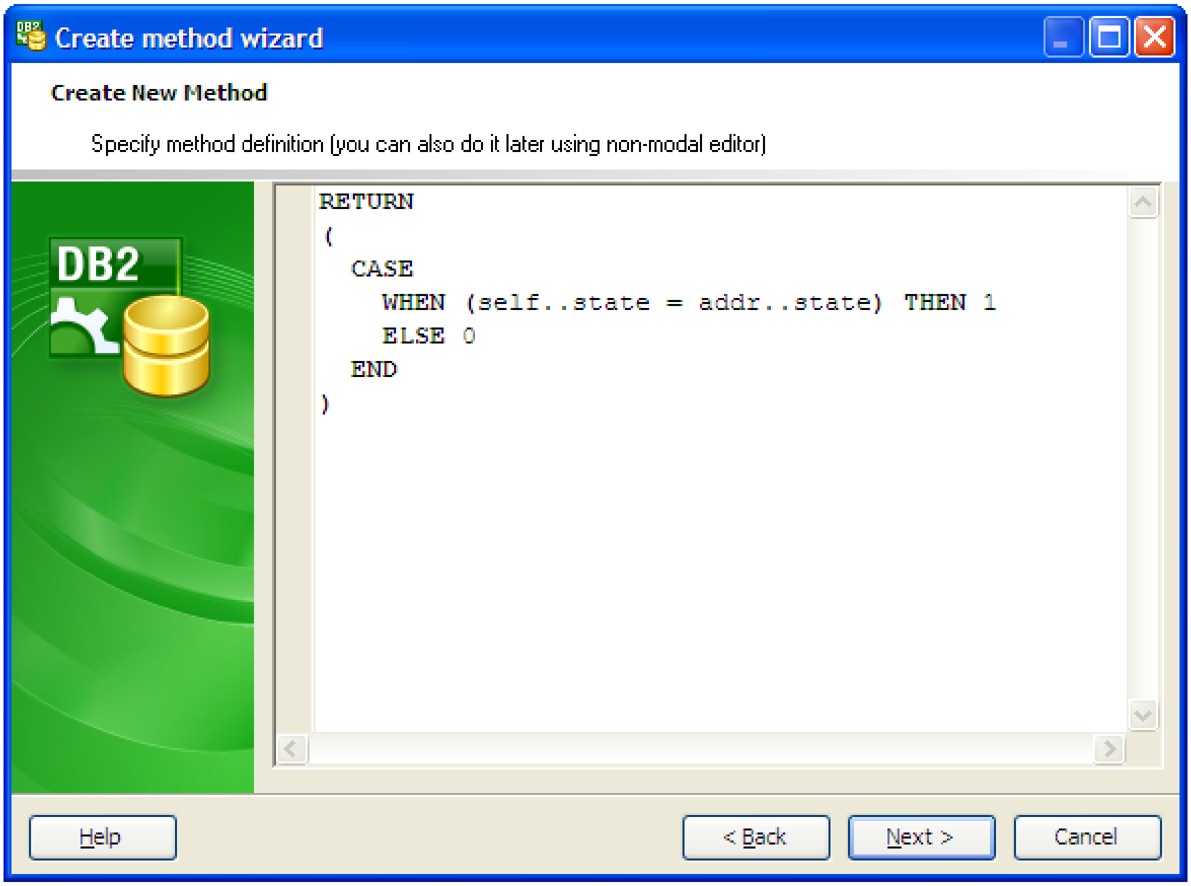
You can also set here method Result options (Data type, size, Precision, LOB unit, Bit data)

Use popup menu Add New Parameter... item to add a new parameter and set its properties. Use the Edit and Delete items to manage method parameters.



Name	Type	Scope
ADDR	DB2ADMIN.ADDRESS_T	Input

At this step you can specify the SQL definition for the new structured type method. The step is optional: you can do it later using a non-modal editor.

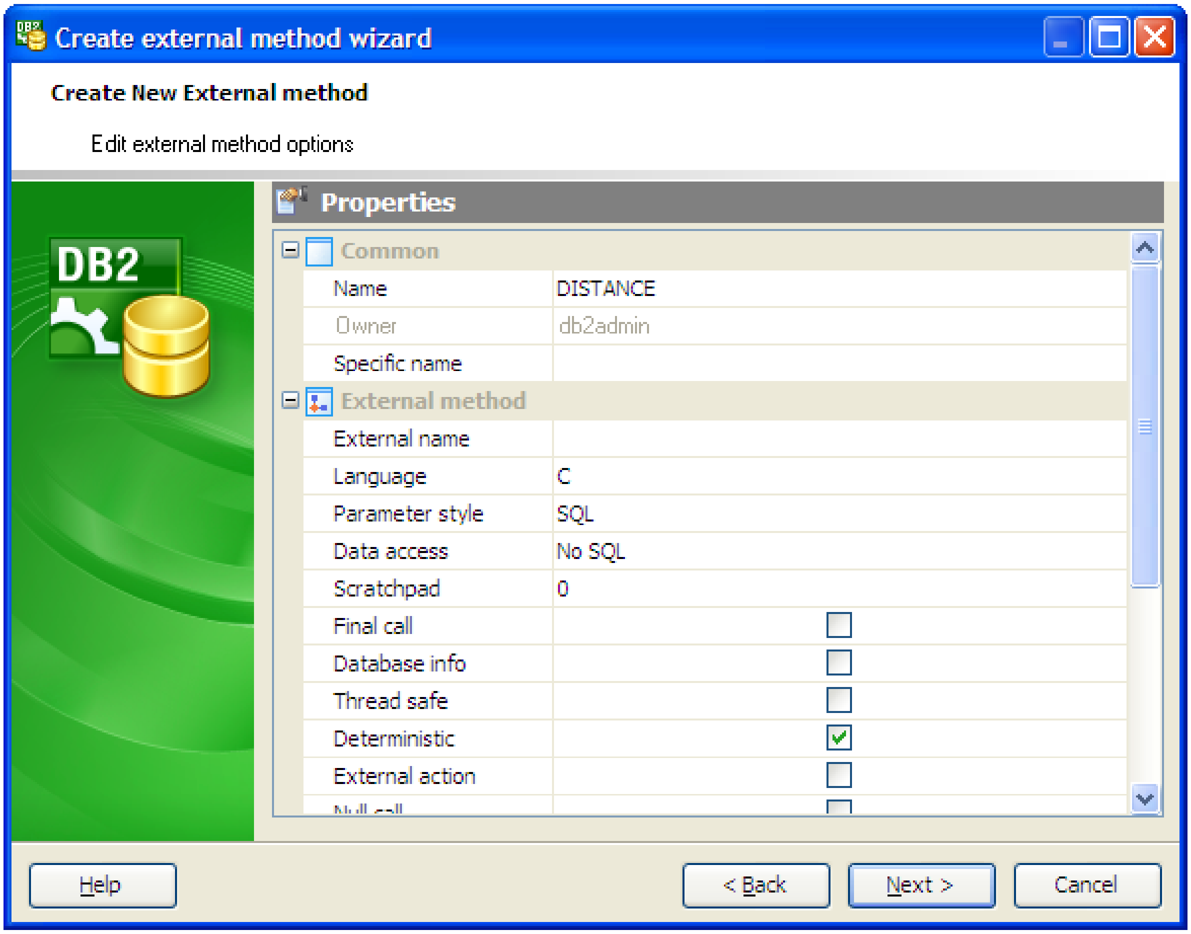


Specify method definition (you can also do it later using non-modal editor)

```
RETURN
(
  CASE
    WHEN (self..state = addr..state) THEN 1
    ELSE 0
  END
)
```

5.10.2.4 Extended methods

Use External method wizard to create a new one. Set the new method Name and (if necessary) Specific name to provide a unique name for the instance of the method.


Create external method wizard
Create New External method
Edit external method options
DB2
Properties
Help
< Back
Next >
Cancel

Common	
Name	DISTANCE
Owner	db2admin
Specific name	
External method	
External name	
Language	C
Parameter style	SQL
Data access	No SQL
Scratchpad	0
Final call	☐
Database info	☐
Thread safe	☐
Deterministic	☑
External action	☐

Language

This mandatory clause is used to specify the language interface convention to which the user-defined method body is written.

Parameter style

This clause is used to specify the conventions used for passing parameters to and returning the value from methods.

Data access

Indicates whether the method issues any SQL statements and, if so, what type.

Scratchpad

This optional clause may be used to specify whether a scratchpad is to be provided for an external method. It is strongly recommended that methods be re-entrant, so a scratchpad provides a means for the method to ?save state? from one call to the next.

Final call

This optional clause specifies whether a final call is to be made to an external method. The purpose of such a final call is to enable the external method to free any system resources it has acquired. It can be useful in conjunction with the SCRATCHPAD keyword in situations where the external method acquires system resources such as memory and anchors them in the scratchpad.

The description of the other External method properties you can find in DB2 SQL Reference Volume 2.

The next wizard step allows you to specify parameters of the new external method. Use popup menu Add New Parameter... item to add a new parameter and set its properties.

5.11 MQ Tables

MQ Table is a materialized query table based on a query.

How can I create a new materialized query table?

New MQ tables are created within Create MQ Table Wizard 153. In order to run the wizard you should either

- select the Object | Create Database Object... main menu item;
- select the MQ Table icon in the Create Database Object dialog

or

- select the MQ Tables list or any object from that list in the explorer tree;
- select the Create New MQ Table... item from the popup menu

or

- open the schema in Schema Editor and the MQ Tables tab there;
- press the **Insert** key or select the Create New MQ Table... item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

To create a new MQ Table with the same properties as one of the existing MQ Tables has:

- select the Object | Duplicate Database Object... main menu item;
- follow the instructions of Duplicate Object Wizard.

How can I edit an existing materialized query table?

MQ Tables can be edited within MQ Table Editor 158. In order to run the editor you should either

- select the MQ Table for editing in the explorer tree (type the first letters of the MQ Table name for quick search);
- select the Edit MQ Table ... item from the popup menu

or

- open the schema in Schema Editor and the MQ Tables tab there;
- select the MQ Table to edit;
- press the **Enter** key or select the Edit MQ Table item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar).

You can change the name of the MQ Table using the Rename MQ Table dialog. To open the dialog you should either

- select the MQ Table to rename in the explorer tree;
- select the Rename MQ Table item from the popup menu

or

- open the schema in Schema Editor and the Aliases tab there;
- select the MQ Table to rename;
- select the Rename MQ Table item from the popup menu

(alternatively, you may use the corresponding link of the Navigation Bar).

How can I drop a materialized query table?

To drop a MQ Table:

- select the MQ Table to drop in the explorer tree;
- select the Drop MQ Table item from the popup menu

or

- open the schema in Schema Editor and the MQ Tables tab there;
- select the MQ Table to drop;
- press the **Delete** key or select the Drop MQ Table item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

5.11.1 Create MQ Table Wizard

Create MQ Table Wizard guides you through the process of creating a new materialized-query table. See How To Create MQ Table 152 for instructions on running this wizard.

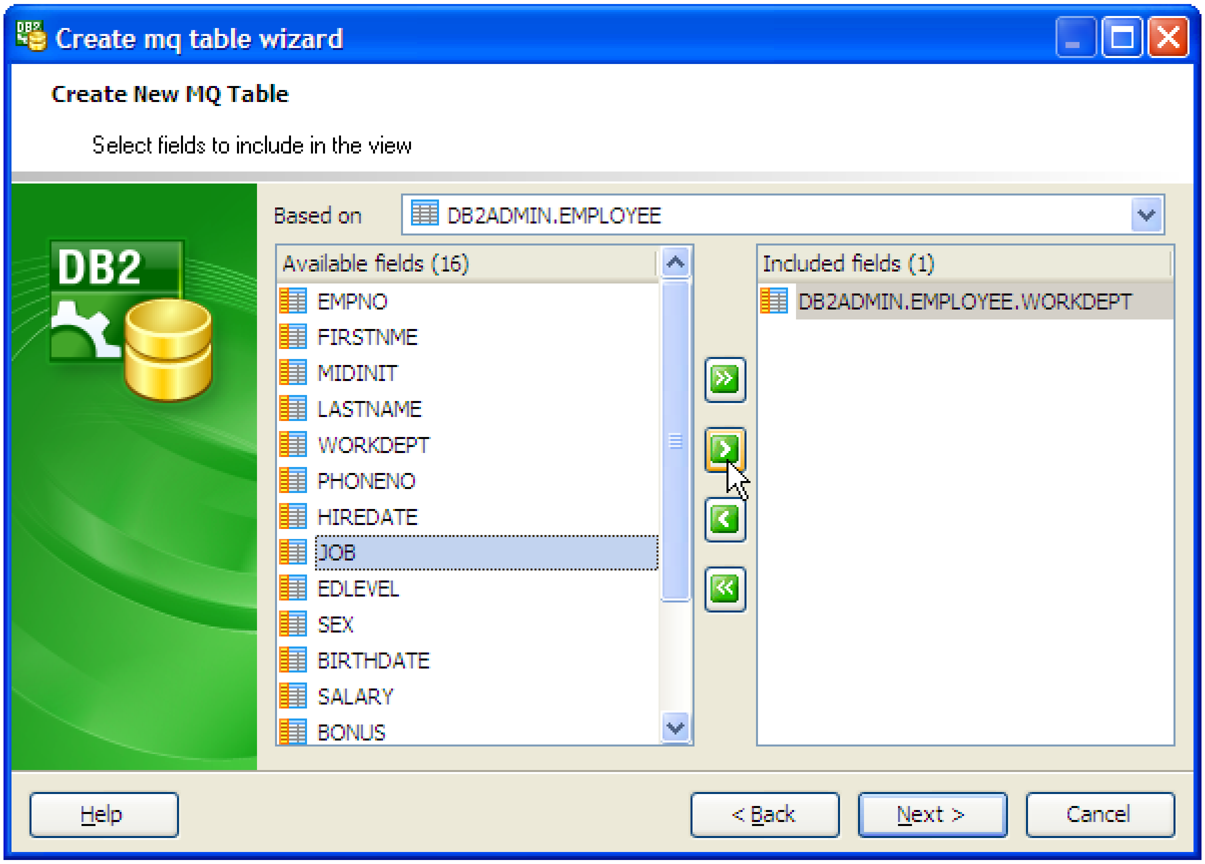
The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

- Selecting fields 153
- Specifying table properties 154
- Specifying the WHERE condition 156

See also: MQ Table Editor 158

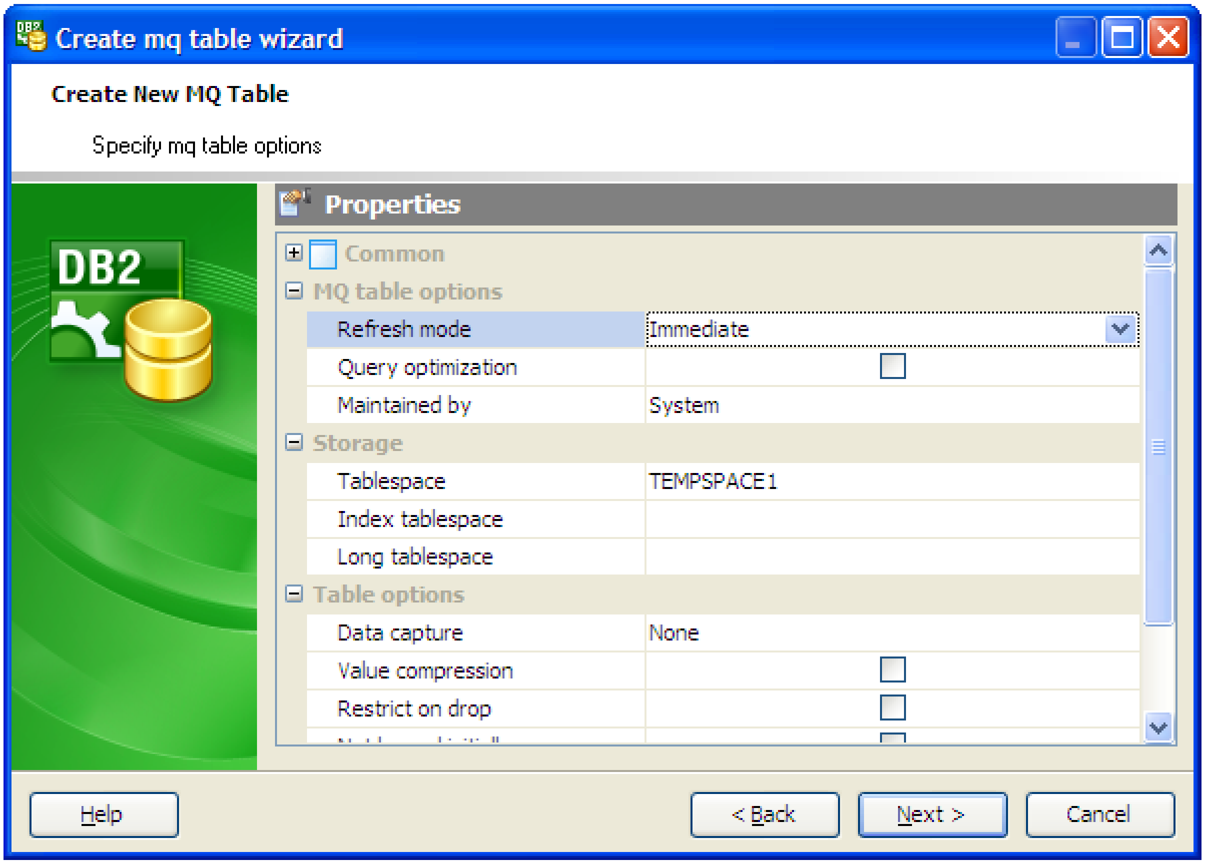
5.11.1.1 Selecting fields

Select a table or a view from the Based on drop-down menu. Then specify which fields will be used in the new MQ Table. Use Add All or Add Selected buttons to include field(s) into view definition. Use the Remove Selected or Remove All items to exclude field(s) from the view's field list. Click the Next button to proceed.



5.11.1.2 Specifying table properties

The wizard step was supplied to define common MQ table properties. The detailed description of the properties you can find below.



Refresh mode	Immediate
Query optimization	☐
Maintained by	System
Tablespace	TEMPSPACE1
Index tablespace	
Long tablespace	
Data capture	None
Value compression	☐
Restrict on drop	☐

Name
The field represents the new MQ Table name as it was set on the previous wizard step.

Owner
Here you can see the owner of the materialized query table. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Refresh mode (Immediate, Deffered, Once)
Indicates how the data in the table is maintained.

Query optimization
Check the option to allow the materialized query table can be used for query optimization under appropriate circumstances.

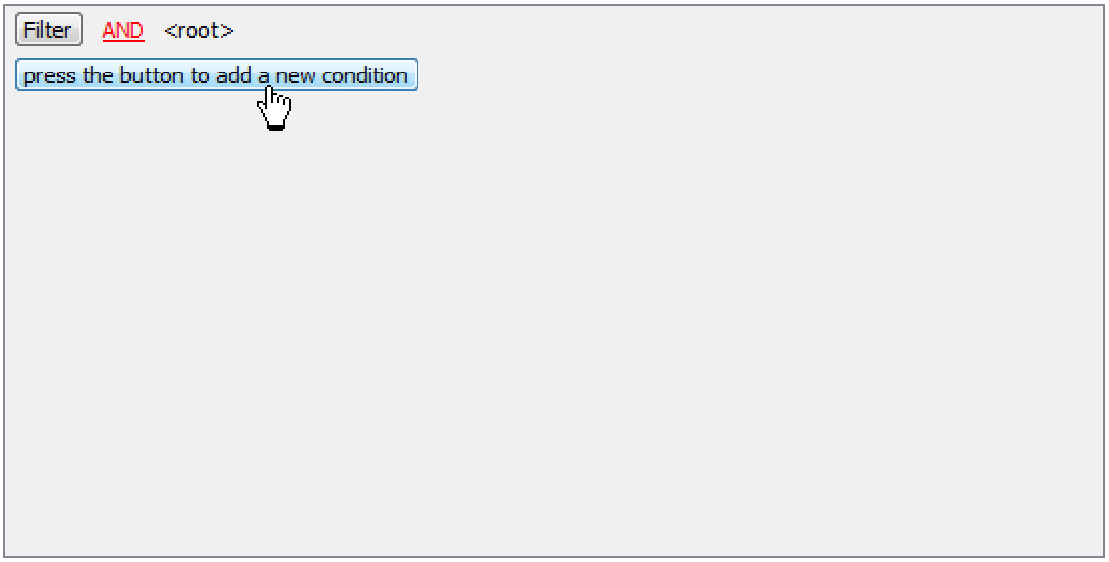
Maintained by
Specifies whether the data in the materialized query table is maintained by the system, user, or replication tool. The default is SYSTEM.
You can specify here also Storage options and Table options (data capture, value compression, restrict on drop, etc.) for materialized query table.

The full description of the materialized query table properties you can find in DB2 SQL Reference Volume 2.

5.11.1.3 Specifying WHERE condition

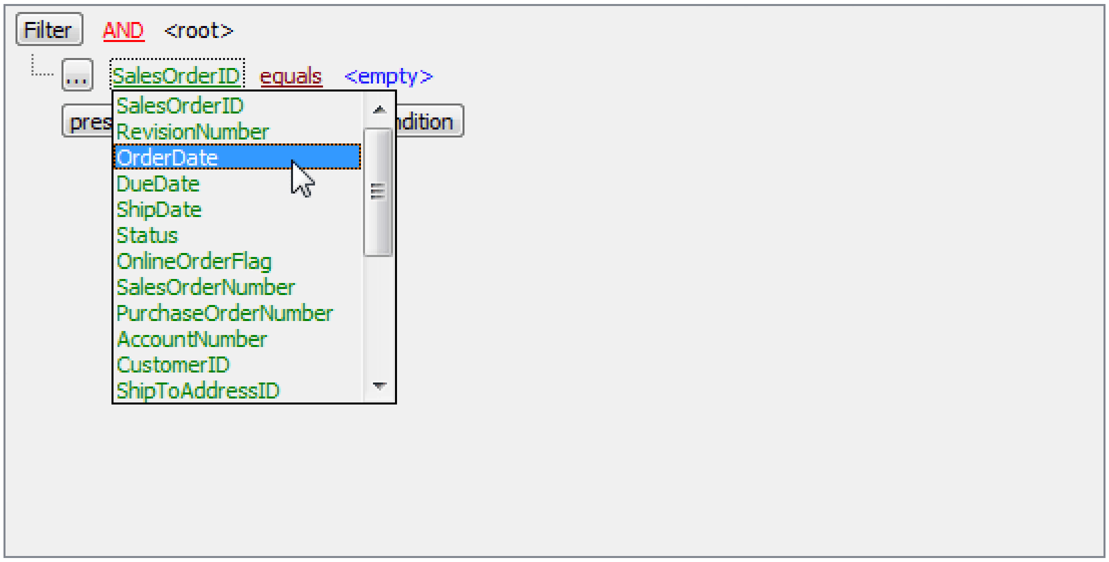
⊟ Adding a new condition to the filter

Suppose we need to select orders from the sample table *Orders* made between 01.02.2010 and 10.02.2010. These criteria are applied to the *OrderDate* column. Press the button to add this condition. Alternatively, you can use the Filter button and select the Add Condition option from the drop-down menu.



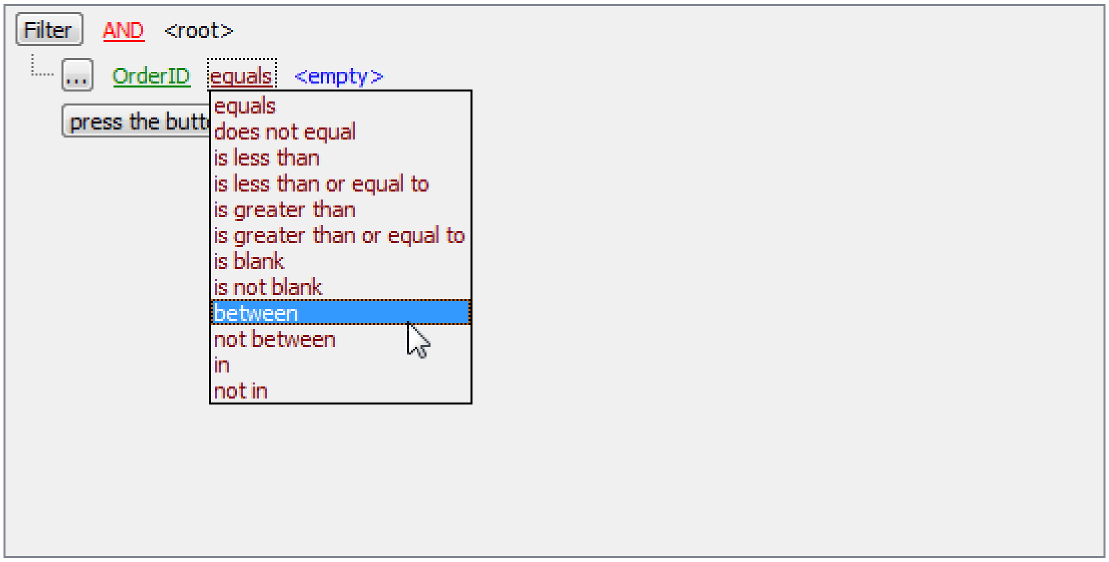
⊟ Setting a filter criteria in the condition

Select the *OrderDate* column in the drop-down list of the available columns.



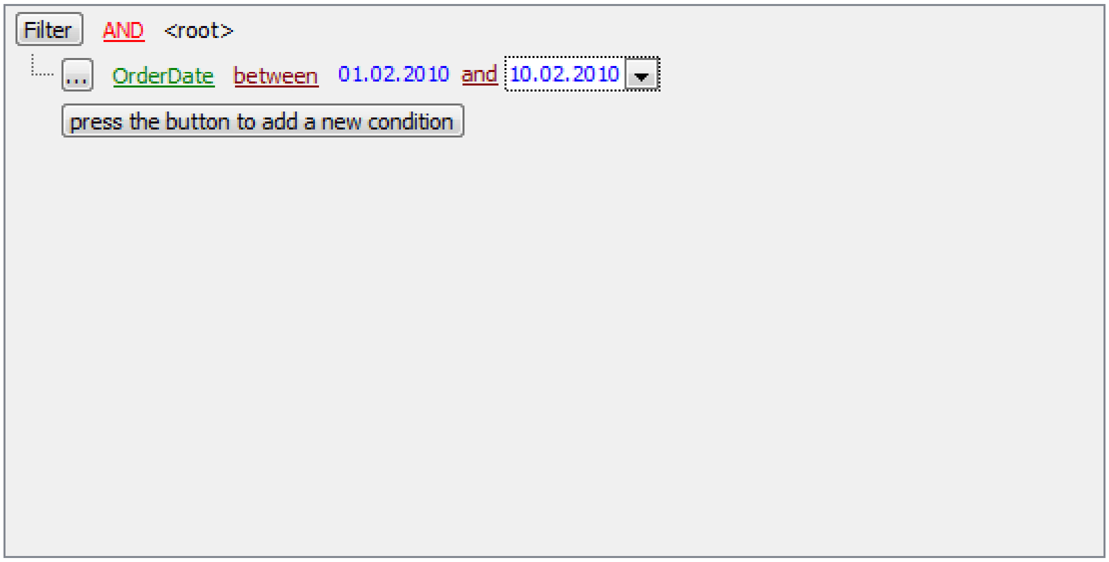
Setting an operator in the condition

Set the proper operator. In our example it is BETWEEN.



Setting criteria values in the condition

Next, you need to specify the range values for the selected operator. The editor used in value boxes is determined by the editor type assigned to the corresponding column.



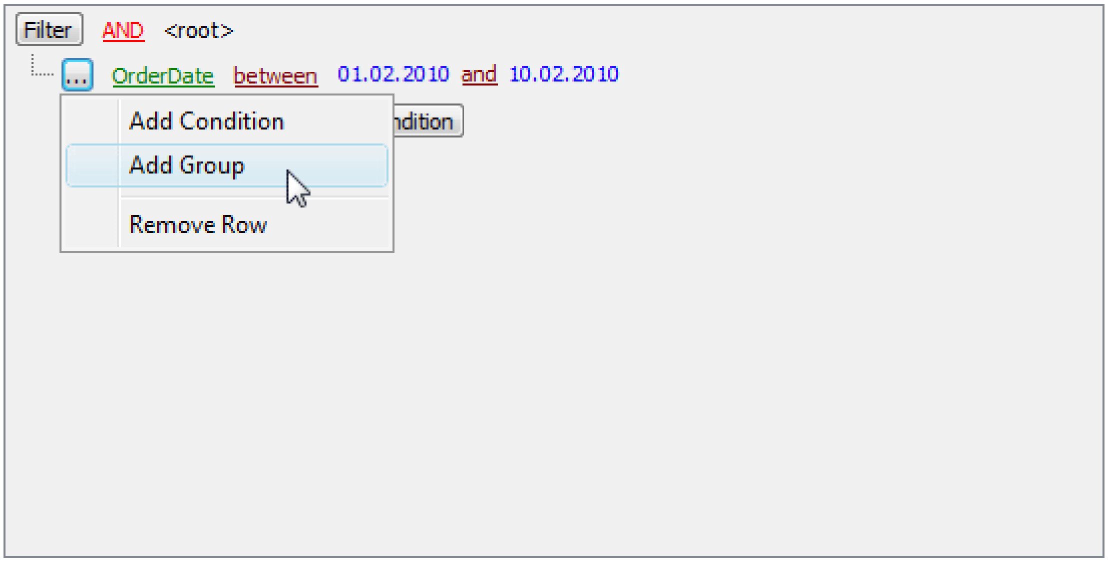
Now use the Apply button to see the filter result.

You can add additional conditions to the same root level to be combined by the

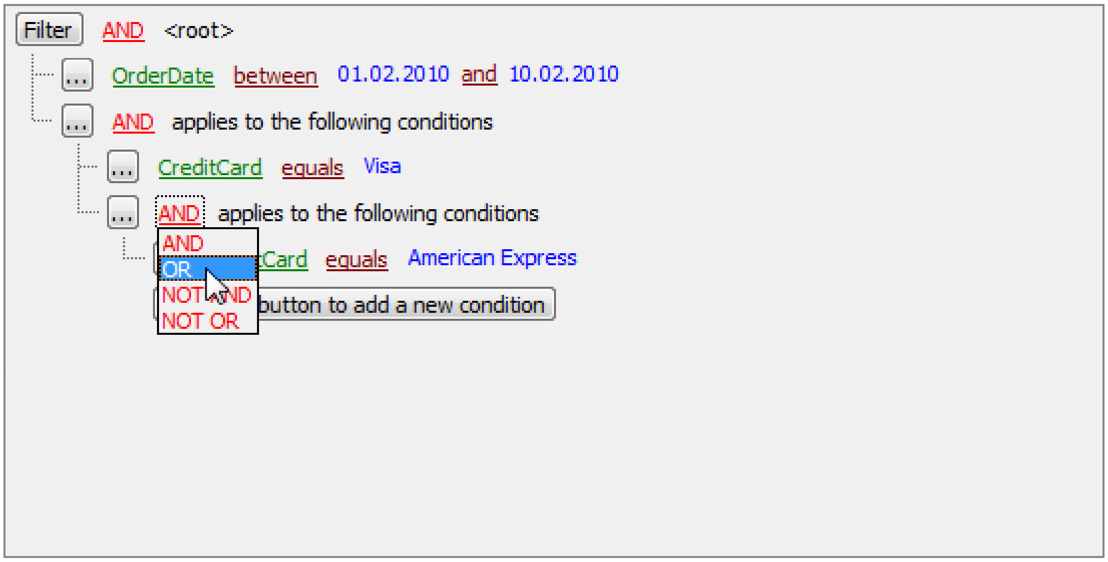
AND operator.

Adding a new group

Suppose we need to select orders made between 01.02.2010 and 10.02.2010 and payed via 'Visa' or 'American Express'. This is a complex filter condition combining two simple conditions with the OR operator. Conditions from the same root level are combined by the AND operator. To add a condition combined with the previous one with the OR (NOT AND, NOT OR) operator, use a new group of conditions.



The next screen represents the finished filter conditions for this example.


Filter AND <root>
... OrderDate between 01.02.2010 and 10.02.2010
... AND applies to the following conditions
... CreditCard equals Visa
... AND applies to the following conditions
AND
OR
NOT AND
NOT OR
Card equals American Express
button to add a new condition

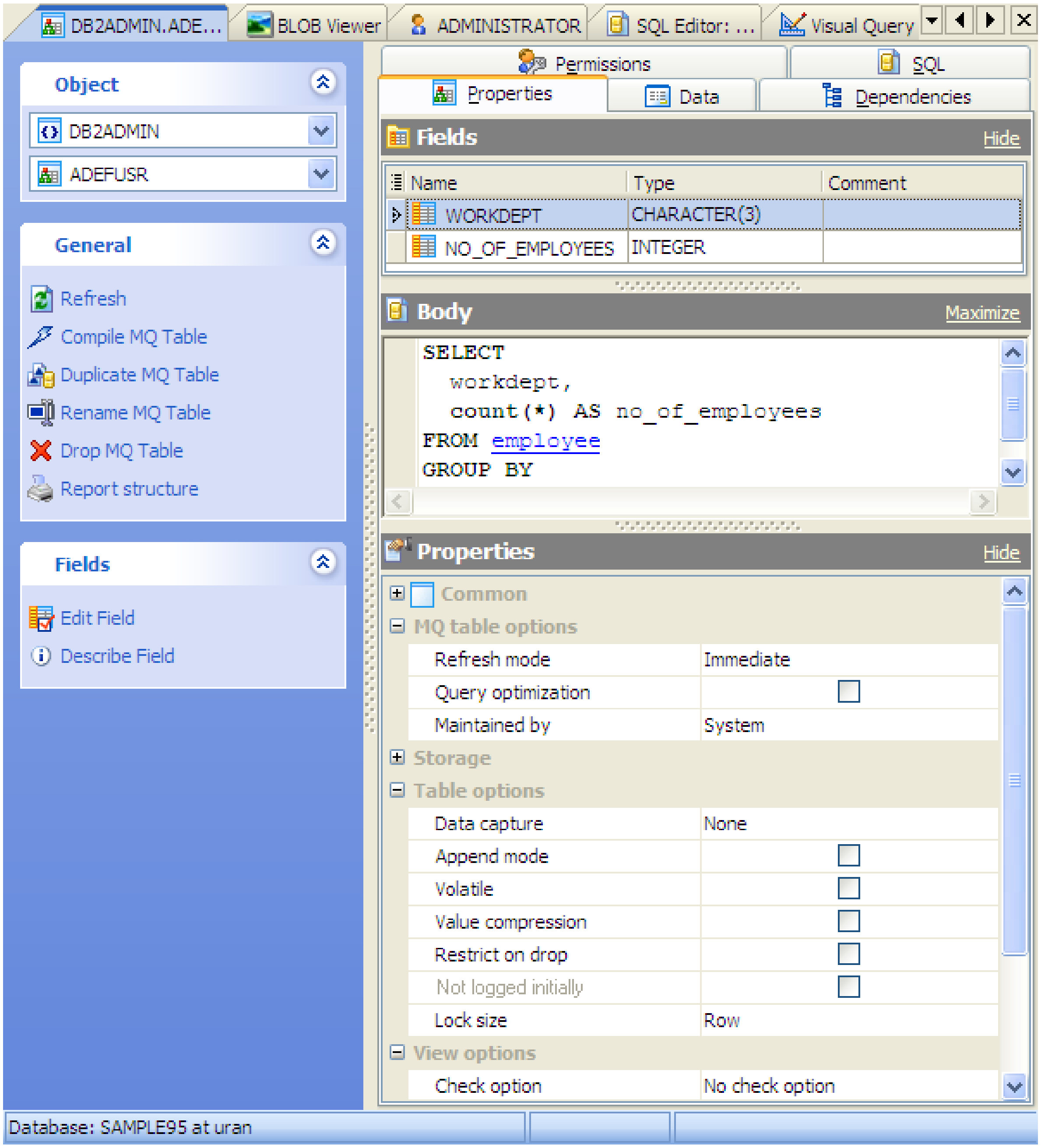
5.11.2 MQ Table Editor

MQ Table Editor can be opened automatically after the materialized-query table is created and is available on editing (see Editing MQ Table 152 for details).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.

- Editing table properties 159
- Viewing table data 161

See also: Create MQ Table Wizard 153



Name	Type	Comment
WORKDEPT	CHARACTER(3)	
NO_OF_EMPLOYEES	INTEGER	

```
SELECT
  workdept,
  count(*) AS no_of_employees
FROM employee
GROUP BY
```

Common

MQ table options

Refresh mode	Immediate
Query optimization	☐
Maintained by	System

Storage

Table options

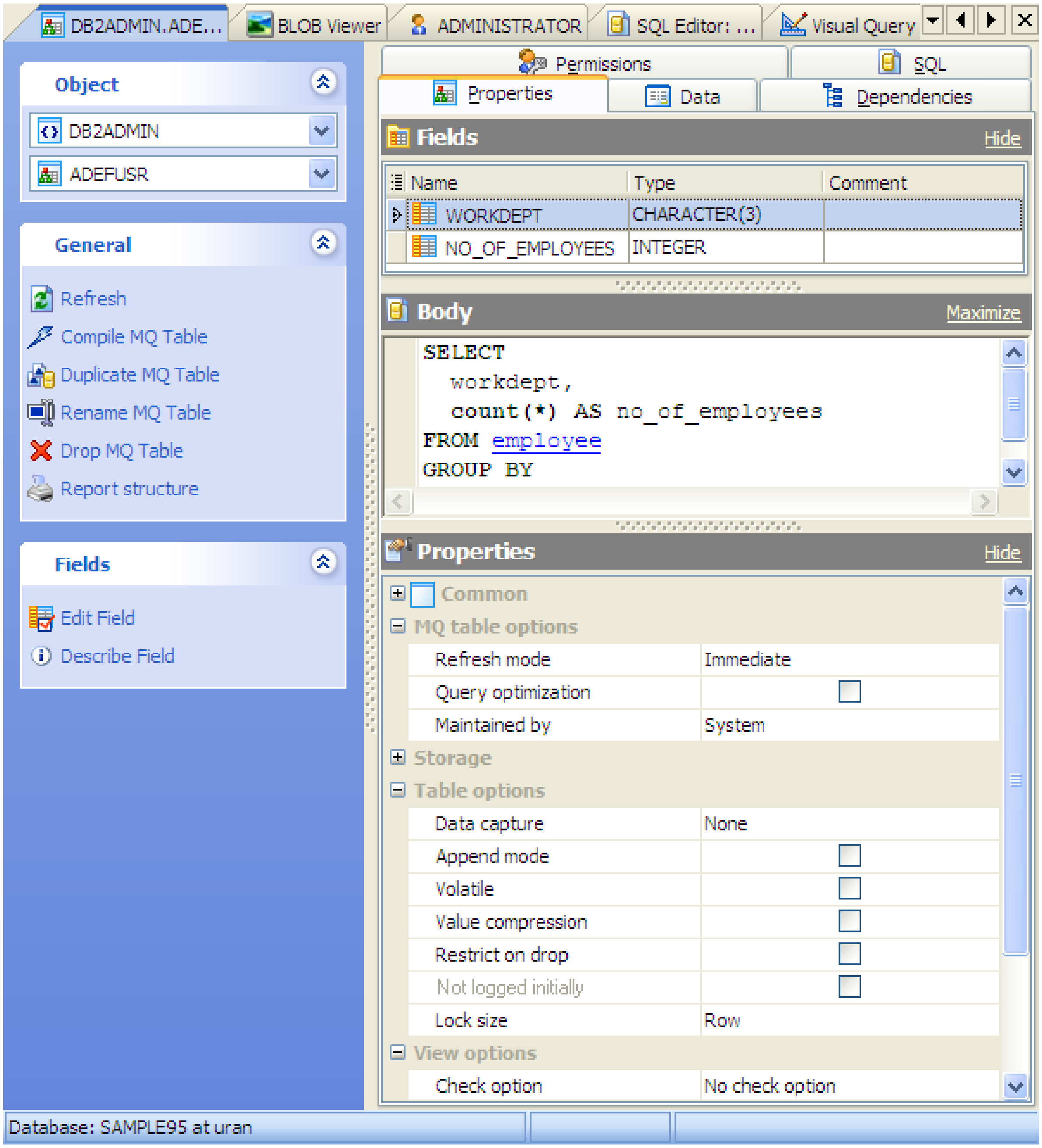
Data capture	None
Append mode	☐
Volatile	☐
Value compression	☐
Restrict on drop	☐
Not logged initially	☐
Lock size	Row

View options

Check option	No check option

5.11.2.1 Editing table properties

MQ Table Editor provides you with an ability to edit its properties fast and easy.



Name	Type	Comment
WORKDEPT	CHARACTER(3)	
NO_OF_EMPLOYEES	INTEGER	

```
SELECT
  workdept,
  count(*) AS no_of_employees
FROM employee
GROUP BY
```

Common	
MQ table options	
Refresh mode	Immediate
Query optimization	☐
Maintained by	System
Storage	
Table options	
Data capture	None
Append mode	☐
Volatile	☐
Value compression	☐
Restrict on drop	☐
Not logged initially	☐
Lock size	Row
View options	
Check option	No check option

Name
The field represents the new MQ Table name as it was set on the previous wizard step.

Owner
Here you can see the owner of the materialized query table. By default, only the owner of an object can perform various operations with the object. In order to allow other users to operate it, privileges must be granted. (However, users that have the superuser attribute can always access any object.)

Refresh mode (Immediate, Deffered, Once)
Indicates how the data in the table is maintained.

Query optimization
Check the option to allow the materialized query table can be used for query optimization under appropriate circumstances.

Maintained by
Specifies whether the data in the materialized query table is maintained by the system, user, or replication tool. The default is SYSTEM.
You can specify here also Storage options and Table options (data capture, value compression, restrict on drop, etc.) for materialized query table.

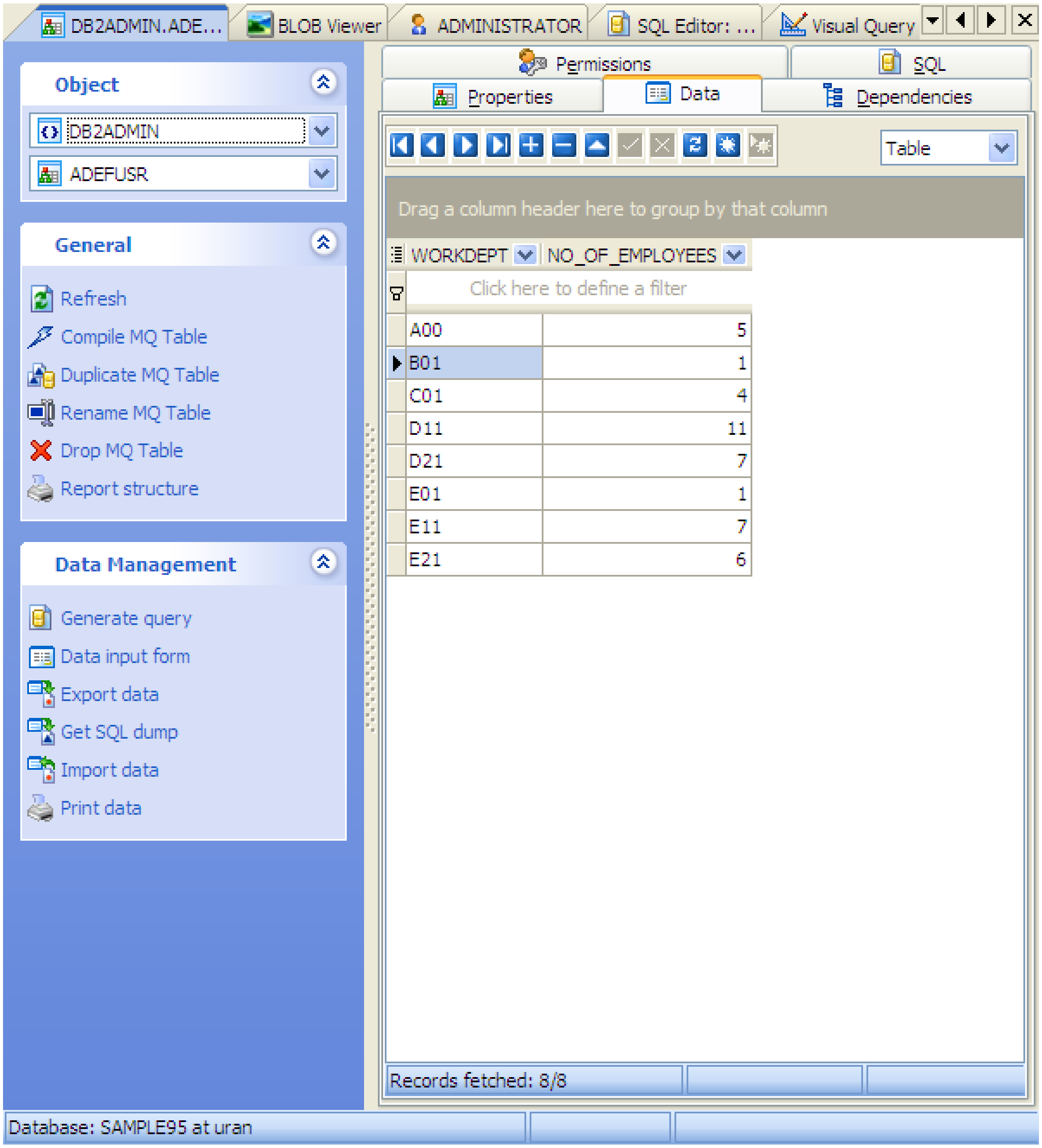
The full description of the materialized query table properties you can find in DB2 SQL Reference Volume 2.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

5.11.2.2 Viewing table data

The Data tab displays the data represented in the view as a grid (see Data View for details). The popup menu of this tab and the Data Management navigation bar allow you to export data, get SQL dump, set the value of the selected record to *Null* or to *Now* (for Date values). In tables with BLOB fields you can also call BLOB Editor to view and edit the BLOB fields.



DB2ADMIN

ADEFUSR

Table

WORKDEPT	NO_OF_EMPLOYEES
A00	5
B01	1
C01	4
D11	11
D21	7
E01	1
E11	7
E21	6

Records fetched: 8/8

Database: SAMPLE95 at uran

6 Server Objects

With DB2 Maestro you can accomplish all the popular actions of server administration. Note that before working with server objects you should connect to any server database first (see Database Management 21).

The following list contains the most common server objects supported by DB2 Maestro.

- User 167;
- Groups 171;
- Tablespaces 175;
- Boofer Pools 180.

Below you can find some common ways of server object management.

⊟ Creating of a new server object

New server objects are created within the appropriate Create Object Wizard. In order to run the wizard you should either

- select the corresponding object list (such as) or any object from that list and then use the Create New... item from the popup menu

or

- open the server in Server Editor 165 and the necessary objects' tab there and press **Insert** or select the Create New... item from the popup menu (Alternatively, use the corresponding link of the Navigation Bar).

⊟ Editing of an existing server object

Server objects are edited within the corresponding Object Editor. In order to open the editor you should either

- select the server object for editing in the explorer tree (type the first letters of the object name for quick search);
- select the Edit Object item from the popup menu

or

- open the server in Server Editor and the corresponding objects' tab there;
- select the server object to edit;
- press the **Enter** key or select the Edit Object item from the popup menu (alternatively, you can use the corresponding link of the Navigation Bar).

⊟ Dropping of a server object

To drop the existing server object:

- select the server object to drop in the explorer tree;

- select the Drop Object item from the popup menu

or

- open the server in Server Editor and the appropriate objects' tab there;
- select the server object to drop;
- press the **Delete** key or select the Drop Object item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

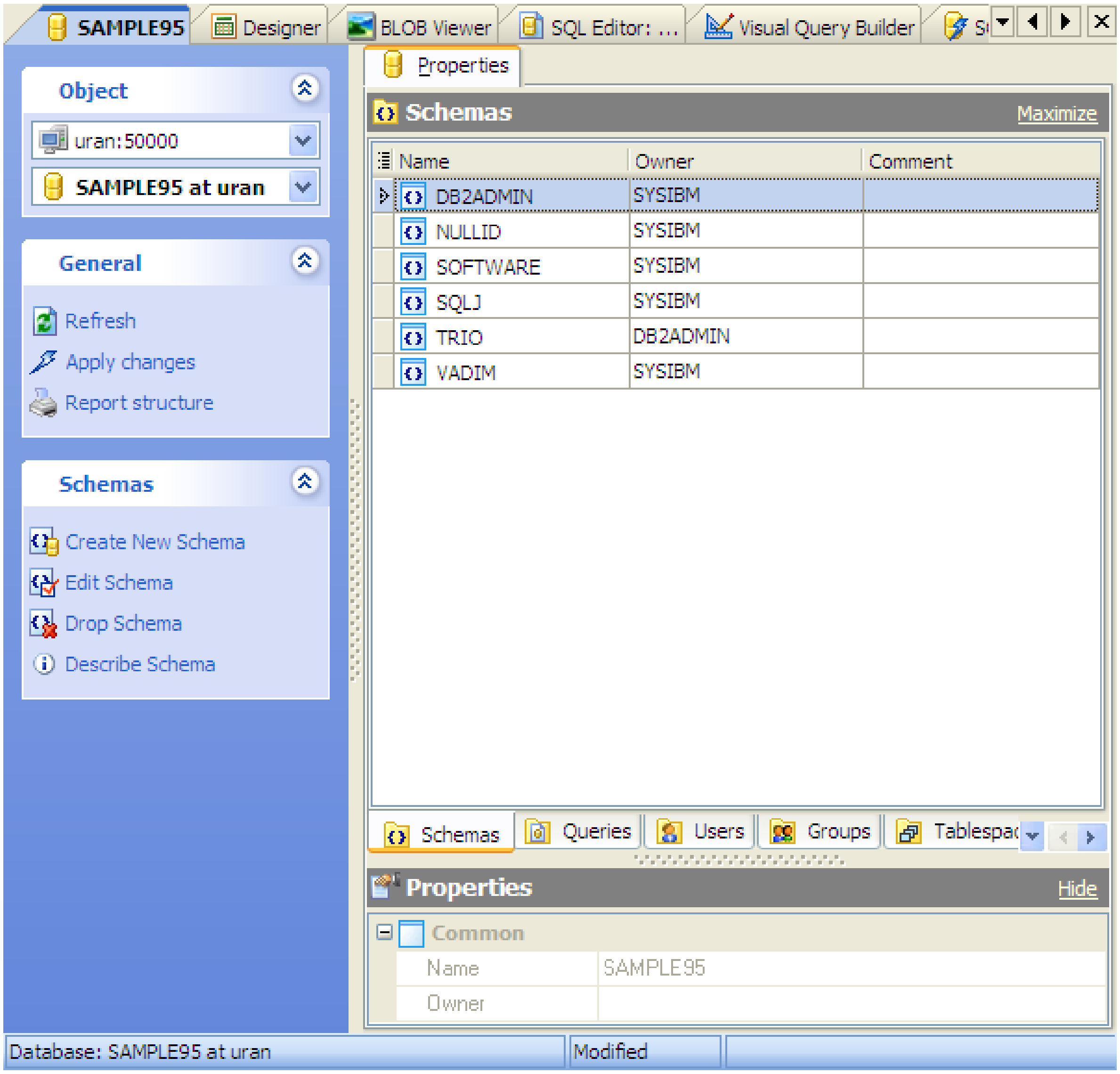
6.1 Server Editor

Server Editor allows you to look through all the server objects. Only connected databases are available for examination.

To run Server Editor, select the essential server from the Explorer Tree and press **Enter**, or use popup menu.

Server Editor consists of several tabs according different kinds of server-scope objects. Every tab is intended for managing server objects (e.g. *databases, users, groups, tablespaces*, etc.). Any object can be opened in its editor. The popup menu allows you to create new, edit or drop the selected server object. Using the popup menu you can also create a copy of the object.

You can operate on several objects at a time. For this you have to select database objects with the **Shift** or the **Ctrl** key pressed. After the group of objects is selected, you can operate on it, e.g. *delete several objects* at once, as it were a single object.



Schemas

Name	Owner	Comment
DB2ADMIN	SYSIBM	
NULLID	SYSIBM	
SOFTWARE	SYSIBM	
SQLJ	SYSIBM	
TRIO	DB2ADMIN	
VADIM	SYSIBM	

Common

Name: SAMPLE95

Owner:

Database: SAMPLE95 at uran

Modified

6.2 Users

On operating systems where users and groups exist with the same name, you should specify whether you are granting the privilege to the user or group.

Users (identified by an authorization ID) can successfully execute SQL or XQuery statements only if they have the authority to perform the specified function. To create a table, a user must be authorized to create tables; to alter a table, a user must be authorized to alter the table; and so forth.

⊟ How can I create a new user?

New users are created within Create User Wizard 167. In order to run the wizard you should open the server in Server Editor and the Users tab there and press **Insert** or select the Create New User item from the popup menu (Alternatively, use the corresponding link of the Navigation Bar).

⊟ How can I edit an existing user?

Users are edited within User Editor 169. In order to run the editor you should

- select the user for editing in the explorer tree (type the first letters of the user name for quick search);
- select the Edit User item from the popup menu.

⊟ How can I drop a user?

To drop the existing user:

- select the user to drop in the explorer tree;
- select the Drop User item from the popup menu(alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

6.2.1 Create User Wizard

Create User Wizard guides you through the process of creating a new user. See How To Create User 167 to learn how to run this wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.DBADM authority

Grants the database administrator authority and all other database authorities except for security administrator authority (SECADM). A database administrator holds nearly all privileges on nearly all objects in the database. The only exceptions are those privileges that are part of the security administrator authority. A database administrator can grant any privilege that is part of database administrator authority to others. All database authorities except for SECADM are implicitly and automatically granted to an authorization-name that is granted DBADM authority.

Create table authority
Grants the authority to create base tables. The creator of a base table automatically has the CONTROL privilege on that table. The creator retains this privilege even if the Create table authority authority is subsequently revoked.

Bind add authority
Grants the authority to create packages. The creator of a package automatically has the CONTROL privilege on that package and retains this privilege even if the Bind add authority authority is subsequently revoked.

Connect authority
Grants the authority to access the database.

No fence authority
Grants the authority to register routines that execute in the database manager's process. Care must be taken that routines so registered will not have adverse side effects. (For more information, see the description of the FENCED clause on the CREATE or ALTER routine statements.) Once a routine has been registered as not fenced, it continues to run in this manner, even if No fence authority is subsequently revoked. External routine authority is automatically granted to an authorization-name that is granted No fence authority authority

Implicitly schema authority
Grants the authority to implicitly create a schema.

Load authority
Grants the authority to load in this database. This authority gives a user the right to use the LOAD utility in this database. SYSADM and DBADM authority also have this authority by default. However, if a user only has LOAD authority (not SYSADM or DBADM authority), the user is also required to have table-level privileges. In addition to LOAD privilege, the user is required to have:

- INSERT privilege on the table for LOAD with mode INSERT, TERMINATE (to terminate a previous LOAD INSERT), or RESTART (to restart a previous LOAD INSERT)
- INSERT and DELETE privilege on the table for LOAD with mode REPLACE, TERMINATE (to terminate a previous LOAD REPLACE), or RESTART (to restart a previous LOAD REPLACE)
- INSERT privilege on the exception table, if such a table is used as part of LOAD

External routine authority
Grants the authority to register external routines. Care must be taken that routines so registered will not have adverse side effects.

Quiesce connect authority
Grants the authority to access the database while it is quiesced.

6.2.2 User Editor

User Editor is the basic DB2 Maestro tool for working with existing users. It can be opened automatically after the user is created and is available on editing the user (see How to edit user 167 for details).

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.

The Properties tab of this editor allows you to change the user password, the user grants.

Name
Here you can view the user name.DBADM authority
Grants the database administrator authority and all other database authorities except for security administrator authority (SECADM). A database administrator holds nearly all privileges on nearly all objects in the database. The only exceptions are those privileges that are part of the security administrator authority. A database administrator can grant any privilege that is part of database administrator authority to others. All database authorities except for SECADM are implicitly and automatically granted to an authorization-name that is granted DBADM authority.

Create table authority
Grants the authority to create base tables. The creator of a base table automatically has the CONTROL privilege on that table. The creator retains this privilege even if the Create table authority authority is subsequently revoked.

Bind add authority
Grants the authority to create packages. The creator of a package automatically has the CONTROL privilege on that package and retains this privilege even if the Bind add authority authority is subsequently revoked.

Connect authority
Grants the authority to access the database.

No fence authority
Grants the authority to register routines that execute in the database manager’s process. Care must be taken that routines so registered will not have adverse side effects. (For more information, see the description of the FENCED clause on the CREATE or ALTER routine statements.) Once a routine has been registered as not fenced, it continues to run in this manner, even if No fence authority is subsequently revoked. External routine authority is automatically granted to an authorization-name that is granted No fence authority authority

Implicitly schema authority
Grants the authority to implicitly create a schema.

Load authority
Grants the authority to load in this database. This authority gives a user the right to use the LOAD utility in this database. SYSADM and DBADM authority also have this authority by default. However, if a user only has LOAD authority (not SYSADM or DBADM authority), the user is also required to have table-level privileges. In addition to LOAD privilege, the user is required to have:

- INSERT privilege on the table for LOAD with mode INSERT, TERMINATE (to terminate a previous LOAD INSERT), or RESTART (to restart a previous LOAD INSERT)
- INSERT and DELETE privilege on the table for LOAD with mode REPLACE, TERMINATE (to terminate a previous LOAD REPLACE), or RESTART (to restart a previous LOAD REPLACE)
- INSERT privilege on the exception table, if such a table is used as part of LOAD

External routine authority
Grants the authority to register external routines. Care must be taken that routines so registered will not have adverse side effects.

Quiesce connect authority
Grants the authority to access the database while it is quiesced.
To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

User objects
Objects that are having this user as an owner are managed within the Objects tab of User Editor. Double click a row to open the necessary object editor. Use grid’s popup menu items to edit, drop or rename object.

6.3 Groups

On operating systems where users and groups exist with the same name, you should specify whether you are granting the privilege to the user or group.

⊟ How can I create a new group?

New groups are created within Create Group Wizard 171. In order to run this wizard you should select the Groups list or any object from that list and then use the Create New Group item from the popup menu.

⊟ How can I edit an existing group?

Groups are edited within Group Editor 172. In order to open the editor you should

- select the group for editing in the explorer tree (type the first letters of the group name for quick search);
- select the Edit Group item from the popup menu.

⊟ How can I drop a group?

To drop the existing group:

- select the group to drop in the explorer tree;
- select the Drop Group item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

and confirm dropping in the dialog window.

6.3.1 Create Group Wizard

Create Group Wizard guides you through the process of creating a new database group. See How To Create Group 171 to learn how to run this wizard.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

DBADM authority
Grants the database administrator authority and all other database authorities except for security administrator authority (SECADM). A database administrator holds nearly all privileges on nearly all objects in the database. The only exceptions are those privileges that are part of the security administrator authority. A database administrator can grant any privilege that is part of database administrator authority to others. All database authorities except for SECADM are implicitly and automatically granted to an authorization-name that is granted DBADM authority.

Create table authority
Grants the authority to create base tables. The creator of a base table automatically has the CONTROL privilege on that table. The creator retains this privilege even if the Create table authority authority is subsequently revoked.

Bind add authority
Grants the authority to create packages. The creator of a package automatically has the CONTROL privilege on that package and retains this privilege even if the Bind add authority authority is subsequently revoked.

Connect authority
Grants the authority to access the database.

No fence authority
Grants the authority to register routines that execute in the database manager's process. Care must be taken that routines so registered will not have adverse side effects. (For more information, see the description of the FENCED clause on the CREATE or ALTER routine statements.) Once a routine has been registered as not fenced, it continues to run in this manner, even if No fence authority is subsequently revoked. External routine authority is automatically granted to an authorization-name that is granted No fence authority authority

Implicitly schema authority
Grants the authority to implicitly create a schema.

Load authority
Grants the authority to load in this database. This authority gives a user the right to use the LOAD utility in this database. SYSADM and DBADM authority also have this authority by default. However, if a user only has LOAD authority (not SYSADM or DBADM authority), the user is also required to have table-level privileges. In addition to LOAD privilege, the user is required to have:

- INSERT privilege on the table for LOAD with mode INSERT, TERMINATE (to terminate a previous LOAD INSERT), or RESTART (to restart a previous LOAD INSERT)
- INSERT and DELETE privilege on the table for LOAD with mode REPLACE, TERMINATE (to terminate a previous LOAD REPLACE), or RESTART (to restart a previous LOAD REPLACE)
- INSERT privilege on the exception table, if such a table is used as part of LOAD

External routine authority
Grants the authority to register external routines. Care must be taken that routines so registered will not have adverse side effects.

Quiesce connect authority
Grants the authority to access the database while it is quiesced.

See also: Group Editor 172

6.3.2 Group Editor

Group Editor is the basic DB2 Maestro tool for working with existing groups. It can be open automatically after the group is created and is available on editing the group (see

How to edit group 171 for details).

You can open a group in Group Editor from the Explorer Tree or Object Manager.

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38 . Below you will find a description of editor tabs that are unique for the current object.

Name
Here you can view the group name.DBADM authority
Grants the database administrator authority and all other database authorities except for security administrator authority (SECADM). A database administrator holds nearly all privileges on nearly all objects in the database. The only exceptions are those privileges that are part of the security administrator authority. A database administrator can grant any privilege that is part of database administrator authority to others. All database authorities except for SECADM are implicitly and automatically granted to an authorization-name that is granted DBADM authority.

Create table authority
Grants the authority to create base tables. The creator of a base table automatically has the CONTROL privilege on that table. The creator retains this privilege even if the Create table authority authority is subsequently revoked.

Bind add authority
Grants the authority to create packages. The creator of a package automatically has the CONTROL privilege on that package and retains this privilege even if the Bind add authority authority is subsequently revoked.

Connect authority
Grants the authority to access the database.

No fence authority
Grants the authority to register routines that execute in the database manager's process. Care must be taken that routines so registered will not have adverse side effects. (For more information, see the description of the FENCED clause on the CREATE or ALTER routine statements.) Once a routine has been registered as not fenced, it continues to run in this manner, even if No fence authority is subsequently revoked. External routine authority is automatically granted to an authorization-name that is granted No fence authority authority

Implicitly schema authority
Grants the authority to implicitly create a schema.

Load authority
Grants the authority to load in this database. This authority gives a user the right to use the LOAD utility in this database. SYSADM and DBADM authority also have this authority by default. However, if a user only has LOAD authority (not SYSADM or DBADM authority), the user is also required to have table-level privileges. In addition to LOAD privilege, the user is required to have:

- INSERT privilege on the table for LOAD with mode INSERT, TERMINATE (to terminate a previous LOAD INSERT), or RESTART (to restart a previous LOAD INSERT)

- INSERT and DELETE privilege on the table for LOAD with mode REPLACE, TERMINATE (to terminate a previous LOAD REPLACE), or RESTART (to restart a previous LOAD REPLACE)

- INSERT privilege on the exception table, if such a table is used as part of LOAD

External routine authority
Grants the authority to register external routines. Care must be taken that routines so registered will not have adverse side effects.

Quiesce connect authority
Grants the authority to access the database while it is quiesced.
To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

6.4 Tablespaces

Storage structures contain database objects. The basic storage structure is the tablespace; it contains tables, indexes, large objects, and data defined with a LONG data type.

There are two types of table spaces:

- Database managed space (DMS) A table space that is managed by the database manager.
- System managed space (SMS) A table space that is managed by the operating system.

All table spaces consist of containers. A container describes where objects are stored. A subdirectory in a file system is an example of a container.

⊟ How can I create a new tablespace?

New tablespaces are created within Create Tablespace Wizard[176]. In order to run this wizard you should either

- select the Tablespaces list or any object from that list and then use the Create New Tablespace item from the popup menu

or

- open the server in Server Editor and the Tablespaces tab there and press **Insert** or select the Create New Tablespace item from the popup menu (Alternatively, use the corresponding link of the Navigation Bar).

⊟ How can I edit an existing tablespace?

Tablespaces are edited within Tablespace Editor[177]. In order to open the editor you should either

- select the tablespace for editing in the explorer tree (type the first letters of the tablespace name for quick search);
- select the Edit Tablespace item from the popup menu

or

- open the server in Server Editor and the Tablespaces tab there;
- select the tablespace to edit;
- press the **Enter** key or select the Edit Tablespace item from the popup menu (alternatively, you can use the corresponding link of the Navigation Bar).

⊟ How can I drop a tablespace?

To drop the existing tablespace:

- select the tablespace to drop in the explorer tree;
- select the Drop Tablespace item from the popup menu

or

- open the server in Server Editor and the Tablespaces tab there;
- select the tablespace to drop;
- press the **Delete** key or select the Drop Tablespace item from the popup menu (alternatively, you may use the corresponding link of the Navigation Bar)

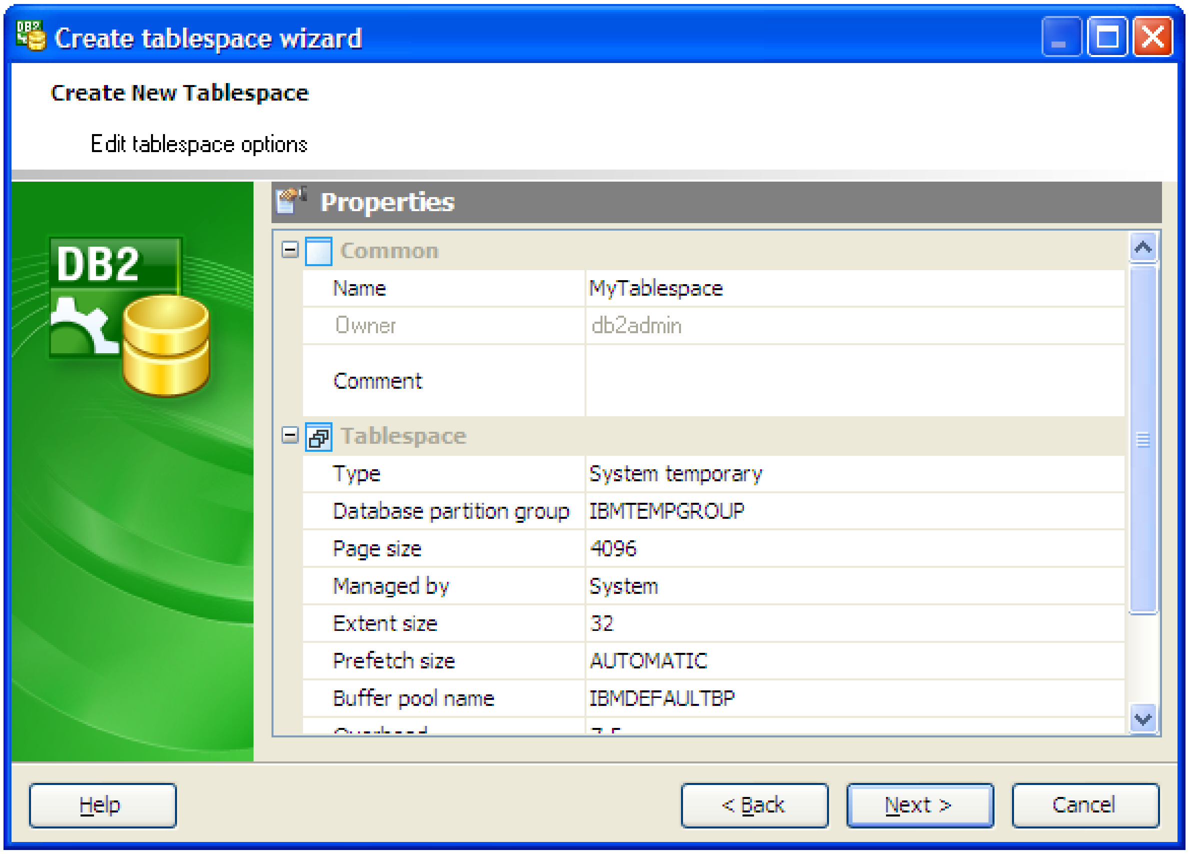
and confirm dropping in the dialog window.

6.4.1 Create Tablespace Wizard

Create Tablespace Wizard guides you through the process of creating a new server tablespace.

The basic principles of Create Object Wizards in DB2 Maestro are explained in a separate topic 35. Below you will find a description of wizard steps that are unique for the current object.

Specify tablespace options according to your needs. The detailed description is given below.



Common	
Name	MyTablespace
Owner	db2admin
Comment	
Tablespace	
Type	System temporary
Database partition group	IBMTEMPGROUP
Page size	4096
Managed by	System
Extent size	32
Prefetch size	AUTOMATIC
Buffer pool name	IBMDEFAULTBP

Type (*LARGE, REGULAR, SYSTEM TEMPORARY, or USER TEMPORARY*)
Specifies the type of table space that is to be created. If no type is specified, the default is determined by the MANAGED BY clause.

Database partition group

Specifies the database partition group for the table space. The database partition group must exist.

Page size
Defines the size of pages used for the table space. The valid values for integer without the suffix K are 4 096, 8 192, 16 384, or 32 768. The valid values for integer with the suffix K are 4, 8, 16, or 32. Any number of spaces is allowed between integer and K, including no space.

Managed by *(SYSTEM,DATABASE)*
SYSTEM specifies that the table space is to be an SMS table space. When the type of table space is not specified, the default behavior is to create a regular table space.
DATABASE specifies that the table space is to be a DMS table space. When the type of table space is not specified, the default behavior is to create a large table space.

Extent size
Specifies the number of pages that will be written to a container before skipping to the next container. The extent size value can also be specified as an integer value followed by K (for kilobytes) or M (for megabytes). If specified in this way, the floor of the number of bytes divided by the page size is used to determine the value for the extent size. The database manager cycles repeatedly through the containers as data is stored.

Prefetch size
Specifies to read in data needed by a query prior to it being referenced by the query, so that the query need not wait for I/O to be performed.

Buffer pool name
The name of the buffer pool used for tables in this table space.

Overhead
Specifies the I/O controller overhead and disk seek and latency time. This value is used to determine the cost of I/O during query optimization.

Transferrate
Specifies the time to read one page into memory. This value is used to determine the cost of I/O during query optimization.

Drop recovery
Indicates whether dropped tables in the specified table space can be recovered.

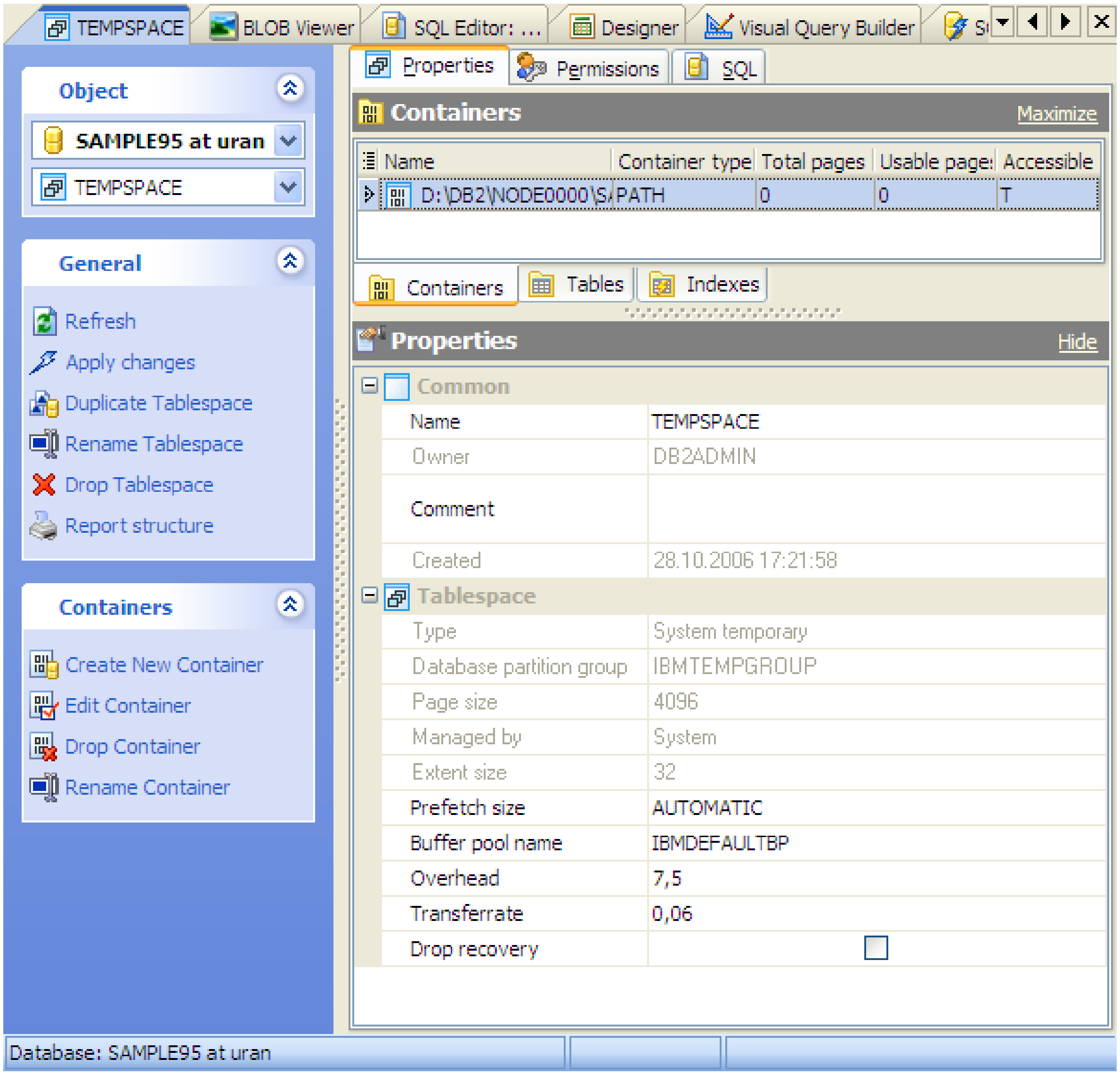
6.4.2 Tableshpace Editor

Tablespace Editor allows you to browse options of existing tablespaces and change some of them. The editor can be open automatically after the tablespace is created and is available on editing the tablespace (see How to edit tablespace 175 for details) or from the corresponding node of Explorer Tree or Object Manager.

The basic principles of Object Editors in DB2 Maestro are explained in a separate topic 38. Below you will find a description of editor tabs that are unique for the current object.

Tablespace properties 178

See also: Create Tablespace Wizard 176



Name	Container type	Total pages	Usable page:	Accessible
D:\DB2\NODE0000\S/	PATH	0	0	T

Common

Name: TEMPSPACE
Owner: DB2ADMIN
Comment:
Created: 28.10.2006 17:21:58

Tablespace

Type: System temporary
Database partition group: IBMTEMPGROUP
Page size: 4096
Managed by: System
Extent size: 32
Prefetch size: AUTOMATIC
Buffer pool name: IBMDEFAULTBP
Overhead: 7,5
Transferrate: 0,06
Drop recovery: ☐

6.4.2.1 Editing tablespace properties

Type (*LARGE, REGULAR, SYSTEM TEMPORARY, or USER TEMPORARY*)
Specifies the type of table space that is to be created. If no type is specified, the default is determined by the MANAGED BY clause.

Database partition group
Specifies the database partition group for the table space. The database partition group must exist.

Page size
Defines the size of pages used for the table space. The valid values for integer without the suffix K are 4 096, 8 192, 16 384, or 32 768. The valid values for integer with the suffix K are 4, 8, 16, or 32. Any number of spaces is allowed between integer and K, including no space.

Managed by *(SYSTEM,DATABASE)*
SYSTEM specifies that the table space is to be an SMS table space. When the type of table space is not specified, the default behavior is to create a regular table space.
DATABASE specifies that the table space is to be a DMS table space. When the type of table space is not specified, the default behavior is to create a large table space.

Extent size
Specifies the number of pages that will be written to a container before skipping to the next container. The extent size value can also be specified as an integer value followed by K (for kilobytes) or M (for megabytes). If specified in this way, the floor of the number of bytes divided by the page size is used to determine the value for the extent size. The database manager cycles repeatedly through the containers as data is stored.

Prefetch size
Specifies to read in data needed by a query prior to it being referenced by the query, so that the query need not wait for I/O to be performed.

Buffer pool name
The name of the buffer pool used for tables in this table space.

Overhead
Specifies the I/O controller overhead and disk seek and latency time. This value is used to determine the cost of I/O during query optimization.

Transferrate
Specifies the time to read one page into memory. This value is used to determine the cost of I/O during query optimization.

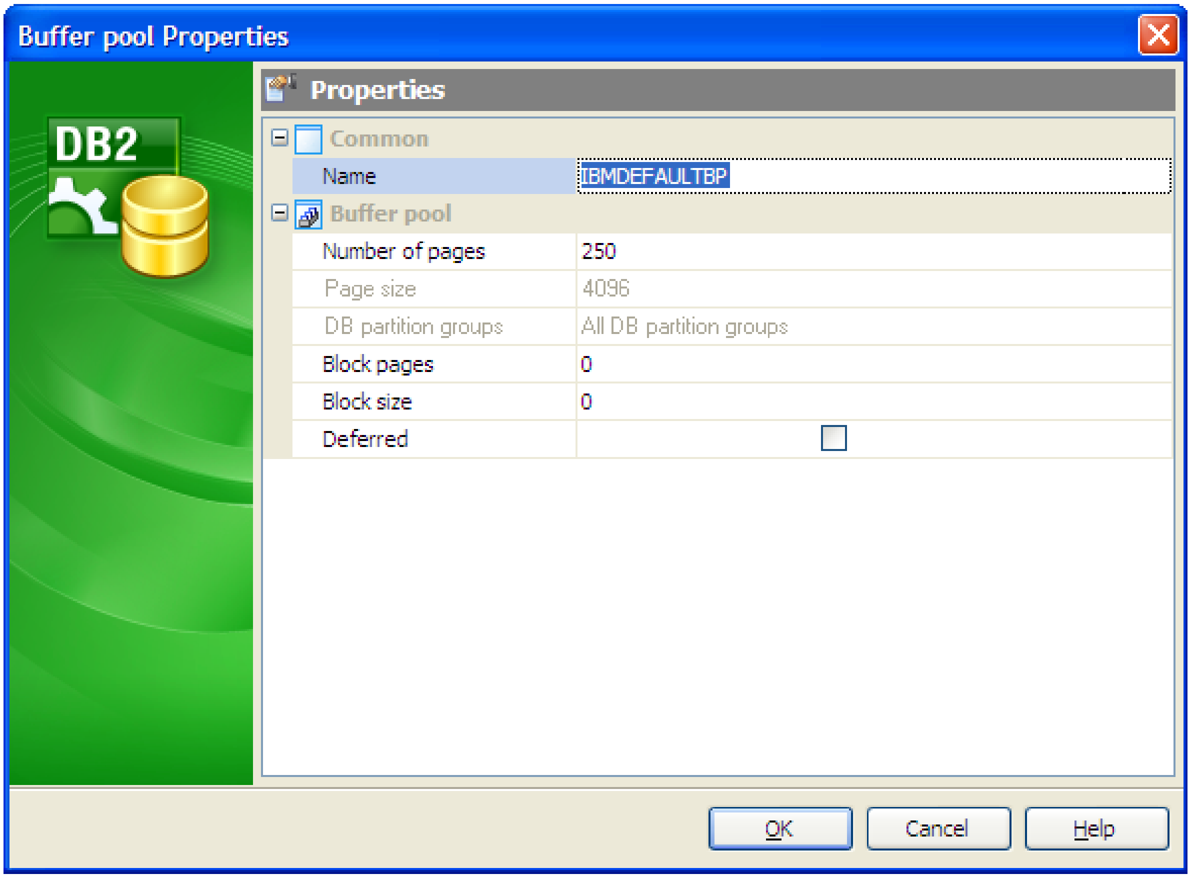
Drop recovery
Indicates whether dropped tables in the specified table space can be recovered.

To apply the changes, select the Apply Changes item in the Navigation bar or use **Ctrl+F9** or **Ctrl+F7** shortcut keys.

It is also possible to modify object properties without opening the object editor: use the Object Properties item of the popup menu of the selected object from the explorer tree.

6.5 Boofer Pools

A buffer pool is associated with a specific table space, thereby allowing control over which data will share the same memory areas for data buffering.



Name: IBMDEFAULTBP
Number of pages: 250
Page size: 4096
DB partition groups: All DB partition groups
Block pages: 0
Block size: 0
Deferred: ☐

Number of pages
The number of pages for the new buffer pool.

Page size
Specifies the size of the buffer pool. For a partitioned database, this will be the default size for all database partitions on which the buffer pool exists. The default is 1000 pages.

DB partition groups
Identifies the database partition group or groups to which the buffer pool definition applies.

Block pages
Specifies the number of pages that should exist in the block-based area. The number of pages must not be greater than 98 percent of the number of pages for the buffer pool.

Block size
Specifies the number of pages in a block. The block size must be a value between 2 and 256 (SQLSTATE 54053). The default value is 32.

Deffered

If checked the buffer pool will be created when the database is deactivated (all applications need to be disconnected from the database). Reserved memory space is not needed; DB2 will allocate the required memory from the system.

7 Queries

DB2 Maestro provides several tools for working with SQL queries:

- SQL Editor 184 for editing the query text directly and executing SELECT queries;
- Visual Query Builder 189 for building SELECT, INSERT, UPDATE and DELETE queries visually;
- SQL Script Editor 234 for executing SQL scripts.

Both SQL Editor and Visual Query Builder supports parameters in queries 188

Save frequently used queries to profiles and manage them in the same way as if they were database objects. This means that you can view queries in the explorer tree, in Object Manager and Object Browser, use them in BLOB Viewer and Diagram Viewer, perform drag-and-drop operation upon them, and copy them to clipboard like you copy an object.

How can I create a new SQL query?

New queries can be created either in SQL Editor or in Visual Query Builder.

To create a new query in SQL Editor:

- select the Tools | SQL Editor main menu item;
- select the Create New Query item from the navigation bar;
- edit the query text on the Editor tab of SQL Editor.

To create a new query in Query Builder:

- select the Tools | Visual Query Builder main menu item;
- build the query on the Diagram tab of Visual Query Builder.

DB2 Maestro also provides you with SQL Generator, a tool to create simple SQL statements.

How can I save a query to a file/profile?

To save an existing query from the editor:

- to save the query to profile, use the Save to profile link from the Navigation bar.
- to save the current query to an **.sql* file, select the Save to file item from the Navigation bar;
- to save all the opened queries to one file, select the Save all queries item from the Navigation bar;
- to save the designed diagram, select the Save diagram item from the Navigation bar of the Diagram tab of Visual Query Builder.

How can I edit an existing SQL query?

Queries can be opened either in SQL Editor or in Visual Query Builder.

You can open the query directly from the Explorer tree with a double click or using popup menu. By default it will be opened in SQL Editor.

To edit a query from file, open SQL Editor (the Tools | SQL Editor main menu item) and use Load From File from the Navigation Bar of SQL Editor to load a query from an **.sql* file.

To edit a query in Query Builder, open the builder (the Tools | Visual Query Builder main menu item) and then perform one of the following operations:

- to edit a query from a profile, drag it from the Explorer and drop on the Editor tab;
- to load a previously saved diagram, use the Load Diagram item from the Navigation Bar;
- to load a query from an **.sql* file, open the Editor tab and select the Load query item from the Navigation Bar .

On the Query Builder opening the Diagram tab contains the last edited query.

How can I execute an SQL query?

To execute a query:

- create a new query or open the existing one;
- select the Execute Query item from the navigation bar of SQL Editor or Visual Query Builder respectively;
- view/edit the returned data on the Result tab.

7.1 SQL Editor

SQL Editor is a tool for creating and executing SELECT queries. It allows you to create and edit SQL text for the query, prepare and execute queries, and view the results of execution. To open SQL Editor, select the Tools | SQL Editor main menu item. The most popular query management actions (creating, editing, deleting) are covered by the corresponding topic 182.

To use the editor for working with several queries, open new query tab with the Create new query link on the Navigation bar. With the tabs' popup menu you can create a new query, close existing one, save the query to profile, etc even if editor's navigation bar is closed. Queries' tabs can been 285 displayed at the all sides of the editor (bottom, top, left or right).

For more information about query executing and working with query result see the corresponding topic 186.

Working with query text

The popup menu of the editing area provides you with standard operations for working with text such as *Cut* (**Ctrl+X**), *Copy* (**Ctrl+C**), *Paste* (**Ctrl +V**), *Undo* (**Ctrl +Z**), *Redo* (**Shift+Ctrl+Z**) along with a possibility to convert selected text to different cases (*lower, UPPER,* and *NameCase*).

You can also comment/uncomment selected text (**Shift+Ctrl+.** and **Shift+Ctrl+,** shortcuts respectively). If no text is selected, the whole line will be commented. By the way, it is not necessary to select commented text to uncomment it, just press **Shift+Ctrl+,** having the cursor inside the commented text. Both kinds of comments (single-line and multi-line) are supported. SQL Formatter 185 is also at your disposal.

SQL Editor allows you to use Visual Query Builder 189 modal instance to design query visually and load the result query text directly in the editor area. For this purpose use the Design query link of the editor area's popup menu.

Code completion

DB2 Maestro provides you with code completion (as on the screen below) to select from a list of tables, columns, views, or other objects without having to manually enter the object's name in the editor. You can activate the completion list by pressing the **Ctrl+Space** key combination.

Syntax highlighting

Database objects are highlighted in the text. You can open the proper object editor by clicking the object name in the text with the **Ctrl** key pressed or with the Find Object link on the Navigation bar. To adjust the highlighting settings, use SQL highlight options 305.

Line modification markers

Lines of code that have been edited during the current session are indicated with a yellow line in the left margin of the editor. When you save the file, the yellow markers turn green. Thus at any time, yellow markers show changed but unsaved lines of code, and green markers show changes in this session that have been saved.

⊟ Find and replace text

Use find and replace to search for, and optionally, replace text in the SQL Editor. To open Find text/Replace text window, use Edit | Find/Replace main menu item, corresponding link of popup menu, or **Ctrl+F/Ctrl+H** shortcut. You can also use the Search again link to apply recent Find text dialog.

⊟ Managing the query text

To load query from .sql file, use the corresponding link on the Navigation bar. You can also find there links allowing you to save query text to file, export the contents of the editor to RTF and HTML formats (to file or to clipboard), copy the selected text from to clipboard as a ready-to-use string written in one of the following programming languages: C#, C++, Delphi (Object Pascal), and Java, and also print/preview the contents of the editor.

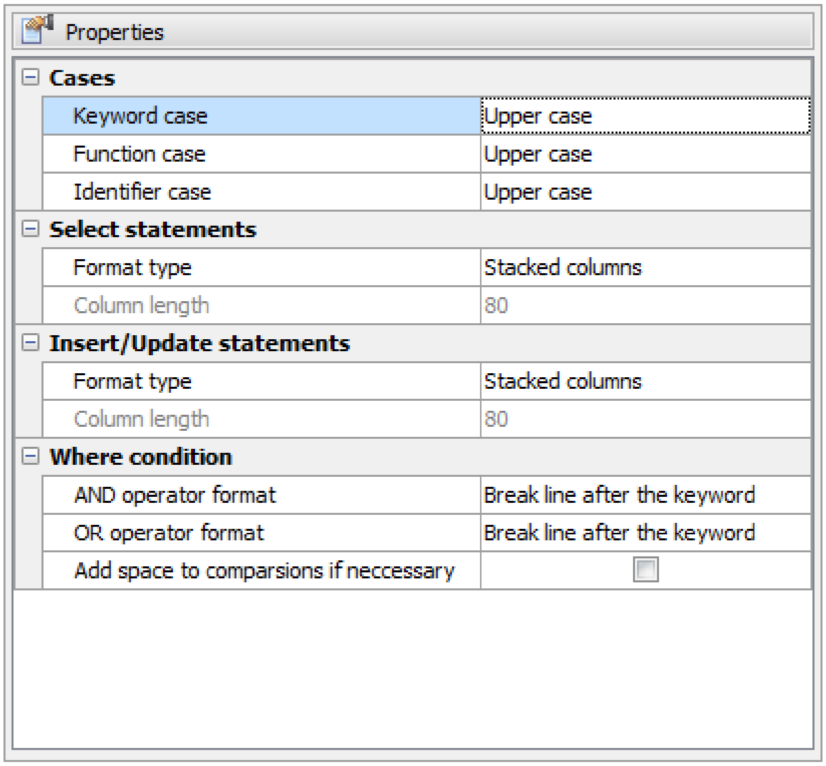
See also: Visual Query Builder 189, SQL Script Editor, SQL Editor Options 285

7.1.1 SQL Formatter

DB2 Maestro provides you with SQL Formatter for DML statements (*SELECT*, *INSERT*, *UPDATE* and *DELETE*). It can be invoked through the Format SQL link on the SQL Editor's navigation bar (**Ctrl+Alt+D** shortcut).

The following options allows you to tune up SQL scripts according to your preferences.

- Cases (for keywords, functions, and identifiers);
- Format type and column length for *INSERT/UPDATE*, and *SELECT* statements;
- *AND* and *OR* operators format.



Cases	
Keyword case	Upper case
Function case	Upper case
Identifier case	Upper case
Select statements	
Format type	Stacked columns
Column length	80
Insert/Update statements	
Format type	Stacked columns
Column length	80
Where condition	
AND operator format	Break line after the keyword
OR operator format	Break line after the keyword
Add space to comparsions if neccessary	☐

7.1.2 Executing query

SQL Editor provides you with several variants of the query executing.

- To execute all statements of the text area with result data, click the Execute query item of the Navigation bar or use **F5**, **F8**, or **F9** shortcuts. Statements of each tab of SQL Editor are executed together in a separate thread in order to continue your work with the software while the query is executing.

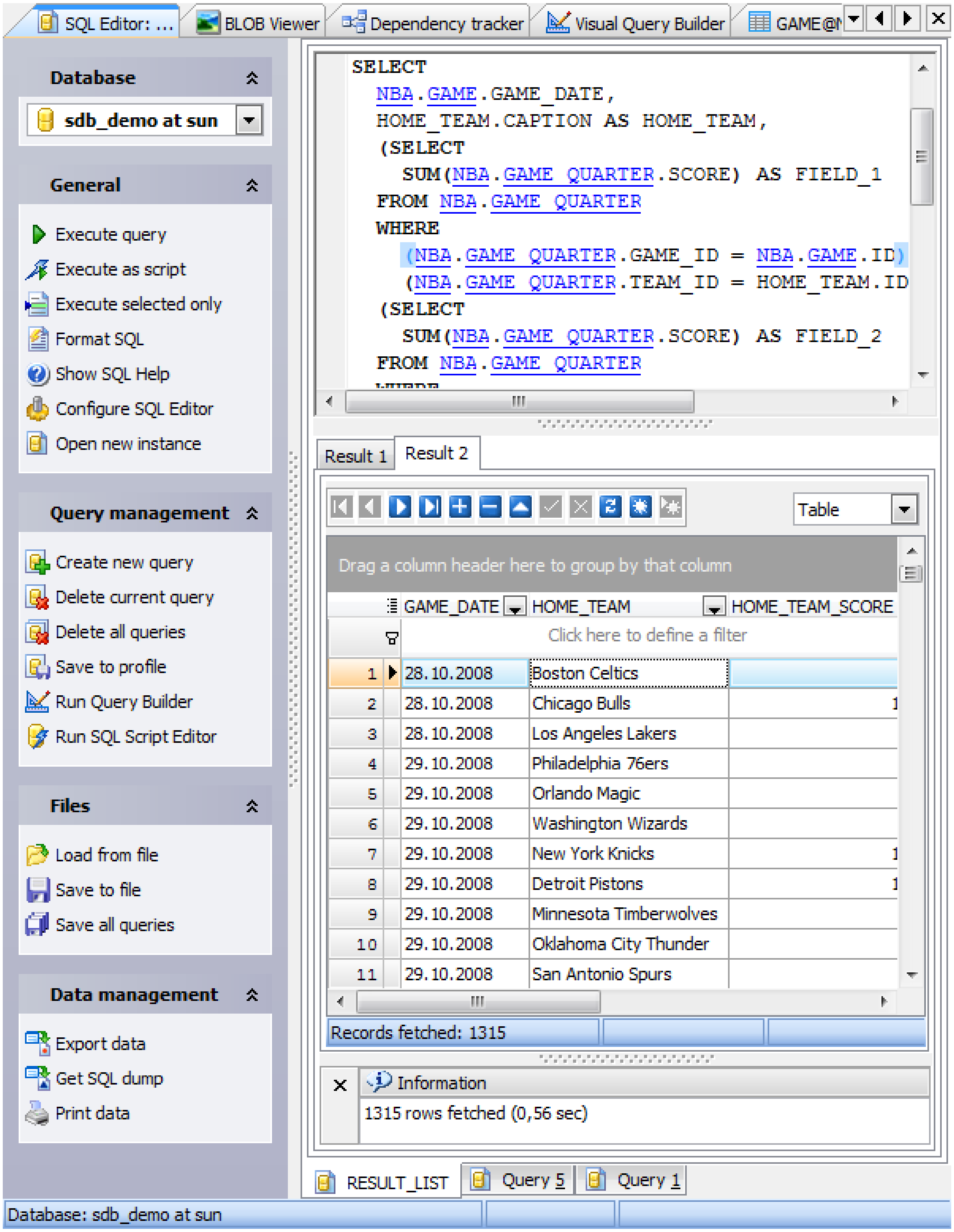
- You can also execute query as script (**Shift+F5**, **Shift+F8**, **Shift+F9**). In this case the query does not return data.

- To execute only a selected part of the query text, use Execute selected only or the **Alt+F5**, **Alt+F8**, **Alt+F9** shortcuts.

- There is also a possibility to execute a statement at the cursor position. For this purpose, use the Execute at cursor link at the Navigation bar or use the **Ctrl+F5**, **Ctrl+F8**, or **Ctrl+F9** shortcuts.

If the query text is correct, the query is executed, and if the query statement is supposed to return data (e.g. SELECT statement), the Result tab opens with the data returned by the query. If an error occurs while executing the query, execution stop is stopped and the appropriate error message is displayed in the Information tab.

The Result area displays the result data in grid. All principles of working with data you can find in Data Management 198 section.



```
SELECT
  NBA.GAME.GAME_DATE,
  HOME_TEAM.CAPTION AS HOME_TEAM,
  (SELECT
    SUM(NBA.GAME_QUARTER.SCORE) AS FIELD_1
  FROM NBA.GAME_QUARTER
  WHERE
    (NBA.GAME_QUARTER.GAME_ID = NBA.GAME.ID)
    (NBA.GAME_QUARTER.TEAM_ID = HOME_TEAM.ID
  (SELECT
    SUM(NBA.GAME_QUARTER.SCORE) AS FIELD_2
  FROM NBA.GAME_QUARTER
```

	GAME_DATE	HOME_TEAM	HOME_TEAM_SCORE
1	28.10.2008	Boston Celtics	
2	28.10.2008	Chicago Bulls	1
3	28.10.2008	Los Angeles Lakers	
4	29.10.2008	Philadelphia 76ers	
5	29.10.2008	Orlando Magic	
6	29.10.2008	Washington Wizards	
7	29.10.2008	New York Knicks	1
8	29.10.2008	Detroit Pistons	1
9	29.10.2008	Minnesota Timberwolves	
10	29.10.2008	Oklahoma City Thunder	
11	29.10.2008	San Antonio Spurs	

Records fetched: 1315

Information

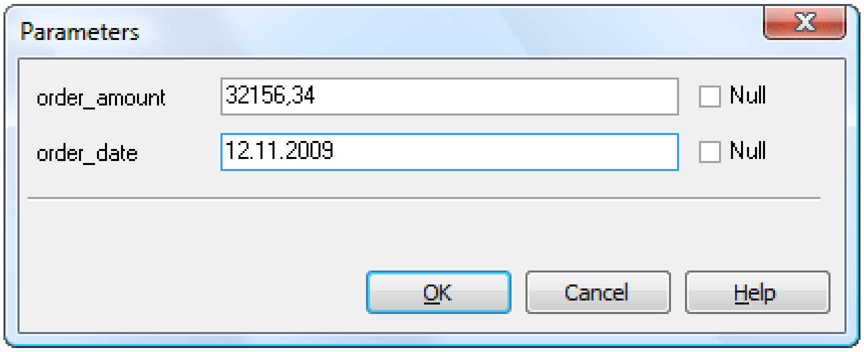
1315 rows fetched (0,56 sec)

Database: sdb_demo at sun

7.1.3 Query Parameters

Both SQL Editor 184 and Visual Query Builder 189 admit to using parameters inside the query text. A parameter is a kind of variable. Its value can be specified just before the query execution in the Parameters window. In the query text the parameter should appear as an identifier with a colon (':') at its beginning, e.g. *:param1*.

The Parameters dialog is used to specify the query parameters as well as values of the input parameters of procedures or functions before the execution. Enter parameter values and click the OK button to apply the values and execute the query or use the Cancel button to abort the execution.



order_amount 32156,34

order_date 12.11.2009

Note: To allow use parameters in query text, check the corresponding option at the Tools 282 tab of DB2 Maestro Options.

7.2 Visual Query Builder

Visual Query Builder is provided for building data manipulation statements visually. It allows you to create and edit queries without knowledge of SQL, prepare and execute queries, and view the results of the execution. Builder can produce *INSERT*, *UPDATE* and *DELETE* statements as well as the *SELECT* statements containing subqueries and/or *UNIONs*. One instance of the builder can be used only for one query at a time. To open Visual Query Builder, select the Tools | Query Builder main menu item.

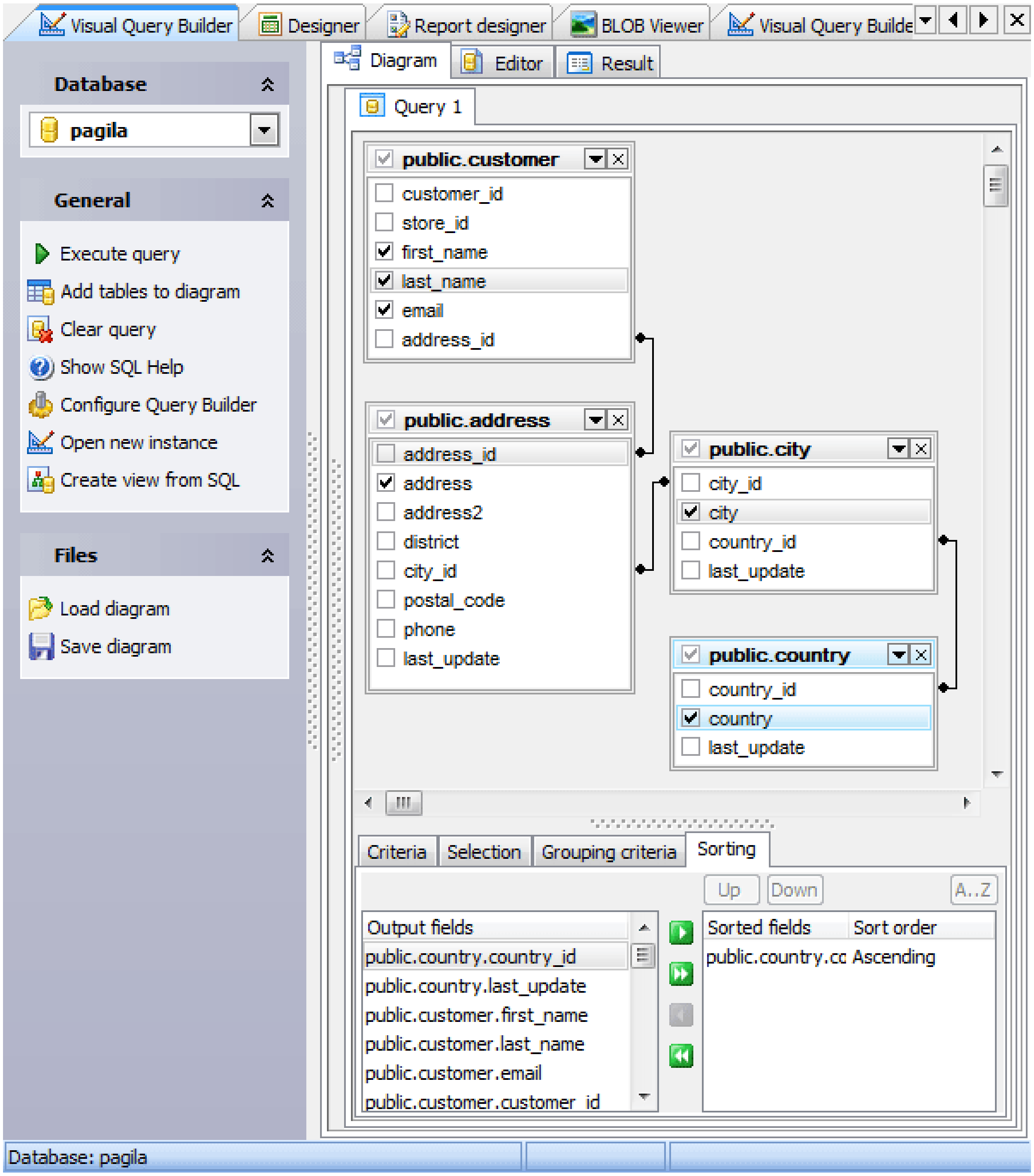
The most popular query management actions (creating, editing, deleting) are covered by the corresponding topic 182.

Builder consists of 3 tabs:

- Diagram 190 - to create a query from a graphical interface,
- Editor 195 – to modify the query text before its executing,
- Result 196 (appears after the query executing) – for working with data the query returns.

The builder also allows you to create a view based on the prepared query. For this purpose after the query creating and possibly testing use the Create view from SQL link at the Navigation bar to invoke the corresponding window, and specify view properties 90.

See also: SQL Editor 184, Visual Query Builder Options 287, Query Parameters 188



Sorted fields	Sort order
public.country.cc	Ascending

Database: pagila

7.2.1 Creating query diagram

The Diagram tab is the main area of Visual Query Builder. Using its graphical interface you can select tables and views, join or select columns, and add conditions to the statement.

The Query Explorer field occupies the left side of Visual Query Builder main window. All the queries included in the result query (unions, subqueries) are represented at the Query Explorer for prompt access. They are grouped by kind and listed under the according node.

Below step-by-step description of query diagram creating.

- **Select the statement type** from the drop-down list at the top of the Diagram tab (*SELECT, INSERT, UPDATE, DELETE*).

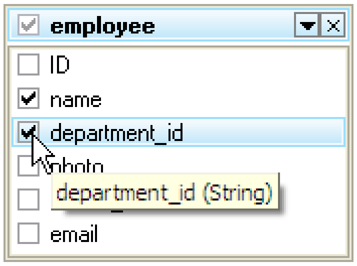
Add required tables to the Diagram area.

Use the Add Table(s) link of the area popup menu and select tables from the opened window (Use **Ctrl** or **Shift** pressed to select several tables).
To add only one table, simply drag it from the Database Explorer or from Object Manager/Browser to the Diagram area.

To remove the object, close its window or select the object and press the **Delete** key.

Pick up columns with data to output

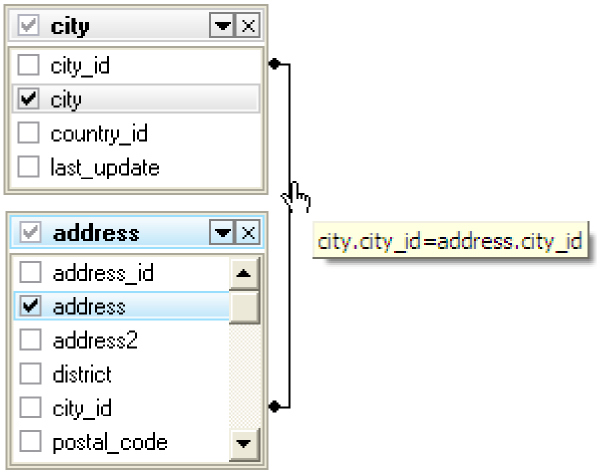
To include a table field to the query, tick off the option box to the left of the field name in the list or double-click it to see the blue icon next to the field name.



To include all the table fields, tick off the option box to the left of the table caption.
In case none fields is included, the SQL statement is generated as SELECT * FROM <Table_Name>, i.e. all the fields are selected.
To remove the fields from the query, uncheck the corresponding boxes.

Join tables if necessary

Visual Query Builder supports *INNER JOIN*, *LEFT OUTER JOIN*, and *RIGHT OUTER JOIN*.
To associate database objects by two fields, drag a field from the first object's field list to a field from another object's field list. This will set a link between these objects by the selected fields. After you finish dragging, a line will appear between the linked fields. By default *INNER JOIN* syntax will be used.



You can view the properties of the object association from the query tab directly. Just set the cursor to the link line. A hint containing the association condition will appear.
To edit the properties, select the Properties item from the popup menu. A dialog window will appear, there you can change the association condition by selecting it from the list (=, >, <, >=, <=, <>). To create *LEFT OUTER JOIN / RIGHT OUTER JOIN* statements, check All rows from first_table/All rows from second_table from the window.

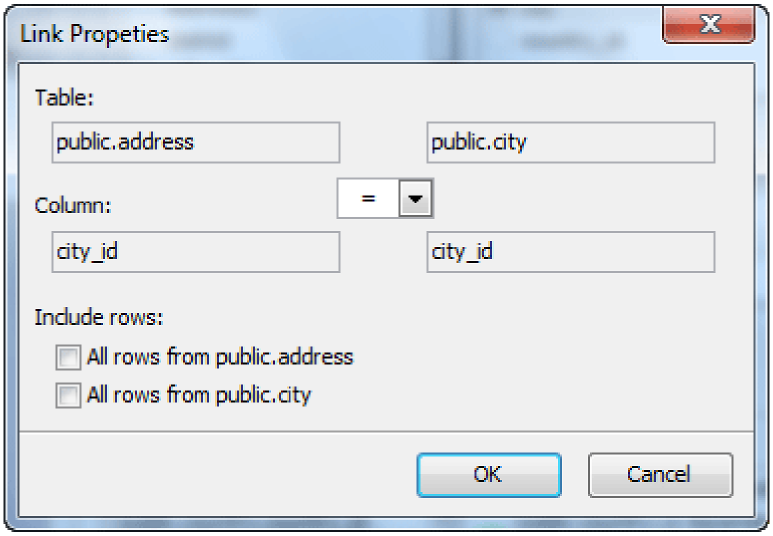

Link Propeties

Table:
public.address
public.city

Column:
=
city_id
city_id

Include rows:
☐ All rows from public.address
☐ All rows from public.city

To remove a link between objects, select the Delete Link item from the popup menu.

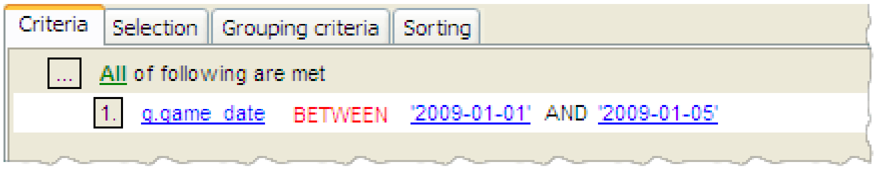
To delete all the links of an object, click the '-' button next to the object alias. To insert a point to the link line, select the Insert Point item from the popup menu, and the new point will appear. Using the point you can move the link line. It does not cause any changes in the query but makes the diagram performance vivid and the visual building more obvious.

⊟ Specify WHERE condition

Criteria tab allows you to set the selection conditions. To add a condition, click the button on the left and select the Add condition item in the popup menu. Edit the condition by clicking its parts and setting their values. Clicking the button to the left of the condition string activates the popup menu which allows you to add a new condition of the same enclosure level, add a new enclosure level, delete the current condition, open or close the condition if it is composite.

A simple condition string contains three fields: an argument, a condition and a second argument (if required for the condition). Clicking each field allows you to set its value. Clicking the argument field make it possible to edit the argument as a text field. You can set a table name or a definite value in this field. The popup menu of the field in the editing mode which contains the Insert Field function (also called by the **Shift+Enter** hot keys combination).

This function allows you to choose a field from the list of all the table fields available in the query. The popup menu of the condition field allows you to specify the condition you need. The way of proceeding the condition is set in the upper string of the area (*All, Any, None,* or *Not all* of the following are possible variants). Click the underlined word to modify it.



All of following are met

1. g.game_date BETWEEN '2009-01-01' AND '2009-01-05'

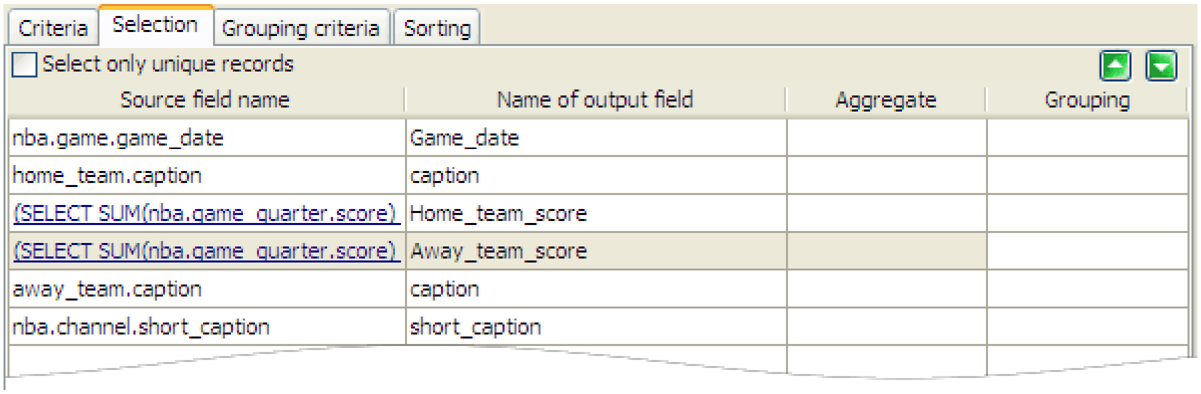
Create subquery if necessary

You can add one or more subqueries to further limit the tables and records returned from a *SELECT* statement when setting a *WHERE* condition in the query builder. To add subquery:
- open Criteria tab;
- click the button on the left and select the Add condition item in the popup menu;
- right click on an argument field and use the Insert query link of the popup menu;
- build the subquery in the new query tab that have appeared in the Diagram area,

or
- open Selection tab;
- use the Insert query link of the popup menu;
- build the subquery in the new query tab that have appeared in the Diagram area.

Use column aliases

You can set/edit the object alias directly from the query tab by double-clicking the object caption.



☐ Select only unique records

Source field name	Name of output field	Aggregate	Grouping
nba.game.game_date	Game_date		
home_team.caption	caption		
(SELECT SUM(nba.game_quarter.score)	Home_team_score		
(SELECT SUM(nba.game_quarter.score)	Away_team_score		
away_team.caption	caption		
nba.channel.short_caption	short_caption		

In case the alias is used as the expression's column name use the Selection tab displays the output fields of the query. It allows you to edit the names of the query or CASE output fields, set their displaying order and set the aggregate functions (*SUM, MIN, MAX, AVG*, etc.) for each field.

AVG	Returns the average of the values in a group
BIT_AND	Returns the bitwise AND of all bits in the expression.
BIT_OR	Returns the bitwise OR of all bits in the expression.
COUNT	Returns the total number of items in a column. This function does not ignore NULL values when calculating results.
GROUP_CONCAT	Returns a string result with the concatenated non-NULL values from a group.
MAX	Returns the maximum value for the column.
MIN	Returns the minimum value for the column.
STD	Returns the population standard deviation of the expression.
STDDEV	Returns the sample standard deviation of a numeric expression evaluated over a set.
SUM	Returns the sum of all the values in the expression.
VARIANCE	Returns the population standard variance of the expression.

To remove the field from the list, select the Delete current row item from the popup menu of the field row.
To modify the input query field, double-click it and then type the field name or select one from the drop-down list.
To modify the output query field name, double-click it and enter the field name.

DISTINCT option

To specify removal of duplicate rows from the result set, open the Selection tab and check the Select only unique records box.

Add HAVING statement

Set the conditions to be included into the HAVING statement within the Grouping Criteria tab. They are set in the same way as the *WHERE* conditions. To set the aggregate function for the field, double-click the field row in the Aggregate column and then type the function name or select one from the drop-down list.

ORDER BY clause

Set the way of sorting the query records within the Sorting tab. The field list on the left represents all the output query fields; the list on the right contains fields by which the query records will be sorted. To move the field from one list to another, drag the selected field or use the Add and Remove buttons. To change the sorting order, select a field in the right list and move it using the Up and Down buttons.

To change the sorting direction, select a filed in the right list and switch the direction (*Ascending, Descending*) using the A..Z/Z..A button.

Create UNIONs

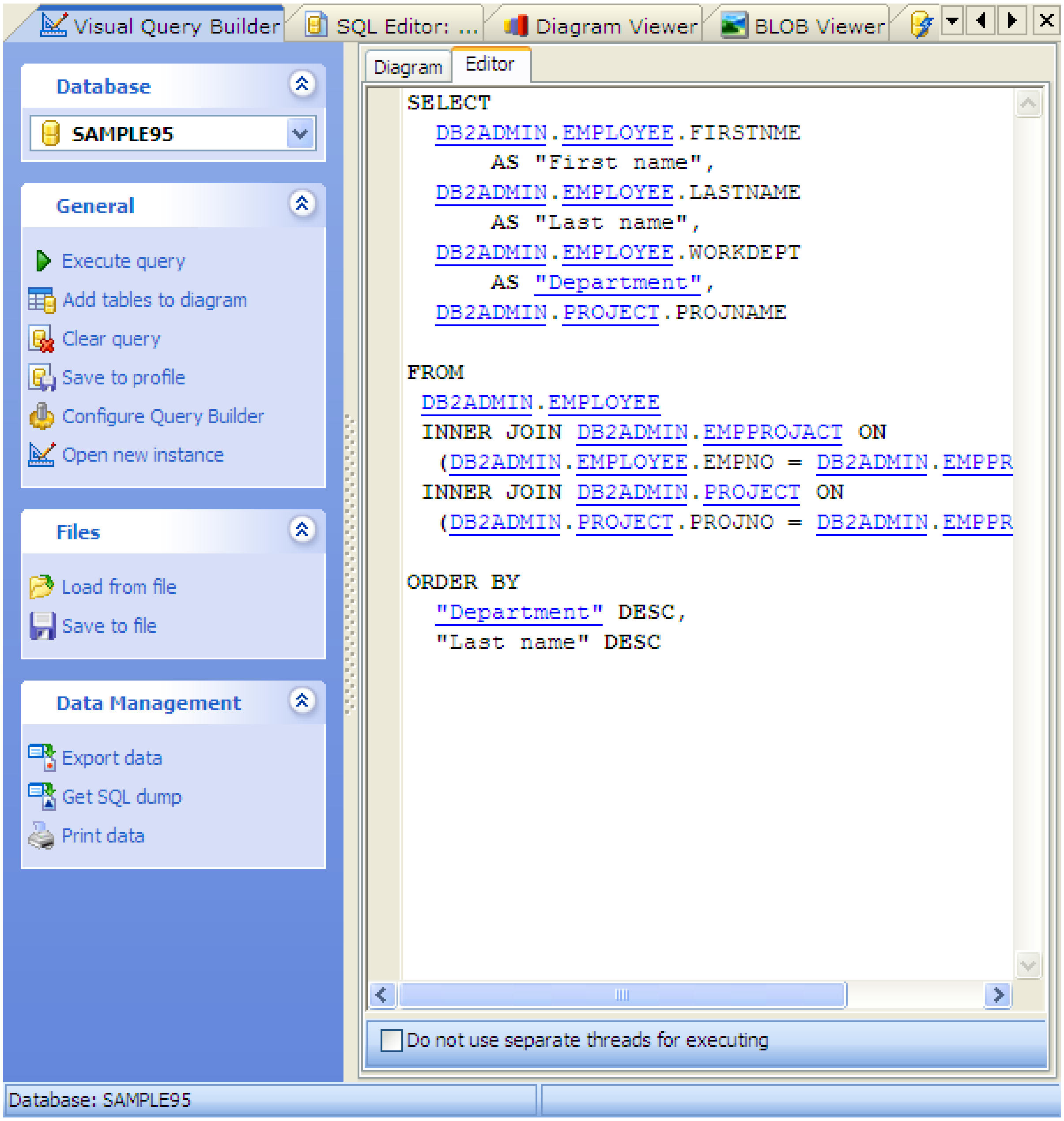
To combine the result from multiple SELECT statements into a single result set, use the Add union link of the Query Explorer popup menu.

Note: The column names from the first SELECT statement are used as the column names for the results returned.
Selected columns listed in corresponding positions of each SELECT statement should have the same data type.

7.2.2 Working with editor area

In the Editor area the query text is automatically generated while you are building the query.

You can edit this text according to the rules of SQL, and all the changes will be displayed on the Diagram page of Visual Query Builder.

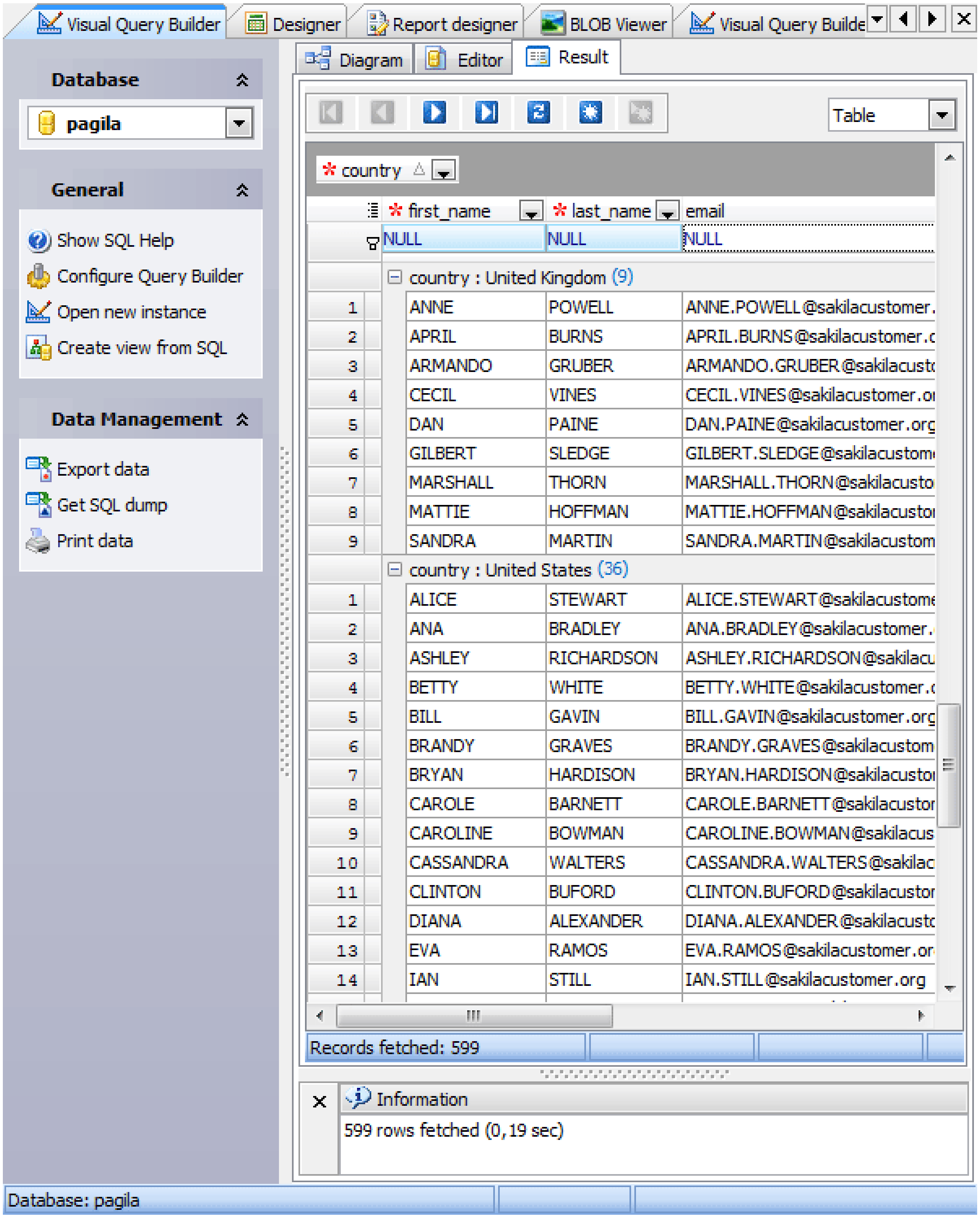


```
SELECT
  DB2ADMIN.EMPLOYEE.FIRSTNME
      AS "First name",
  DB2ADMIN.EMPLOYEE.LASTNAME
      AS "Last name",
  DB2ADMIN.EMPLOYEE.WORKDEPT
      AS "Department",
  DB2ADMIN.PROJECT.PROJNAME

FROM
 DB2ADMIN.EMPLOYEE
 INNER JOIN DB2ADMIN.EMPPROJACT ON
  (DB2ADMIN.EMPLOYEE.EMPNO = DB2ADMIN.EMPPR
 INNER JOIN DB2ADMIN.PROJECT ON
  (DB2ADMIN.PROJECT.PROJNO = DB2ADMIN.EMPPR

ORDER BY
  "Department" DESC,
  "Last name" DESC
```

☐ Do not use separate threads for executing

7.2.3 Executing query

To execute the query select the Execute item in the navigation bar. After that the Result tab is displayed. This page contains the result data returned by the query, as a grid (see Data View for details). The popup menu of this tab and the items of the navigation bar allow you to export data and get SQL dump.



	first_name	last_name	email
	NULL	NULL	NULL
	country : United Kingdom (9)		
1	ANNE	POWELL	ANNE.POWELL@sakilacustomer.
2	APRIL	BURNS	APRIL.BURNS@sakilacustomer.c
3	ARMANDO	GRUBER	ARMANDO.GRUBER@sakilacusto
4	CECIL	VINES	CECIL.VINES@sakilacustomer.o
5	DAN	PAINE	DAN.PAINE@sakilacustomer.org
6	GILBERT	SLEDGE	GILBERT.SLEDGE@sakilacustom
7	MARSHALL	THORN	MARSHALL.THORN@sakilacusto
8	MATTIE	HOFFMAN	MATTIE.HOFFMAN@sakilacusto
9	SANDRA	MARTIN	SANDRA.MARTIN@sakilacustom
	country : United States (36)		
1	ALICE	STEWART	ALICE.STEWART@sakilacustome
2	ANA	BRADLEY	ANA.BRADLEY@sakilacustomer.
3	ASHLEY	RICHARDSON	ASHLEY.RICHARDSON@sakilacu
4	BETTY	WHITE	BETTY.WHITE@sakilacustomer.c
5	BILL	GAVIN	BILL.GAVIN@sakilacustomer.org
6	BRANDY	GRAVES	BRANDY.GRAVES@sakilacustom
7	BRYAN	HARDISON	BRYAN.HARDISON@sakilacusto
8	CAROLE	BARNETT	CAROLE.BARNETT@sakilacusto
9	CAROLINE	BOWMAN	CAROLINE.BOWMAN@sakilacus
10	CASSANDRA	WALTERS	CASSANDRA.WALTERS@sakilac
11	CLINTON	BUFORD	CLINTON.BUFORD@sakilacusto
12	DIANA	ALEXANDER	DIANA.ALEXANDER@sakilacusto
13	EVA	RAMOS	EVA.RAMOS@sakilacustomer.or
14	IAN	STILL	IAN.STILL@sakilacustomer.org

Records fetched: 599

599 rows fetched (0,19 sec)

Database: pagila

8 Data Management

Query results and table data are displayed on the Data 69 or Result 186 tabs of Table Editor 67, SQL Editor 184 or Visual Query Builder 189.

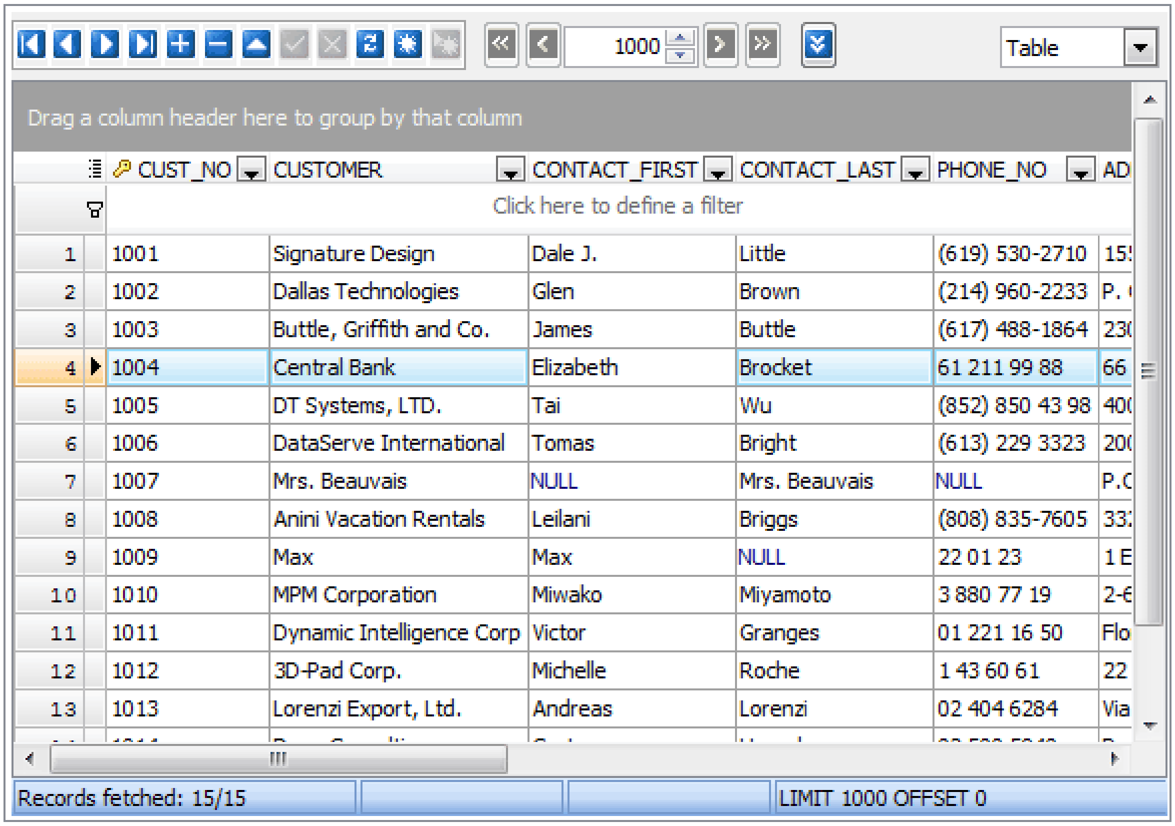
Data are displayed as a grid (or as info cards) which provide a lot of useful features such as editing, grouping, sorting, filtering, etc. See Data View 199 for details.

Navigation bars of these tabs as well as popup menus of their working areas places at your disposal the following functions for managing data:

- Export Data 215 allows you to export data to various formats, including MS Excel, MS Access, RTF, HTML, PDF and more.
- Get SQL Dump 222 exports data to the SQL script as a number of INSERT statements.
- Import Data 225 provides you with possibility to import data from MS Excel, MS Access, DBF, XML, TXT, and CSV.
- Edit BLOB 210 allows you to view and edit the content of BLOB and TEXT fields.

8.1 Data View

DB2 Maestro represents all data (stored in tables and views, results of queries and procedures) in grid 200 or in info cards 205. By default, data is displayed in a grid - tabular view of data. To change the type of the data representation, use the drop-down list at the top of the tab. Both of the data representations support UNICODE/UTF-8 data. The status bar displays the number of records in the current data set. To reset grid to default settings, open the Data tab when holding the **Ctrl** key.


1000
Table
Drag a column header here to group by that column
Click here to define a filter

	CUST_NO	CUSTOMER	CONTACT_FIRST	CONTACT_LAST	PHONE_NO	AD
1	1001	Signature Design	Dale J.	Little	(619) 530-2710	15
2	1002	Dallas Technologies	Glen	Brown	(214) 960-2233	P.
3	1003	Buttle, Griffith and Co.	James	Buttle	(617) 488-1864	23
4	1004	Central Bank	Elizabeth	Brocket	61 211 99 88	66
5	1005	DT Systems, LTD.	Tai	Wu	(852) 850 43 98	40
6	1006	DataServe International	Tomas	Bright	(613) 229 3323	20
7	1007	Mrs. Beauvais	NULL	Mrs. Beauvais	NULL	P.C
8	1008	Anini Vacation Rentals	Leilani	Briggs	(808) 835-7605	33
9	1009	Max	Max	NULL	22 01 23	1 E
10	1010	MPM Corporation	Miwako	Miyamoto	3 880 77 19	2-6
11	1011	Dynamic Intelligence Corp	Victor	Granges	01 221 16 50	Flo
12	1012	3D-Pad Corp.	Michelle	Roche	1 43 60 61	22
13	1013	Lorenzi Export, Ltd.	Andreas	Lorenzi	02 404 6284	Via

Records fetched: 15/15 | LIMIT 1000 OFFSET 0

Navigation buttons

Both data representations are equipped with navigation buttons. They are represented at the top of the data tab and allow you to navigate between records and to accomplish common operations:

- To add a new record, use the *Plus* button or the **Insert** shortcut.
- To delete a new record, use the *Minus* button or the **Delete** shortcut.
- To edit an existing record, push the corresponding button or invoke the Data Input Form 206 using popup menu of the necessary record, with **Ctrl+Alt+D** shortcut, or with the corresponding link at the Navigation bar. To edit a field value, click it and enter the new one inline.

The pagination option allows you to limit the number of browsed records. By default, the number of records represented in grid at once is 1000. To change the number of records represented in the current grid, enter the necessary value in the pagination bar. To specify the default one or to disable pagination, use the data grid option 294.

Navigation bar

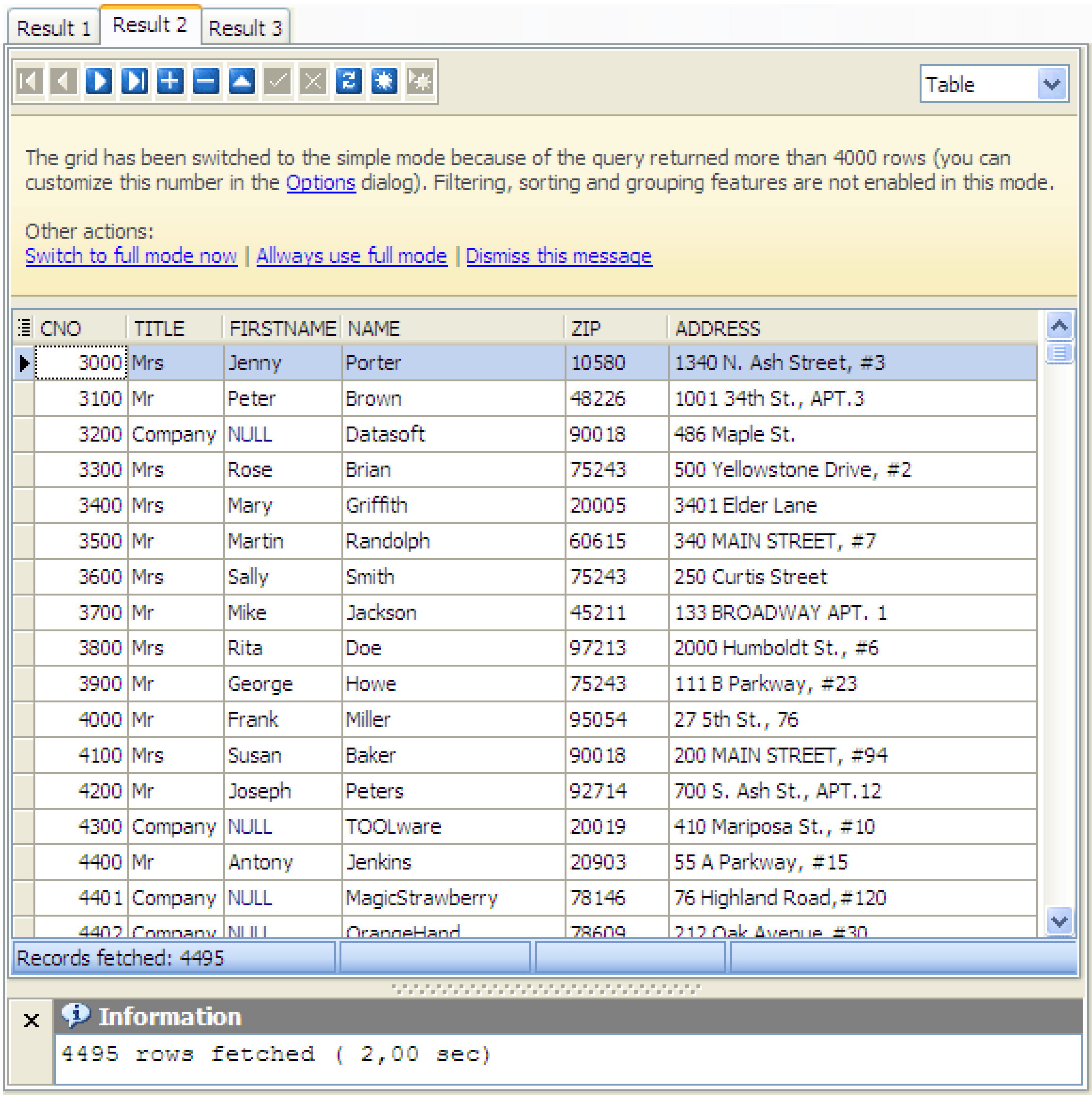
The Data management group of the Navigation bar allows to invoke Data Input Form 206, SQL Editor 184 with SELECT query, Data Export 215, and Data Import 225 modules using corresponding links, also get SQL dump 222 of the current data set and print current data with enabled preview in WYSIWYG mode.

See also: Table Editor 67, SQL Editor 184, Visual Query Builder 189

8.1.1 Working with data grid

Our software offers two grid modes:

- the full grid mode is a fully functional data representation equipped with abilities to filter and to sort data;
- the simple grid mode is provided for working with large number of records. For speed-up data fetching, filtering and sorting abilities are not enabled in this mode. The notification bar at the top of the grid (see the picture below) announces that the grid has been switched to the simple mode.



The grid has been switched to the simple mode because of the query returned more than 4000 rows (you can customize this number in the Options dialog). Filtering, sorting and grouping features are not enabled in this mode.

Other actions:
Switch to full mode now | Allways use full mode | Dismiss this message

CNO	TITLE	FIRSTNAME	NAME	ZIP	ADDRESS
3000	Mrs	Jenny	Porter	10580	1340 N. Ash Street, #3
3100	Mr	Peter	Brown	48226	1001 34th St., APT.3
3200	Company	NULL	Datasoft	90018	486 Maple St.
3300	Mrs	Rose	Brian	75243	500 Yellowstone Drive, #2
3400	Mrs	Mary	Griffith	20005	3401 Elder Lane
3500	Mr	Martin	Randolph	60615	340 MAIN STREET, #7
3600	Mrs	Sally	Smith	75243	250 Curtis Street
3700	Mr	Mike	Jackson	45211	133 BROADWAY APT. 1
3800	Mrs	Rita	Doe	97213	2000 Humboldt St., #6
3900	Mr	George	Howe	75243	111 B Parkway, #23
4000	Mr	Frank	Miller	95054	27 5th St., 76
4100	Mrs	Susan	Baker	90018	200 MAIN STREET, #94
4200	Mr	Joseph	Peters	92714	700 S. Ash St., APT.12
4300	Company	NULL	TOOLware	20019	410 Mariposa St., #10
4400	Mr	Antony	Jenkins	20903	55 A Parkway, #15
4401	Company	NULL	MagicStrawberry	78146	76 Highland Road, #120
4402	Company	NULL	OrangeHand	78609	212 Oak Avenue, #30

Records fetched: 4495

Information

```
4495 rows fetched ( 2,00 sec)
```

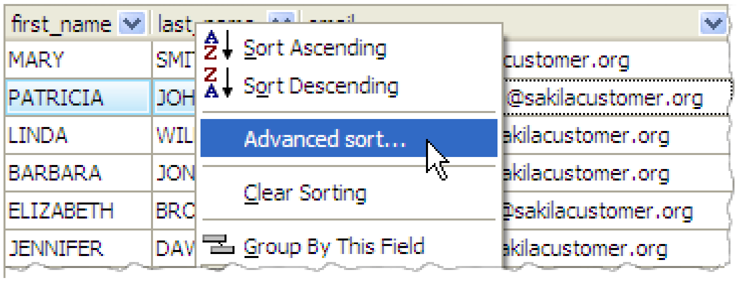
By default, the grid automatically switches to the simple mode for queries returning more than 5000 records (the number can be customized in the Options 294 dialog).

The following abilities are not available in the simple grid mode:

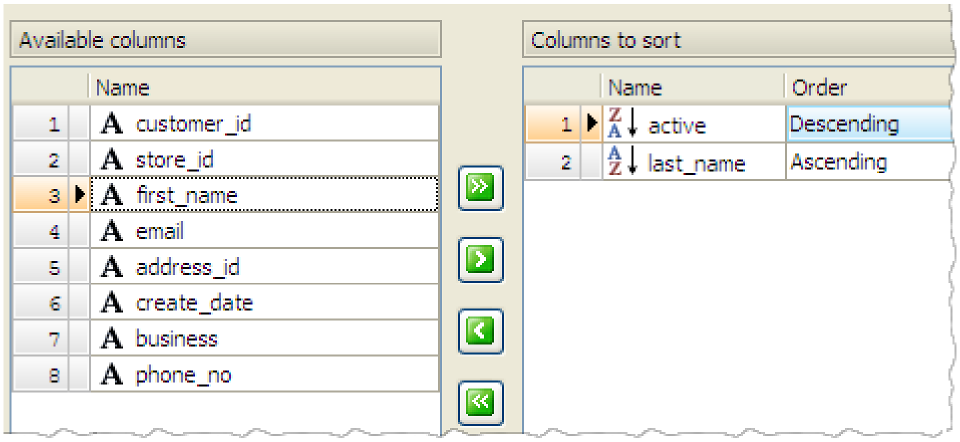
Sorting data (only in the full grid mode)

Click the column caption to sort data by the values of this column. To select sort order (ascending or descending), use popup menu of the column caption.

To sort data on a combination of grid columns, use the Advanced sort... link of the popup menu of the grid's header. The Advanced sorting window will be shown.



Select there the columns you want to sort from the Available columns list in the order of priority. Specify the sort order if necessary and click OK.



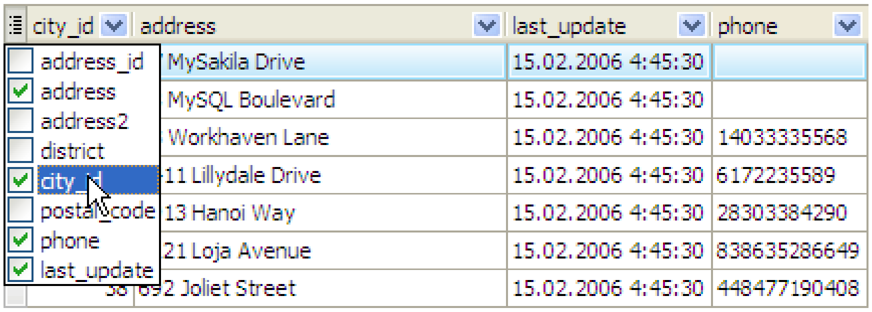
To cancel the sorting order, press **Ctrl** and click on the sorted column caption.

Filtering represented records (only in the full grid mode)

There are several ways to filter data represented in grid. See the corresponding topic 207 to find out their descriptions.

Hiding selected columns

You can show/hide columns using a button in the left top corner of the grid. Just check/uncheck the column in the drop-down list.

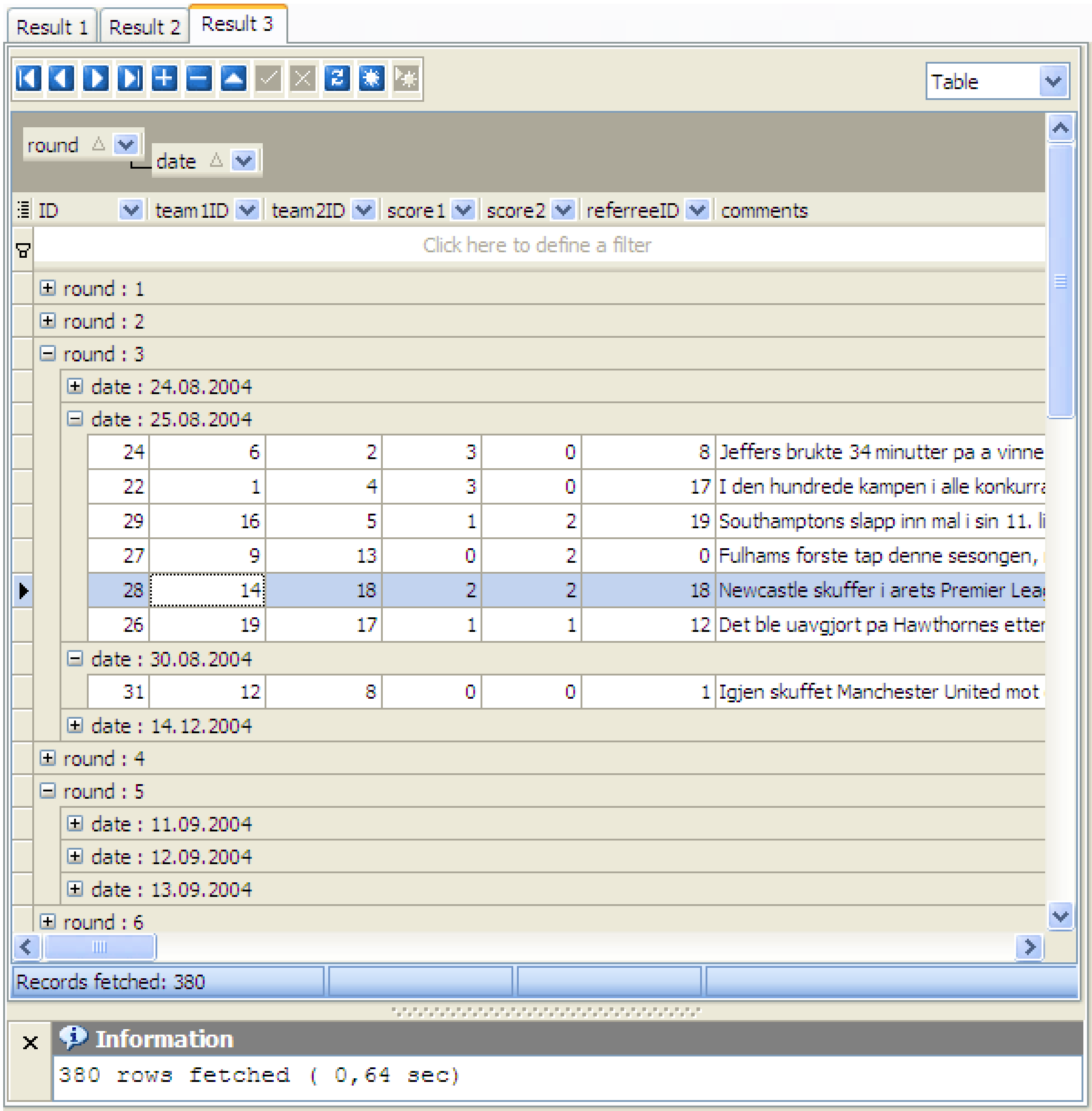


Columns reordering

To reorder columns, use drag-n-drop.

Grouping records

You can group grid data by any of the columns by dragging the column header to the destination area. Now all the records are displayed as subnodes to the grouping row value as shown in the picture. To reverse grouping, just drag the column name from the upper area back.



round : 1
round : 2
round : 3
date : 24.08.2004
date : 25.08.2004

ID	team1ID	team2ID	score1	score2	referreeID	comments
24	6	2	3	0	8	Jeffers brukte 34 minutter pa a vinne
22	1	4	3	0	17	I den hundrede kampen i alle konkurra
29	16	5	1	2	19	Southamptons slapp inn mal i sin 11. li
27	9	13	0	2	0	Fulhams forste tap denne sesongen,
28	14	18	2	2	18	Newcastle skuffer i arets Premier Lea
26	19	17	1	1	12	Det ble uavgjort pa Hawthornes etter

date : 30.08.2004

ID	team1ID	team2ID	score1	score2	referreeID	comments
31	12	8	0	0	1	Igjen skuffet Manchester United mot

date : 14.12.2004
round : 4
round : 5
date : 11.09.2004
date : 12.09.2004
date : 13.09.2004
round : 6

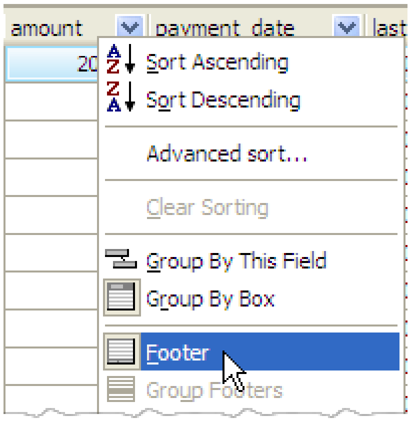
Records fetched: 380

Information

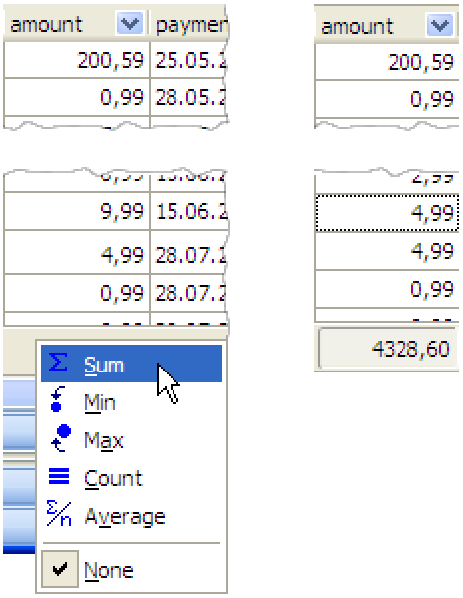
```
380 rows fetched ( 0,64 sec)
```

Using aggregate functions

To get a sum of column values, a min or a max value, an average column value or an amount of records, use Data Grid Footer. Select the Footer item at the grid caption's popup menu.



It will be shown at the bottom of the grid. The popup menu of the footer allows you to get an aggregate function result calculated with the corresponding column values.



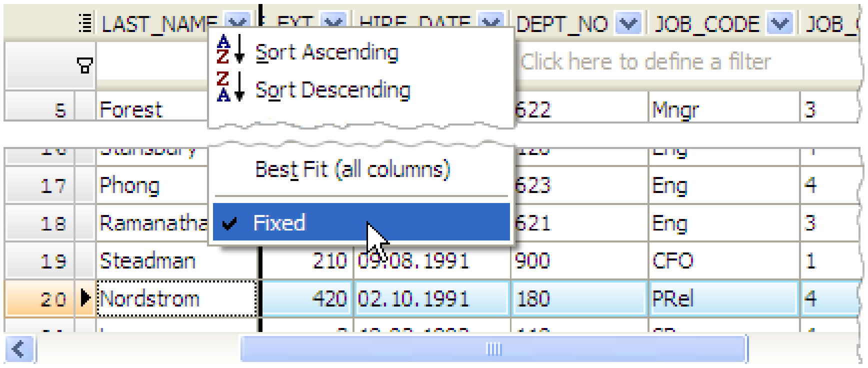
For grouped data use Group Footers.

Data alignment

The grid's header popup menu allows to align column data. Use the Alignment link and select the alignment type.

Fixing columns

You can fix grid columns to view them permanently when working with other grid data. To fix a column, choose the corresponding item from the grid's header popup menu.

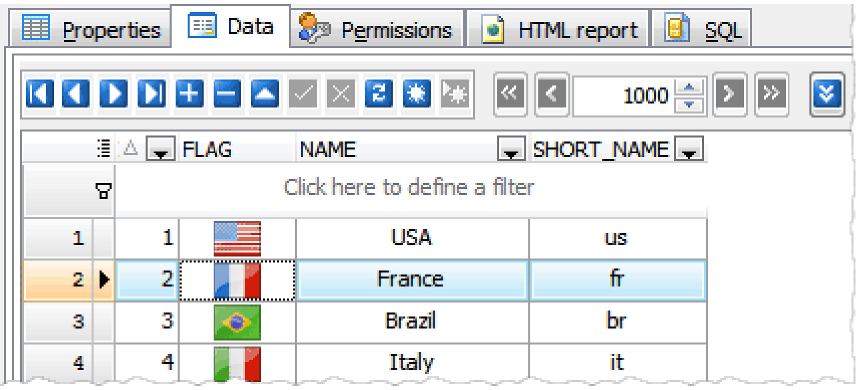


Row numbering

There is also a possibility to display row numbers in grids. You can adjust 295 the corresponding column to yours liking.

Inline images

It is possible to display images directly in the grid as on the picture below.



		FLAG	NAME	SHORT_NAME
1	1		USA	us
2	2		France	fr
3	3		Brazil	br
4	4		Italy	it

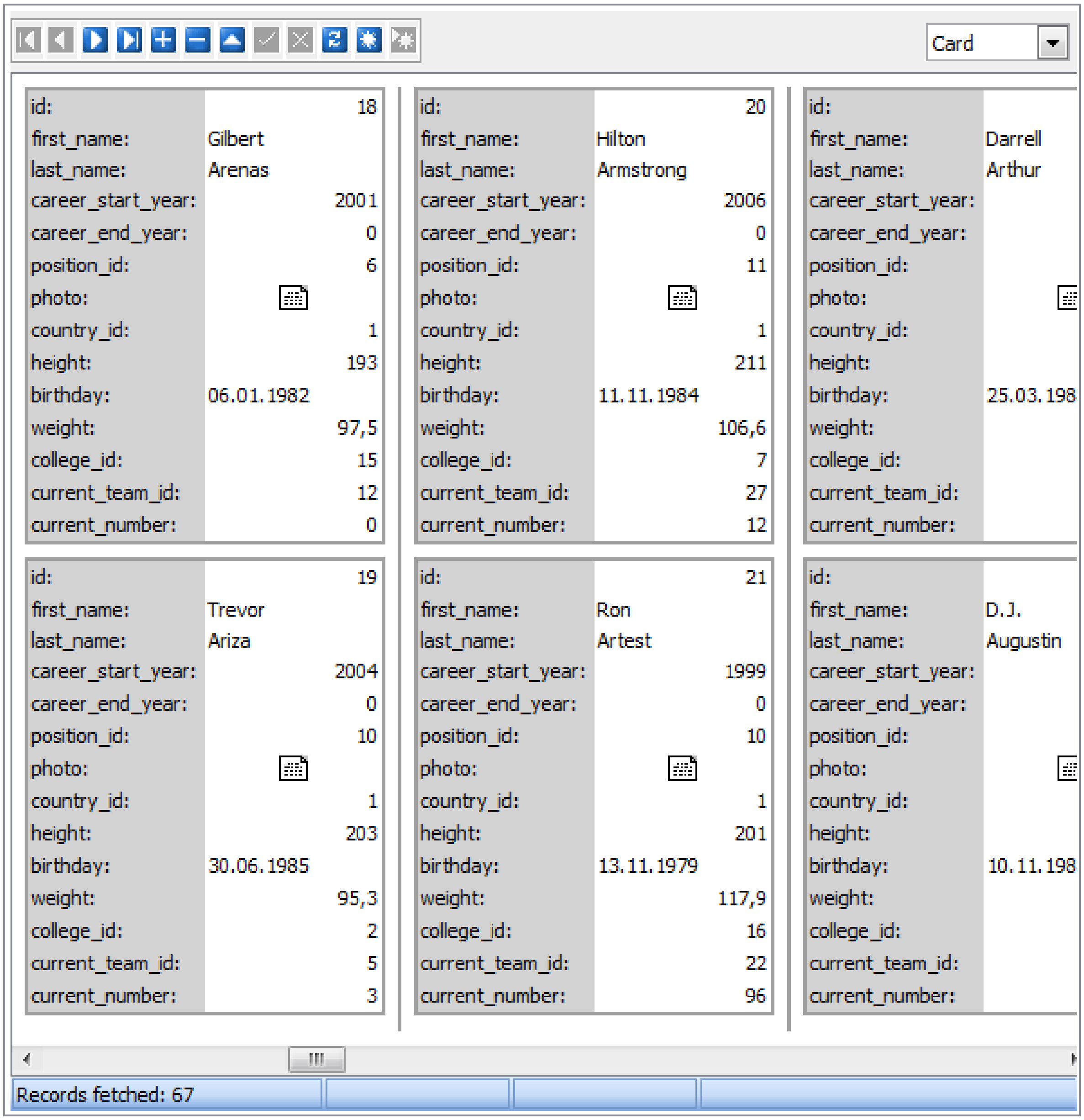
To enable/disable this view mode, open the *Enable inline images* window using the *Manage inline images* item of the column popup menu. The window options allow to set or change the image fitting and specify the row height. To add new images or change existing ones, use BLOB Editor 210 (see below).

Working with BLOBs

To edit a BLOB field 210, double click the field, or use the corresponding popup menu item. There are also possibilities to export all BLOBs stored in the table column to files and import BLOBs from a directory to the table columns. In this case you need to set the Target directory, specify the template to be used for file names and the column BLOBs to be exported from (imported to).

8.1.2 Working with info cards

Info cards correspond to the records. You can filter records by custom conditions 207 and edit data directly in info cards or with Data Input Form 206.



id: 18
first_name: Gilbert
last_name: Arenas
career_start_year: 2001
career_end_year: 0
position_id: 6
photo:
country_id: 1
height: 193
birthday: 06.01.1982
weight: 97,5
college_id: 15
current_team_id: 12
current_number: 0

id: 19
first_name: Trevor
last_name: Ariza
career_start_year: 2004
career_end_year: 0
position_id: 10
photo:
country_id: 1
height: 203
birthday: 30.06.1985
weight: 95,3
college_id: 2
current_team_id: 5
current_number: 3

id: 20
first_name: Hilton
last_name: Armstrong
career_start_year: 2006
career_end_year: 0
position_id: 11
photo:
country_id: 1
height: 211
birthday: 11.11.1984
weight: 106,6
college_id: 7
current_team_id: 27
current_number: 12

id: 21
first_name: Ron
last_name: Artest
career_start_year: 1999
career_end_year: 0
position_id: 10
photo:
country_id: 1
height: 201
birthday: 13.11.1979
weight: 117,9
college_id: 16
current_team_id: 22
current_number: 96

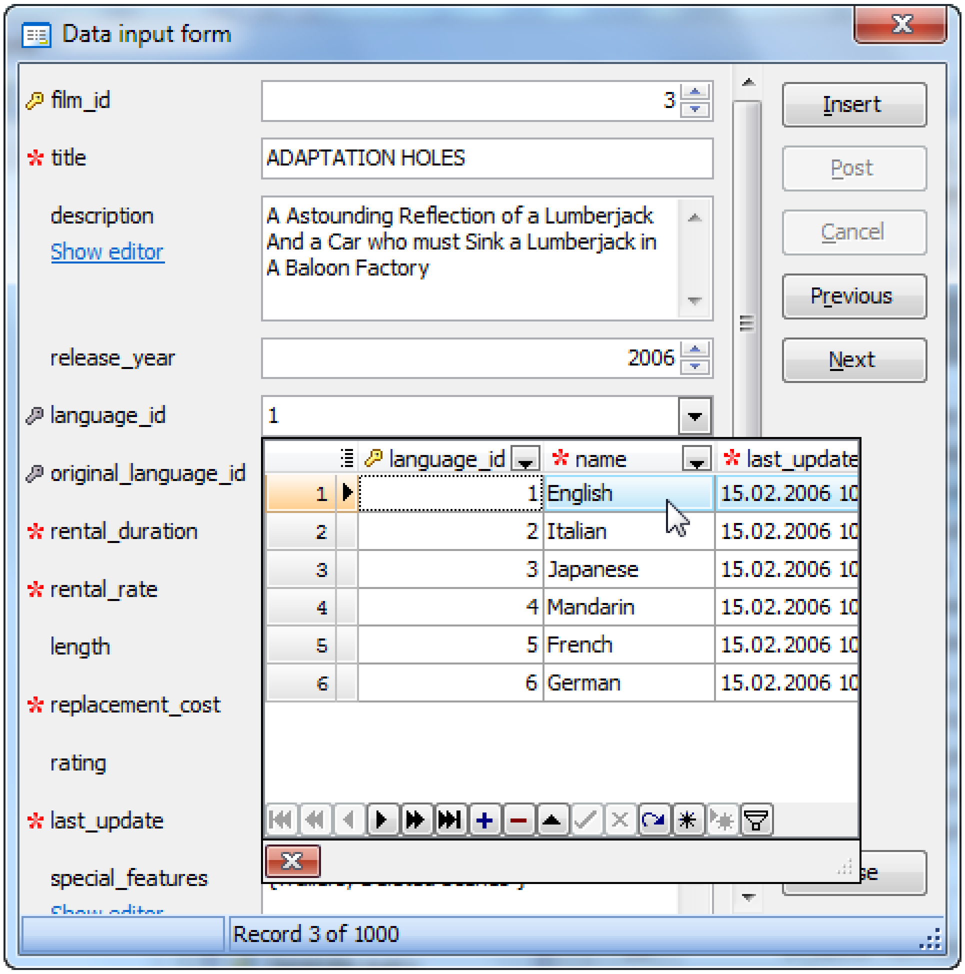
id:
first_name: Darrell
last_name: Arthur
career_start_year:
career_end_year:
position_id:
photo:
country_id:
height:
birthday: 25.03.198
weight:
college_id:
current_team_id:
current_number:

id:
first_name: D.J.
last_name: Augustin
career_start_year:
career_end_year:
position_id:
photo:
country_id:
height:
birthday: 10.11.198
weight:
college_id:
current_team_id:
current_number:

Records fetched: 67

8.1.3 Data input form

Use Data Input Form to add new records or edit existing ones. To invoke the dialog, use the corresponding link from the popup menu or **Ctrl+Alt+D** shortcut.



film_id	3
* title	ADAPTATION HOLES
description	A Astounding Reflection of a Lumberjack And a Car who must Sink a Lumberjack in A Baloon Factory
release_year	2006
language_id	1
original_language_id	
* rental_duration	
* rental_rate	
length	
* replacement_cost	
rating	
* last_update	
special_features	

	language_id	* name	* last_update
1	1	English	15.02.2006 10
2	2	Italian	15.02.2006 10
3	3	Japanese	15.02.2006 10
4	4	Mandarin	15.02.2006 10
5	5	French	15.02.2006 10
6	6	German	15.02.2006 10

Record 3 of 1000

The dialog's fields contain the values of the current grid row. Use the Insert button to enter values of a new record and the Post button to update the current row. The Cancel button reverts all the field values within a form to their initial values (or to the last posted values). The Previous and Next buttons allow you to switch between grid records without closing the dialog.

Controls containing values of primary and foreign key columns are marked with the 'gold key' and 'silver key' images accordingly. Controls containing values of required (NOT NULL) columns are marked with a red asterisk.

There are possibilities to use lookup editors on working with columns linked with foreign keys, a calendar for *timestamp* columns and a calculator for *decimal* ones.

8.1.4 Data filtering

DB2 Maestro support filtering records by the following methods:

- **Filter by a column value**

  Select the Use as Filter item from the field popup menu to filter records by the current column value.

- **Filter by several column values**

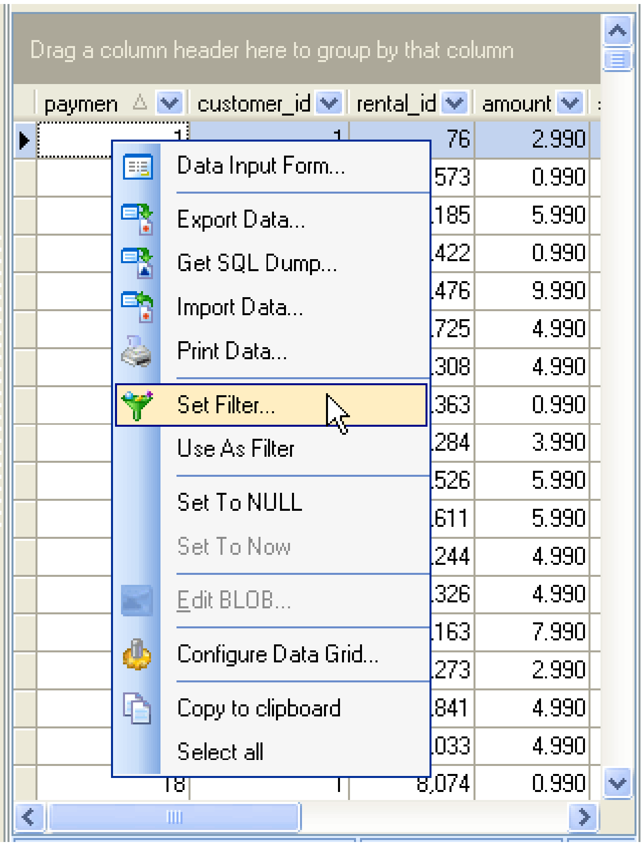
Use the drop-down button in the column caption area to filter records by the selected column value(s) or enter the filter condition directly in the filter row 299.

Filter by two operators

Invoke simple filter dialog using the Custom item of the column caption area drop-down list. Select a logical operator for checking the column values (like "is less than", "is greater than", etc.) and set the value to be checked by this operator in the next box; then set the second condition if necessary in the following way and set the relation between these two conditions, whether both of them should be matched or just one of them; use the '_' character to represent any single symbol in the condition and the '%' character to represent any series of symbols in the condition.

Filter by any custom criteria

To filter data according to more difficult custom conditions, use the Filter Builder dialog. To invoke the dialog, use the Set Filter link of popup menu or click the Customize button on the Filter panel. This panel is visible if any filtering is already applied to the grid (you can use column header menu or grid menu for quick filtering).



The dialog also allows to save filter criteria to an external file for future use.

After you set a filter, the filtering panel becomes visible at the top/bottom of the grid where you can see the active filtering condition and easily enable or disable it by clicking the check box on the left. To customize the filtering process, use filter options 299.

The Copy current filter as SQL condition to clipboard feature is useful in case the same compound filter is applied several times. Just once apply the filter, copy to clipboard as SQL condition, paste to SQL Editor 184 and save as a query. You can also use Generate query link on the Navigation bar.

See also: Data View 199, Table Editor 67, SQL Editor 184, Visual Query Builder 189

8.2 BLOB Editor

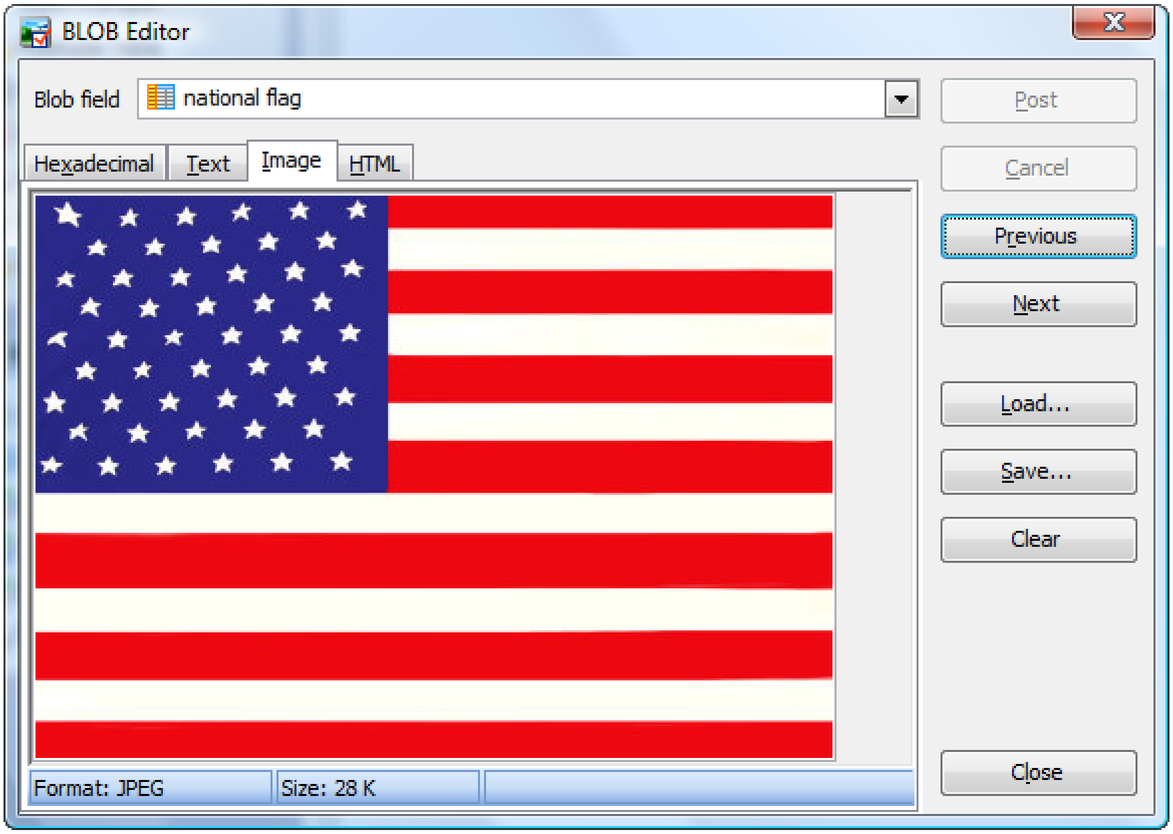
BLOB Editor is a tool to view and edit BLOB data in the following ways: hexadecimal dump [211], plain text [211], graphical image [210], HTML page [212], or PDF document [213]. BLOB Editor is invoked from data grid [199] of any table editor [67] or the result tab of SQL Editor [184] and Visual Query Builder [189] by double clicking of the BLOB field to be edited or with the Edit BLOB link of the field's popup menu. The editor also can be called from BLOB Viewer [238] with the Edit current BLOB button.

With BLOB Editor you can work with all BLOB columns of the grid. To switch between columns, select the necessary one from the BLOB field list.

BLOB Editor allows you to navigate between the grid records using the Previous and Next buttons. You can load the new BLOB content and save or clear it using corresponding buttons. After changes are made, click the Post button to apply the changes or the Cancel button to discard them.

8.2.1 Editing as image

The Image panel of BLOB Editor displays field data as graphical image. Use the Save and Load buttons to save the image to a file or load an image from a file. A graphical representation of BLOB data supports five image formats: BMP, Windows metafile, JPEG, GIF and PNG.



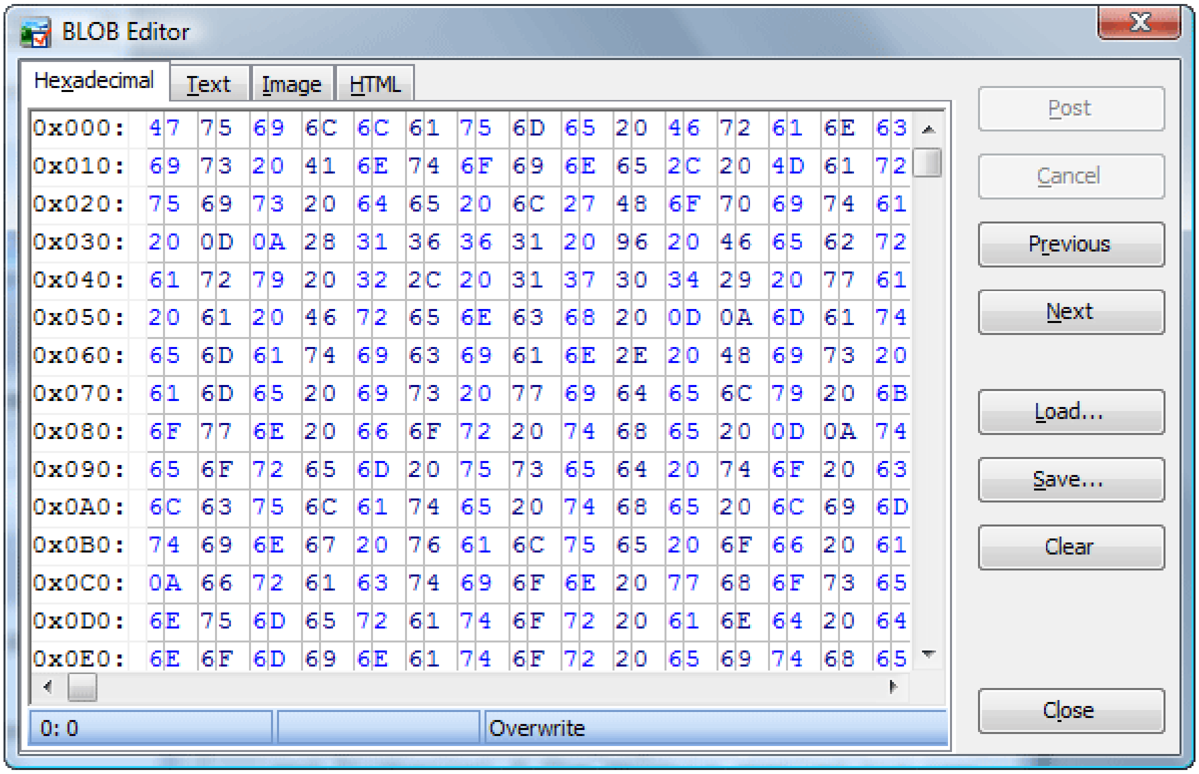
Blob field: national flag

Format: JPEG

Size: 28 K

8.2.2 Editing as hexadecimal dump

The Hexadecimal panel allows you to edit data in hexadecimal mode. To load/save a hexadecimal dump from/to a file, use the corresponding buttons. Use the Insert key to switch between Insert and Overwrite modes.

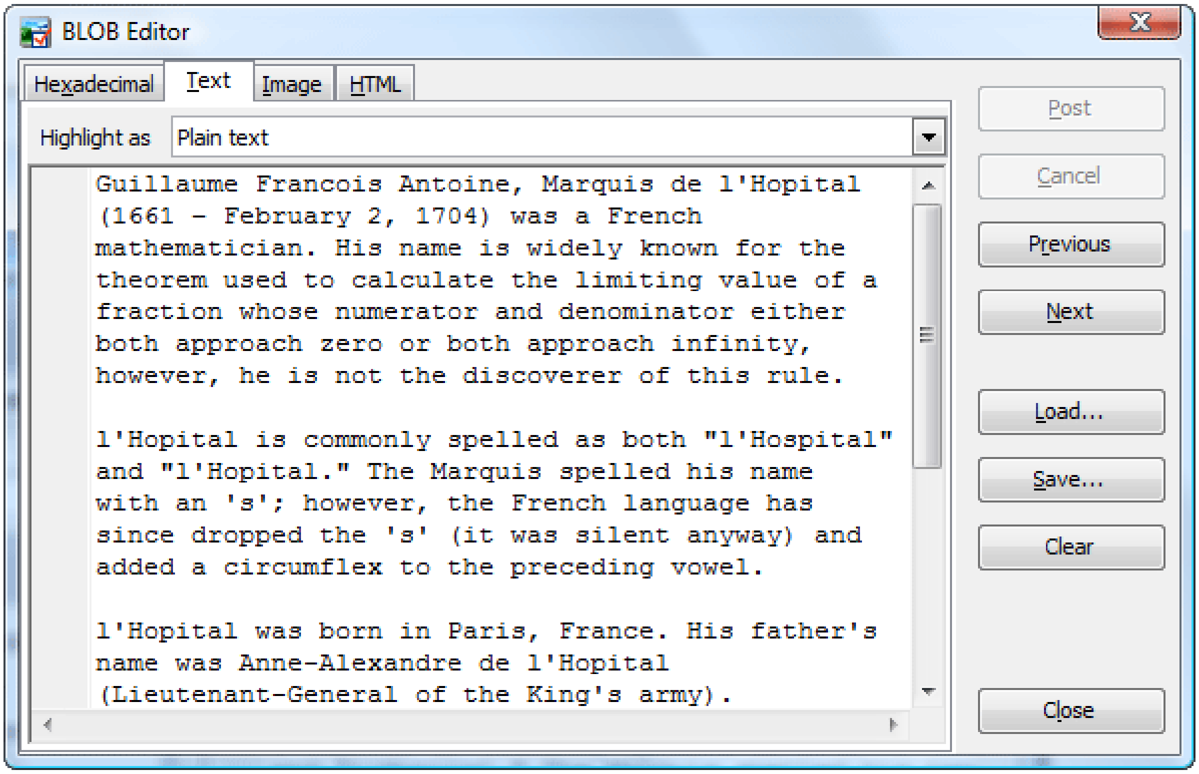


```
0x000: 47 75 69 6C 6C 61 75 6D 65 20 46 72 61 6E 63
0x010: 69 73 20 41 6E 74 6F 69 6E 65 2C 20 4D 61 72
0x020: 75 69 73 20 64 65 20 6C 27 48 6F 70 69 74 61
0x030: 20 0D 0A 28 31 36 36 31 20 96 20 46 65 62 72
0x040: 61 72 79 20 32 2C 20 31 37 30 34 29 20 77 61
0x050: 20 61 20 46 72 65 6E 63 68 20 0D 0A 6D 61 74
0x060: 65 6D 61 74 69 63 69 61 6E 2E 20 48 69 73 20
0x070: 61 6D 65 20 69 73 20 77 69 64 65 6C 79 20 6B
0x080: 6F 77 6E 20 66 6F 72 20 74 68 65 20 0D 0A 74
0x090: 65 6F 72 65 6D 20 75 73 65 64 20 74 6F 20 63
0x0A0: 6C 63 75 6C 61 74 65 20 74 68 65 20 6C 69 6D
0x0B0: 74 69 6E 67 20 76 61 6C 75 65 20 6F 66 20 61
0x0C0: 0A 66 72 61 63 74 69 6F 6E 20 77 68 6F 73 65
0x0D0: 6E 75 6D 65 72 61 74 6F 72 20 61 6E 64 20 64
0x0E0: 6E 6F 6D 69 6E 61 74 6F 72 20 65 69 74 68 65
```

0: 0 | Overwrite

8.2.3 Editing as plain text

The Text panel allows you to edit data as a simple text. Several types of text highlighting are available (*Plain text, SQL, XML, Java, VBScript, JScript, Cmd batch, PHP, CSS, UnixShell Script, INI,* and *HTML*). The popup menu of the panel allows you to invoke Find Text, Replace Text and Go to line dialogs.

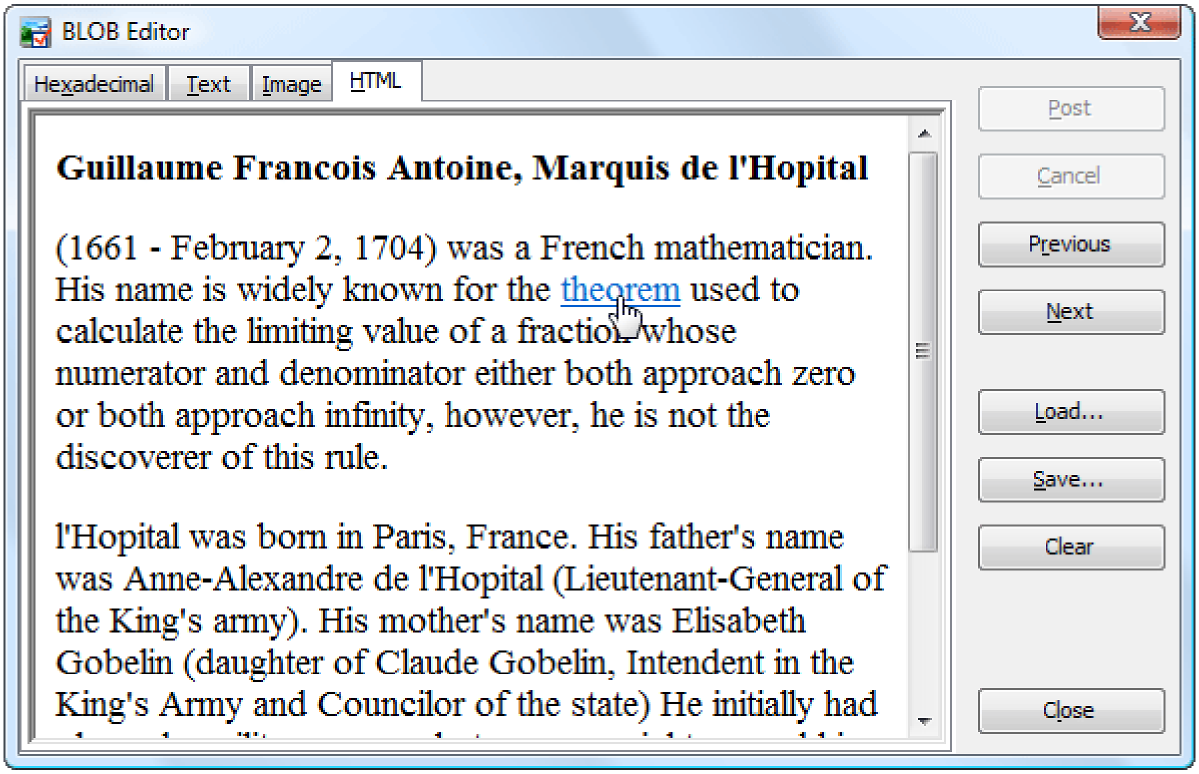


Highlight as Plain text

```
Guillaume Francois Antoine, Marquis de l'Hopital
(1661 - February 2, 1704) was a French
mathematician. His name is widely known for the
theorem used to calculate the limiting value of a
fraction whose numerator and denominator either
both approach zero or both approach infinity,
however, he is not the discoverer of this rule.

l'Hopital is commonly spelled as both "l'Hospital"
and "l'Hopital." The Marquis spelled his name
with an 's'; however, the French language has
since dropped the 's' (it was silent anyway) and
added a circumflex to the preceding vowel.

l'Hopital was born in Paris, France. His father's
name was Anne-Alexandre de l'Hopital
(Lieutenant-General of the King's army).
```

8.2.4 Editing as HTML

The HTML panel presents field data as HTML. You can load a new content of the current field from a .html file or type it manually within the Text tab of the editor.



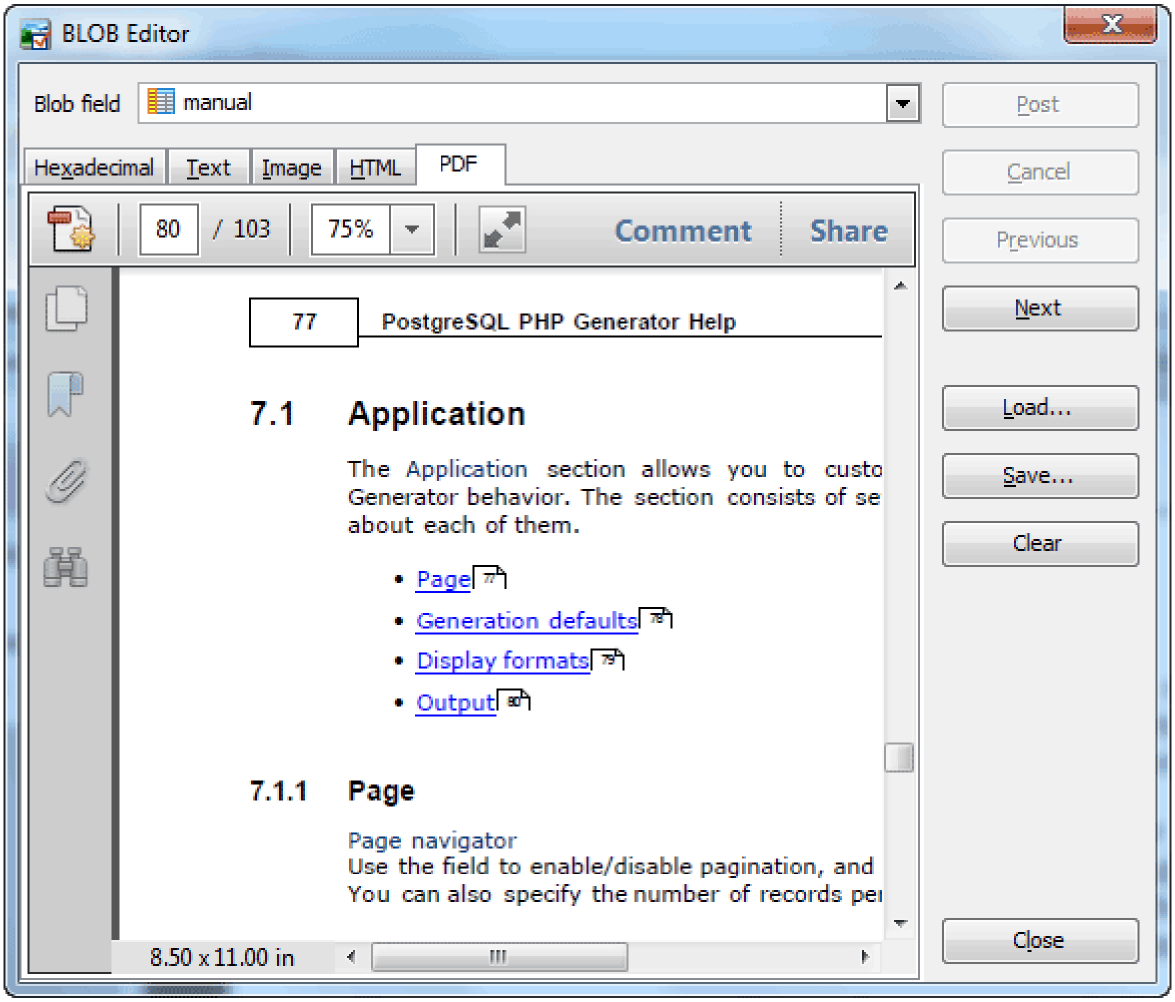
Guillaume Francois Antoine, Marquis de l'Hopital

(1661 - February 2, 1704) was a French mathematician. His name is widely known for the theorem used to calculate the limiting value of a fraction whose numerator and denominator either both approach zero or both approach infinity, however, he is not the discoverer of this rule.

l'Hopital was born in Paris, France. His father's name was Anne-Alexandre de l'Hopital (Lieutenant-General of the King's army). His mother's name was Elisabeth Gobelin (daughter of Claude Gobelin, Intendent in the King's Army and Councilor of the state) He initially had

8.2.5 Editing as PDF document

The PDF panel presents field data as PDF document. To accomplish common operations with data, use the Adobe Reader toolbar.



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7.1 Application

The Application section allows you to custo
Generator behavior. The section consists of se
about each of them.

- Page 77
- Generation defaults 78
- Display formats 79
- Output 80

7.1.1 Page

Page navigator
Use the field to enable/disable pagination, and
You can also specify the number of records pe

8.3 Export Data Wizard

Data Export wizard is a tool to save data from DB2 tables, views, and queries to the most popular formats. It allows you to fully customize output files including header and footer, fonts, colors, and data formats.

Export Data tool supports:

- Microsoft Office Excel 97-2003, 2007
- CSV
- HTML
- XML
- Text
- Microsoft Office Word 97-2003, 2007
- Microsoft Office Access
- OpenDocument Spreadsheet
- OpenDocument Text
- DBF
- PDF
- RTF
- DIF
- SYLK
- LaTex.

In order to run the wizard you should either

- open the table in Table Editor;
- go on to the Data tab

or

- open and execute the query in SQL Editor or Query Builder;
- proceed to the Result tab

and select the Export Data item from the Navigation Bar.

To export your data,

- Set the format and the name 215 of the destination file;
- Specify such additional options of the result file as header and footer 216, formats applied to exported data 217 and some format-specific options 218;
- Select columns 217 you want to include into result files;
- Specify other export options 221.

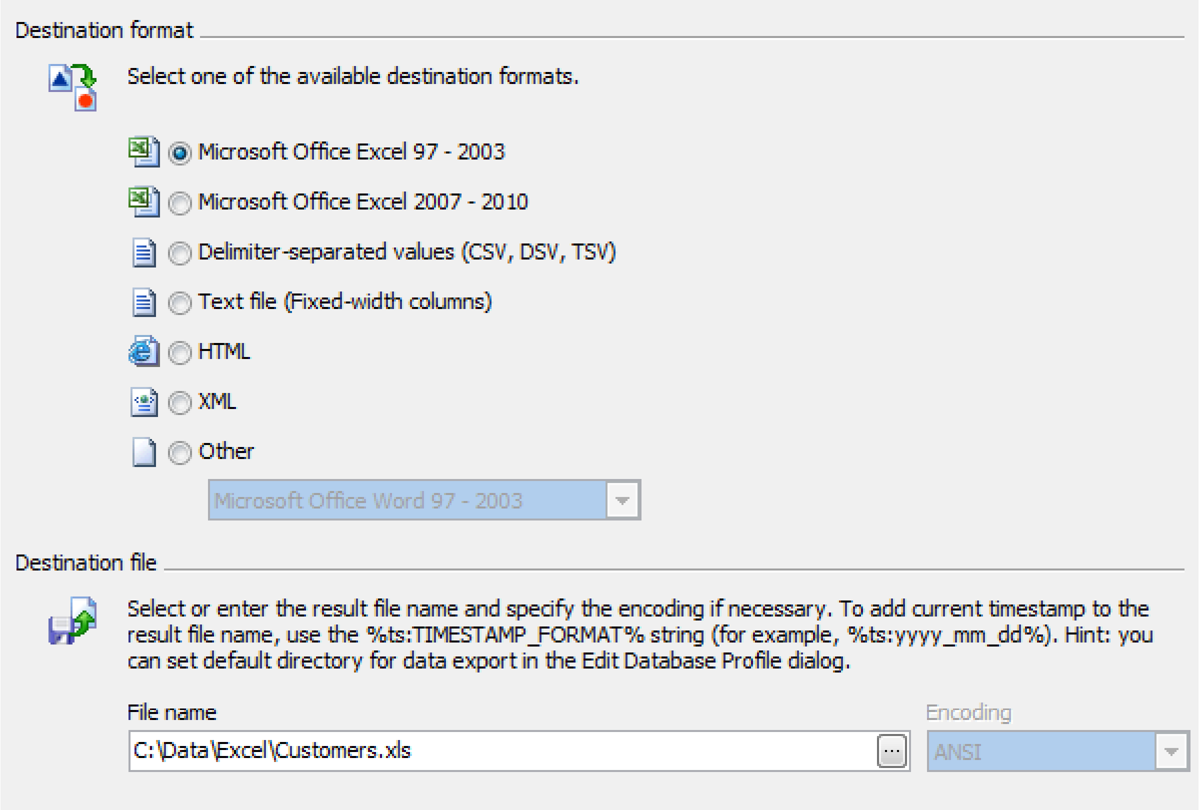
See also: Get SQL Dump, Import Data Wizard 225

8.3.1 Setting destination file name and format

Select one of the available destination formats and set the name for the result file. The file name extension in the Destination file name box varies according to the selected export type.

The file name may contain current timestamp with the %ts:TIMESTAMP_FORMAT% string. Examples of valid log file names:

dbname_export_%ts:yyyy_mm_dd%.log
export_%ts:yyyy_mm_dd_hh_mm%.log
%ts:yyyy_mm_dd_hh_mm_ss%.log



Destination format

Select one of the available destination formats.

- ● Microsoft Office Excel 97 - 2003
- ○ Microsoft Office Excel 2007 - 2010
- ○ Delimiter-separated values (CSV, DSV, TSV)
- ○ Text file (Fixed-width columns)
- ○ HTML
- ○ XML
- ○ Other

Microsoft Office Word 97 - 2003

Destination file

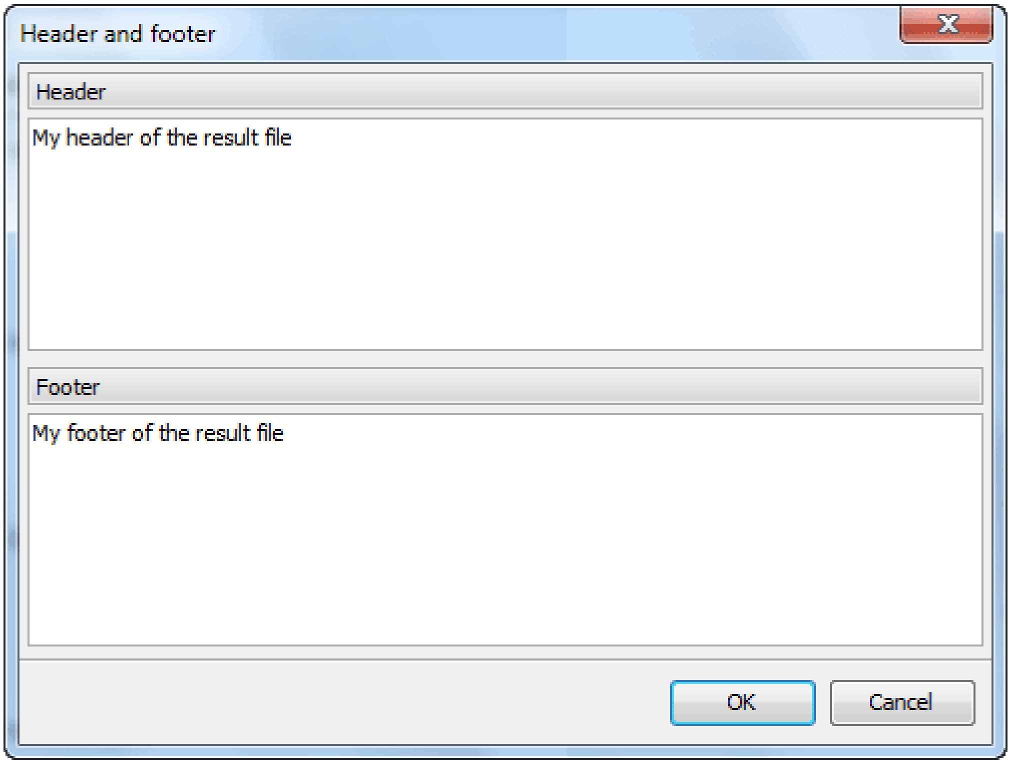
Select or enter the result file name and specify the encoding if necessary. To add current timestamp to the result file name, use the %ts:TIMESTAMP_FORMAT% string (for example, %ts:yyyy_mm_dd%). Hint: you can set default directory for data export in the Edit Database Profile dialog.

File name: C:\Data\Excel\Customers.xls

Encoding: ANSI

8.3.2 Setting header and footer

To specify the result file's header and footer, double click the corresponding button and complete fields of the Header and Footer window.

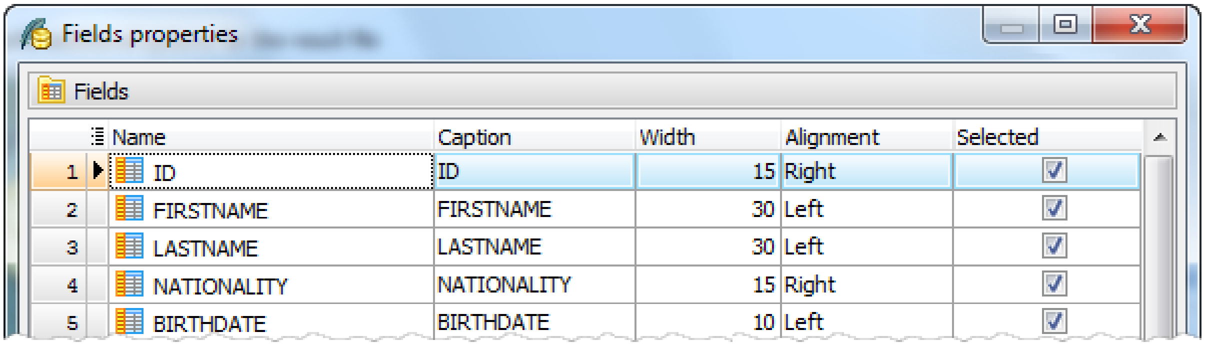


My header of the result file

My footer of the result file

8.3.3 Selecting fields for export

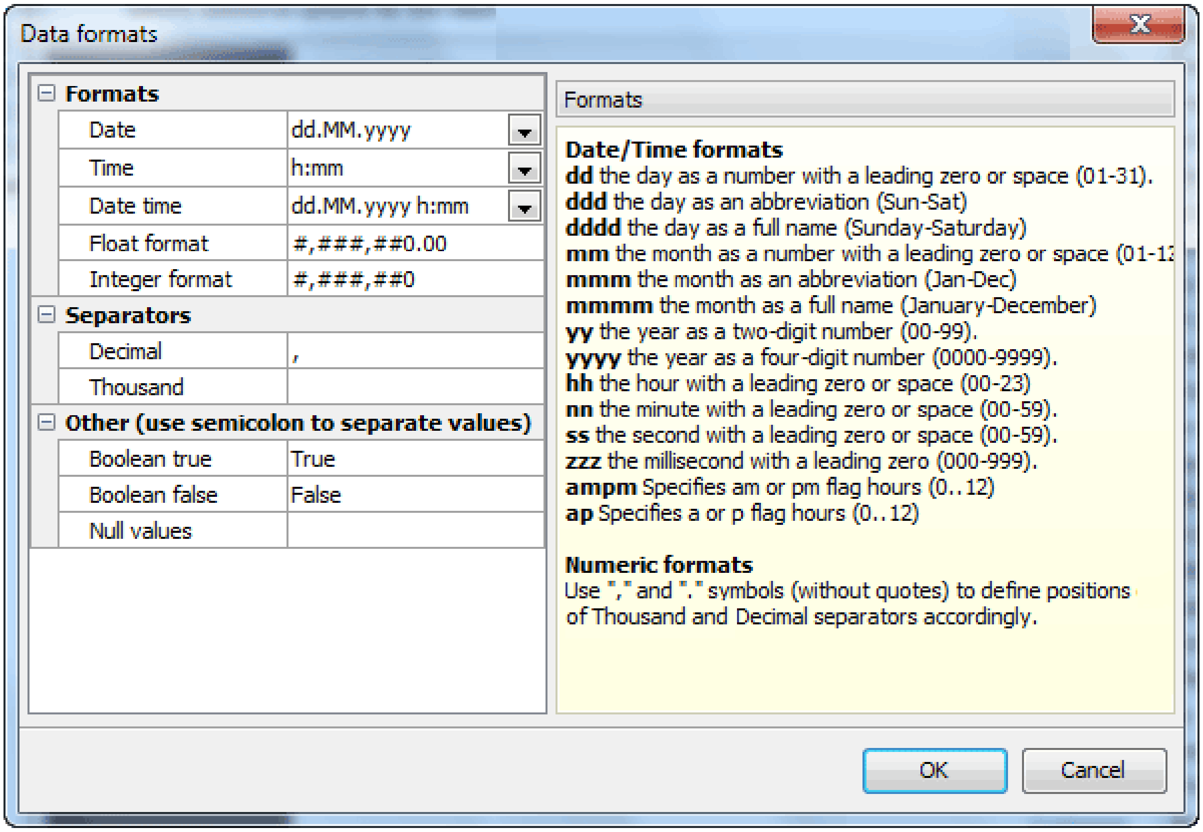
Uncheck the Selected box to exclude the corresponding field from the export, specify a Caption to be used for the result column, and also width, and alignment for output columns (when applicable).



	Name	Caption	Width	Alignment	Selected
1	ID	ID	15	Right	☑
2	FIRSTNAME	FIRSTNAME	30	Left	☑
3	LASTNAME	LASTNAME	30	Left	☑
4	NATIONALITY	NATIONALITY	15	Right	☑
5	BIRTHDATE	BIRTHDATE	10	Left	☑

8.3.4 Adjusting data formats

This step allows you to customize formats applied to exported data. Edit the format masks to adjust the result format in the way you need.



Formats	
Date	dd.MM.yyyy
Time	h:mm
Date time	dd.MM.yyyy h:mm
Float format	#,###,##0.00
Integer format	#,###,##0
Separators	
Decimal	,
Thousand	
Other (use semicolon to separate values)	
Boolean true	True
Boolean false	False
Null values	

Formats

Date/Time formats
dd the day as a number with a leading zero or space (01-31).
ddd the day as an abbreviation (Sun-Sat)
dddd the day as a full name (Sunday-Saturday)
mm the month as a number with a leading zero or space (01-1
mmm the month as an abbreviation (Jan-Dec)
mmmm the month as a full name (January-December)
yy the year as a two-digit number (00-99).
yyyy the year as a four-digit number (0000-9999).
hh the hour with a leading zero or space (00-23)
nn the minute with a leading zero or space (00-59).
ss the second with a leading zero or space (00-59).
zzz the millisecond with a leading zero (000-999).
ampm Specifies am or pm flag hours (0..12)
ap Specifies a or p flag hours (0..12)

Numeric formats
Use "," and "." symbols (without quotes) to define positions of Thousand and Decimal separators accordingly.

8.3.5 Setting format-specific options

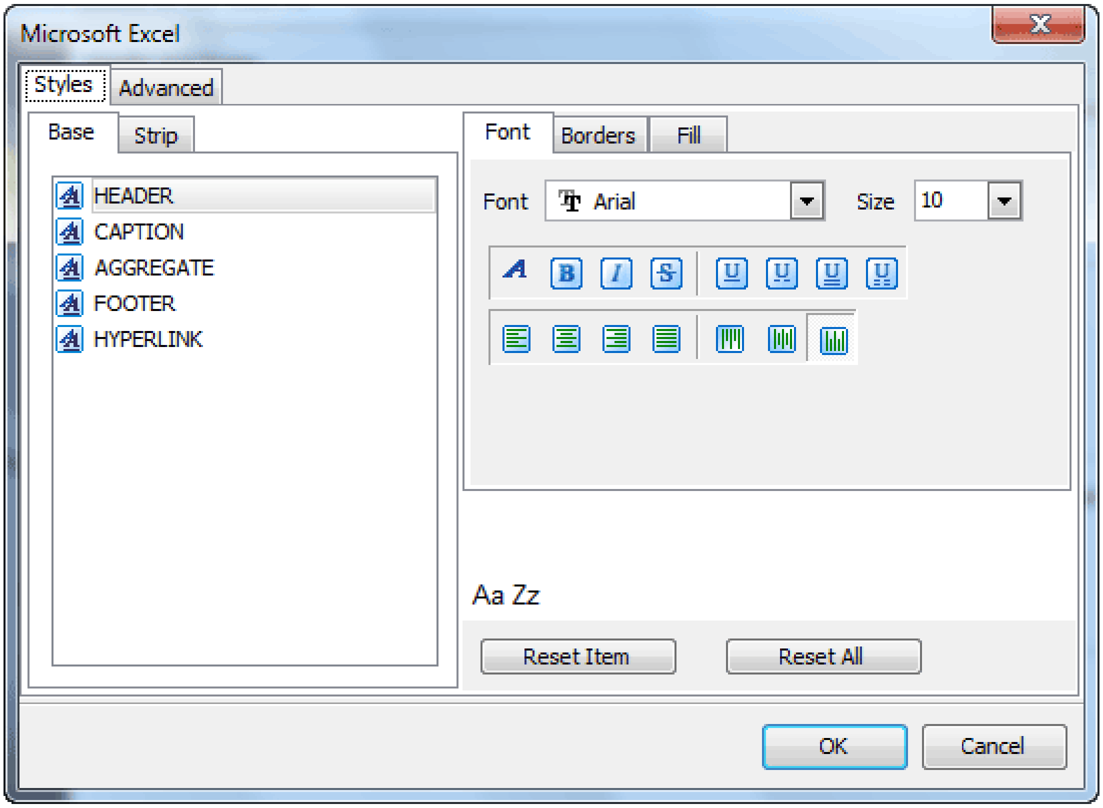
Each format supposes corresponding additional export options. Use the wizard option to adjust export properties depending on the target file format you have selected earlier. The following formats are at your disposal: Microsoft Excel 218, Microsoft Excel 2007, CSV 220, Text 220, HTML 219, XML 220, Microsoft Word, Microsoft Word 2007, Microsoft Access, OpenDocument Spreadsheet, OpenDocument Text, DBF, PDF, RTF, DIF, SYLK, and LaTeX.

Microsoft Excel

The Data Format tab contains general options, which allow you to adjust the format for each kind of Excel cells. This means that you can specify such parameters as font, borders, filling color and method, etc. for each entity (such as data field, header, footer, caption, data, hyperlink and so on) separately. Also it is possible to create styles to make target Excel file be striped by columns or rows (the Styles tab).

The Extensions tab provides a possibility to add hyperlinks and notes to any cell of target file. Click the Plus button to add a new hyperlink or note to target Excel sheet and adjust its parameters. Click the Minus button to delete added hyperlink or note.

The Advanced tab allows you to define page header, page footer and title for target Excel sheet.



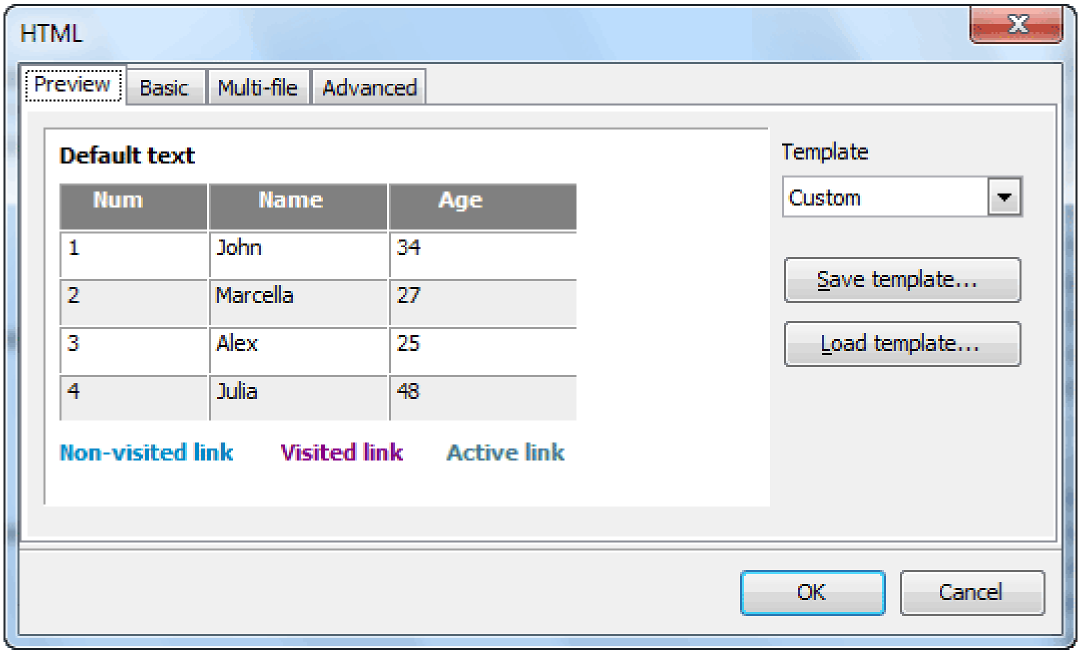
HTML

The Preview tab allows you to select the style of HTML file from a number of built-in templates provided by the Templates combo box. You can choose any of these templates, customize it by clicking on objects in the preview panel, and save it as a custom template using the Save template button. Use the Load template button to load previously saved custom templates from hard disk.

The Basic tab allows you to specify basic parameters of target HTML file, such as its title, cascade style sheet options, etc.

The Multi-file tab provides you with a possibility to split target HTML file into several separated files. This tab allows you to specify the record count for a single file, set an option to generate an index HTML file, and add an ability of navigation between each other to each of exported files.

The Advanced tab contains such HTML options as default font, background, cell padding and spacing, etc.



Default text

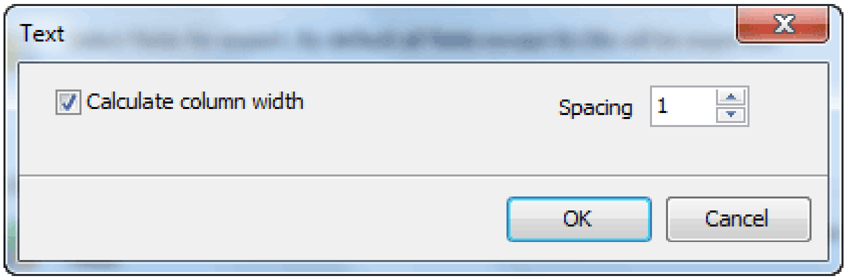
Num	Name	Age
1	John	34
2	Marcella	27
3	Alex	25
4	Julia	48

Non-visited link Visited link Active link

Template: Custom

Text files

Set the Calculate column width options on if you want each column of target file to be adjusted to the maximum number of characters in it. The Spacing option specifies the number of spaces between columns in the target file.

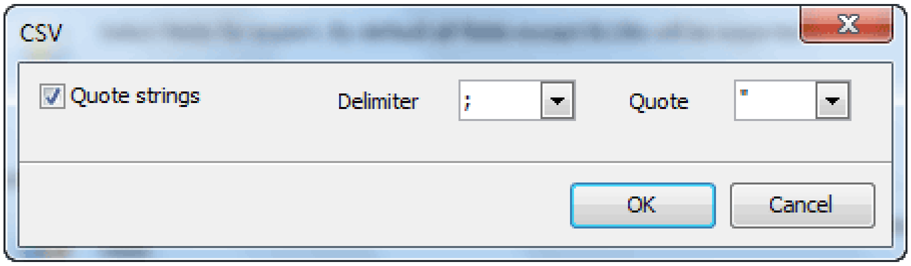


☑ Calculate column width

Spacing: 1

CSV files

You can specify column separator and optional values quote character for the target file on this step.



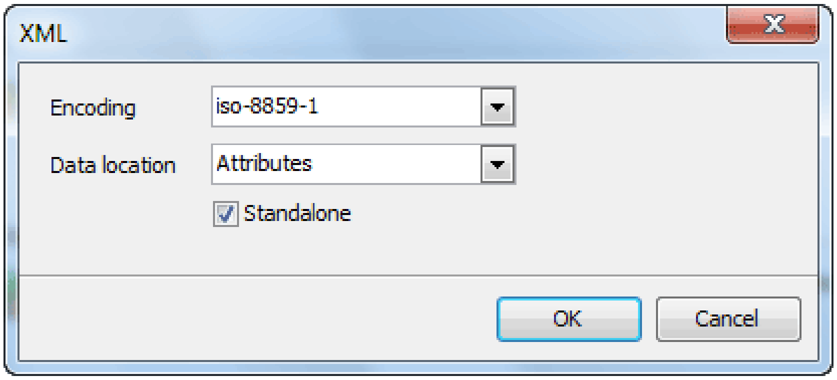
☑ Quote strings

Delimiter: ;

Quote: "

XML documents

Specify XML document encoding in the Encoding edit box and set the Standalone option on if you wish the target document to be standalone.



Encoding: iso-8859-1

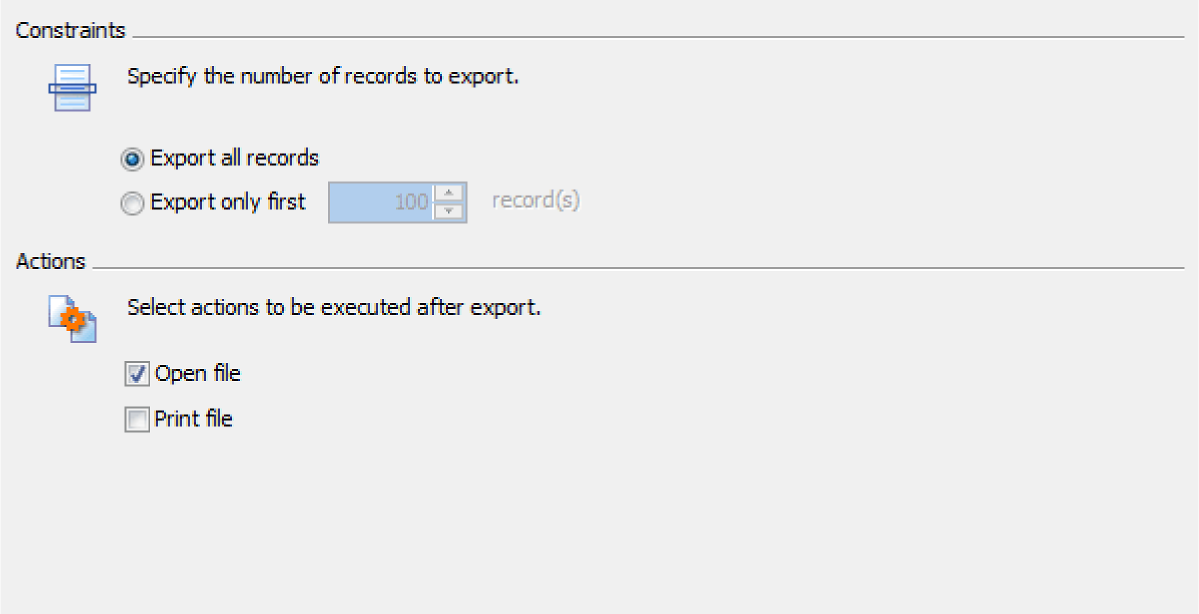
Data location: Attributes

☑ Standalone

8.3.6 Setting common export options

Use this step to specify options to be applied to all exported data:

- Select the number of records to be exported from each table: a fixed number or all records.
- Specify actions to be executed after the export. To open the result files in the associated program (MS Excel, Notepad, default browser, etc), check the Open file box. To send the result files to the default printer, use the Print file checkbox.



Specify the number of records to export.

● Export all records

○ Export only first 100 record(s)

Select actions to be executed after export.

☑ Open file

☐ Print file

8.4 Get SQL Dump

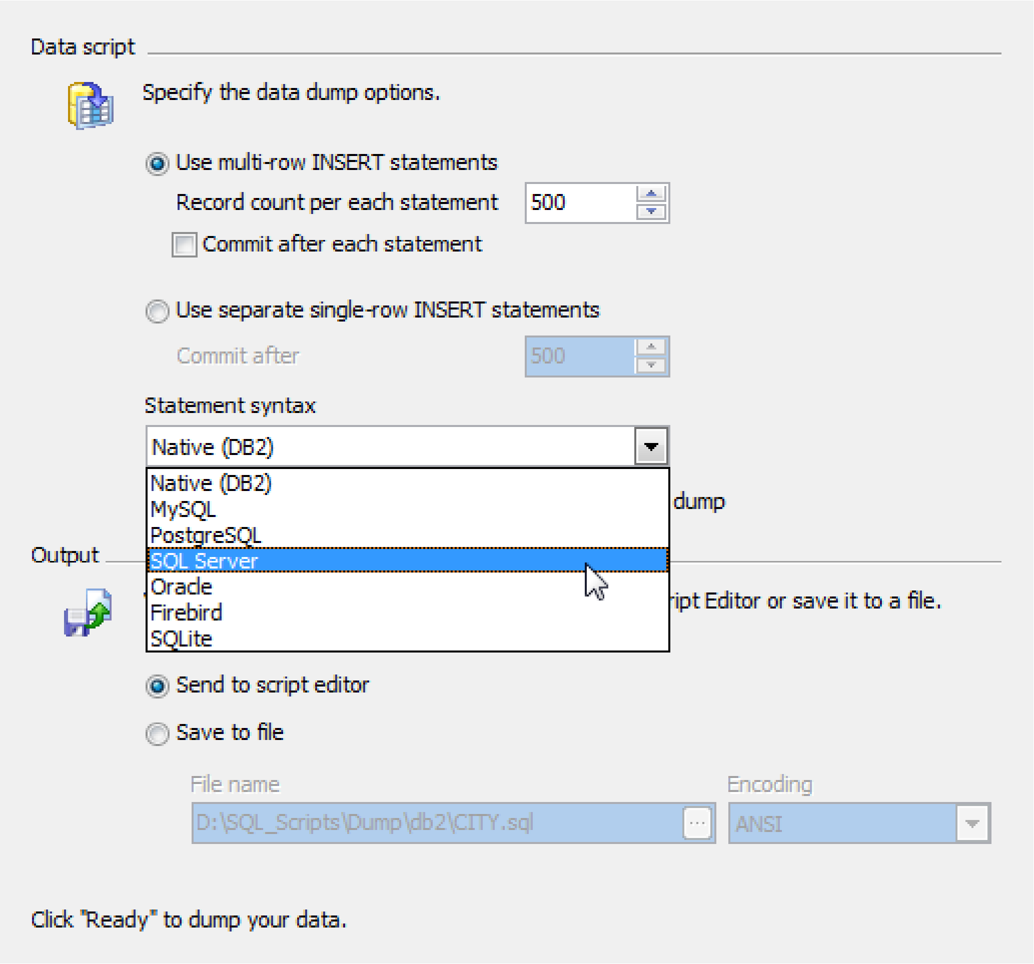
Get SQL Dump Wizard allows you to export data from a table or a query result to the SQL script as a number of INSERT statements.

In order to get a SQL dump from a table or a query:

- open the table in Table Editor or open and execute query in SQL Editor or Query Builder;
- open the Data tab or the Result tab respectively;
- use the Get SQL Dump item of the Navigation Bar.

- Selecting fields to include in the result INSERT statement 222
- Specifying dump options 223

See also: Export Data Wizard 215, SQL Script Editor 234



Data script

Specify the data dump options.

● Use multi-row INSERT statements

Record count per each statement 500

☐ Commit after each statement

○ Use separate single-row INSERT statements

Commit after 500

Statement syntax

Native (DB2)

dump

Output

ript Editor or save it to a file.

● Send to script editor

○ Save to file

File name D:\SQL_Scripts\Dump\db2\CITY.sql

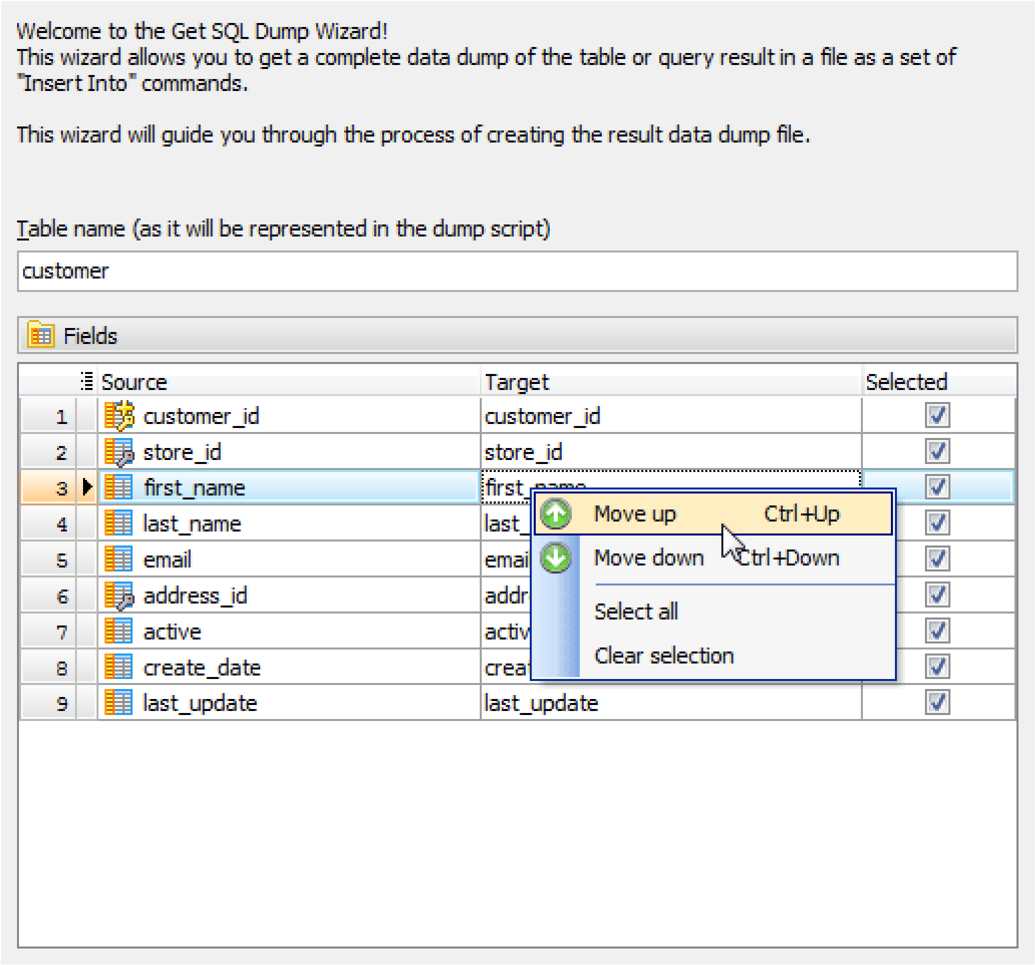
Encoding ANSI

Click "Ready" to dump your data.

8.4.1 Selecting fields

The first wizard step allows you to specify the table name as it will be included in the result script.

You can also select the fields to be included in the result *INSERT* statement. All the table fields are included into the Selected fields list by default. If you do not want some fields to be exported, move them back to the Available fields list. *Text*, *GUID*, *Date*, *Time*, and *DateTime* columns are included in the result INSERT statements according to the Storage Options of the Database Profile 26.


Welcome to the Get SQL Dump Wizard!
This wizard allows you to get a complete data dump of the table or query result in a file as a set of "Insert Into" commands.

This wizard will guide you through the process of creating the result data dump file.

Table name (as it will be represented in the dump script)

customer

Fields

	Source	Target	Selected
1	customer_id	customer_id	☑
2	store_id	store_id	☑
3	first_name	first_name	☑
4	last_name	last_	☑
5	email	emai	☑
6	address_id	addr	☑
7	active	activ	☑
8	create_date	creat	☑
9	last_update	last_update	☑

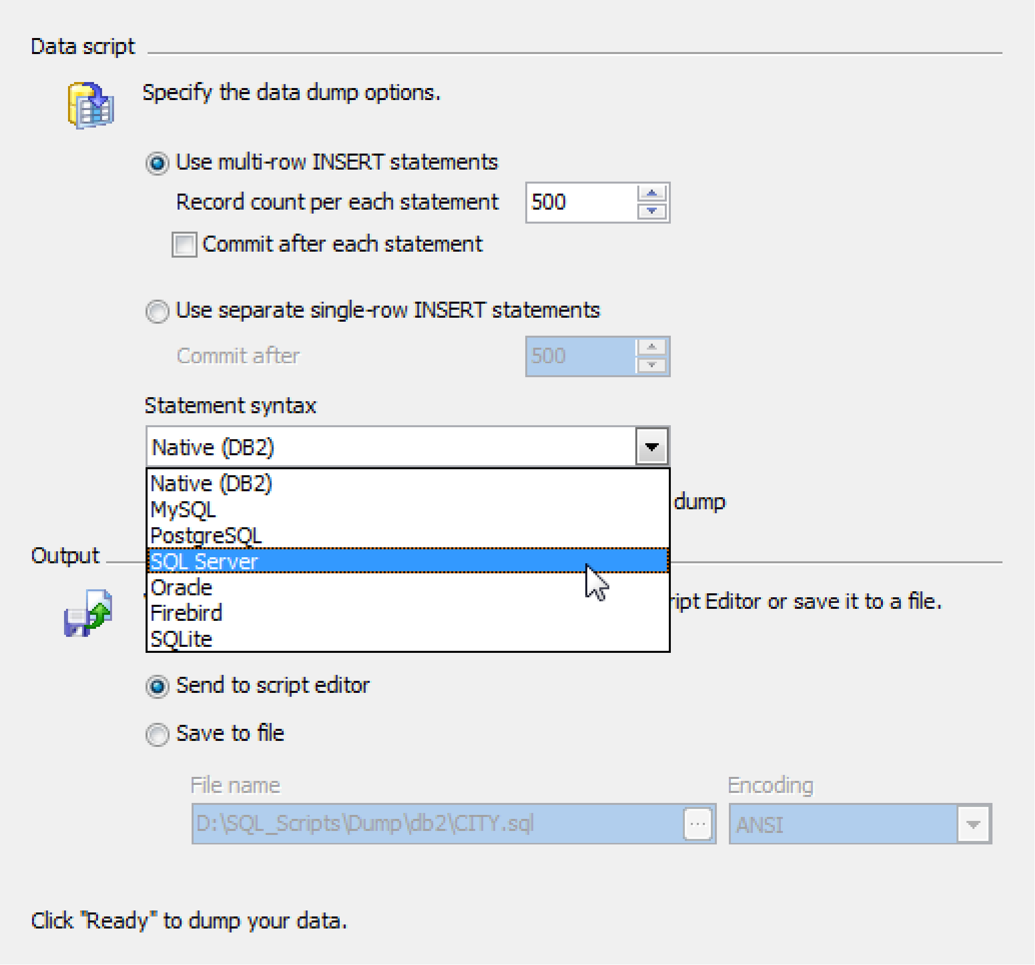
8.4.2 Specifying dump options

Select the data dump mode to be used (Multi-row INSERT statements or separate single-row INSERT statements) and specify commits' frequency.

To add the "CREATE TABLE" to the top of the dump, check the corresponding box.

Get SQL Dump Wizard allows you to send the result script to SQL Script Editor 234 or to save it to a specified file. Select the Send to script editor option to load the result to the editor. To save the result to the file, enter the script file name (**.sql*).

Click the Ready button to start the process.



Data script

Specify the data dump options.

● Use multi-row INSERT statements

Record count per each statement 500

☐ Commit after each statement

○ Use separate single-row INSERT statements

Commit after 500

Statement syntax

Native (DB2)

Output

ipt Editor or save it to a file.

● Send to script editor

○ Save to file

File name D:\SQL_Scripts\Dump\db2\CITY.sql

Encoding ANSI

Click "Ready" to dump your data.

8.5 Import Data Wizard

Import Data Wizard provides you with a graphical user interface to import data from the most popular files formats into existing DB2 tables. It allows you to adjust data formats, empty target tables, execute custom SQL scripts, etc.

Import Data tool supports:

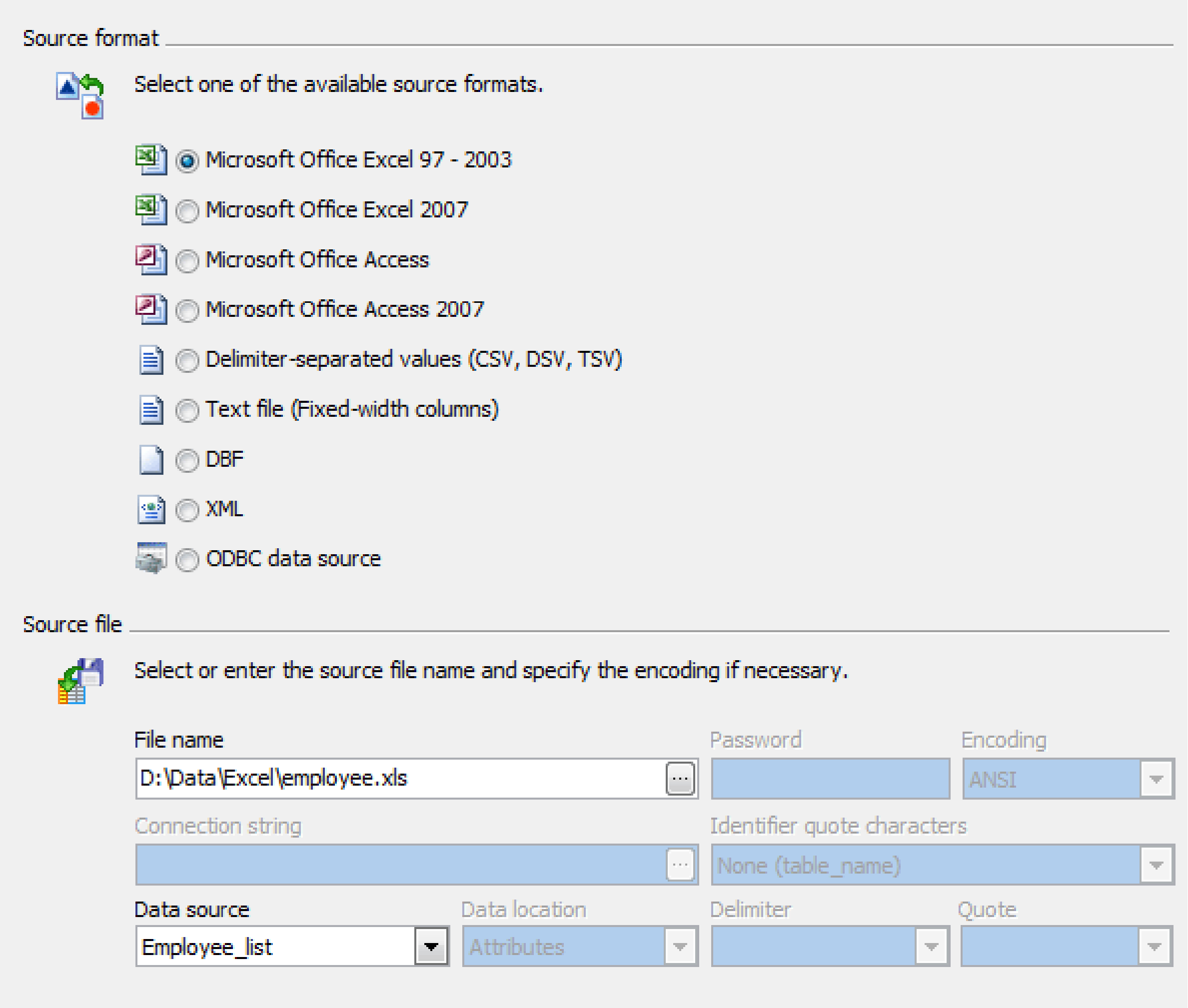
- Microsoft Office Excel 95-2003
- Microsoft Office Excel 2007
- Microsoft Office Access
- Microsoft Office Access 2007
- Delimiter-separated values (CSV, DSV, TSV)
- DBF
- Text files
- XML
- ODBC data sources (any database accessible via an ODBC driver or OLE DB provider, such as SQL Server, MySQL, Oracle, MS Access, Sybase, DB2, PostgreSQL, etc.)

In order to run the wizard you should

- open the table in Table Editor;
- go on to the Data tab;
- select the Import Data item from the Navigation Bar.

To import data,

- Set the format 226 of the input data and the source file name;
- Map source file columns and target table fields 228;
- Specify other import options 231.



Source format

Select one of the available source formats.

- ● Microsoft Office Excel 97 - 2003
- ○ Microsoft Office Excel 2007
- ○ Microsoft Office Access
- ○ Microsoft Office Access 2007
- ○ Delimiter-separated values (CSV, DSV, TSV)
- ○ Text file (Fixed-width columns)
- ○ DBF
- ○ XML
- ○ ODBC data source

Source file

Select or enter the source file name and specify the encoding if necessary.

File name: D:\Data\Excel\employee.xls
Password:
Encoding: ANSI
Connection string:
Identifier quote characters: None (table_name)
Data source: Employee_list
Data location: Attributes
Delimiter:
Quote:

See also: Export Data Wizard 215

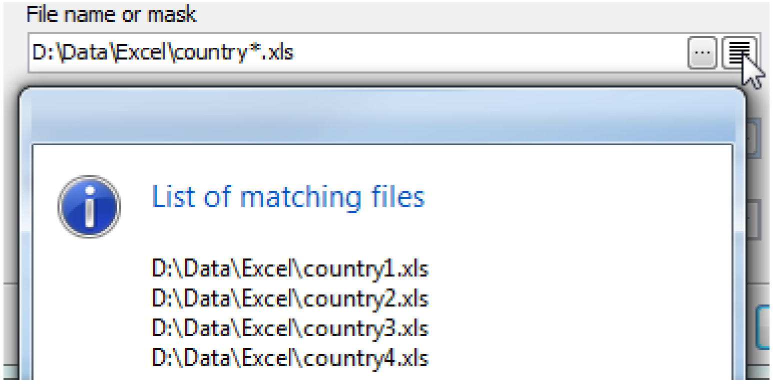
8.5.1 Setting source file name and format

1. Select the format of the source file.
2. Specify the file you want to import. The file name extension in the File name box varies according to the selected import type. The wizard allows you to import data from several files at a time.

To import data from multiple files with the same structure, set the mask of the file names to the corresponding field. To see the list of matching files, use with the button on the right.

Example 1:

Suppose, you need to import data from the following tables:
D:\Data\Excel\country1.xls
D:\Data\Excel\country2.xls
D:\Data\Excel\country3.xls
D:\Data\Excel\country4.xls
The mask for these file names is *D:\Data\Excel\country*.xls*.



File name or mask

D:\Data\Excel\country*.xls

List of matching files

D:\Data\Excel\country1.xls
D:\Data\Excel\country2.xls
D:\Data\Excel\country3.xls
D:\Data\Excel\country4.xls

3. For ODBC data sources specify the connection string to be used to connect to the data source.

4. Select the data source to import: a table of MS Access database or a spreadsheet of MS Excel.

5. Enter the password to the database (MS Access).

6. For CSV file set the delimiter and quote characters.

7. Select source file Encoding.

8. For .XML files, define the XPath to the data to be imported to the selected table and select whether data is stored in Attributes or in Subnodes.

Example 2:
To import data from the following .xml file, use XPath=*/Employees/Employee* and Data location=*Subnodes*

```
<?xml version="1.0" encoding="utf-8"?>
<Employees>
  <Employee>
    <ID>1</ID>
    <FirstName>Klaus</FirstName>
    <LastName>Salchner</LastName>
    <PhoneNumber>410-727-5112</PhoneNumber>
  </Employee>
  <Employee>
     <ID>2</ID>
    <FirstName>Peter</FirstName>
    <LastName>Pan</LastName>
    <PhoneNumber>604-111-1111</PhoneNumber>
  </Employee>
</Employees>
```

Example 3:
To import data from the .xml file below, use XPath=*DATAPACKET/Data/Item* and Data location=*Attributes*

```
<?xml version="1.0"?>
```

```
<DATAPACKET Version="2.0">
<Data>
    <Item ID="1" FirstName="Klaus" LastName="Salchner" PhoneNumber="410-727-
5112" />
   <Item ID="2" FirstName="Peter" LastName="Pan" PhoneNumber="604-111-1111" />

</Data>
</DATAPACKET>
```

8.5.2 Setting the accordance between source and target columns

The wizard provides you with several ways to map input data to the target table columns.

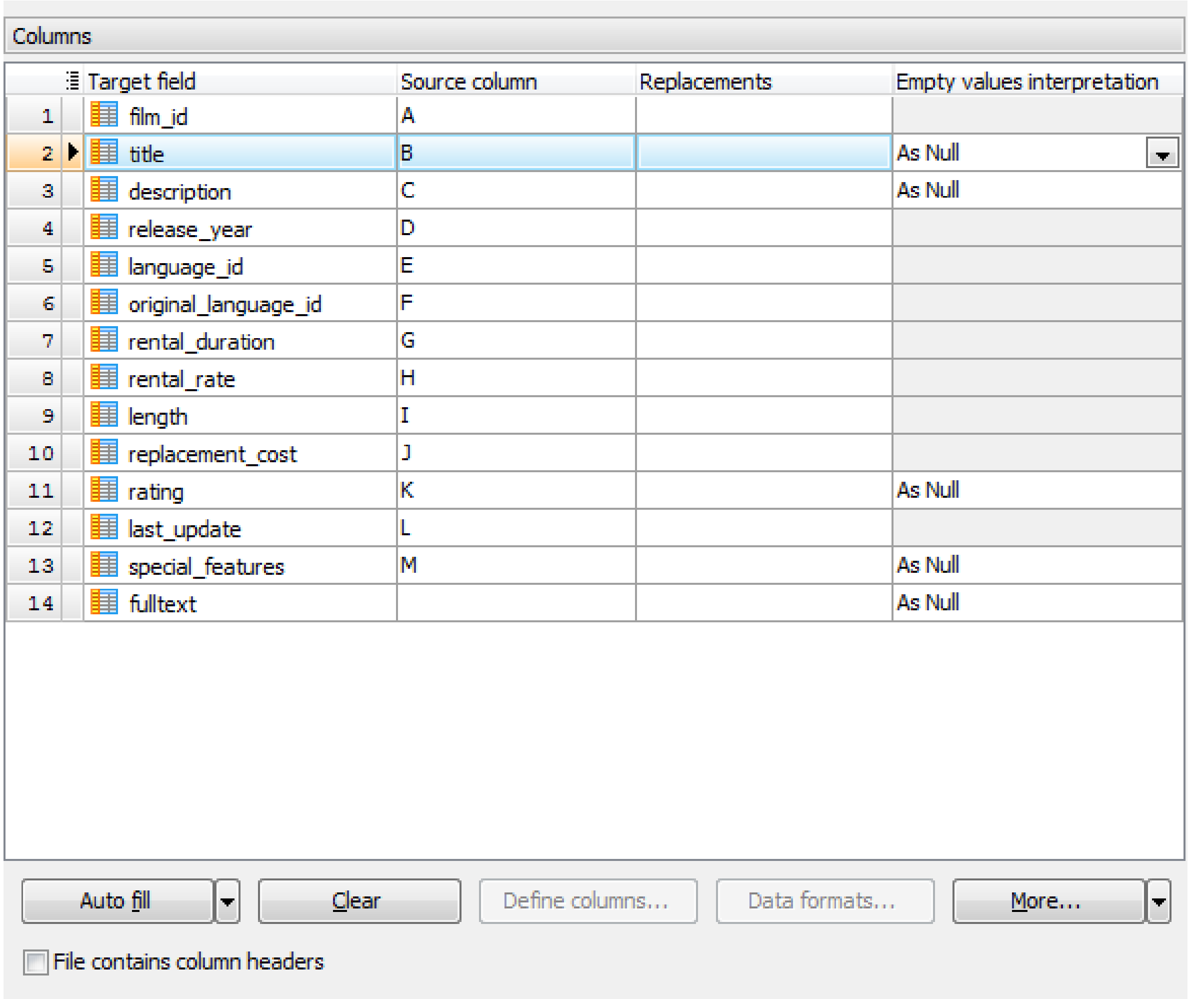
- You can map columns automatically by order with the Auto Fill and Auto fill all maps buttons.
- You can do it manually using the drop-down list of Source column fields.
- To map columns visually, open Map builder 229 with the Build map link.

It's useful to save a specified map to a file for further using it in the next wizard sessions. To save a map, use the More... button and follow the Save map link.

To see the 100 first rows of input file or output table, use the More... button and follow the View source data or Preview results links respectively.

You can also specify Replacements to be applied to the selected column before the import and data format masks 230 used for the input file.

To exclude the first file row, use the File contains column header checkbox.

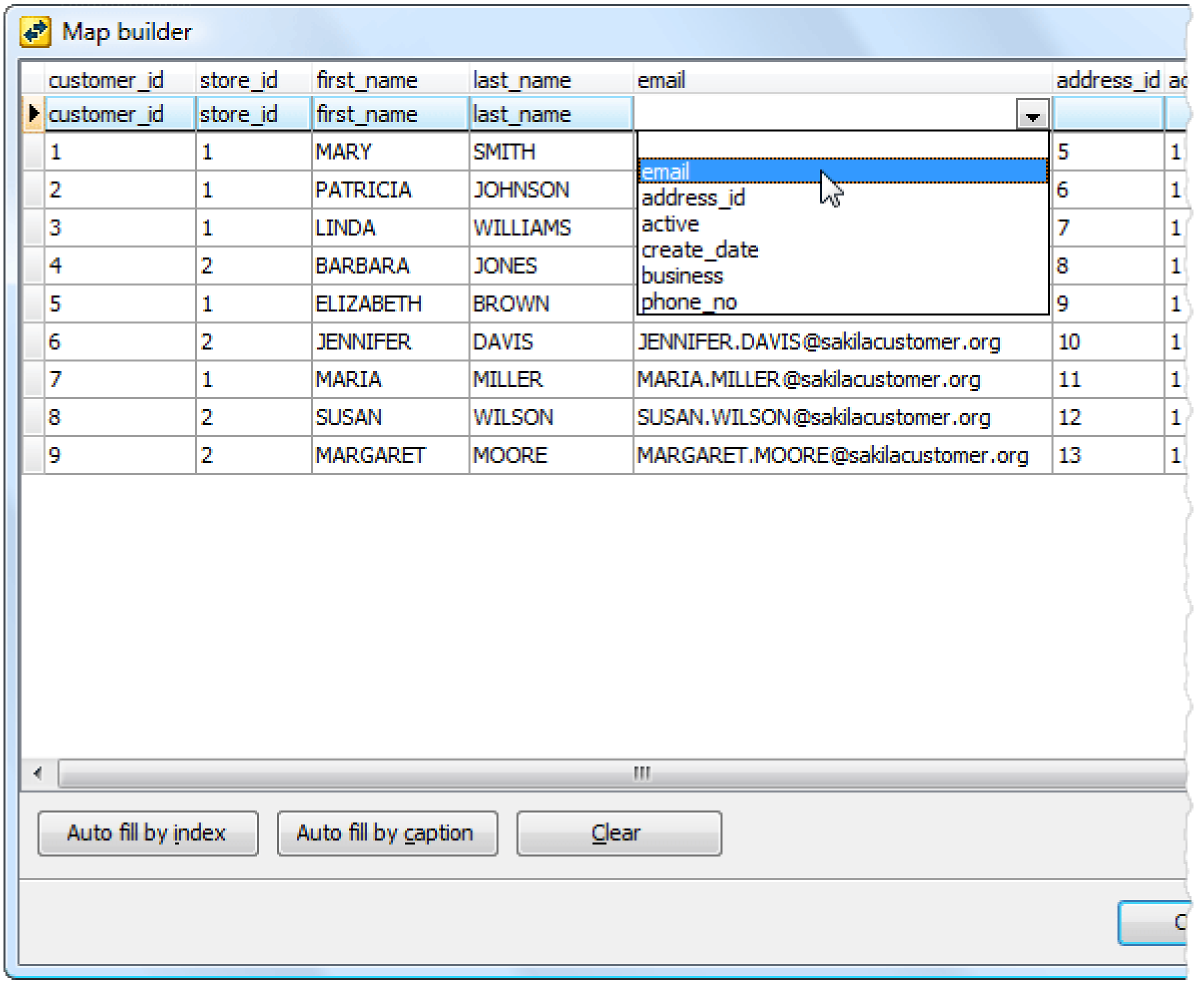


	Target field	Source column	Replacements	Empty values interpretation
1	film_id	A		
2	title	B		As Null
3	description	C		As Null
4	release_year	D		
5	language_id	E		
6	original_language_id	F		
7	rental_duration	G		
8	rental_rate	H		
9	length	I		
10	replacement_cost	J		
11	rating	K		As Null
12	last_update	L		
13	special_features	M		As Null
14	fulltext			As Null

☐ File contains column headers

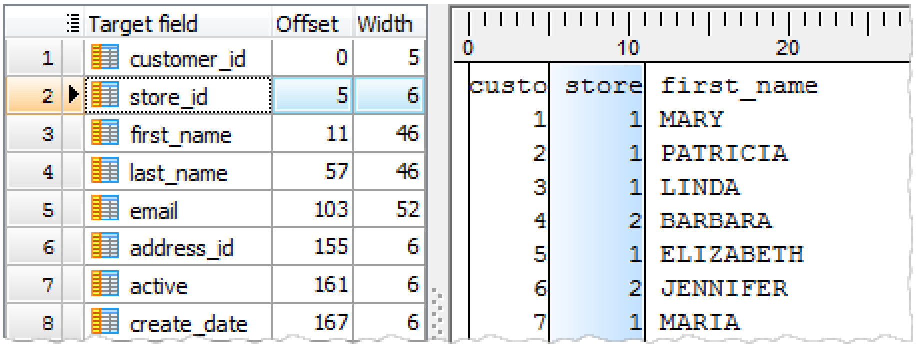
8.5.2.1 Map builder

To specify the accordance between source and target columns visually, use popup menu of the upper row to map source file columns to target table fields.



customer_id	store_id	first_name	last_name	email	address_id	ac
customer_id	store_id	first_name	last_name			
1	1	MARY	SMITH		5	1
2	1	PATRICIA	JOHNSON		6	1
3	1	LINDA	WILLIAMS		7	1
4	2	BARBARA	JONES		8	1
5	1	ELIZABETH	BROWN		9	1
6	2	JENNIFER	DAVIS	JENNIFER.DAVIS@sakilacustomer.org	10	1
7	1	MARIA	MILLER	MARIA.MILLER@sakilacustomer.org	11	1
8	2	SUSAN	WILSON	SUSAN.WILSON@sakilacustomer.org	12	1
9	2	MARGARET	MOORE	MARGARET.MOORE@sakilacustomer.org	13	1

For text files define columns bounds first. To add a bound, double-click near the column data in the builder area. To map a column to a target table field, select the field in the Target field list and then click between the bounds.



	Target field	Offset	Width
1	customer_id	0	5
2	store_id	5	6
3	first_name	11	46
4	last_name	57	46
5	email	103	52
6	address_id	155	6
7	active	161	6
8	create_date	167	6

```
custo store first_name
    1     1 MARY
    2     1 PATRICIA
    3     1 LINDA
    4     2 BARBARA
    5     1 ELIZABETH
    6     2 JENNIFER
    7     1 MARIA
```

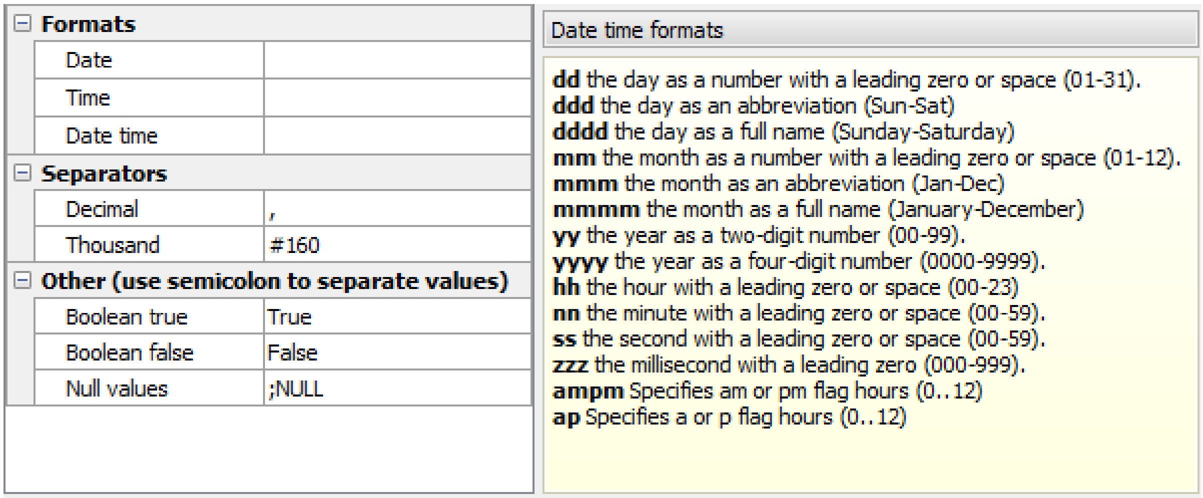
8.5.2.2 Data formats

Use the window fields to indicate format masks of the source data imported to the table. It allows the application to import data correctly.

The components of the date time format mask are represented at the window. Compose your date, time, and date time format mask of this components and separators. The following table contains some types of input fields and suggests masks to import them.

To import these input data correctly	Use these format masks
June 29	mmm dd
Jun 29, 2009	mmmm dd, yyyy
Tue Jun 14 16:50:49	ddd mmm dd hh:nn:ss
01/15/09 08:26 AM	mm/dd/yy h:nn ampm

You can also set decimal and thousand separators, and custom NULL,TRUE and FALSE values. If you have several values to be imported to NULL(TRUE, FALSE) value, use semicolons to separate them.



Formats	
Date	
Time	
Date time	
Separators	
Decimal	,
Thousand	#160
Other (use semicolon to separate values)	
Boolean true	True
Boolean false	False
Null values	;NULL

Date time formats

dd the day as a number with a leading zero or space (01-31).
ddd the day as an abbreviation (Sun-Sat)
dddd the day as a full name (Sunday-Saturday)
mm the month as a number with a leading zero or space (01-12).
mmm the month as an abbreviation (Jan-Dec)
mmmm the month as a full name (January-December)
yy the year as a two-digit number (00-99).
yyyy the year as a four-digit number (0000-9999).
hh the hour with a leading zero or space (00-23)
nn the minute with a leading zero or space (00-59).
ss the second with a leading zero or space (00-59).
zzz the millisecond with a leading zero (000-999).
ampm Specifies am or pm flag hours (0..12)
ap Specifies a or p flag hours (0..12)

8.5.3 Customizing common options

On the wizard step you can set the number of records to import, whether the tool import all table records or only the specified number. In the second case you can set the number of records to skip.

Logging
This options group let you to manage logging of the import process.

Scripts
There are many cases where the import process is necessary to correct with additional scripts. So to disable table indexes before the importing, specify the corresponding scripts to be executed before and after the process.

The typical example of usage of the Before each table and After each table scripts is the import data to autoincrement columns of several tables. In this case it's neseccary to set the corresponding scripts:
SET IDENTITY_INSERT %table_name% ON
and
SET IDENTITY_INSERT %table_name% OFF
to be executed before and after import data to each table correspondingly.

9 Database Tools

DB2 Maestro provides a number of powerful tools for working with databases.

The following tools are available:

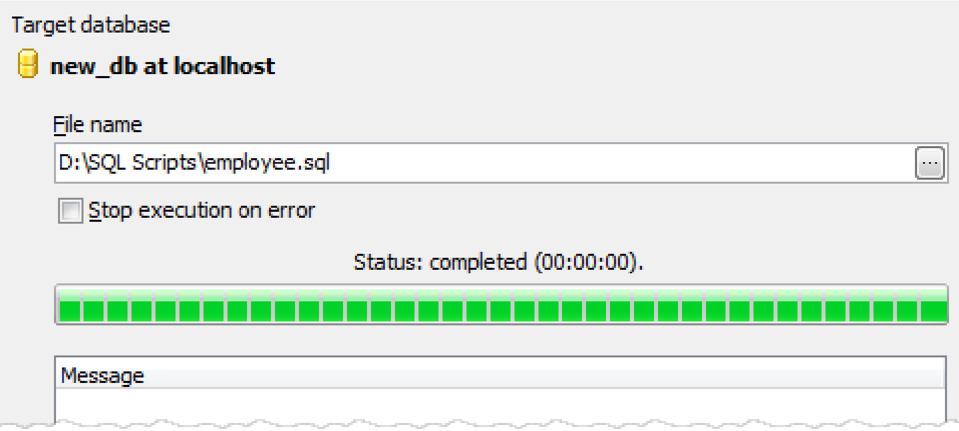
- **SQL Editor** 184
  Creates and executes SQL queries.
- **Visual Query Builder** 189
  Builds queries visually.
- **Script Runner** 233
  Executes SQL scripts to the database.
- **SQL Script Editor** 234
  Allows to edit and execute SQL scripts.
- **Generate Database Report Wizard** 236
  Generates the database HTML or PDF report for structure of selected object in a whole or partially.
- **BLOB Viewer** 238
  Displays a content of BLOB fields in different representations.
- **Diagram Viewer** 244
  Represents data from a table or a query as a diagram in various ways.
- **Data Analysis** 248
  Allows to slice and dice information efficiently according your business rules.
- **Report Designer** 253
  Prepares data for reading, viewing, and printing in a polished look.
- **Schema Designer** 260
  Allows to represent database tables and relationships as ER diagrams.
- **SQL Generator** 266
  Provides you with a set of simple SQL statements.
- Simple tools for **DML procedures** 267 and **Updatable views** 269 generation allow to create a bunch of CRUD procedures automatically.

9.1 Script Runner

Script Runner is designed for executing of SQL scripts that don't require modifications. The window can be invoked from the Tools menu or with the Execute script from file link of SQL Script Editor 234.

Script Runner allows to execute .sql files as well as archived scripts directly from .zip files. In case archived files this tool unpacks zip archives to temporary files by itself for further executing.The tool neither starts any implicit transactions before executing the script nor issues COMMIT or ROLLBACK commands after the executing.

To execute a script with Script Runner, set the file name and the Stop execution on error option value. This option allows to view all the execution errors (OFF). The specified script will be executed immediately on the database which name is represented at the top of the window.

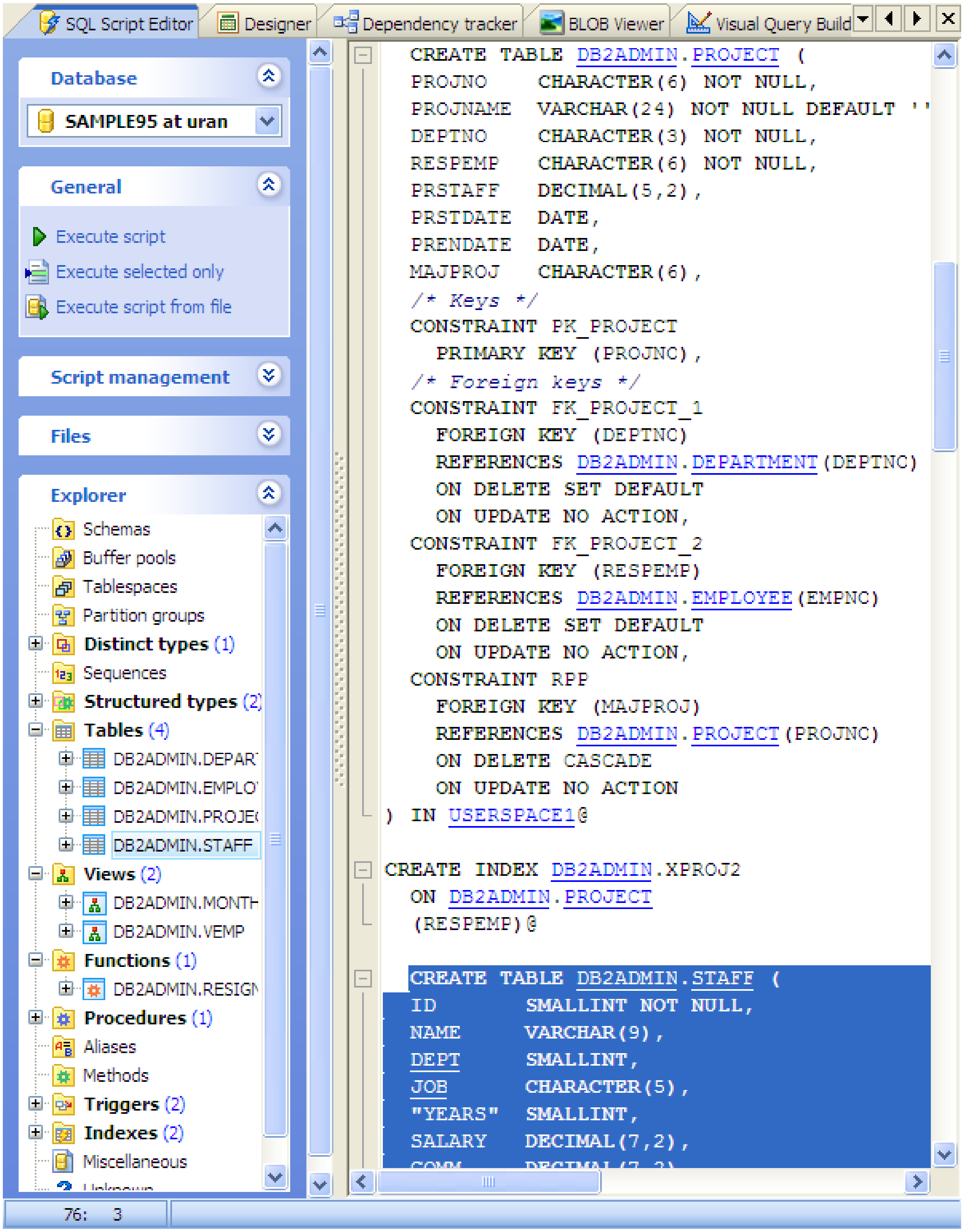

Target database
new_db at localhost
File name
D:\SQL Scripts\employee.sql
☐ Stop execution on error
Status: completed (00:00:00).

9.2 SQL Script Editor

SQL Script Editor is designed for SQL scripts editing and executing. The editor does not display results of SELECT queries. To work with such queries' data, use SQL Editor 184. If you have a script that is ready to use, execute it with Script Runner 233. To open SQL Script Editor, select the Tools | SQL Script Editor main menu item.

To work with a script within SQL Script Editor, load it from an *.sql* file or type it in the editor area directly. To prevent mistakes in SQL syntax, the editor supports syntax highlighting, code completion and divides the script text into logical parts that can be individually collapsed or expanded (code folding). All the logical parts are represented at the Explorer at the Navigation bar. It allows you to transfer to the proper script fragment quickly by clicking the corresponding node in the tree.

SQL Script Editor allows you to execute the whole SQL script or only its selected part. To make the executing of a large script much faster, execute the script directly from a file with Script Runner 233. By default, if a user opens a file larger than 100K, SQL Script Editor will suggest him to execute the script file without opening it in the editor. This file size may be changed at the editor's options 286 tab.

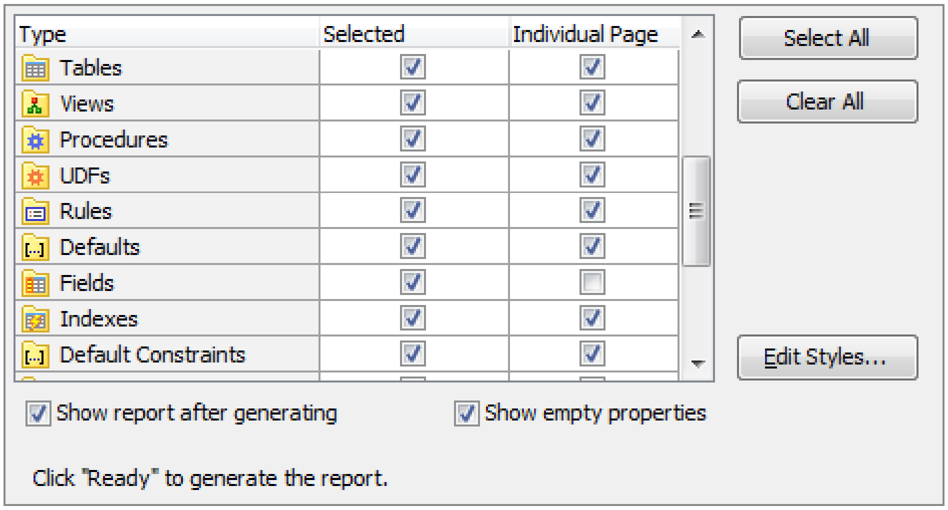


```
 CREATE TABLE DB2ADMIN.PROJECT (
 PROJNO     CHARACTER(6) NOT NULL,
 PROJNAME   VARCHAR(24) NOT NULL DEFAULT ''
 DEPTNO     CHARACTER(3) NOT NULL,
 RESPEMP    CHARACTER(6) NOT NULL,
 PRSTAFF    DECIMAL(5,2),
 PRSTDATE   DATE,
 PRENDATE   DATE,
 MAJPROJ    CHARACTER(6),
 /* Keys */
 CONSTRAINT PK_PROJECT
   PRIMARY KEY (PROJNO),
 /* Foreign keys */
 CONSTRAINT FK_PROJECT_1
   FOREIGN KEY (DEPTNO)
   REFERENCES DB2ADMIN.DEPARTMENT(DEPTNO)
   ON DELETE SET DEFAULT
   ON UPDATE NO ACTION,
 CONSTRAINT FK_PROJECT_2
   FOREIGN KEY (RESPEMP)
   REFERENCES DB2ADMIN.EMPLOYEE(EMPNO)
   ON DELETE SET DEFAULT
   ON UPDATE NO ACTION,
 CONSTRAINT RPP
   FOREIGN KEY (MAJPROJ)
   REFERENCES DB2ADMIN.PROJECT(PROJNO)
   ON DELETE CASCADE
   ON UPDATE NO ACTION
) IN USERSPACE1@

CREATE INDEX DB2ADMIN.XPROJ2
 ON DB2ADMIN.PROJECT
 (RESPEMP)@

 CREATE TABLE DB2ADMIN.STAFF (
 ID        SMALLINT NOT NULL,
 NAME      VARCHAR(9),
 DEPT      SMALLINT,
 JOB       CHARACTER(5),
 "YEARS"   SMALLINT,
 SALARY    DECIMAL(7,2),
```

9.3 Generate Database Report

With the help of Generate Database Report Wizard you can create HTML or PDF report for the structure of the selected object in the whole or partially. To run this wizard select the Tools | Generate Database Report main menu item.

- Selecting reporting elements and setting other report options 236
- Specifying reporting objects and editing styles 236



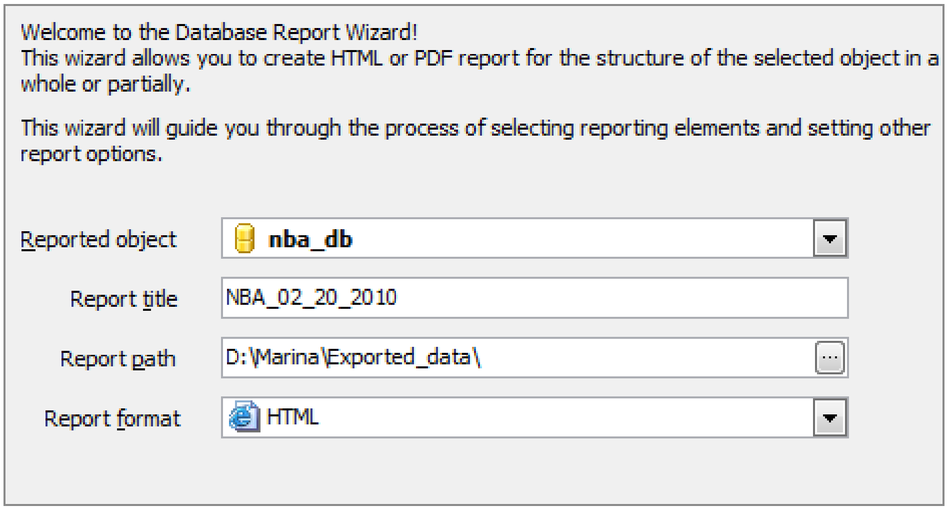
Type	Selected	Individual Page
Tables	☑	☑
Views	☑	☑
Procedures	☑	☑
UDFs	☑	☑
Rules	☑	☑
Defaults	☑	☑
Fields	☑	☐
Indexes	☑	☑
Default Constraints	☑	☑

☑ Show report after generating ☑ Show empty properties

Click "Ready" to generate the report.

9.3.1 Selecting reporting elements and setting other report options

Select the report object and the report format items, set the report title and the report path options in the respective boxes.



Welcome to the Database Report Wizard!
This wizard allows you to create HTML or PDF report for the structure of the selected object in a whole or partially.

This wizard will guide you through the process of selecting reporting elements and setting other report options.

Reported object: **nba_db**
Report title: NBA_02_20_2010
Report path: D:\Marina\Exported_data\
Report format: HTML

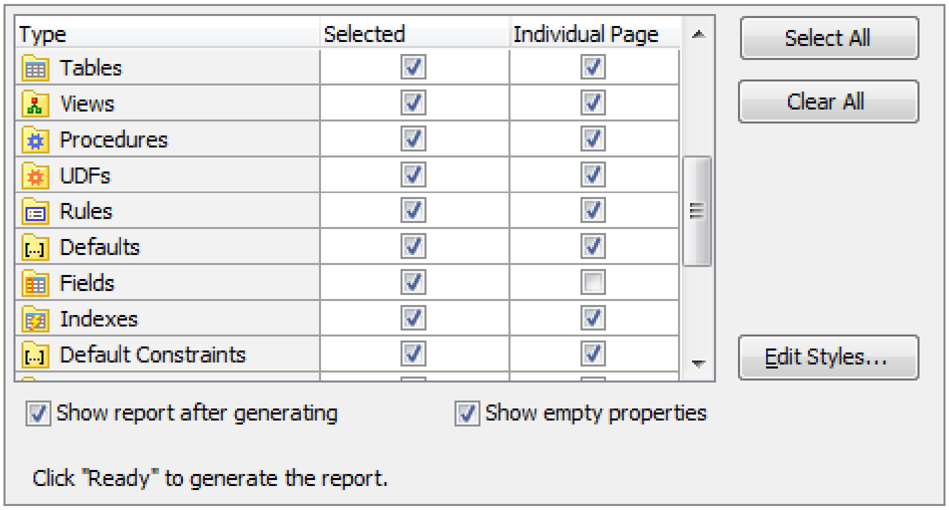
9.3.2 Reporting objects and editing styles options

This step allows you to select the essential objects to report and to specify the output format and style using Report Style Editor 237.

☑ Show report after generating

If checked, opens the result files in the associated program after making the report.

☑ Show empty properties
If checked, allows you to report objects even if they are empty.



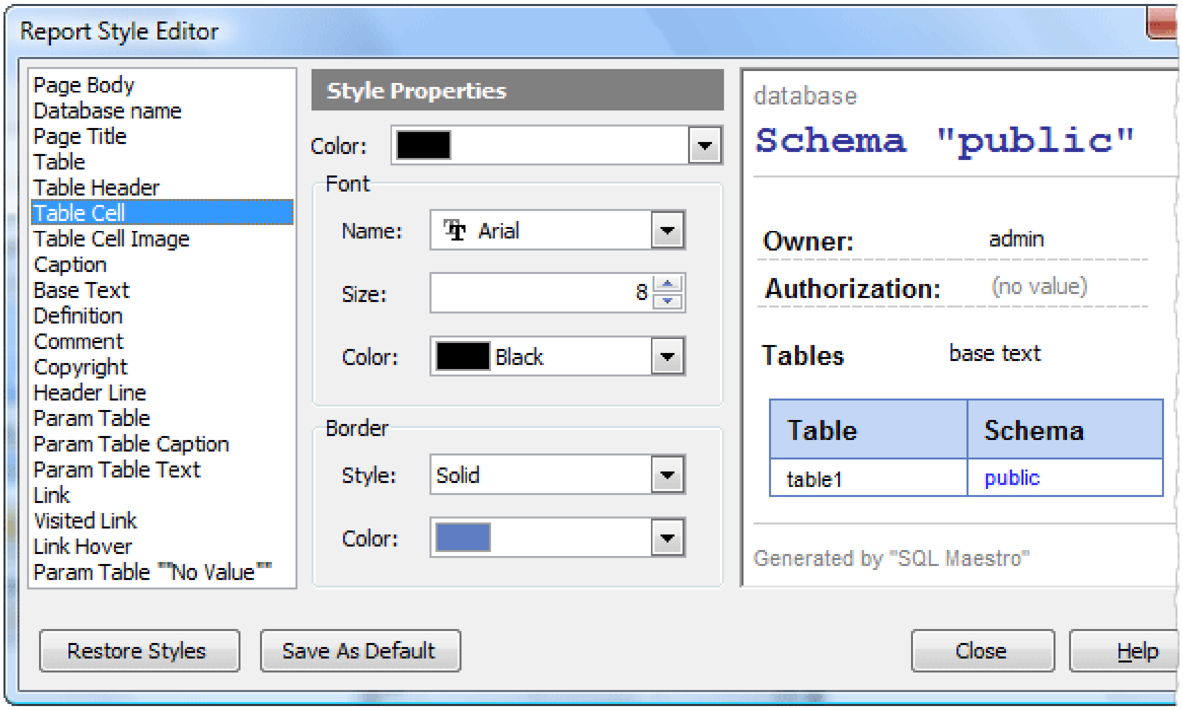
Type	Selected	Individual Page
Tables	☑	☑
Views	☑	☑
Procedures	☑	☑
UDFs	☑	☑
Rules	☑	☑
Defaults	☑	☑
Fields	☑	☐
Indexes	☑	☑
Default Constraints	☑	☑

☑ Show report after generating ☑ Show empty properties

Click "Ready" to generate the report.

9.3.3 Editing database report style

Using Report Style Editor you can specify style properties of a report including font size, color and name for different elements.



Color:

Font

Name: Arial

Size: 8

Color: Black

Border

Style: Solid

Color:

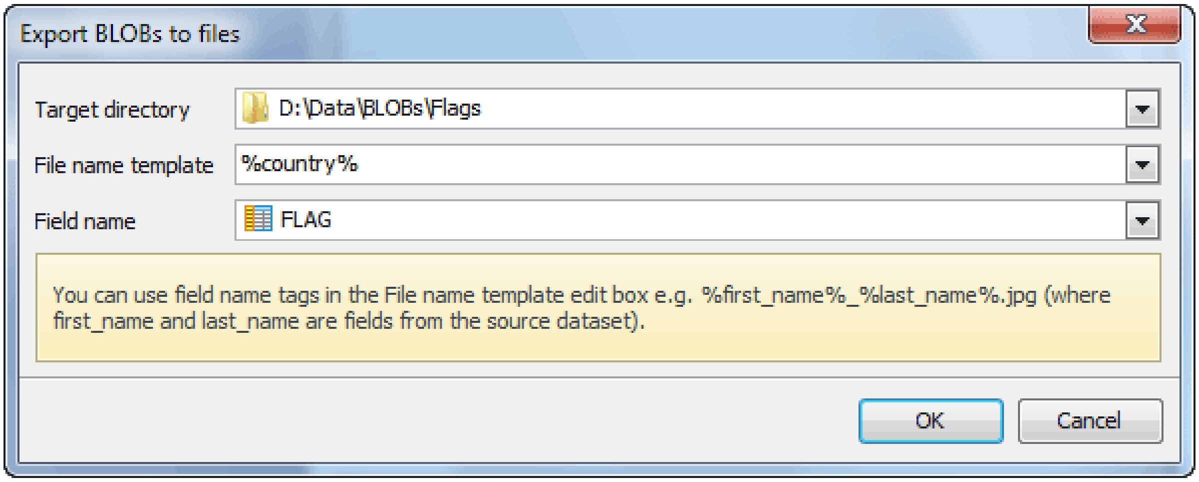
9.4 BLOB Viewer

BLOB Viewer allows you to view the content of the BLOB fields in various representations.

- Viewing BLOB field as hexadecimal dump 238
- Viewing BLOB field as plain text 239
- Viewing BLOB field as graphical image 240
- Viewing BLOB field as HTML 241
- Viewing BLOB field as PDF 242

See also: BLOB Editor 210

BLOB Viewer also allows you to save all BLOBs from a table or view to a given directory. Just click Save to files on the Navigation bar and fill all fields in the Export BLOBs window shown below. You can use table columns' names enclosed in % as a file name template.



Target directory: D:\Data\BLOBs\Flags

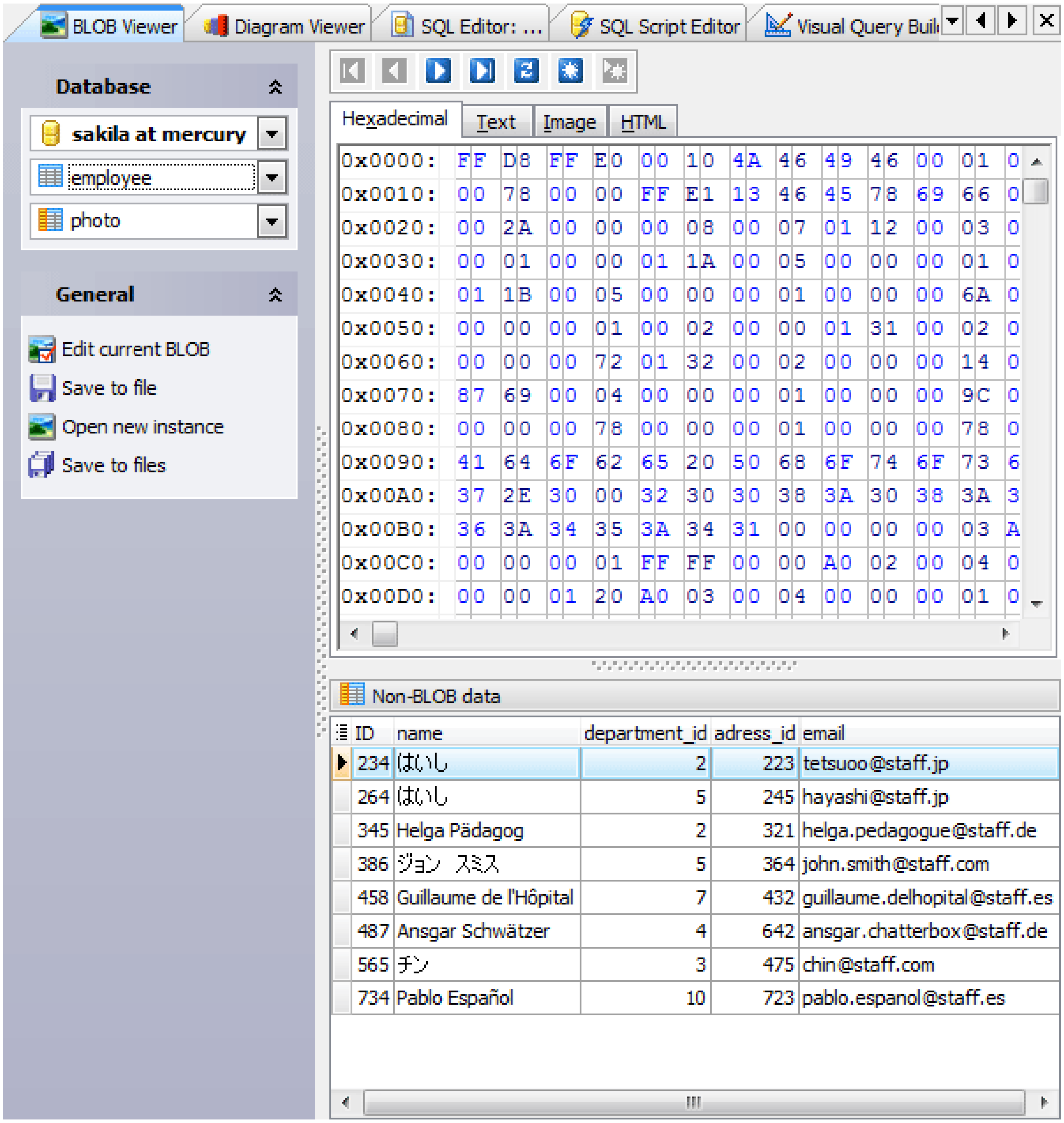
File name template: %country%

Field name: FLAG

You can use field name tags in the File name template edit box e.g. %first_name%_%last_name%.jpg (where first_name and last_name are fields from the source dataset).

9.4.1 Viewing as hexadecimal dump

The Hexadecimal panel allows you to view data in hexadecimal mode.

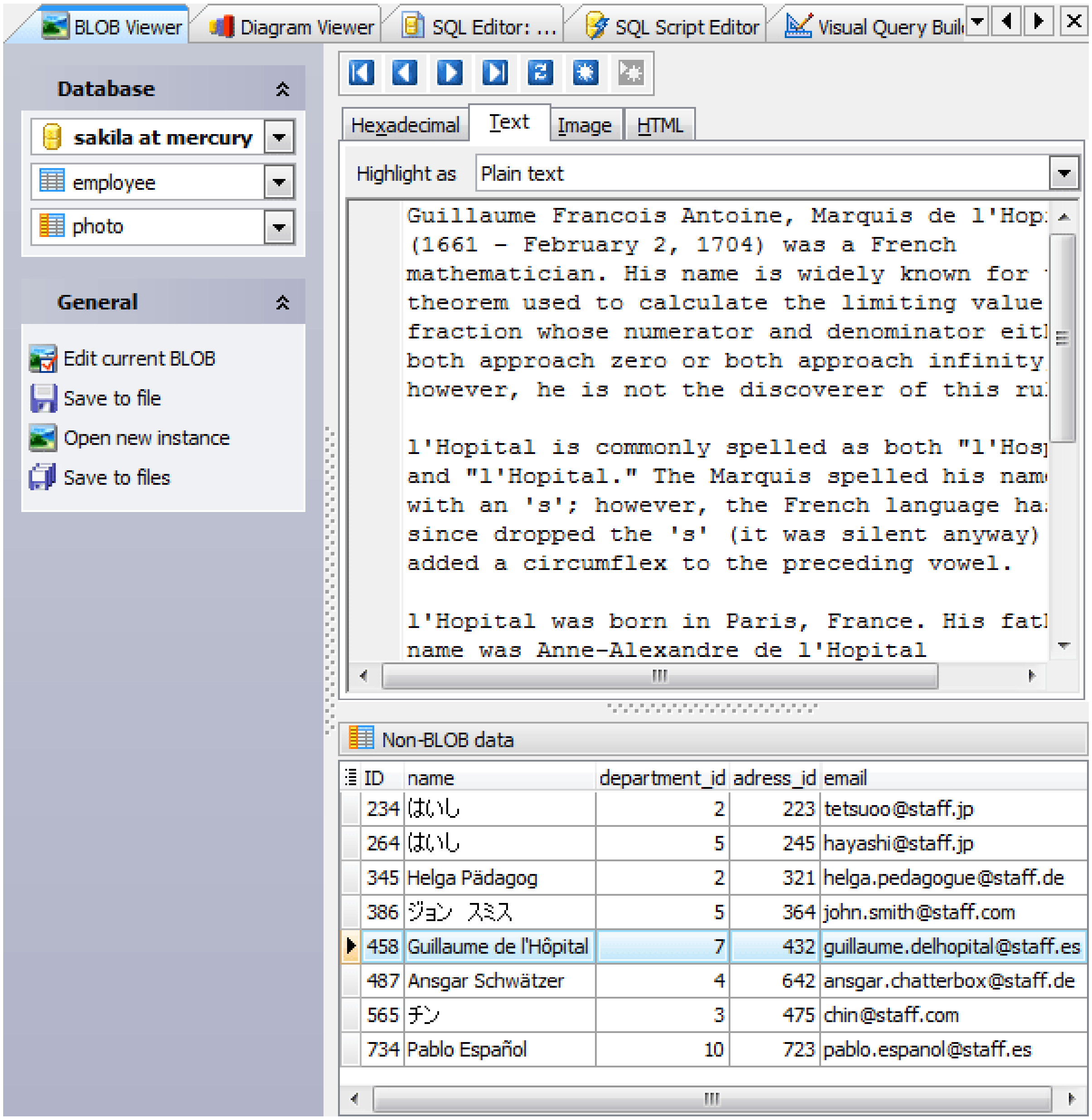


```
0x0000:  FF D8 FF E0 00 10 4A 46 49 46 00 01 0
0x0010:  00 78 00 00 FF E1 13 46 45 78 69 66 0
0x0020:  00 2A 00 00 00 08 00 07 01 12 00 03 0
0x0030:  00 01 00 00 01 1A 00 05 00 00 00 01 0
0x0040:  01 1B 00 05 00 00 00 01 00 00 00 6A 0
0x0050:  00 00 00 01 00 02 00 00 01 31 00 02 0
0x0060:  00 00 00 72 01 32 00 02 00 00 00 14 0
0x0070:  87 69 00 04 00 00 00 01 00 00 00 9C 0
0x0080:  00 00 00 78 00 00 00 01 00 00 00 78 0
0x0090:  41 64 6F 62 65 20 50 68 6F 74 6F 73 6
0x00A0:  37 2E 30 00 32 30 30 38 3A 30 38 3A 3
0x00B0:  36 3A 34 35 3A 34 31 00 00 00 00 03 A
0x00C0:  00 00 00 01 FF FF 00 00 A0 02 00 04 0
0x00D0:  00 00 01 20 A0 03 00 04 00 00 00 01 0
```

ID	name	department_id	adress_id	email
234	はいし	2	223	tetsuoo@staff.jp
264	はいし	5	245	hayashi@staff.jp
345	Helga Pädagog	2	321	helga.pedagogue@staff.de
386	ｼﾞｮﾝ ｽﾐｽ	5	364	john.smith@staff.com
458	Guillaume de l'Hôpital	7	432	guillaume.delhopital@staff.es
487	Ansgar Schwätzer	4	642	ansgar.chatterbox@staff.de
565	ﾁﾝ	3	475	chin@staff.com
734	Pablo Español	10	723	pablo.espanol@staff.es

9.4.2 Viewing as plain text

The Text panel allows you to view data as simple text. For your convenience several types of text highlighting are available (*Plain text, HTML, JScript, CSS, PHP, XML, SQL,* and *SQLite DDL*). The popup menu of the panel provides you to Find or Replace a necessary text fragment.



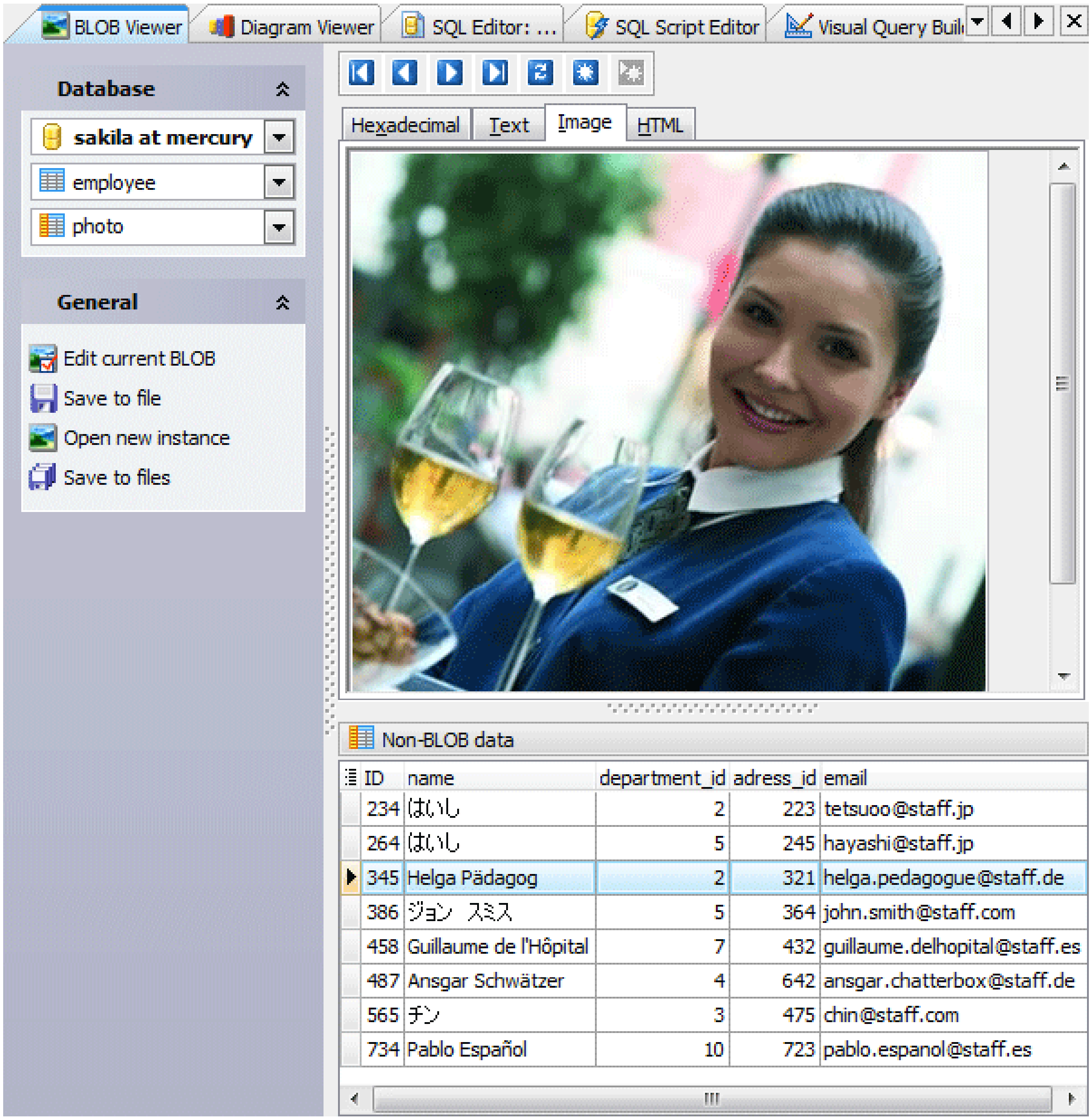
Highlight as: Plain text

```
Guillaume Francois Antoine, Marquis de l'Hop
(1661 - February 2, 1704) was a French
mathematician. His name is widely known for
theorem used to calculate the limiting value
fraction whose numerator and denominator eit
both approach zero or both approach infinity
however, he is not the discoverer of this ru

l'Hopital is commonly spelled as both "l'Hos
and "l'Hopital." The Marquis spelled his nam
with an 's'; however, the French language ha
since dropped the 's' (it was silent anyway)
added a circumflex to the preceding vowel.

l'Hopital was born in Paris, France. His fat
name was Anne-Alexandre de l'Hopital
```

ID	name	department_id	adress_id	email
234	はいし	2	223	tetsuoo@staff.jp
264	はいし	5	245	hayashi@staff.jp
345	Helga Pädagog	2	321	helga.pedagogue@staff.de
386	ジョン スミス	5	364	john.smith@staff.com
458	Guillaume de l'Hôpital	7	432	guillaume.delhopital@staff.es
487	Ansgar Schwätzer	4	642	ansgar.chatterbox@staff.de
565	チン	3	475	chin@staff.com
734	Pablo Español	10	723	pablo.espanol@staff.es

9.4.3 Viewing as image

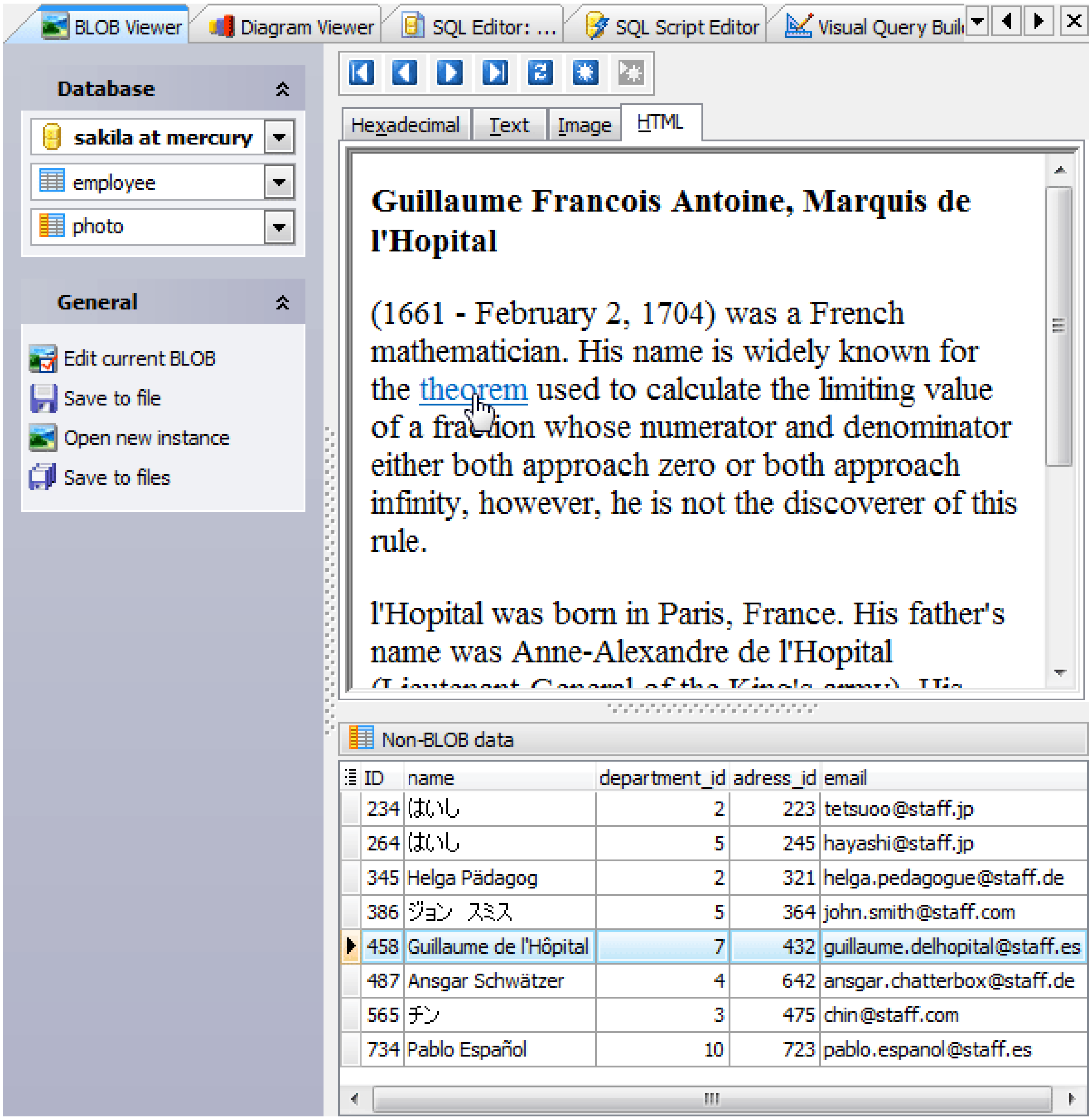
The Image panel displays field data as image.



ID	name	department_id	adress_id	email
234	はいし	2	223	tetsuoo@staff.jp
264	はいし	5	245	hayashi@staff.jp
345	Helga Pädagog	2	321	helga.pedagogue@staff.de
386	ジョン　スミス	5	364	john.smith@staff.com
458	Guillaume de l'Hôpital	7	432	guillaume.delhopital@staff.es
487	Ansgar Schwätzer	4	642	ansgar.chatterbox@staff.de
565	チン	3	475	chin@staff.com
734	Pablo Español	10	723	pablo.espanol@staff.es

9.4.4 Viewing as HTML

The HTML panel displays field data as HTML.



Guillaume Francois Antoine, Marquis de l'Hopital

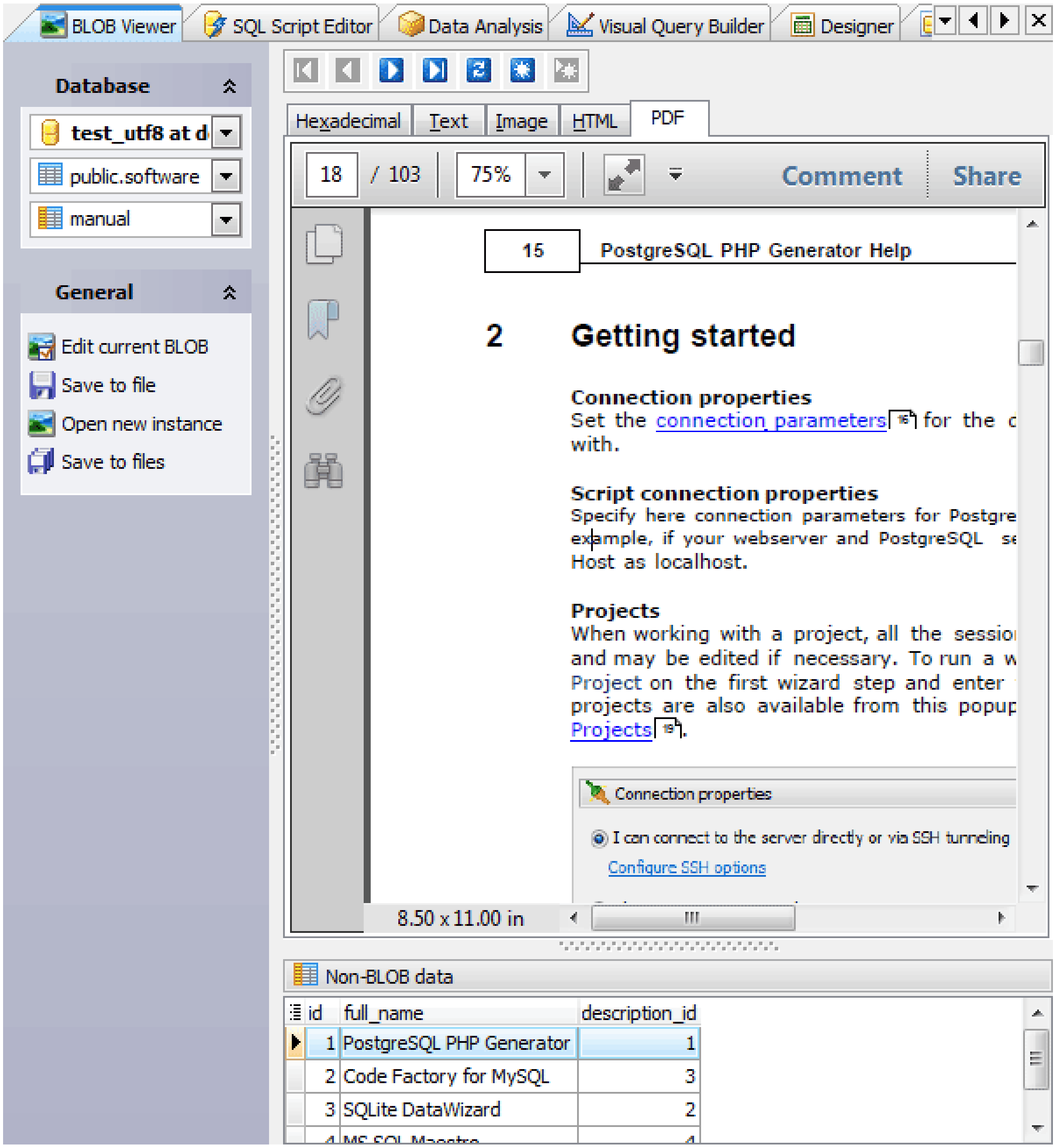
(1661 - February 2, 1704) was a French mathematician. His name is widely known for the theorem used to calculate the limiting value of a fraction whose numerator and denominator either both approach zero or both approach infinity, however, he is not the discoverer of this rule.

l'Hopital was born in Paris, France. His father's name was Anne-Alexandre de l'Hopital

ID	name	department_id	adress_id	email
234	はいし	2	223	tetsuoo@staff.jp
264	はいし	5	245	hayashi@staff.jp
345	Helga Pädagog	2	321	helga.pedagogue@staff.de
386	ジョン スミス	5	364	john.smith@staff.com
458	Guillaume de l'Hôpital	7	432	guillaume.delhopital@staff.es
487	Ansgar Schwätzer	4	642	ansgar.chatterbox@staff.de
565	チン	3	475	chin@staff.com
734	Pablo Español	10	723	pablo.espanol@staff.es

9.4.5 Viewing as PDF

The PDF panel allows you to browse PDF data stored in the database.



test_utf8 at d
public.software
manual

18 / 103 75%

15 PostgreSQL PHP Generator Help

2 Getting started

Connection properties
Set the connection parameters for the c
with.

Script connection properties
Specify here connection parameters for Postgre
example, if your webserver and PostgreSQL se
Host as localhost.

Projects
When working with a project, all the sessio
and may be edited if necessary. To run a w
Project on the first wizard step and enter
projects are also available from this popup
Projects.

Connection properties

● I can connect to the server directly or via SSH tunneling

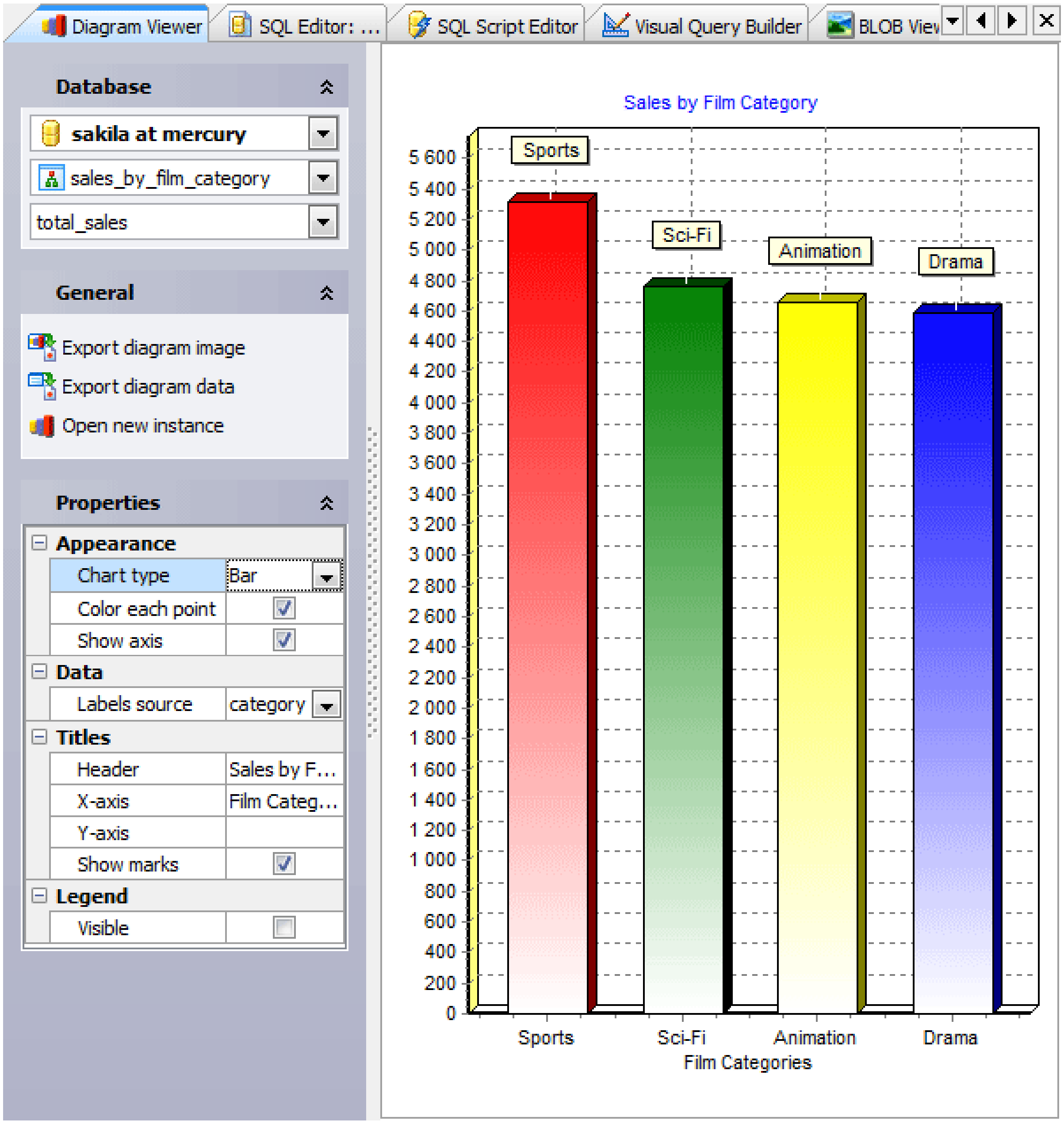
Configure SSH options

id	full_name	description_id
1	PostgreSQL PHP Generator	1
2	Code Factory for MySQL	3
3	SQLite DataWizard	2
4	MS SQL Maestro	4

9.5 Diagram Viewer

Diagram Viewer is a tool for representing data from a table or a query as a diagram in various ways. This means you can build a diagram represented as bars, lines, areas, points or pies, colored or not, with axis visible or not; specify axis labels source, diagram header and more. The Diagram Viewer also has the Export diagram image 246 and the Export diagram data features implemented, with a lot of formats supported.

- Customizing diagram options 245
- Exporting diagram as a graphical image 246



sakila at mercury
sales_by_film_category
total_sales

Appearance

Chart type	Bar
Color each point	☑
Show axis	☑

Data

Labels source	category

Titles

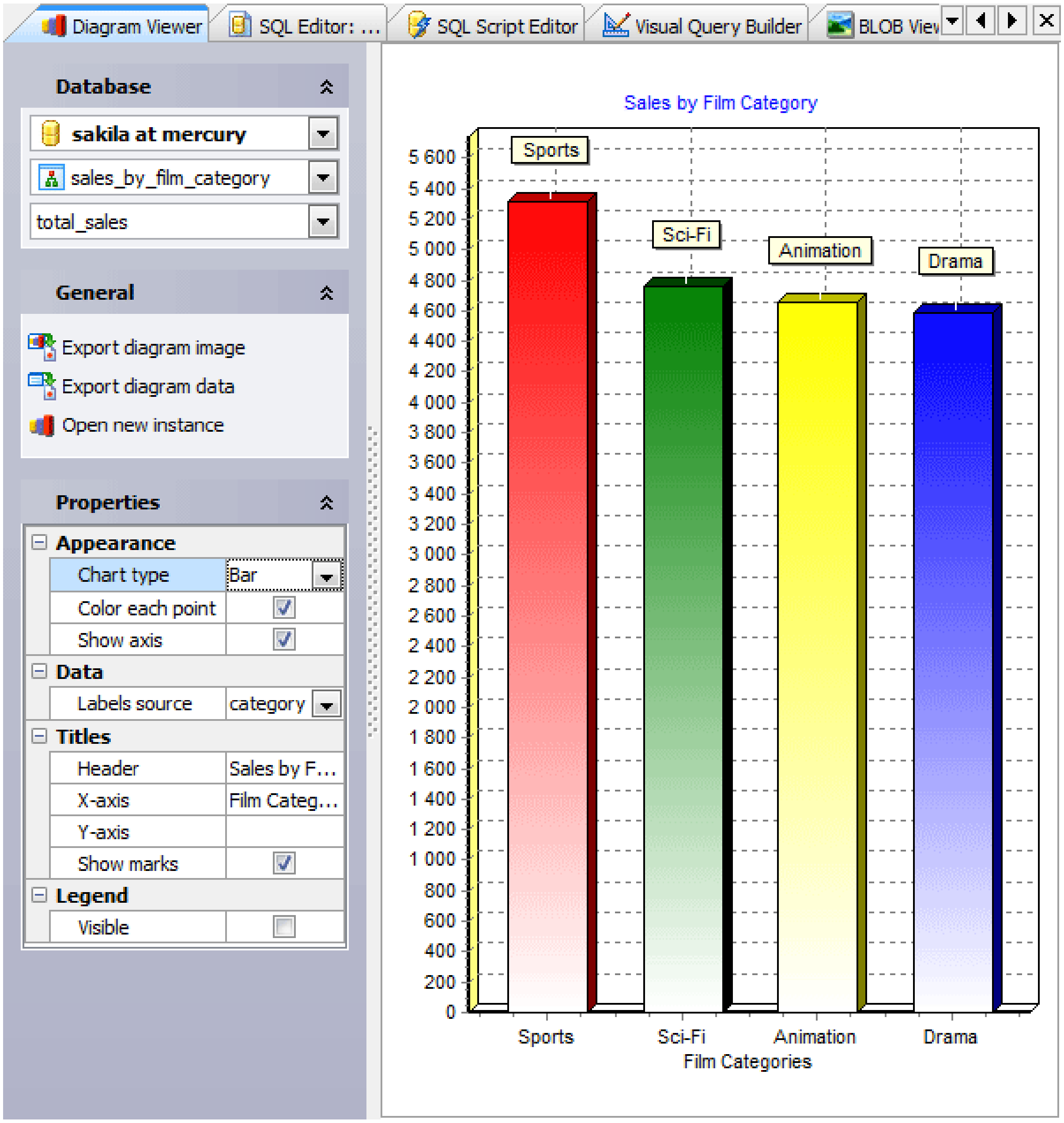
Header	Sales by F...
X-axis	Film Categ...
Y-axis	
Show marks	☑

Legend

Visible	☐

9.5.1 Customizing diagram properties

To build a diagram in Diagram Viewer, you should select the source field(s) to be represented in the diagram first. Only numeric types of fields can be used in the diagram, and each selected field corresponds to a separated diagram series. Fields are selected by checking items in the third combo box from the top in the Database group of the Navigation Bar. If the combo box is empty then either data source is not yet selected or it contains no numeric fields.



sakila at mercury
sales_by_film_category
total_sales

Appearance	
Chart type	Bar
Color each point	☑
Show axis	☑
Data	
Labels source	category
Titles	
Header	Sales by F...
X-axis	Film Categ...
Y-axis	
Show marks	☑
Legend	
Visible	☐

Diagram Viewer provides a special control for customizing the diagram properties. This control is located in the Properties group of the Navigation Bar and consists of four separate subgroups:

Appearance
Contains properties responsible for major diagram appearance:

- Chart type - defines a way of how the diagram will be represented: as bars, lines, areas, points, pies, or fast lines
- Color each points - if checked, each bar, point, line or sector of the diagram has an individual color; if not checked, all the points are colored red
- Show axis - defines if the diagram has the axis and background grid or not

Data
Contains the Labels source property which allows you to specify the field for X-axis labels as well as for diagram point marks .

Titles
Contains properties for defining titles for different parts of the diagram:

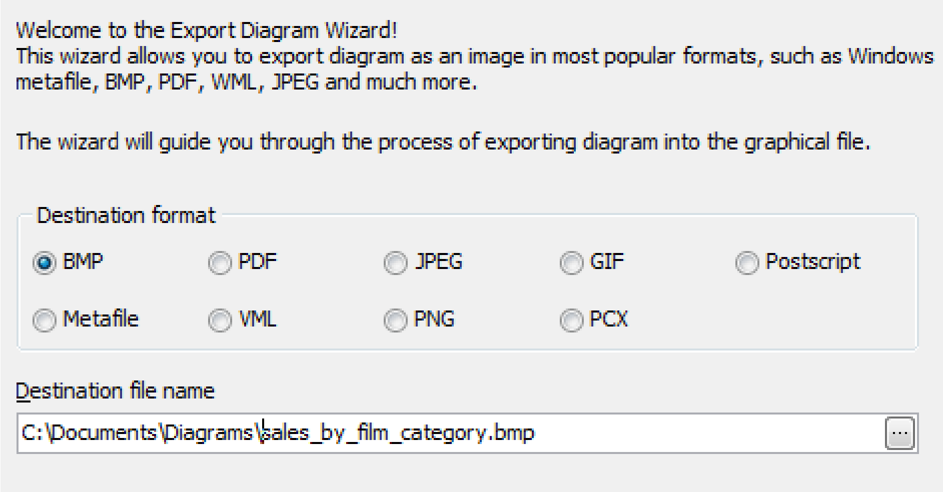
- Header - defines the title appeared on the top of the diagram
- X-axis and Y-axis - define the titles for diagram axis
- Show marks - defines if the diagram point marks are visible or not

Legend
The only Visible property of this subgroup specifies whether the legend rectangle should be represented on the right side of the diagram or not.

9.5.2 Exporting diagram image

Diagram Viewer provides an ability to export current diagram to a file as graphical image. This ability is constituted in Export Diagram Wizard which can be invoked by the Export diagram image item of the Navigation Bar.

Select the desired graphical format in the Destination format radio group and specify the file name in the Destination file name box.



Welcome to the Export Diagram Wizard!
This wizard allows you to export diagram as an image in most popular formats, such as Windows metafile, BMP, PDF, WML, JPEG and much more.

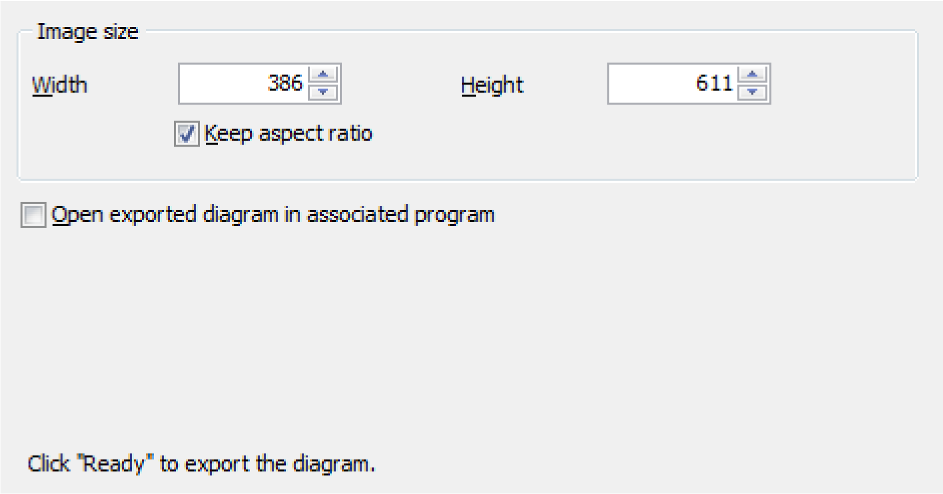
The wizard will guide you through the process of exporting diagram into the graphical file.

Destination format

● BMP ○ PDF ○ JPEG ○ GIF ○ Postscript
○ Metafile ○ VML ○ PNG ○ PCX

Destination file name: C:\Documents\Diagrams\sales_by_film_category.bmp

Set the destination width and height by the corresponding spin edits. Check or uncheck the Keep aspect ratio option to keep the image ratio for exported image or not. Check the Open exported image in associated program option to view the image after the export is done.



Width 386

Height 611

☑ Keep aspect ratio

☐ Open exported diagram in associated program

Click "Ready" to export the diagram.

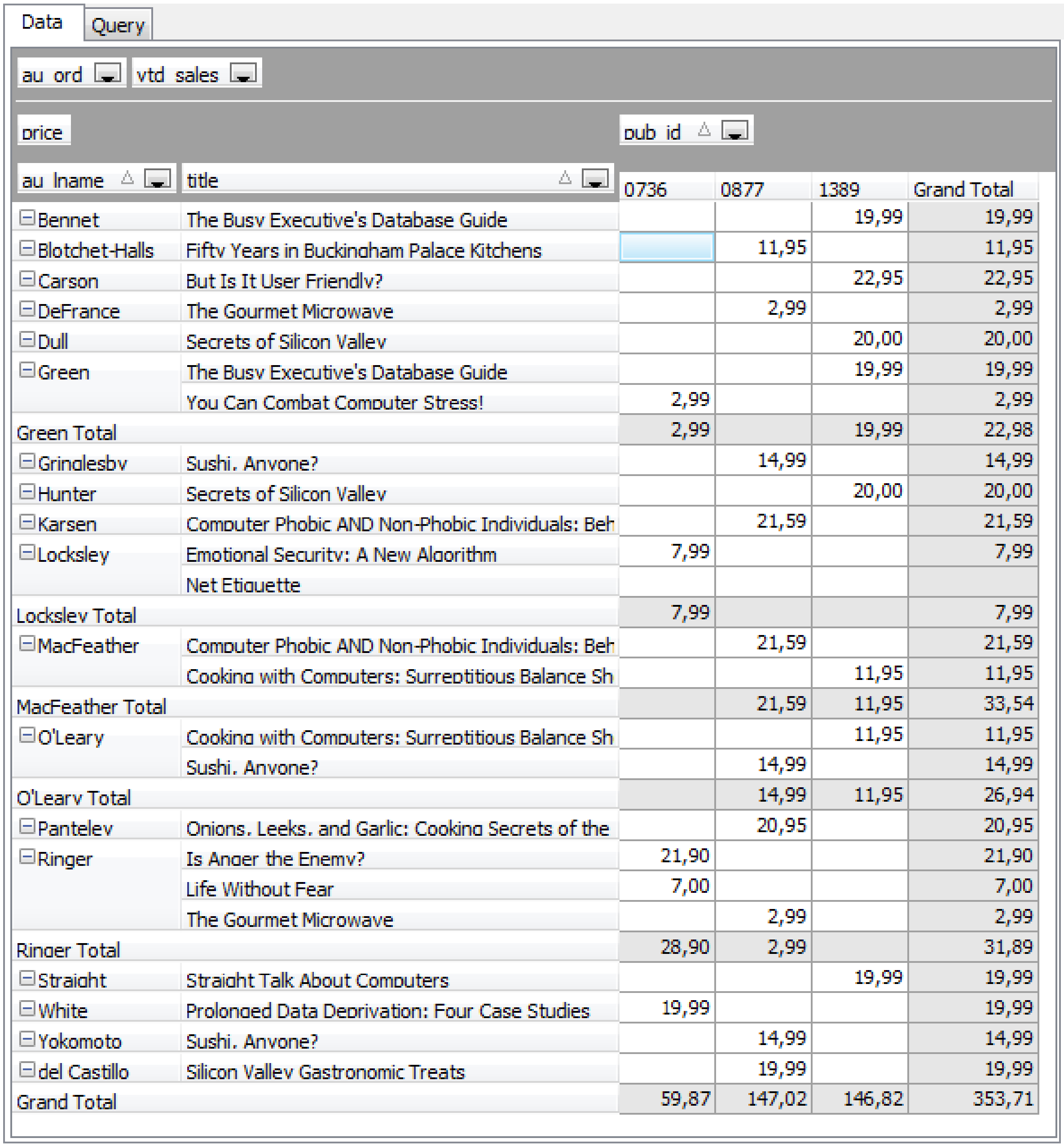
9.6 Data Analysis

Data Analysis is a tool to define a multidimensional model with analytic calculations to analyze information also called OLAP cube. Such cubes could effectively be re-oriented. So the tool allows you to view data in various ways, such as displaying all the cities down the page and all the products across a page and then immediately view it in another way. Because this re-orientation involves re-summarizing very large amounts of data, this new view of the data has to be generated efficiently to avoid wasting the analyst's time, i.e. within seconds, rather than the hours a relational database and conventional report-writer might have taken. It allows you to focus on business rules rather than creating dozens and dozens of reports. To run Data Analysis, choose Tools | Data Analysis main menu item.

To get an OLAP cube:

- Input SELECT query 249 in the Query window or load it from the .cub file.
- Manage report data 250 in the Data window.

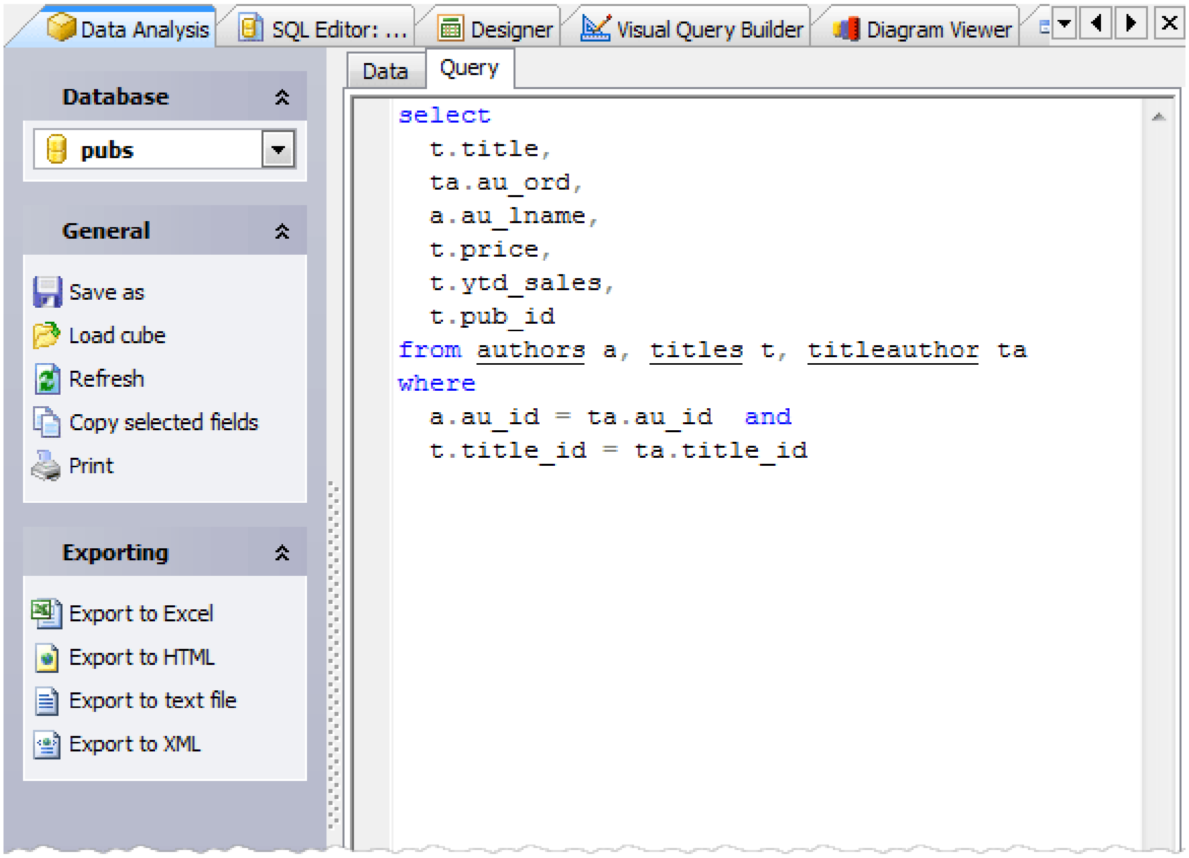
The Data Analysis tool allows you to save the created OLAP cube to .cub file, print it, or export it to Excel, HTML, XML, and text file.



au_lname	title	0736	0877	1389	Grand Total
Bennet	The Busy Executive's Database Guide			19,99	19,99
Blotchet-Halls	Fifty Years in Buckingham Palace Kitchens		11,95		11,95
Carson	But Is It User Friendly?			22,95	22,95
DeFrance	The Gourmet Microwave		2,99		2,99
Dull	Secrets of Silicon Valley			20,00	20,00
Green	The Busy Executive's Database Guide			19,99	19,99
	You Can Combat Computer Stress!	2,99			2,99
Green Total		2,99		19,99	22,98
Gringlesby	Sushi, Anyone?		14,99		14,99
Hunter	Secrets of Silicon Valley			20,00	20,00
Karsen	Computer Phobic AND Non-Phobic Individuals: Beh		21,59		21,59
Locksley	Emotional Security: A New Algorithm	7,99			7,99
	Net Etiquette				
Locksley Total		7,99			7,99
MacFeather	Computer Phobic AND Non-Phobic Individuals: Beh		21,59		21,59
	Cooking with Computers: Surreptitious Balance Sh			11,95	11,95
MacFeather Total			21,59	11,95	33,54
O'Leary	Cooking with Computers: Surreptitious Balance Sh			11,95	11,95
	Sushi, Anyone?		14,99		14,99
O'Leary Total			14,99	11,95	26,94
Panteley	Onions, Leeks, and Garlic: Cooking Secrets of the		20,95		20,95
Ringer	Is Anger the Enemy?	21,90			21,90
	Life Without Fear	7,00			7,00
	The Gourmet Microwave		2,99		2,99
Ringer Total		28,90	2,99		31,89
Straight	Straight Talk About Computers			19,99	19,99
White	Prolonged Data Deprivation: Four Case Studies	19,99			19,99
Yokomoto	Sushi, Anyone?		14,99		14,99
del Castillo	Silicon Valley Gastronomic Treats		19,99		19,99
Grand Total		59,87	147,02	146,82	353,71

9.6.1 Input SELECT query

To get an OLAP cube 250, enter SELECT query as a snowflake schema, represented by centralized fact tables (with numeric data) which are connected to multiple dimensions (the numeric data to be categorized by). Input the query text in the SQL Editor area directly or use "drag-n-drop" operation SQL Editor or Visual Query Builder areas and the Query tab of Data Analisis.

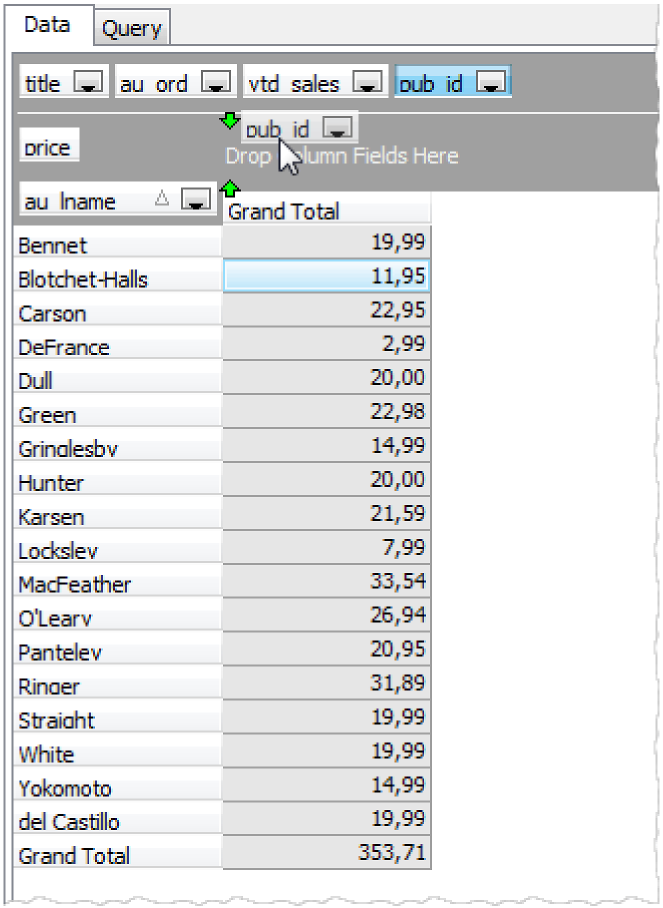


```
select
  t.title,
  ta.au_ord,
  a.au_lname,
  t.price,
  t.ytd_sales,
  t.pub_id
from authors a, titles t, titleauthor ta
where
  a.au_id = ta.au_id  and
  t.title_id = ta.title_id
```

9.6.2 Managing report data

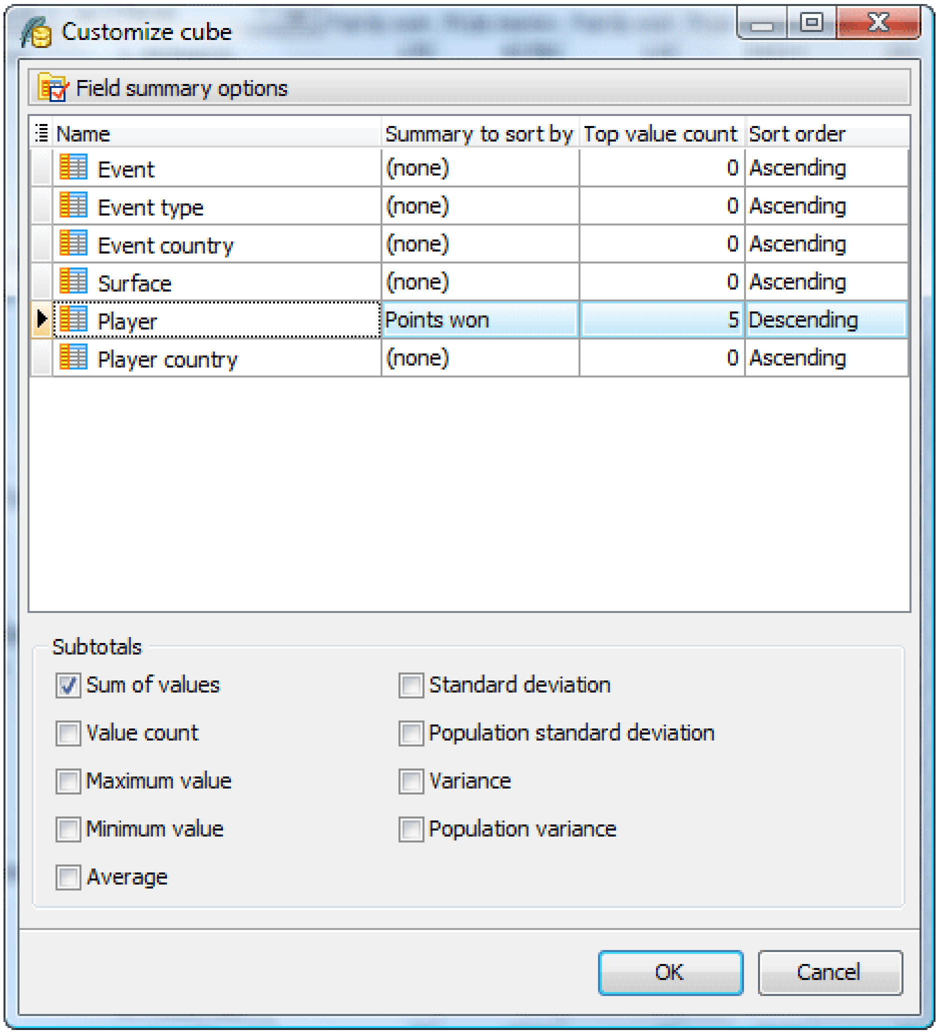
The Data tab allows you to manipulate the created OLAP cube appearance. At the beginning all the query 249 columns are arranged at the top of the tab. Put them according to your business rules: drag numeric columns to be filtered and summarized corresponding to the chosen columns and rows to the Data Fields area; place necessary columns to Column Fields / Row Fields areas respectively.

Note: Use for the Data Fields area only numerical columns.



au lname	Grand Total
Bennet	19,99
Blotchet-Halls	11,95
Carson	22,95
DeFrance	2,99
Dull	20,00
Green	22,98
Gringlesby	14,99
Hunter	20,00
Karsen	21,59
Locksley	7,99
MacFeather	33,54
O'Leary	26,94
Panteley	20,95
Ringer	31,89
Straight	19,99
White	19,99
Yokomoto	14,99
del Castillo	19,99
Grand Total	353,71

To set the aggregates calculated on the numeric columns, use the Customize cub window opened with the corresponding link at the Navigation bar. The window provides you also with an ability to specify columns the summary to be sorted by, the sort order and the max number of records represented in grid.



Name	Summary to sort by	Top value count	Sort order
Event	(none)	0	Ascending
Event type	(none)	0	Ascending
Event country	(none)	0	Ascending
Surface	(none)	0	Ascending
Player	Points won	5	Descending
Player country	(none)	0	Ascending

Subtotals

☑ Sum of values	☐ Standard deviation
☐ Value count	☐ Population standard deviation
☐ Maximum value	☐ Variance
☐ Minimum value	☐ Population variance
☐ Average	

9.7 Report Designer

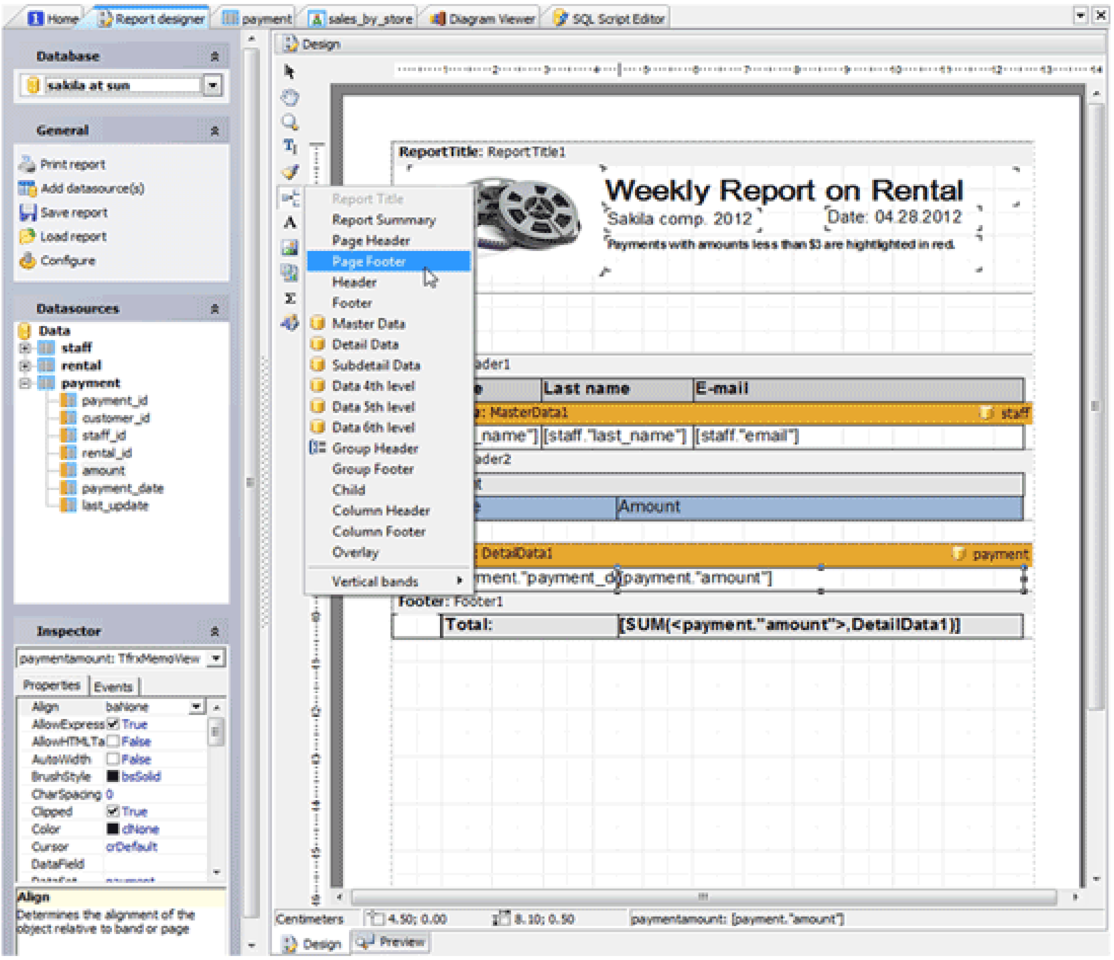
Report Designer allows you to create database reports, define reports appearance in your own style, equip it with master-detail data views, aggregate functions, and images and control the result with the ability of simultaneous previewing. To run Report Designer, choose Tools | Report Designer main menu item.

To create a report, you need to:

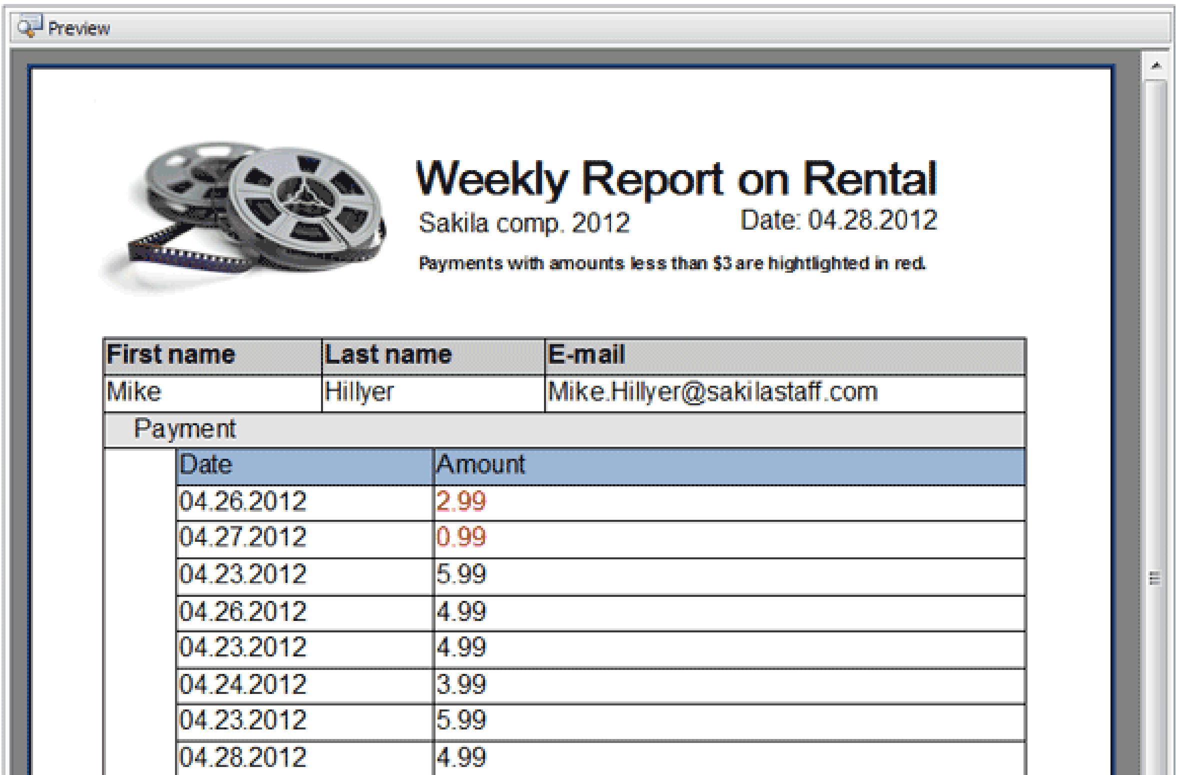
- specify data sources 255 for the data to be used in the report;
- add all necessary objects 255 to the report template;
- set the objects' format within the Inspector window 257.

The prepared report pages are available immediately at the Preview window where you can browse it, save to it an .smr file, or print.

Report Designer in Action



Report Preview



Weekly Report on Rental

Sakila comp. 2012 Date: 04.28.2012

Payments with amounts less than $3 are hightlighted in red.

First name	Last name	E-mail
Mike	Hillyer	Mike.Hillyer@sakilastaff.com

Payment

Date	Amount
04.26.2012	2.99
04.27.2012	0.99
04.23.2012	5.99
04.26.2012	4.99
04.23.2012	4.99
04.24.2012	3.99
04.23.2012	5.99
04.28.2012	4.99

9.7.1 Designer Tools and Objects

A blank report is presented as a paper page. At any place on the page, a user is able to add objects, which can display different information (such as text and/or graphics), as well as to define report's appearance. There is a possibility to use rulers and a grid with a specified size in the Design tab. To enable/disable these options, follow the Configure link at the Navigation Bar and check the corresponding boxes.

Datasources
To use content of a table (view) column data in a report,

- check the necessary database is selected as Database at the Navigation Bar;
- drag the table which data to be used in the report to the Datasources pane at the Navigation Bar;
- drag the necessary column from this pane and drop it to the necessary location on a report page.

Designer tools:
Select tool
The standard tool to select objects, modify their sizes, etc.

Hand tool
The tool allows dragging a report page.

Zoom tool
When the button is pressed, clicking on the left button doubles the zoom (adds 100%), while clicking the right one zooms out by 100%. When holding the left mouse button while dragging,the selected area would be zoomed.

Edit text tool
Clicking on the text object allows editing its contents right on the report page. If you hold the left mouse button when moving the cursor, the text object appears in the selected place, and then its editor launches.

Copy format tool
The button becomes enabled when the text object is selected. When clicking on the text object with the left button, it copies formatting, which has the previously selected text object, into the object.

Available objects:
Band objects allow to specify where, when, and how to display data and information in reports. Bands are used for logically placing the objects it contains at a location on the output page. Insert Band adds an area with definite behaviour according to it's type such basic bands as Header, Footer, Title, and Summary, and databands whose allow to print data from database tables such as Master Data, Detail Data, etc.

Text object displays one or several text lines within the rectangular area.

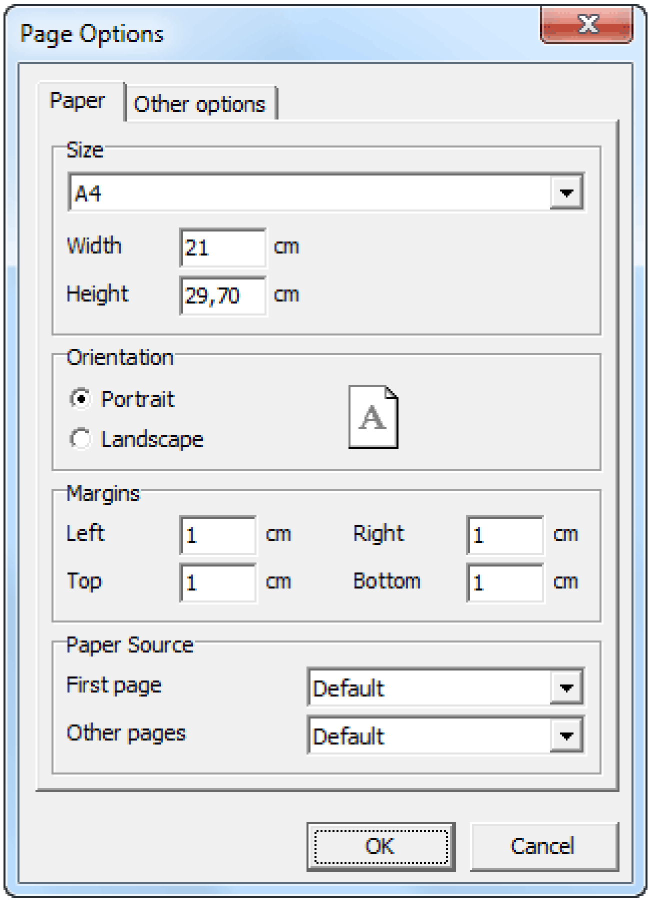
Picture object displays a graphic file in BMP, JPEG, ICO, WMF, or EMF format.

Subreport object allows inserting an additional report design page inside the basic one.

System text displays service information (date, time, page number, etc), as well as aggregate values.

Draw object represents different geometrical figures (diagonal line, rectangle, rounded rectangle, ellipse, triangle, and diamond).

Page options
This dialogue allows you to set the page settings of the prepared. To invoke the window, use the Edit... link of the page blank space popup menu. The dialogue has two pages: Paper and Other options. On the Paper page, you can select size and alignment of paper, as well as set margins. In Paper source drop-down lists you can select a printer tray for the first page and the rest of the report pages.



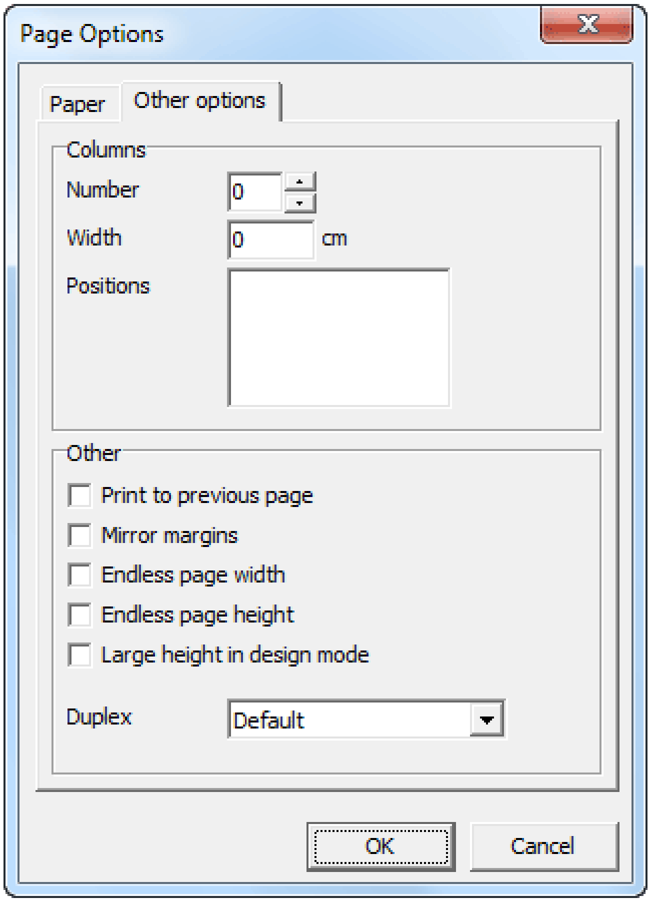
Size
A4
Width 21 cm
Height 29,70 cm

Orientation
● Portrait
○ Landscape

Margins
Left 1 cm
Right 1 cm
Top 1 cm
Bottom 1 cm

Paper Source
First page Default
Other pages Default

On Other Options you can set the number of columns for multi-column reports' printing. The current settings are displayed in the designer.



The Print to previous page flag allows you to print pages, beginning from blank space of the previous page. This option can be used in case when a report template consists of several pages or when printing batch (composite) reports.

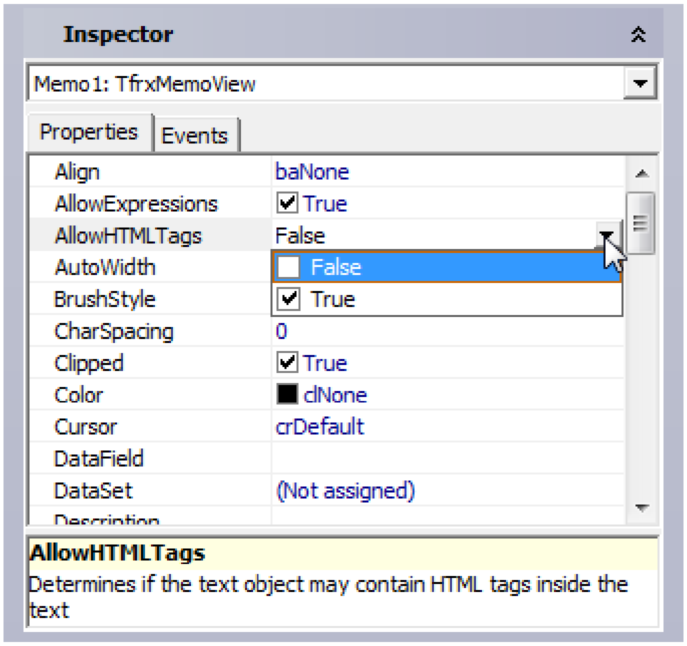
The Mirror margins option switches right and left margins of page for even pages during previewing or printing a report.

The Endless page width & height option increases page's sizes depending on number of data records on the page (when running a report). In this case you will see one big page in the preview window instead of several standard size pages.

The Large height in design mode option increases page’s height several times more. This feature can be useful if many bands are located in the page, and must be used when working with the overlay band. This only effects the page height in design mode.

9.7.2 Object Inspector

Object Inspector pane allows you to specify the appearance of each report object in detail. To setup object properties, select it at the Design area or select it from the popup menu at the top of the pane. Now all the properties of the object are available for editing. The most of properties are provided by a set of available values. The description of the selected option is displayed at the bottom of the pane.



Align	baNone
AllowExpressions	☑ True
AllowHTMLTags	False
AutoWidth	
BrushStyle	
CharSpacing	0
Clipped	☑ True
Color	■ clNone
Cursor	crDefault
DataField	
DataSet	(Not assigned)
Description	

AllowHTMLTags
Determines if the text object may contain HTML tags inside the text

Below you can find a brief description of several options.

Align - set here the align option of the object according to the list.

AllowExpressions - enables the ability to display not only a static text, but expressions as well.

AllowHTMLTags - Enables using some simple HTML tags inside the text of an object. This option is disabled by default.Here is the list of supported tags:
<b> - bold text;
<i> - text in italic;
<u> - underlined text;
<sub> - subscript;
<sup> - superscript;
<font color> - font color;
<nowrap> - text which does not get broken up when using WordWrap, but gets transported wholly.

Font: there are abilities to specify the charset, font color, font name, and font size, and also set the bold, italic, underline, strike out attributes.

Frame: You can set as the color, the style and the shadow for all the frame, as well as for each frame line.

BrushStyle – type of object filling.

CharSpacing – space between symbols in pixels.

GapX, GapY – text indents from object's left and top boundaries (in pixels).

LineSpacing – space between lines (in pixels).

ParagraphGap – the first paragraph line indent (in pixels).

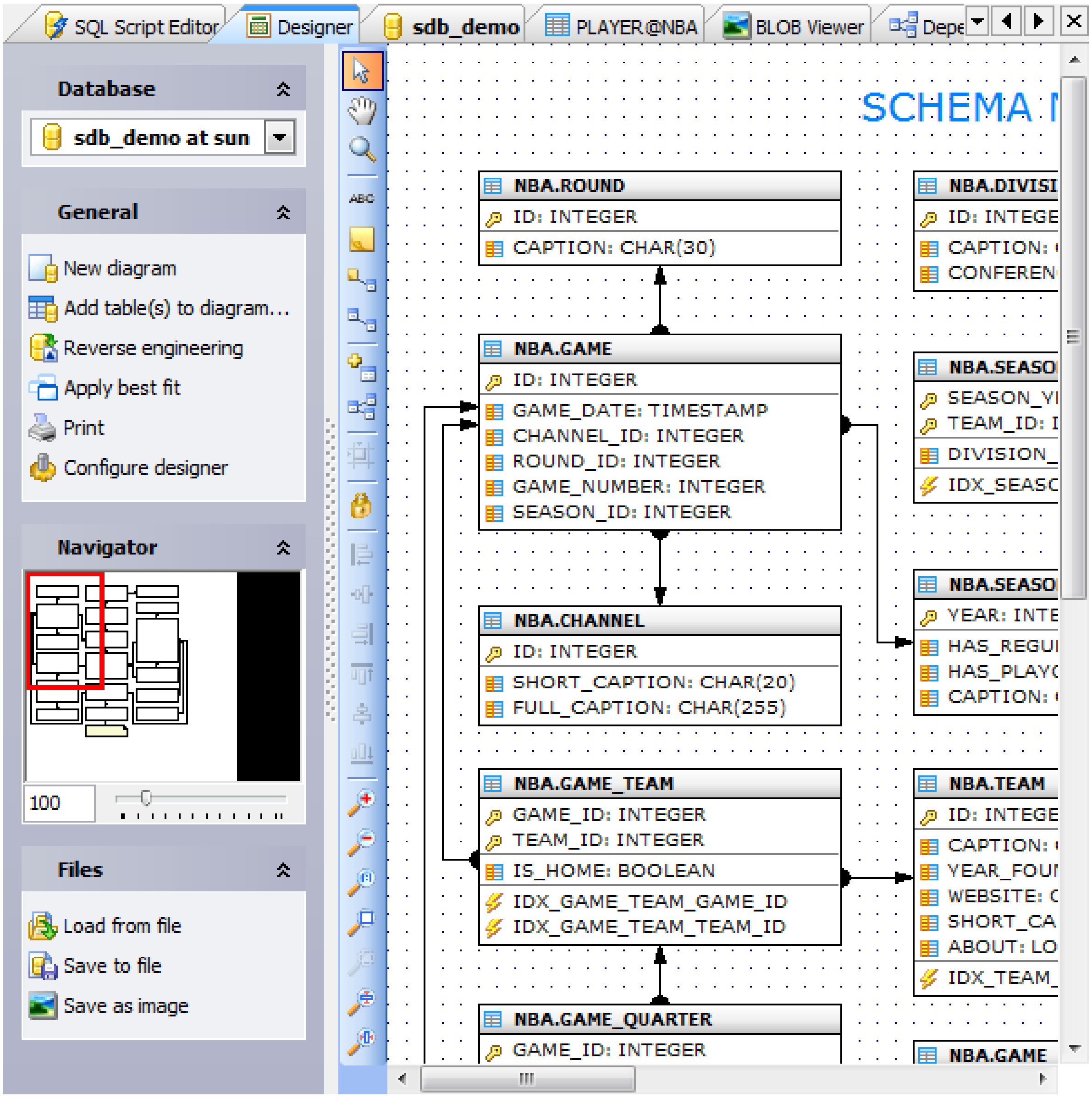
Rotation - specify the angle of the text rotation in the field.

WordWrap - if it is disabled, the long lines will be simply cut off.

9.8 Schema Designer

Schema Designer allows you to create physical Entity Relationship Diagram that will represent objects in your DB2 database. A diagram represents the tables of your database and the relationships between them. The tool is intended for reverse engineering and database modification in an easy and powerful way. It helps you to simplify database maintenance.

A diagram of your database can help you define operational aspects of your application logic that you might otherwise overlook. Also, a well-defined data diagram that accurately represents your tasks can be helpful in orienting employees to goals and operations. The data diagram can also serve as an invaluable communications tool for both internal and external constituents.



Below you can find answers for the following questions:

- How can I add a table to a diagram? 261
- How can I add a relationship between tables? 261
- How can I delete a diagram object? 261
- How can I work with diagram objects? 262

See also: Designer Navigation bar 262, Schema Designer Toolbox 262.

Adding a table

You can add an existing DB2 table to the diagram using popup menu in the working area, or with the corresponding link on the Navigation bar 262.

To create a new table, use the appropriate item of the popup menu in the working area. The table will be created in the current database.

Tables also may be dragged on the diagram from Explorer and the similar to Explorer tools like Object Manager and Object Browser.

Moreover, Designer provides you with a possibility to represent all the tables and relationships existing in the database automatically (the Reverse engineering link of the Navigation bar). At that the database contents will be represented on a diagram in the most compact and vivid manner.

All the diagram objects are available for editing. Just double click the object (table or relationship) to view/edit its properties within the corresponding editor.

Adding a relationship between tables

At adding to a diagram tables that reference on each other, the relationships between tables are represented automatically. The Schema Designer tool also allows you to add new foreign keys to the diagram tables. Thereto you can do the following.

Select a table (child table)

- Use the Create new... item of the popup menu to launch Foreign Key Properties 76 window.
- Specify there properties of the relationship been created.

Moreover you can add a reference graphically:

- Choose the Create relation tool on the Toolbox 262. Your mouse cursor will change its appearance.
- Then click on the table (child table) that will have foreign key and then click on the second table (parent table) whose primary key will be referred by the new foreign key.
- Specify properties of the relationship been created in the Foreign Key Properties 76 window.

With the Create new... item of the popup menu you can also add a new field, an index, a trigger, etc. to the selected table. For more information about object properties see: Field Editor 71, Index Editor 74, Create Trigger Wizard 82.

Deleting of the diagram objects

To hide a table (several tables) or a relationship between tables, select the objects and click Remove selection link of the popup menu or Navigation bar. You can also use the **Del** key for this purpose.

It’s also possible to physically delete a table/foreign key from the database: just select the object to delete and use the appropriate item of the popup menu.

Editing of a diagram appearance
Movement of a table/several tables along the diagram is realized with dragging or pressing **Ctrl**+arrows. You can use **Shift**+arrows to change width/height of table/several tables representation.

Designer also allows you to edit shape of the line representing foreign key relations/ logical relations. In order to break the line you should

- Select the relationship.
- Press **Ctrl** and click on the necessary line section to create a new node.
- Position the node by dragging.

You can also delete a node on the line. Thereto

- Select the relationship.
- Press **Alt** and click the node to delete. In that case the near nodes will be united by a straight line.

9.8.1 Designer Navigation Bar

The Navigation Bar of Schema Designer provides you the following opportunities:

Use the Database drop-down list to move around your DB2 databases.

There are also links for adding a New diagram or an existing table to diagram quickly.

Reverse engineering
The link provides you to create a new diagram with all the database tables and

Apply best fit
Use the link to dispose tables on the diagram in the most clear manner.

Remove selection
The link cancels current object selection.

Use Print to see the print preview of the diagram.

Certainly, it's possible to customize Schema Designer with Configure designer. For more information see Schema Designer Customization 291.

The Navigator part allows you to adjust the scale of the diagram and the position of the visible part.

Besides the Navigation bar allows you to Load a diagram from file, Save to file, and Save as image (Bitmap, GIF and JPEG formats are supported).

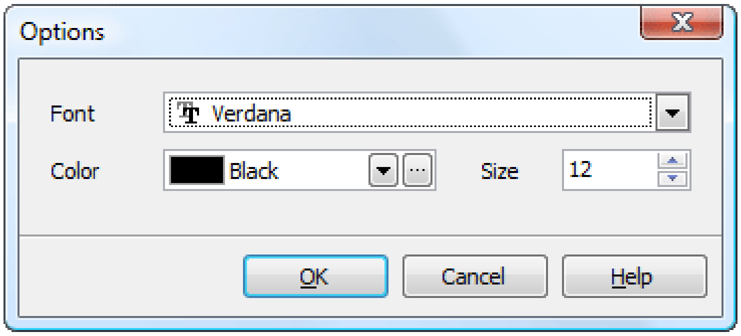
9.8.2 Schema Designer Toolbox

The toolbox is located on the left side of the Schema Designer's working area.

Move
The tool is intended for selection of diagram objects. Use the tool then click anywhere inside of the object. Double click opens the corresponding Object Editor.

To select multiple objects, use the tool then click and drag a selection rubber-band so that the rubber-band box encompasses the objects you want to select, and then release the mouse button.
To add objects to the list of already selected objects again, use the Move tool then click anywhere inside of the object holding the **Shift** button. To quick launch of the tool, use **M** shortcut.

Use Create text box to add title and comments on your diagram. Click on the necessary place and double-click on the appeared box to enter a text. You can also tune up the text font, color and size with Text options of the box popup menu. To quick launch of the tool, use **XX** shortcut.


Options

Font: Verdana

Color: Black

Size: 12

Moreover you can add notes and also links between them and diagram elements using Create note and Create link to note links. To quick launch of the tools, use **N** and **L** shortcuts accordingly.

Lock
The tool to locking/unlocking diagram objects. This feature prevents your diagram from unforeseen changes: when the diagram is locked, you can neither move/resize/delete existing objects nor add new ones.

Hand tool moves a diagram within its window. To quick launch of the tool, use **H** shortcut.

Zoom magnifies and reduces the view of a diagram. To zoom out, hold the Alt key. To quick launch of the tool, use **Z** shortcut.

There are also tools allowing to Create table and Create relation directly from the Designer. To quick launch of the tool, use **T** and **R** shortcut.

Below you can find toolset for aligning the selected objects by left and right edges, by horizontal and vertical centers, tops and bottoms.

Click the Zoom in button in the options bar to magnify to the next preset percentage.

When the image has reached its maximum magnification level, the command is dimmed.

Click the Zoom out button in the options bar to reduce to the previous preset percentage. When the image has reached its maximum reduction level, the command is dimmed.

Click the Zoom 1:1 button to display a diagram at 100%.

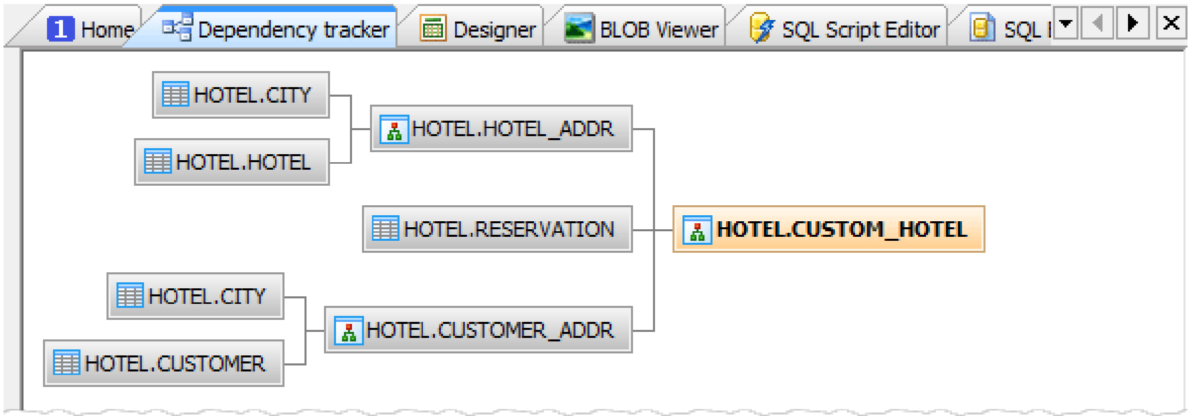
Pay attention to the Fit diagram function, that pick-up properly scaling factor to display your diagram fully. For your convenience the Fit selected, Fit height, and Fit width were added.

9.9 Dependency tracker

Dependency tracker is a tool to browse all-level dependencies of a schema object (table, view, function, etc). To display dependencies of an object, drag and drop it from the Explorer tree (or Object Manager, Object Browser) to the tracker's working area.

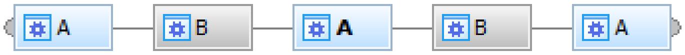
This tool allows you to see the way any database object is involved in the net of scheme dependencies. The selected object is displayed in a highlighted rectangle in the center of the working area. The right side of this area represents objects depending on the selected one. The left side represents objects on which the selected object depends.

To highlight all occurrences of an object in the diagram, click the appropriate rectangle. Double click an object to change the tracker focus to this object. Right click a rectangle to display a popup menu with common operations related to the appropriate object.



The recursive dependencies are marked with a semicircle. This means marked object depends on itself directly or via other objects.

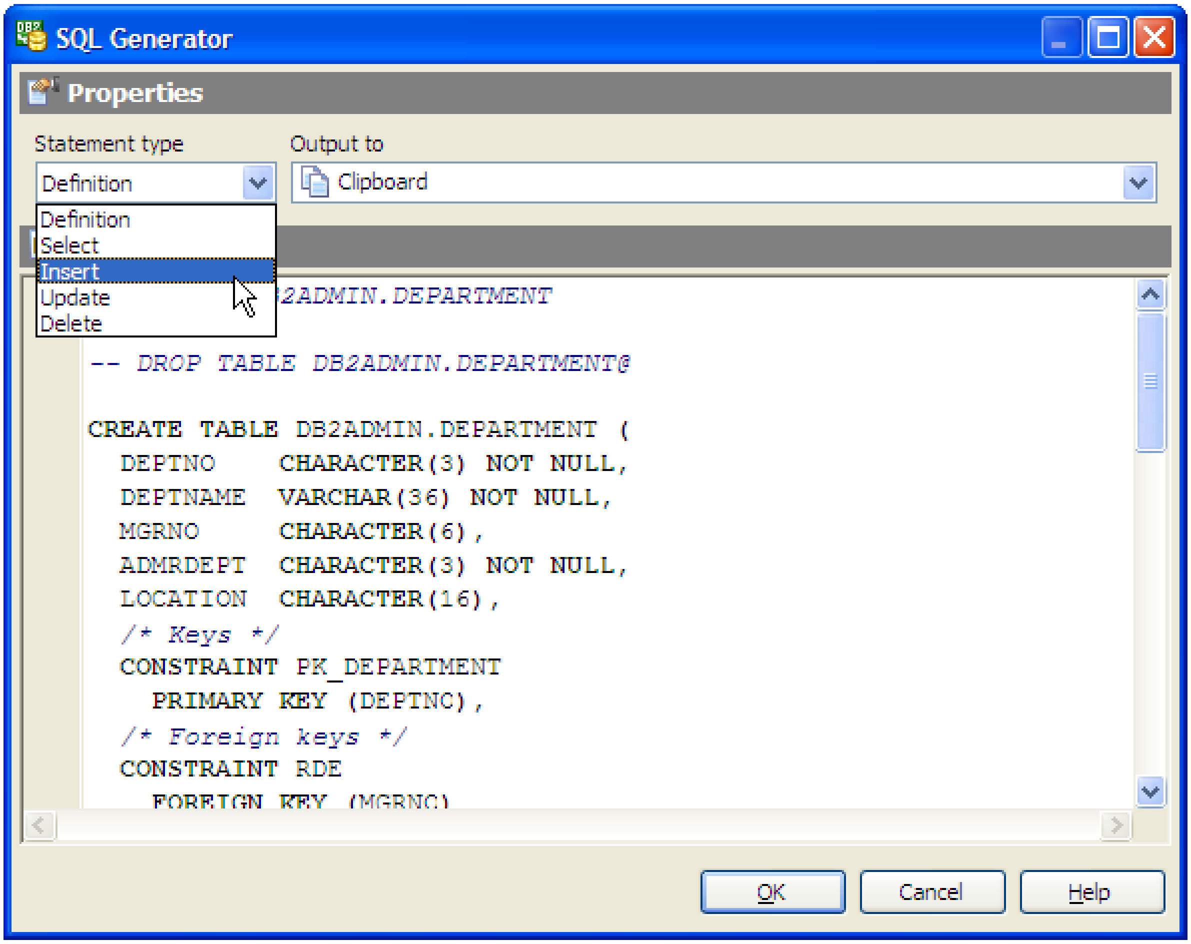
Example
Suppose we have two procedures A and B calling each other. The tracker displays these dependencies in the following way:



9.10 SQL Generator

Among other features DB2 Maestro provides you with SQL Generator, a tool to create simple SQL statements. Just choose a database object, select statement type (Definition, Select, Insert, Update, or Delete) and the destination device (Clipboard, File, SQL Editor, SQL Script Editor).

The SQL Generator window can be invoked from the Explorer tree.



Statement type: Definition

Output to: Clipboard

```
2ADMIN.DEPARTMENT

-- DROP TABLE DB2ADMIN.DEPARTMENT@

CREATE TABLE DB2ADMIN.DEPARTMENT (
  DEPTNO     CHARACTER(3) NOT NULL,
  DEPTNAME   VARCHAR(36) NOT NULL,
  MGRNO      CHARACTER(6),
  ADMRDEPT   CHARACTER(3) NOT NULL,
  LOCATION   CHARACTER(16),
  /* Keys */
  CONSTRAINT PK_DEPARTMENT
    PRIMARY KEY (DEPTNO),
  /* Foreign keys */
  CONSTRAINT RDE
    FOREIGN KEY (MGRNO)
```

9.11 DML procedures generation

DB2 Maestro allows you to create DML (also known as CRUD) procedures automatically. CRUD is an acronym for the four essential database operations: Create, Read, Update, and Delete. The application designer has many choices for accomplishing the CRUD operations but the most efficient choice in terms of DB2 performance is to create a set of stored procedures to perform the operations.

The reasons for using DML Procedures instead of allowing ad hoc SQL statements are:

- The best possible performance

After the first use of each stored procedure, the plan for executing the procedure is cached in the server's procedure cache. For subsequent invocations of the stored procedure, the plan is reused. This avoids the parsing and optimization steps with their overhead.

- Removing of the SQL code from the other layers of the application

By removing the SQL statements from the application code, all the SQL can be kept in the database.

- Preventing of SQL injection attacks

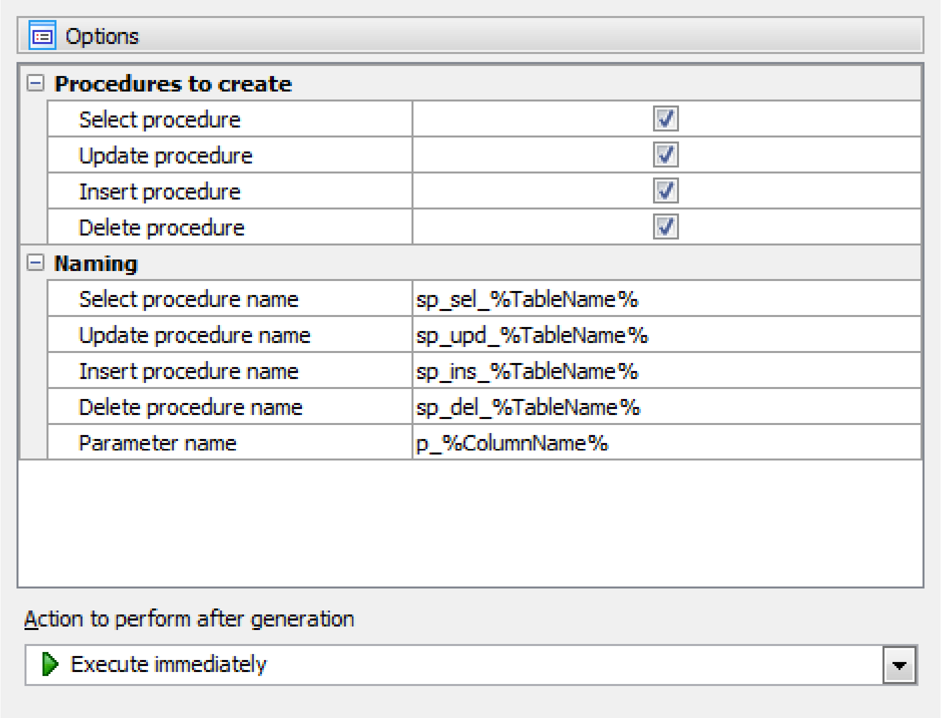
Anytime a client application uses string concatenation to create SQL statements, there is a possibility of a SQL injection attack. In short, these attacks involve clever entry of SQL in the data entry fields of an application in such a way that the SQL statements executed are different from the ones intended by the programmer. They require that the application developer is careless about not cleaning any user input to prevent the attack.

- Preventing of casual table browsing and modifications

If an application uses ad hoc SQL statements, the users of the application must have the required permissions on the database tables. Once they are given permission on the tables, they can work with them in any application that can read and manipulate the data such as Excel, Word and various report writers. Casual examination of the data and even updates that bypass the application's business rules become possible. Stored procedures have long been used to prevent casual browsing and updates. This is implemented by granting permission to execute the CRUD stored procedures to the users and revoking permission to access the tables directly.

To generate DML procedure,

- select the Object | Generate DML procedures... main menu item (to create procedures for several tables) or use the corresponding popup menu item of the table's node at the Explorer tree (to create procedures for one table).
- Specify tables the procedures will be created for (in case of several tables).
- Uncheck the operations the procedures will not be created for. By default the procedures are generated for inserting, reading, updating, and deleting of table data.
- Adjust templates of procedures names.
- Select the action to perform after the generation. The created definitions can be copied to Clipboard, saved to a file, sent to SQL Script Editor or executed immediately.



Options

Procedures to create

Select procedure	☑
Update procedure	☑
Insert procedure	☑
Delete procedure	☑

Naming

Select procedure name	sp_sel_%TableName%
Update procedure name	sp_upd_%TableName%
Insert procedure name	sp_ins_%TableName%
Delete procedure name	sp_del_%TableName%
Parameter name	p_%ColumnName%

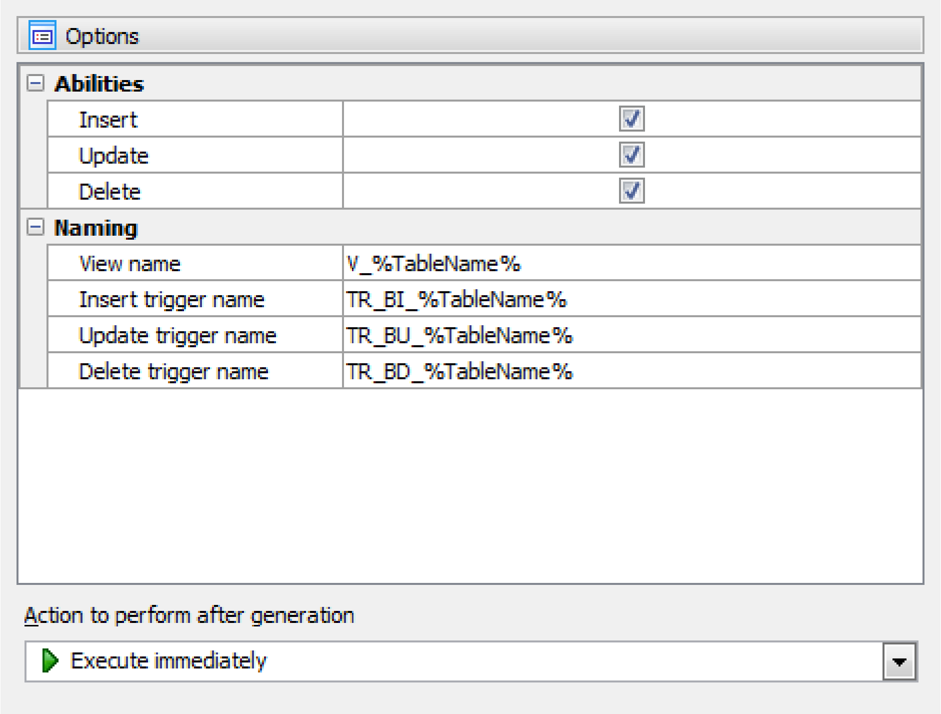
Action to perform after generation

Execute immediately

9.12 Generation of updatable views

To generate updatable view,

- select the Object | Generate updatable views... main menu item (to create views for several tables) or use the corresponding popup menu item of the table's node at the Explorer tree (to create a view for one table).
- Specify tables the views will be created for (in case of several tables).
- Specify the abilities to be available on working with the view data. By default the views are generated for inserting, updating, and deleting of table data.
- Adjust the name templates of views and corresponding triggers.
- Select the action to perform after the generation. The created definitions can be copied to Clipboard, saved to a file, sent to SQL Script Editor or executed immediately.



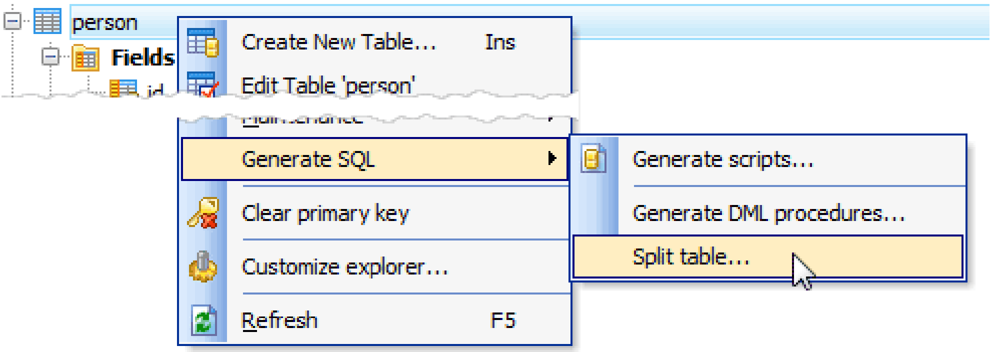
Options

Abilities	
Insert	☑
Update	☑
Delete	☑
Naming	
View name	V_%TableName%
Insert trigger name	TR_BI_%TableName%
Update trigger name	TR_BU_%TableName%
Delete trigger name	TR_BD_%TableName%

Action to perform after generation: Execute immediately

9.13 Split table

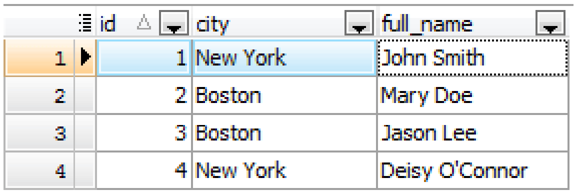
It's not an uncommon situation when new requirements arise, or when you need to enforce referential integrity on a set of columns, and the best decision is to split a table into two separate tables. DB2 Maestro provides you with Split Table Wizard, a simple tool to generate a bunch of SQL scripts to modify the primary table, to create a secondary table with a primary key, and to transfer data from the primary table to the secondary one without duplicating of data. To invoke the wizard, follow the corresponding link of the Generate SQL section of popup menu of the selected table at the Explorer tree.



Let's see the wizard in action on the example of a table with the following SQL definition:

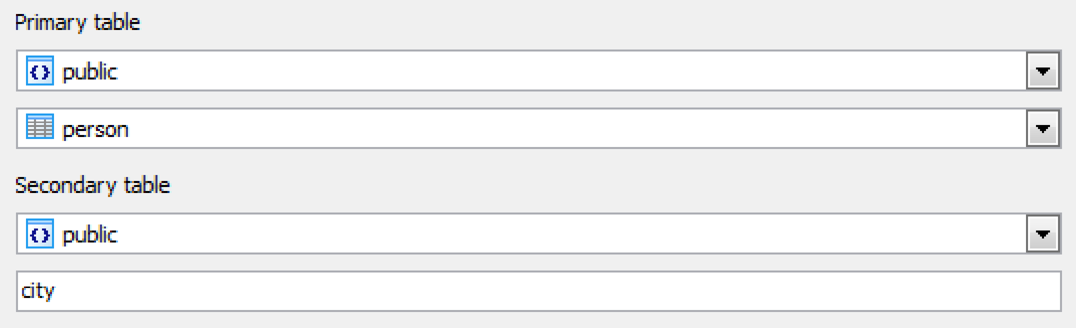
```
CREATE TABLE person (
  id          integer NOT NULL,
  city        varchar(30) NOT NULL,
  full_name   varchar(30) NOT NULL,
  /* Keys */
  CONSTRAINT  person_pkey
    PRIMARY KEY (id)
);
```

The table stores sample data:



	id	city	full_name
1	1	New York	John Smith
2	2	Boston	Mary Doe
3	3	Boston	Jason Lee
4	4	New York	Deisy O'Connor

To enforce the referential integrity, we specify 'city' as secondary table:



Primary table

public

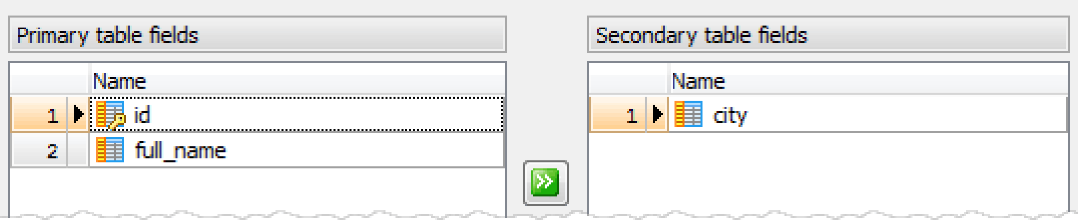
person

Secondary table

public

city

The primary table must contain now only 'id' and' full_name' columns. The field 'city_id' will be added to the table automatically.



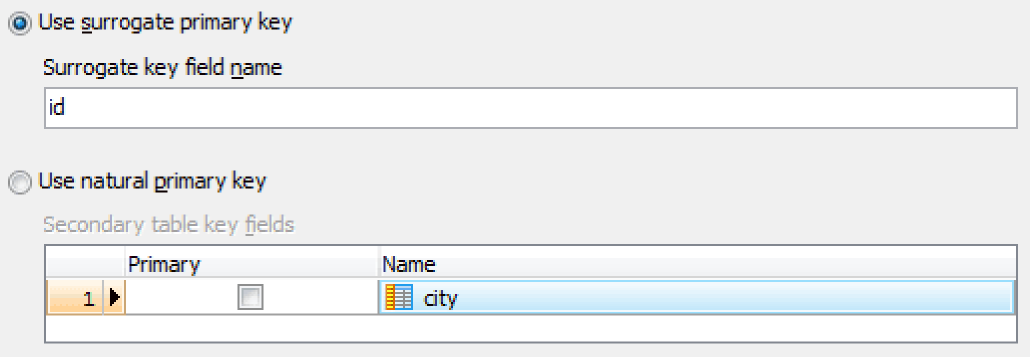
Primary table fields

	Name
1	id
2	full_name

Secondary table fields

	Name
1	city

Now we have to specify what kind of primary key to be created for the secondary table: surrogate or natural. We create create the 'city' table with a surrogate primary key.



● Use surrogate primary key

Surrogate key field name

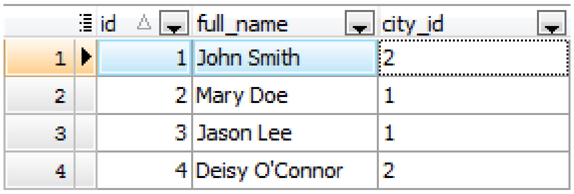
id

○ Use natural primary key

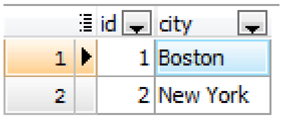
Secondary table key fields

	Primary	Name
1	☐	city

Then click Ready and get the following tables:



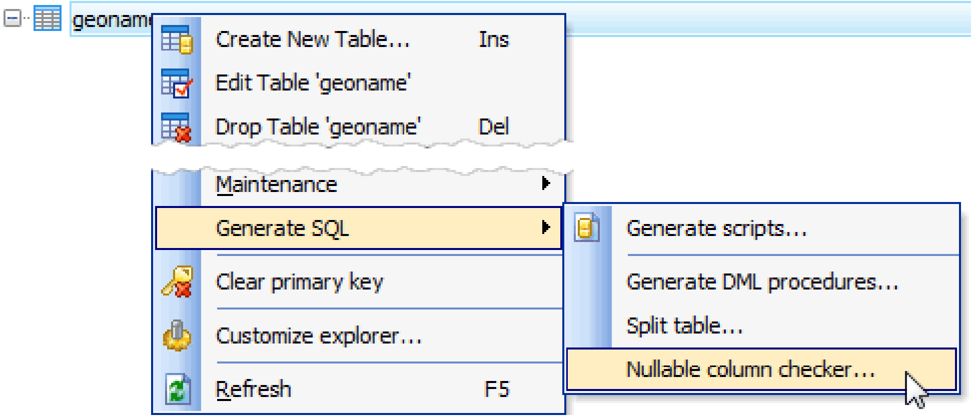
	id	full_name	city_id
1	1	John Smith	2
2	2	Mary Doe	1
3	3	Jason Lee	1
4	4	Deisy O'Connor	2



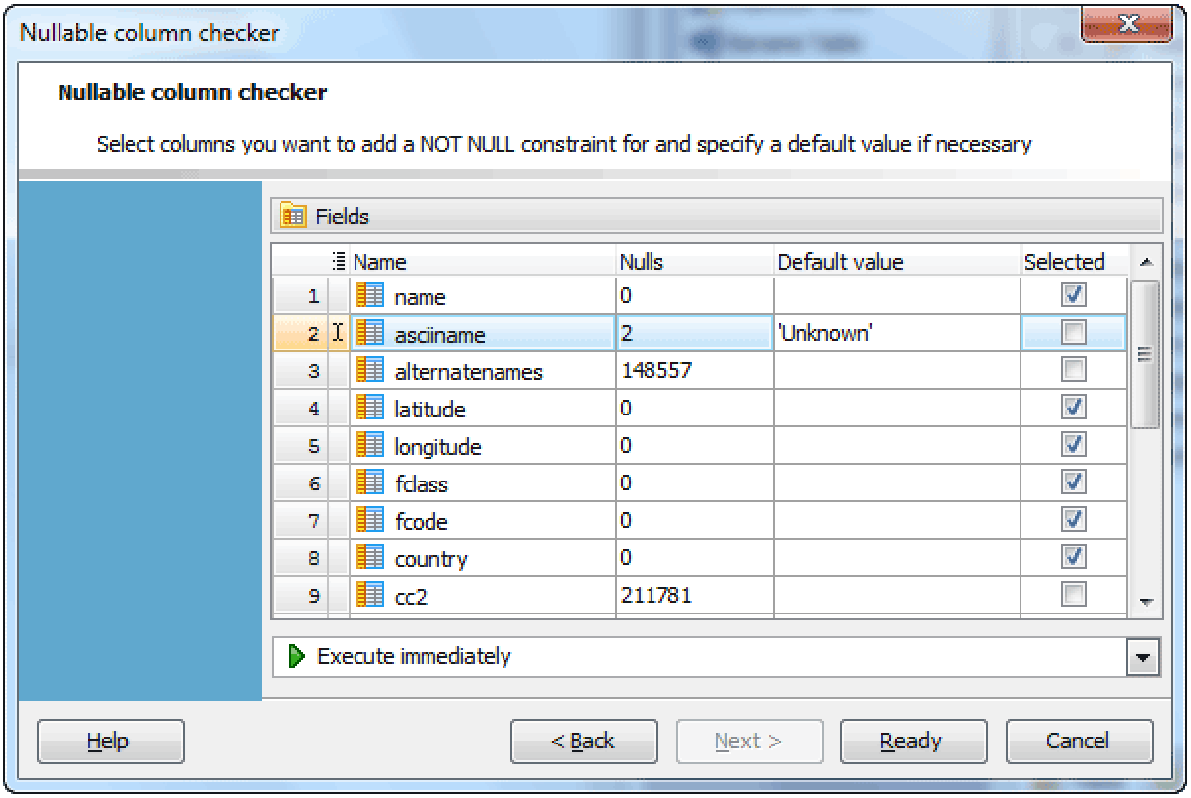
	id	city
1	1	Boston
2	2	New York

9.14 Nullable Column Checker

Nullable Column Checker allows you to refactor your database schema by enforcing NOT NULL constraints to all necessary table columns. It suggests candidates for NOT NULL columns among columns of the selected table and generates SQL script to replace all NULL values of selected columns with specified default values and to add the NOT NULL constraint to these columns. To invoke the wizard, follow the corresponding link of the Generate SQL section of popup menu of the selected table at the Explorer tree.



To get SQL scripts enforcing NOT NULL constraints to columns of an existing table, select the necessary columns, specify the default values to be used instead of existing columns NULLs and select the action to perform after the generation. The created scripts can be copied to Clipboard, saved to a file, sent to SQL Script Editor 234 or executed immediately.



Nullable column checker

Select columns you want to add a NOT NULL constraint for and specify a default value if necessary

Fields

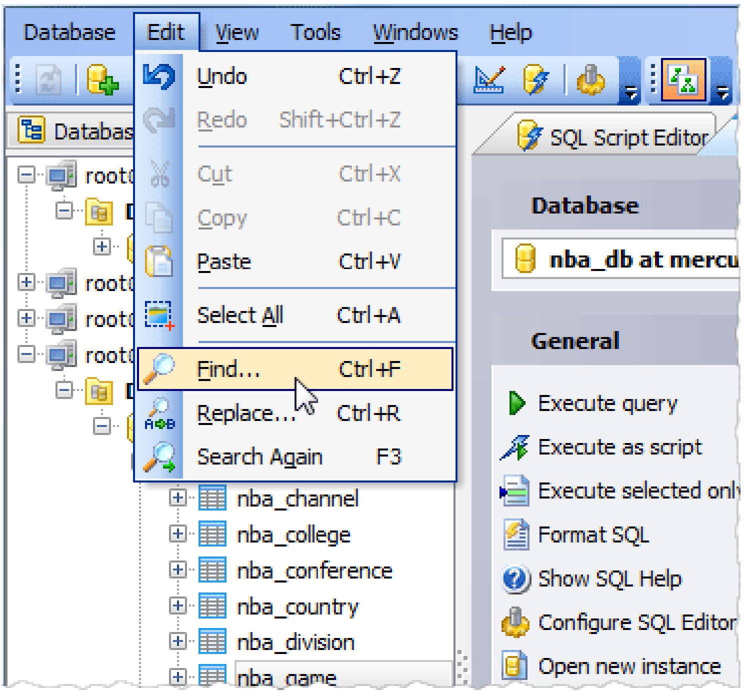
	Name	Nulls	Default value	Selected
1	name	0		☑
2	asciiname	2	'Unknown'	☐
3	alternatenames	148557		☐
4	latitude	0		☑
5	longitude	0		☑
6	fclass	0		☑
7	fcode	0		☑
8	country	0		☑
9	cc2	211781		☐

Execute immediately

9.15 Dialogs

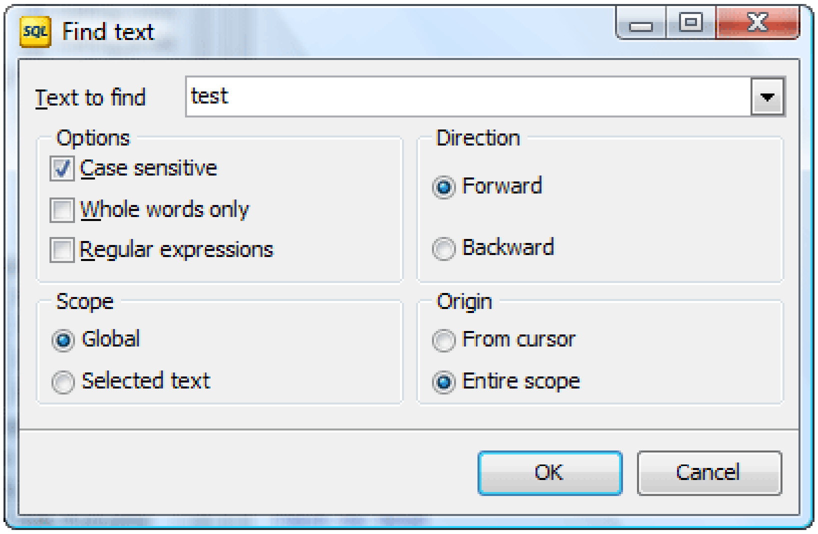
DB2 Maestro provides two dialogs for searching and replacing text in the editor areas of the database tools. Both of them are available through the popup menu of the editor area.

- Find Text dialog 274
- Replace Text dialog 275



9.15.1 Find Text dialog

The Find Text dialog is provided for quick search for certain text.


Find text

Text to find: test

Options
☑ Case sensitive
☐ Whole words only
☐ Regular expressions

Direction
● Forward
○ Backward

Scope
● Global
○ Selected text

Origin
○ From cursor
● Entire scope

Text to find
Enter a search string or click the down arrow next to the input box to select from a list of previously entered search strings.

☑ Case sensitive
Differentiates uppercase from lowercase when performing a search.

☑ Whole words only
Searches for words only. (With this option off, the search string might be found within longer words.)

☑ Regular expressions
Recognizes regular expressions in the search string.

Forward
Searches from the current position to the end of the file. Forward is the default.

Backward
Searches from the current position to the beginning of the file.

Global
Searches the entire file, in the direction specified by the Direction setting. Global is the default scope.

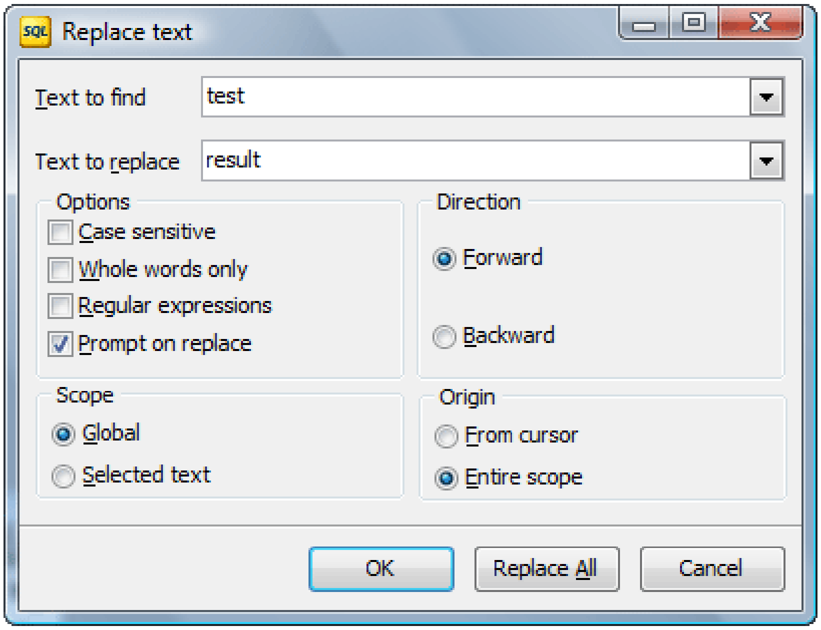
Selected text
Searches within the selected text only, in the direction specified by the Direction setting. You can use the mouse or block commands to select a block of text.

From cursor
The search starts at the cursor's current position, and then proceeds either forward to the end of the scope, or backward to the beginning of the scope depending on the Direction setting. From Cursor is the default setting.

Entire scope
The search covers either the entire block of selected text or the entire file (no matter where the cursor is), depending upon the Scope options.

9.15.2 Replace Text dialog

The Replace Text dialog is provided for searching and replacing text in the editor window.



Text to find: test

Text to replace: result

Options
☐ Case sensitive
☐ Whole words only
☐ Regular expressions
☑ Prompt on replace

Direction
● Forward
○ Backward

Scope
● Global
○ Selected text

Origin
○ From cursor
● Entire scope

Text to find

Enter a search string. To select from a list of previously entered search strings, click the down arrow next to the input box.

Text to replace

Enter the replacement string. To select from a list of previously entered search strings, click the down arrow next to the input box. To replace the text with nothing, leave this input box blank.

☑ Case sensitive

Differentiates uppercase from lowercase when performing a search.

☑ Whole words only

Searches for words only. (With this option off, the search string might be found within longer words.)

☑ Regular expressions

Recognizes specific regular expressions in the search string.

☑ Prompt on replace

Prompts you before replacing each occurrence of the search string. When Prompt on replace is off, the editor automatically replaces the search string.

Forward

Searches from the current cursor position, to the end of the file. Forward is the default Direction setting.

Backward

Searches from the current cursor position, to the beginning of the file.

Global

Searches the entire file, in the direction specified by the Direction setting. Global is the default scope.

From cursor
The search starts at the cursor's current position, and proceeds either forward to the end of the scope, or backward to the beginning of the scope depending on the Direction setting. From cursor is the default Origin setting.

Entire scope
The search covers either the entire block of selected text or the entire file (no matter where the cursor is in the file), depending upon the Scope options.

Replace All
Click Replace all to replace every occurrence of the search string. If you check Prompt on replace, the Confirm dialog box appears on each occurrence of the search string.

10 Options

DB2 Maestro allows you to customize the way it works within the Options dialog. To open the dialog, select the Tools | Options main menu item.

The window allows you to customize the options grouped by the following sections:

- **Application** 279
  General DB2 Maestro options: environment style, confirmations, window restrictions, explorer tree, SQL Editor, Visual Query Builder, etc.

- **Editors & Viewers** 301
  Customizing of all the SQL editors - SQL Editor, SQL Script Editor, etc.

- **Appearance** 309
  Customizing program interface - bars, trees, menus, etc.

Besides, the Options dialog allows you to export all program settings to a **.reg* file for future use, e.g. on another PC (see Export Settings 318 for details).

It is a good idea to check through these settings before you start working with DB2 Maestro. You may be surprised at all the things you can adjust and configure!

10.1 Application

The Application section allows you to customize common rules of DB2 Maestro behavior. The section consists of several tab; follow the links to find out more about each of them.

- Preferences 279
- Confirmations 280
- Directories 282
- Tools 282
    - Explorer 284
    - Object Manager 285
    - SQL Editor 285
    - SQL Script Editor 286
    - Query Builder 287
    - BLOB Viewer 289
    - Export data 290
    - Database Designer 291
- Object Editors 292
    - Table 294
- Data Grid 294
    - Colors 297
    - Formats 297
    - Filter 299

10.1.1 Preferences

User interface area allow you to select your favorite UI style according to your preferences.

☑ Display splash screen at startup
Displays the splash screen on DB2 Maestro startup.

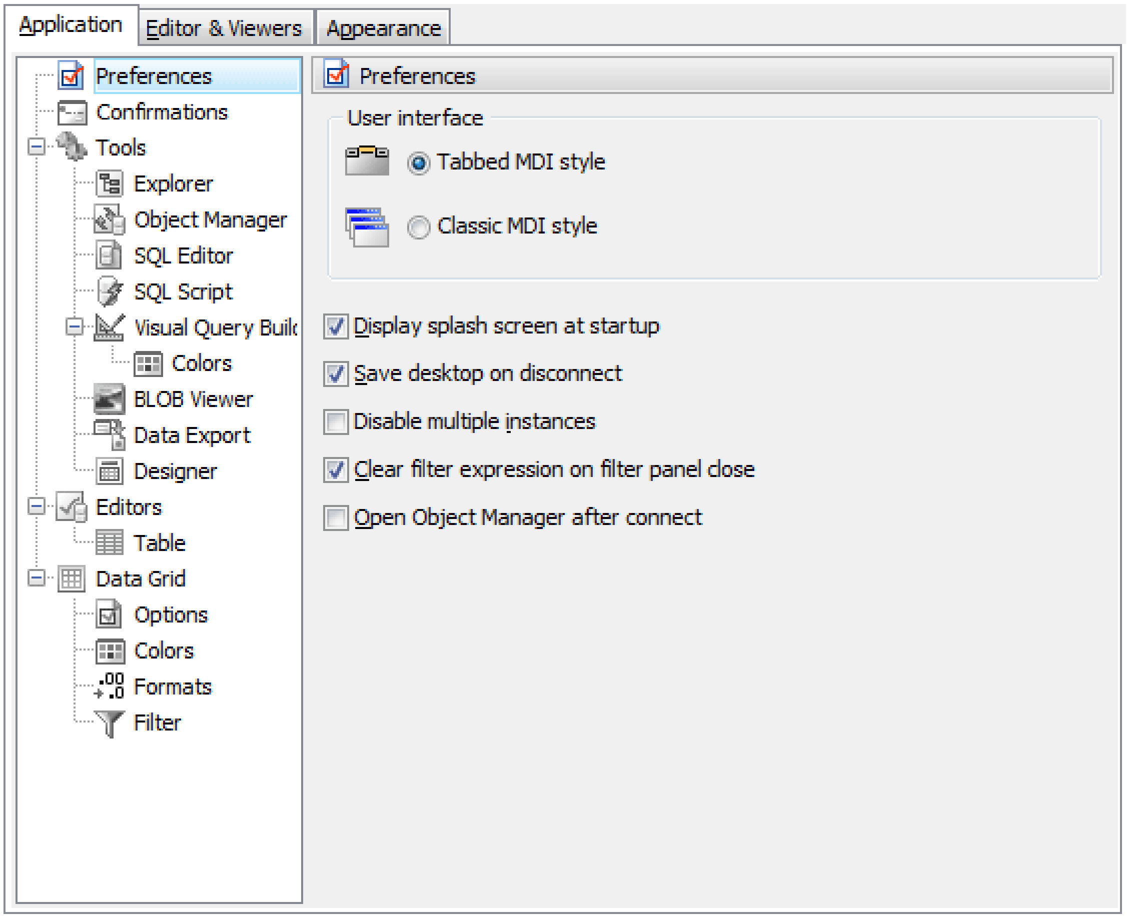
☑ Save desktop on disconnect
Saves all the database windows and their positions on disconnecting from the database.

☑ Disable multiple instances
Prohibits running multiple instances of DB2 Maestro.

☑ Open Object Manager after connect
Opens the Object Manager window after connection is established.

☑ Clear filter expression on filter panel close
Clears the filter applied to the explorer tree and all the instances of Object Manager

after the filter panel is closed.



User interface

● Tabbed MDI style

○ Classic MDI style

☑ Display splash screen at startup

☑ Save desktop on disconnect

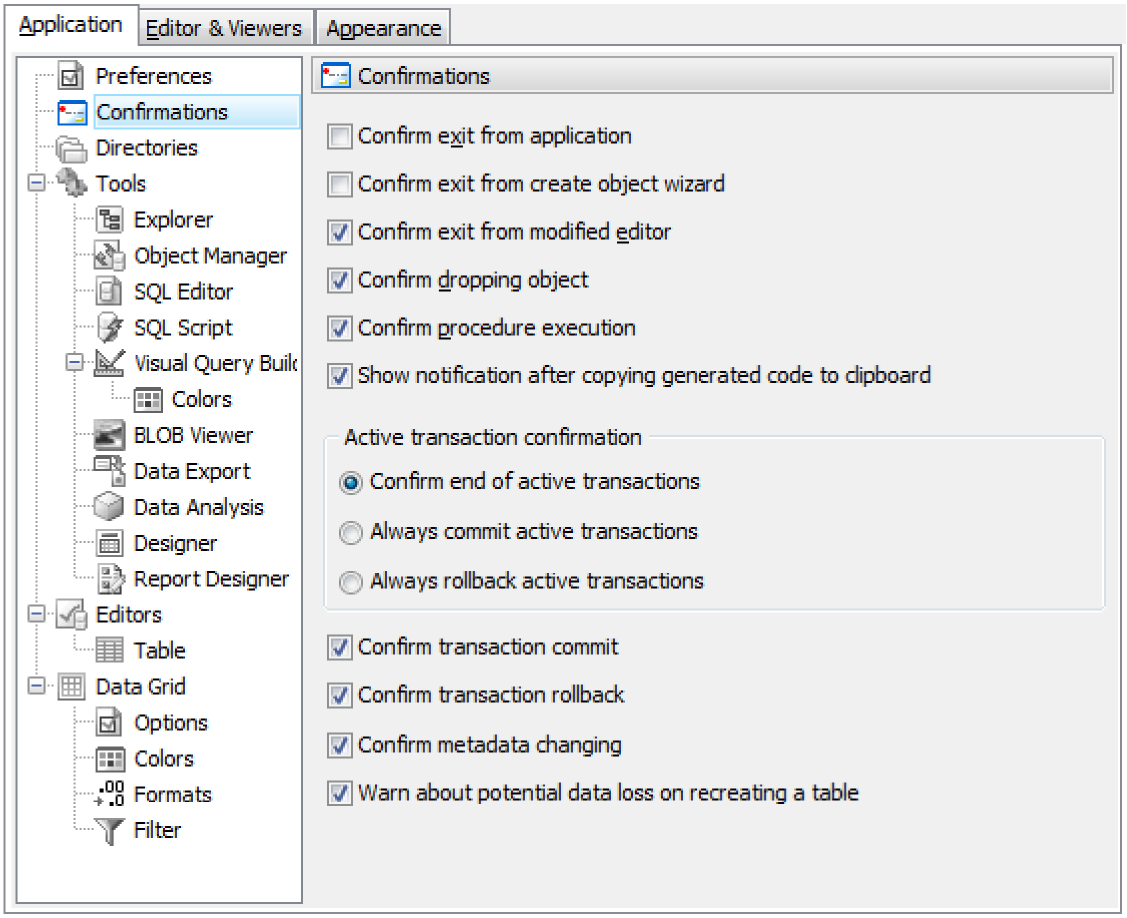
☐ Disable multiple instances

☑ Clear filter expression on filter panel close

☐ Open Object Manager after connect

10.1.2 Confirmations

Use this tab to manage application confirmations.



☐ Confirm exit from application
☐ Confirm exit from create object wizard
☑ Confirm exit from modified editor
☑ Confirm dropping object
☑ Confirm procedure execution
☑ Show notification after copying generated code to clipboard

Active transaction confirmation
● Confirm end of active transactions
○ Always commit active transactions
○ Always rollback active transactions

☑ Confirm transaction commit
☑ Confirm transaction rollback
☑ Confirm metadata changing
☑ Warn about potential data loss on recreating a table

☑ **Confirm exit from Create Object Wizard**

If this option is checked, the program requires confirmation each time you want to exit the Create Object Wizard.

☑ **Confirm exit from modified editor**

If this option is checked, the program asks you to confirm exit from the editor, if you have made any changes.

☑ **Confirm dropping object**

If this option is checked, the program requires confirmation for dropping database object.

☑ **Confirm exit from application**

If this option is checked, the program requires confirmation when you want to exit <% PRODUCT_NAME%.

☑ **Transaction confirmation**

Select whether you will be prompted to commit or rollback active transaction or DB2 Maestro will commit or rollback transactions without asking.

☑ **Confirm metadata changing**

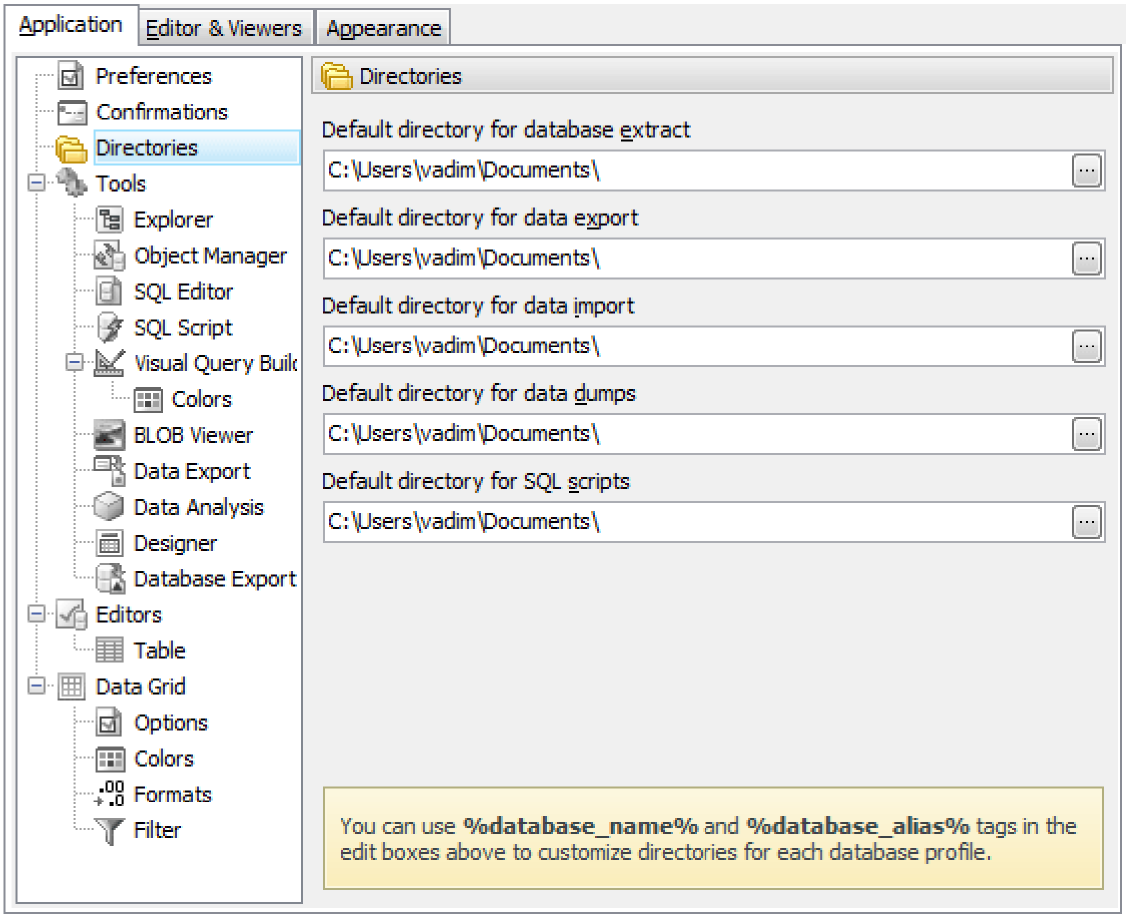
If this option is checked, the program requires confirmation for changing metadata.

10.1.3 Directories

The tab allows you to specify default directories to be used on database profiles creating. You can use such variables as %database_name%, %database_alias%, and %user_name%.

Example:
To store all SQL scripts in folders sorted by databases in the "C:\SQL Scripts\" directory, specify the default directory for SQL scripts as follows:

C:\SQL Scripts\%database_name%



Default directory for database extract
C:\Users\vadim\Documents\

Default directory for data export
C:\Users\vadim\Documents\

Default directory for data import
C:\Users\vadim\Documents\

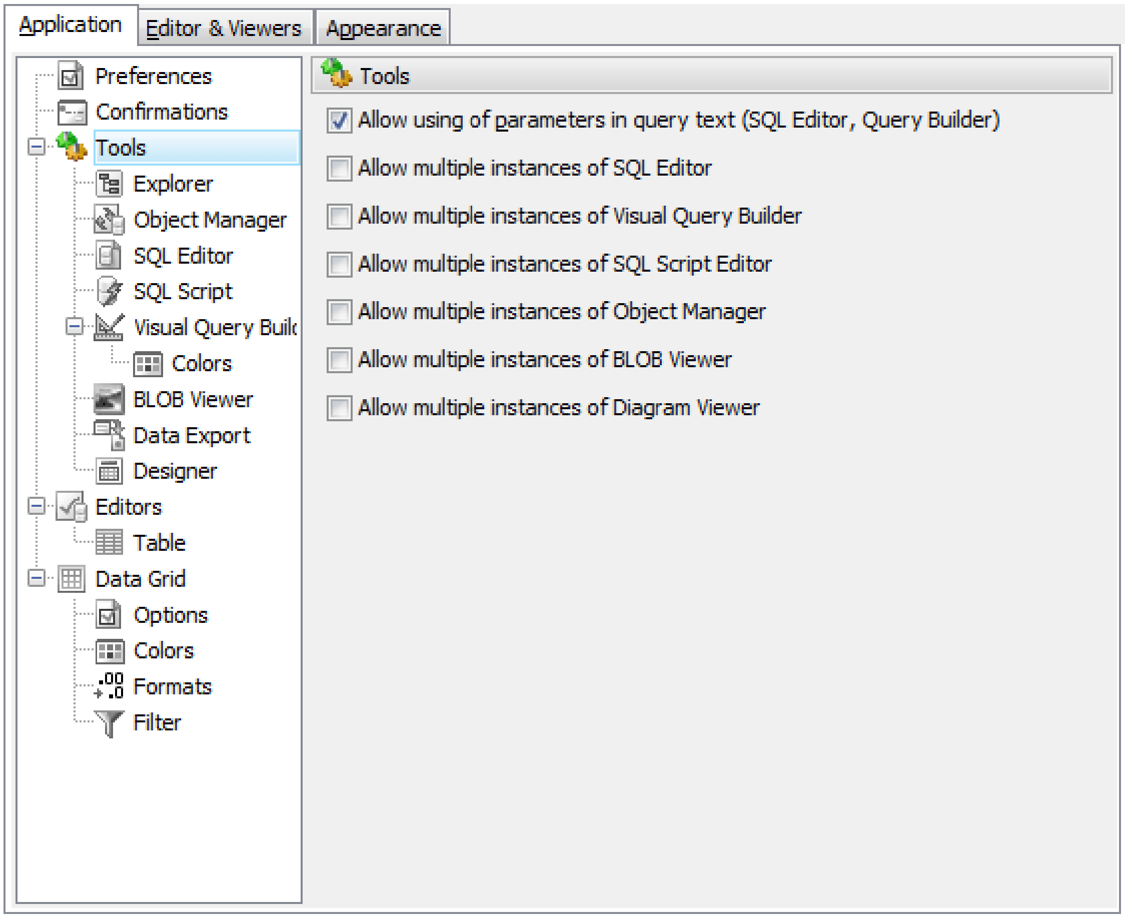
Default directory for data dumps
C:\Users\vadim\Documents\

Default directory for SQL scripts
C:\Users\vadim\Documents\

You can use **%database_name%** and **%database_alias%** tags in the edit boxes above to customize directories for each database profile.

10.1.4 Tools

Below you will find a detailed decryption of the following tools options.



☑ Allow using of parameters in query text (SQL Editor, Query Builder)

☐ Allow multiple instances of SQL Editor

☐ Allow multiple instances of Visual Query Builder

☐ Allow multiple instances of SQL Script Editor

☐ Allow multiple instances of Object Manager

☐ Allow multiple instances of BLOB Viewer

☐ Allow multiple instances of Diagram Viewer

☑ Allow using of parameters in query text

Check this option to be able to use query parameters in SQL Editor 184 and Visual Query Builder 189.

☑ Allow multiple instances of SQL Editor

Check this option to be able to use multiple instances of SQL Editor 184 simultaneously.

☑ Allow multiple instances of Visual Query Builder

Check this option to be able to use multiple instances of Visual Query Builder 189 simultaneously.

☑ Allow multiple instances of SQL Script Editor

Check this option to be able to use multiple instances of SQL Script Editor 234 simultaneously.

☑ Allow multiple instances of Object Manager

Check this option to be able to use multiple instances of Object Manager simultaneously.

☑ Allow multiple instances of BLOB Viewer

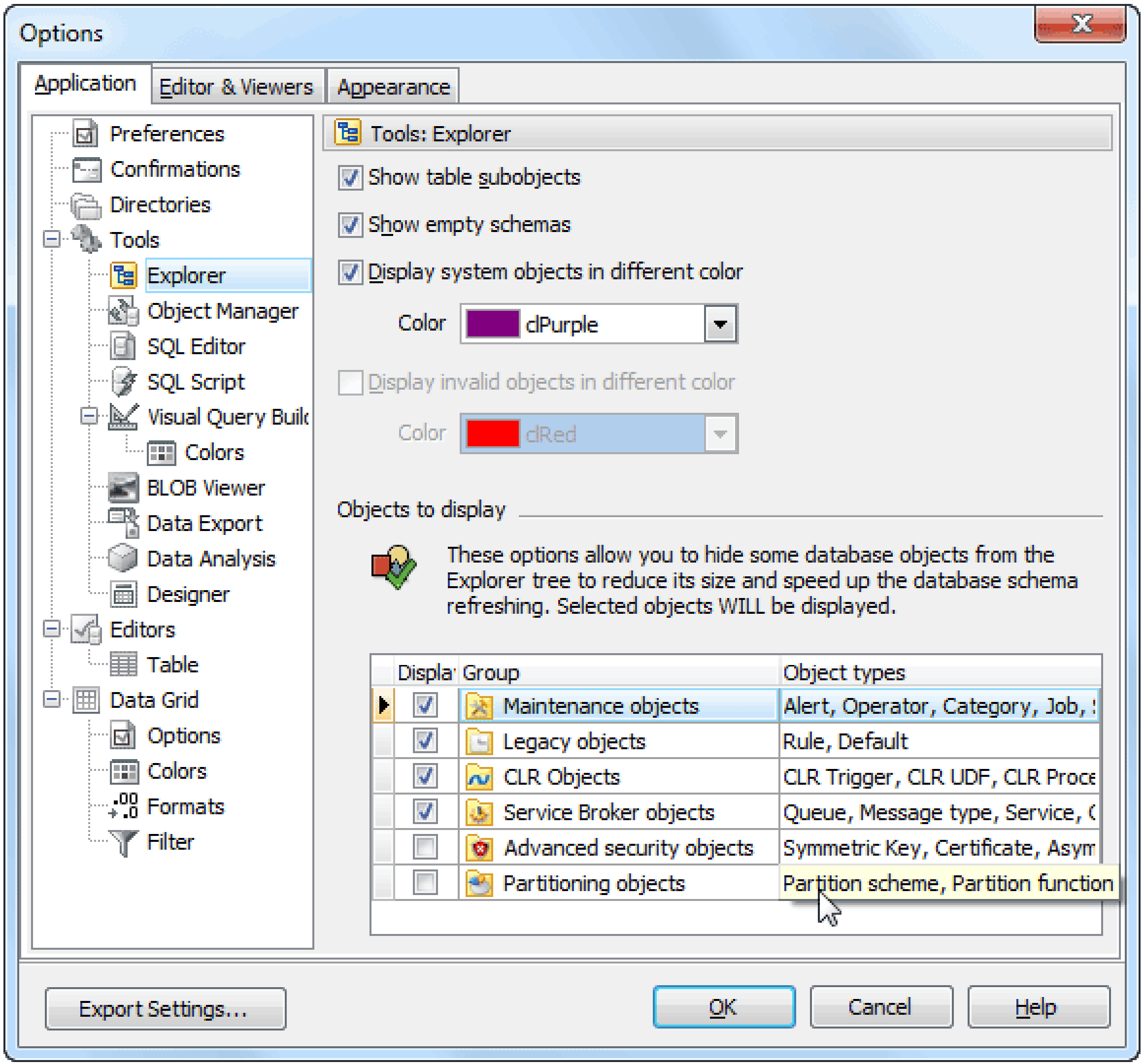
Check this option to be able to use multiple instances of BLOB Viewer 238 simultaneously.

☑ Allow multiple instances of Diagram Viewer

Check this option to be able to use multiple instances of Diagram Viewer 244 simultaneously.

10.1.4.1 Explorer

Below you will find a detailed decryption of the following explorer options.



Tools: Explorer

☑ Show table subobjects

☑ Show empty schemas

☑ Display system objects in different color

Color: dPurple

☐ Display invalid objects in different color

Color: dRed

Objects to display

These options allow you to hide some database objects from the Explorer tree to reduce its size and speed up the database schema refreshing. Selected objects WILL be displayed.

Displa	Group	Object types
☑	Maintenance objects	Alert, Operator, Category, Job,
☑	Legacy objects	Rule, Default
☑	CLR Objects	CLR Trigger, CLR UDF, CLR Proce
☑	Service Broker objects	Queue, Message type, Service,
☐	Advanced security objects	Symmetric Key, Certificate, Asym
☐	Partitioning objects	Partition scheme, Partition function

☑ Show table subobjects

Shows/hides table subobjects (fields and indexes) in the explorer tree.

☑ Sort profiles by aliases

Sorts profile aliases alphabetically in the explorer tree.

☑ Expand the "Tables" node after connection

Shows all database tables in the explorer tree after connecting to the database.

☑ Expand the "Queries" node after connection

Shows all database queries in the explorer tree after connecting to the database.

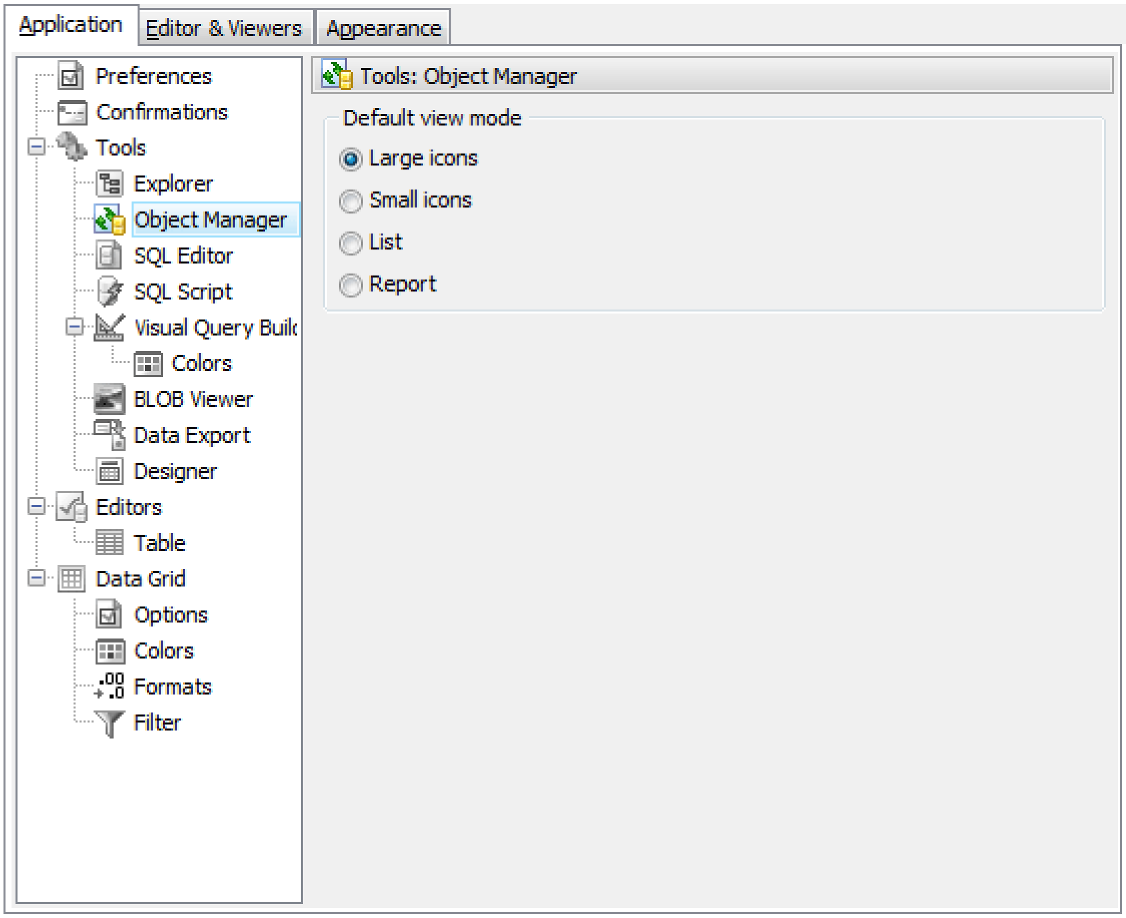
☑ Display system objects in different color

Represents all system objects in selected color.

You can also exclude/include rarely used objects from/to the Explorer tree. Manage object groups to be displayed at Explorer with corresponding checkboxes.

10.1.4.2 Object Manager

Below you will find a detailed decryption of the following Object Manager options.



Default view mode

● Large icons

○ Small icons

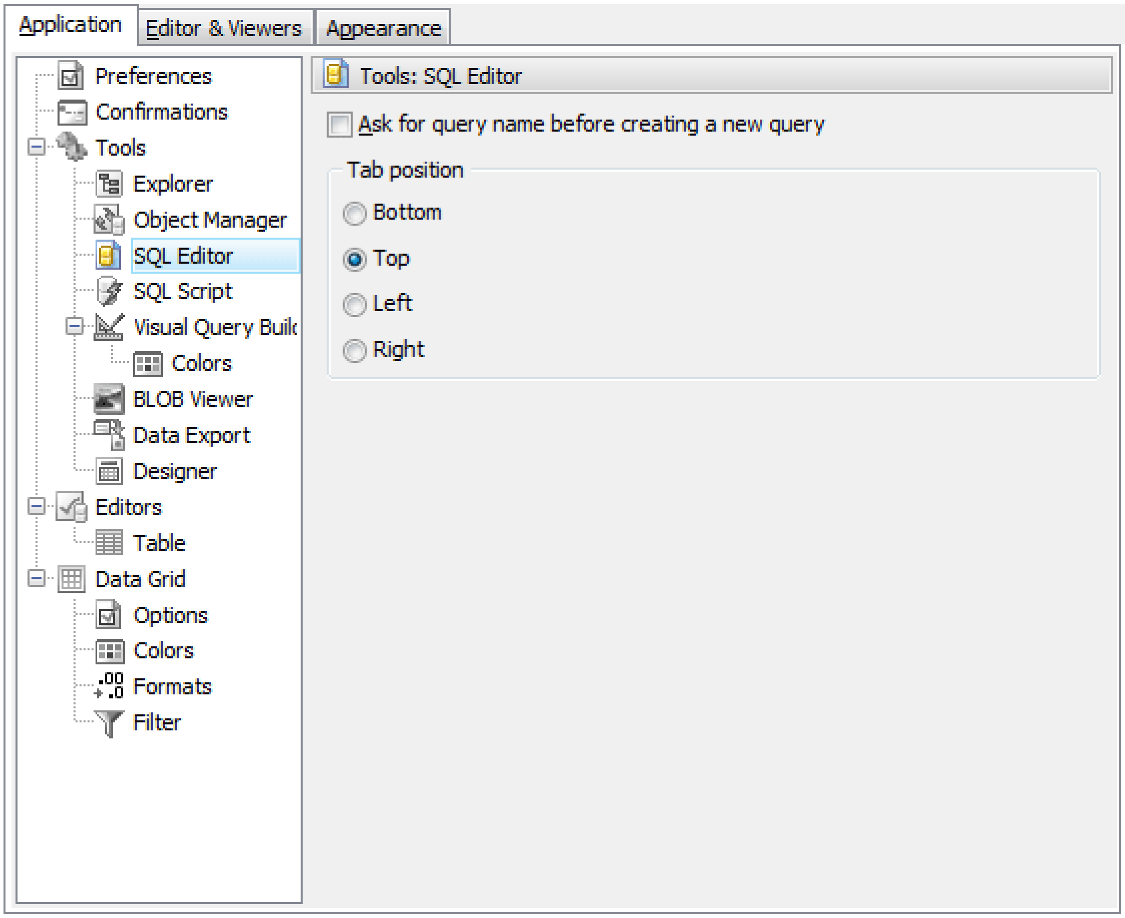
○ List

○ Report

Default view mode
Defines which view mode (*large icons*, *small icons*, *list* or *report*) is applied to Object Manager by default.

10.1.4.3 SQL Editor

Below you will find a detailed decryption of the following SQL Editor options.



☐ Ask for query name before creating a new query

Tab position

○ Bottom

● Top

○ Left

○ Right

☑ Ask for query name before creating a new query

If this option is checked, SQL Editor 184 asks for a query name each time you create a new query.

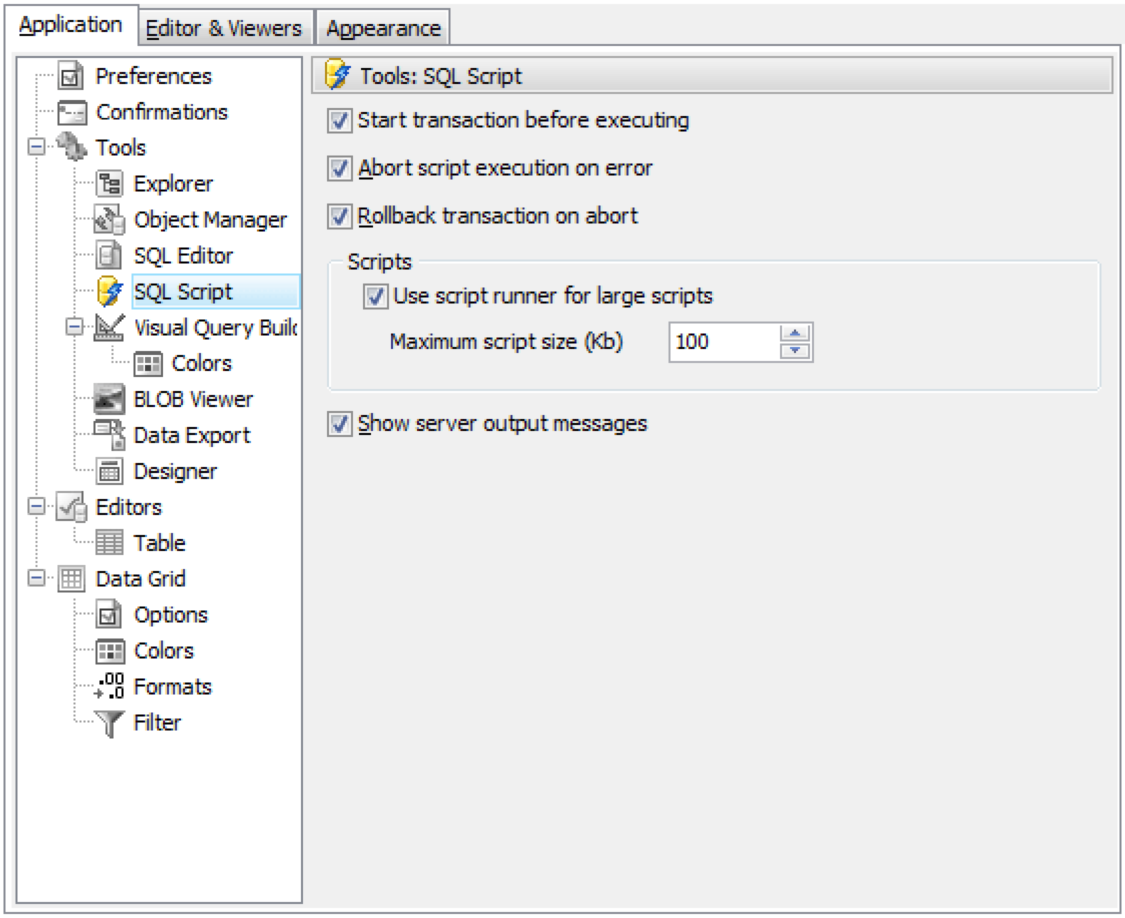
☑ Auto commit

Check the option to execute queries in autocommit mode (default value) or leave it blank to manage transactions manually.

You can also select position of query tabs.

10.1.4.4 SQL Script Editor

Below you will find a detailed decryption of the following SQL Script Editor options.



Tools: SQL Script

☑ Start transaction before executing

☑ Abort script execution on error

☑ Rollback transaction on abort

Scripts

☑ Use script runner for large scripts

Maximum script size (Kb) 100

☑ Show server output messages

☑ Abort script execution on error

If this option is checked, script execution aborts when an error occurs.

☑ Rollback transaction on abort

This option evokes automatic rollback on script execution abort.

☑ Use script runner for large scripts

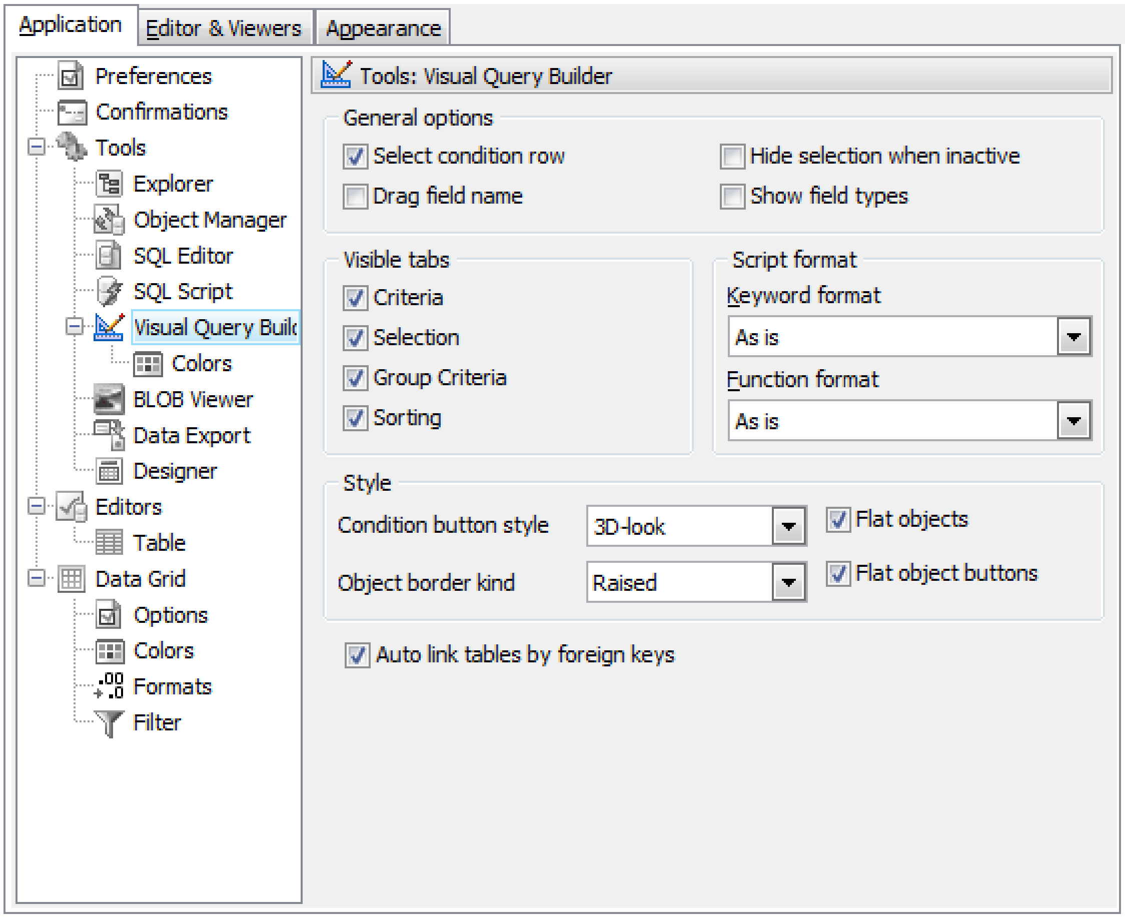
Check the box to execute large script in the fastest way. You can change the maximum size of a script to execute without script runner.

☑ Show server output messages

Turn the option ON to see warning messages generated by the server.

10.1.4.5 Query Builder

Below you will find a detailed decryption of the following Query Builder options.



Tools: Visual Query Builder

General options

☑ Select condition row
☐ Hide selection when inactive
☐ Drag field name
☐ Show field types

Visible tabs

☑ Criteria
☑ Selection
☑ Group Criteria
☑ Sorting

Script format

Keyword format: As is
Function format: As is

Style

Condition button style: 3D-look
Object border kind: Raised
☑ Flat objects
☑ Flat object buttons

☑ Auto link tables by foreign keys

☑ Select condition row
Displays the selected condition in different row on the Criteria and Grouping Criteria tabs of Visual Query Builder 189.

☑ Drag field name
Displays the dragged field name in the Builder area.

☑ Hide selection when inactive
Hides the selection when the query builder is inactive.

☑ Show field types
Displays the field type next to the field in the table box.

Visible tabs
These options specify which the query builder tabs are available and which are not. Check them to make the appropriate tabs visible.

Script format
These options specify the case formatting of keywords and functions in query text on the Edit tab. As is saves the original case, Uppercase sets all the keywords/functions to upper case, Lowercase sets all the keywords/functions to lower case, and First upper sets the first letters of all keywords/functions to upper case.

Style

These options specify how different the Query Builder objects look like - 3D, flat, etc.

☑ Auto link tables by foreign keys

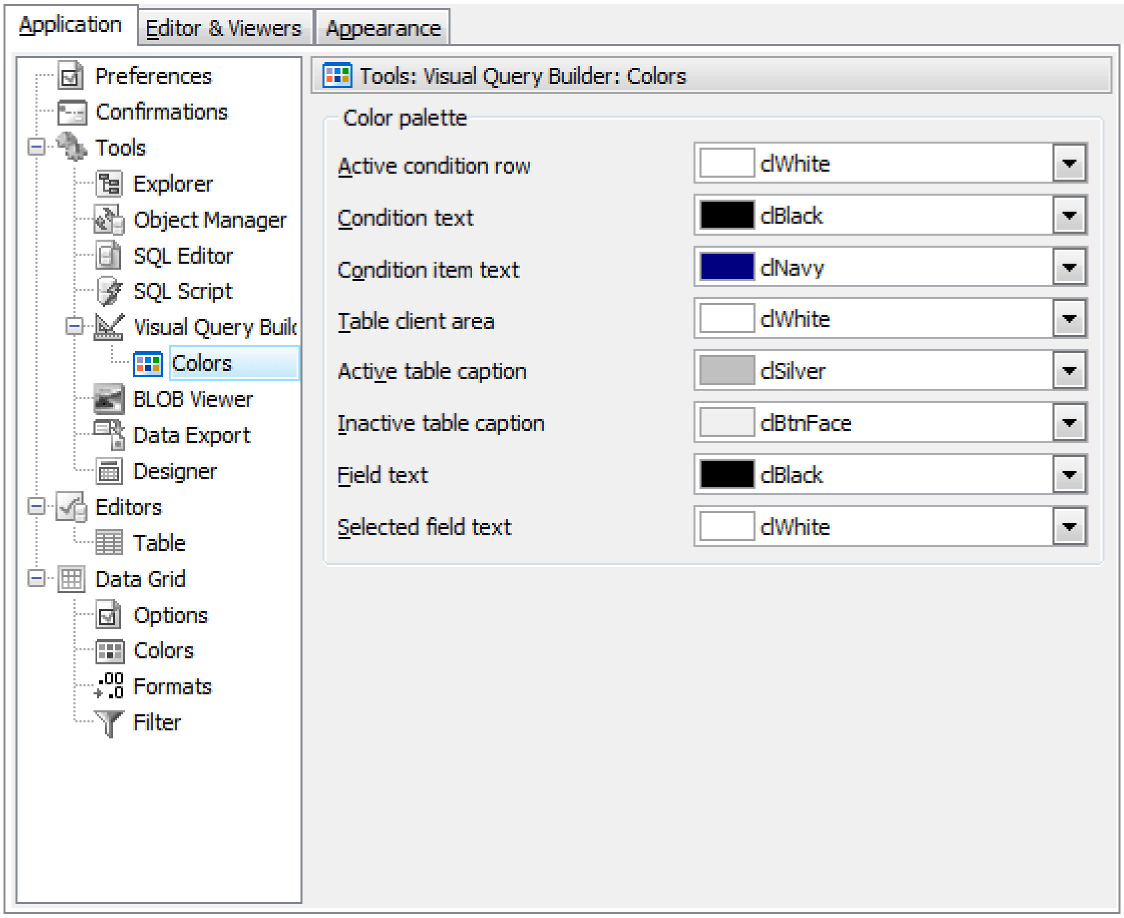
If tables that have foreign key reference are placed in Query Builder, in diagram they will be auto linked.END

Colors

These options define colors of the different Query Builder elements: condition row, active caption, table client area, etc. Click an item to select a color for the appropriate Query Builder element.

10.1.4.5.1 Colors

The tab is provided to editing of the Query Builder color schema. Customize colors for all editor element according to your preferences.



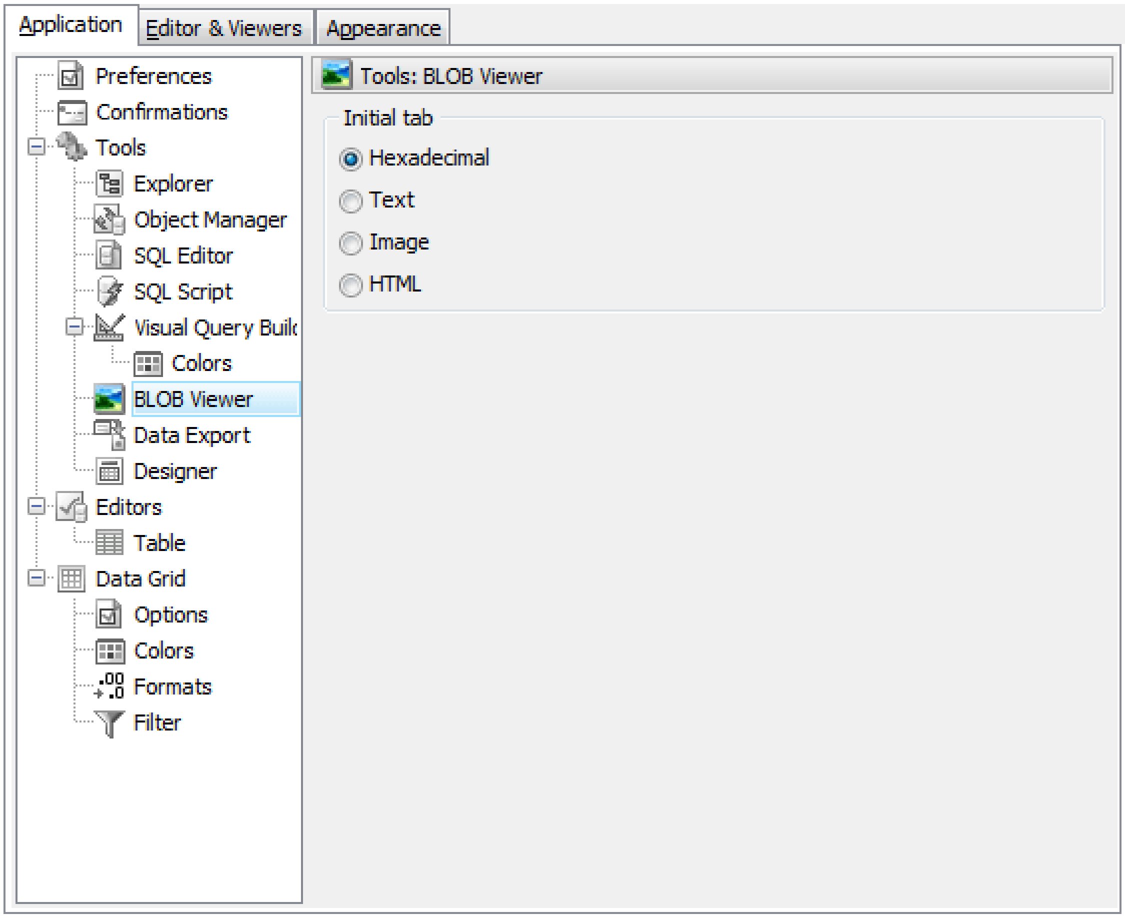
Tools: Visual Query Builder: Colors

Color palette

Active condition row	clWhite
Condition text	clBlack
Condition item text	clNavy
Table client area	clWhite
Active table caption	clSilver
Inactive table caption	clBtnFace
Field text	clBlack
Selected field text	clWhite

10.1.4.6 BLOB Viewer

Below you will find a detailed decryption of the following BLOB Viewer 238 options.



Tools: BLOB Viewer

Initial tab

● Hexadecimal
○ Text
○ Image
○ HTML

Initial tab
Specifies which tab of BLOB Viewer should be active when it is initially opened.

10.1.4.7 Data Export

This window allows you to customize formats applied to exported data. Edit the format masks to adjust the result format in the way you need.

In *numeric* formats using digit placeholder (# or 0) you can specify the format of number. For example, integer 1234567890 with # ### ##0 integer format is represented like 1 234 567 890. The locations of the leftmost '0' before the decimal point in the format string and the rightmost '0' after the decimal point in the format string determine the range of digits that are always present in the output string.

Conversion and their description for *date*, *time* and *date time* format:

dd	day of the month, represented by 1 or 2 symbols. For example, the first day of month is 1
DD	day of the month, represented only by 2 symbols. For example, the first day of month is 01
mm	minutes

MM	month
yy	year, represented by 2 symbols. For example, 2006 year will be 06
yyyy	year, represented by 4 symbols. For example, 2006
h	hour, represented by 1 or 2 symbols. For example, 2
hh	hour, represented only by 2 symbols. For example, 02

".", ",", ":" symbols can be placed as separators in format masks for *integer, float, date, time, date time, currency* types.

☑ Auto save format strings

Auto saves format strings when they are changed (e.g. at the Adjusting data formats step in Export Data Wizard 215).

Using Set defaults button, you can set default values of data formats.

10.1.4.8 Database Designer

The following topic provides a shot Database Designer 260 retrofitting's description.

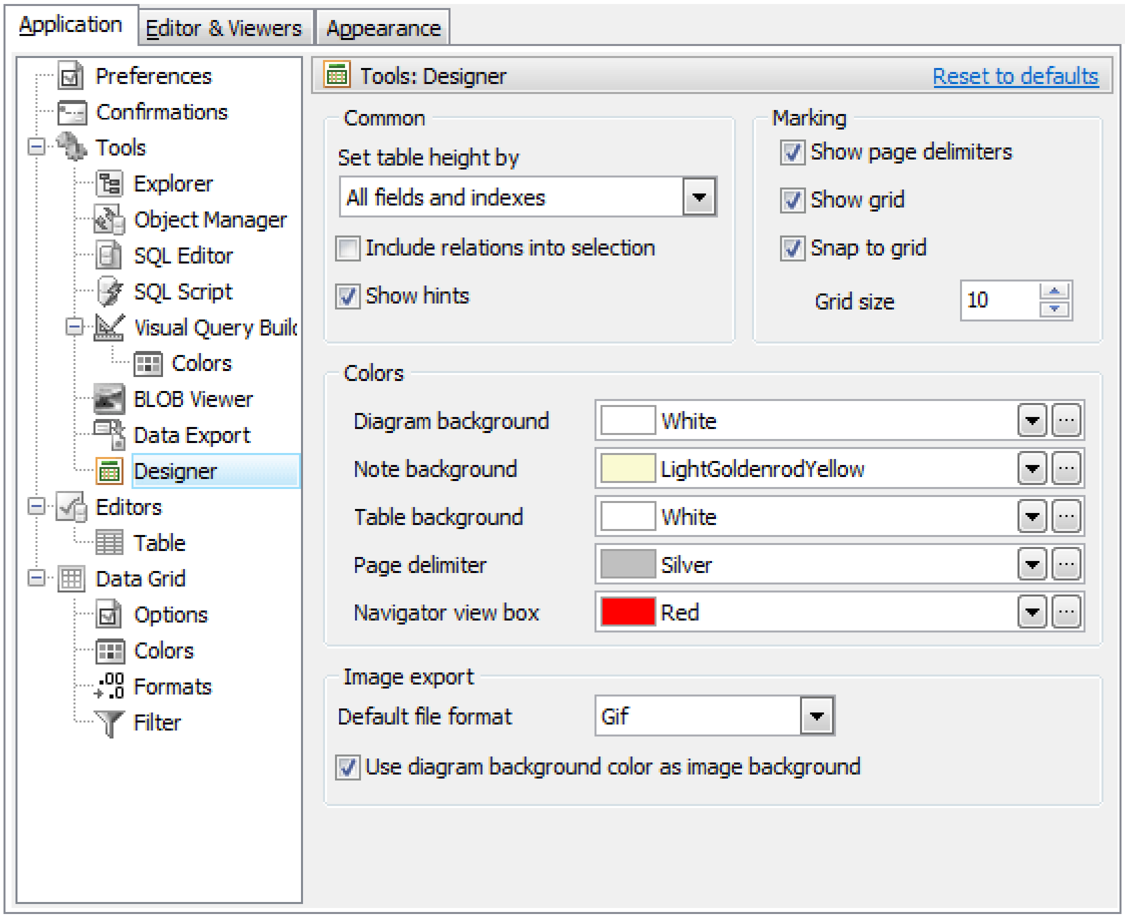
The Set table height option determines what the table attributes will be represented at the diagram (Caption only, Key fields, All fields or All fields and indexes).

Frequently it is necessary to line up some tables and objects on the diagram in a column. One of the ways that you may find convenient to do this is to take advantage of the grid. You can enable showing of the grid by checking the Show grid clause at the Marking options. Then diagram will be covered by points disposed on the same interval between.

If you enable snap to grid function by using the Snap to grid checkbox, when you move the table or other object, its upper left corner "snaps" to the nearest grid point. This feature will assist you to line up objects both horizontally and vertically. Diagram objects moved on a diagram can be automatically snapped to the grid points even if the grid is not displayed on the diagram.

Interval between grid points can be changed as grid size.

The Colors options are to attune the Designer appearance to your taste. Here you change diagrams and tables background colors, the colors of page delimiter and Navigator view box.



Tools: Designer

Common

Set table height by: All fields and indexes

☐ Include relations into selection

☑ Show hints

Marking

☑ Show page delimiters

☑ Show grid

☑ Snap to grid

Grid size 10

Colors

Diagram background: White

Note background: LightGoldenrodYellow

Table background: White

Page delimiter: Silver

Navigator view box: Red

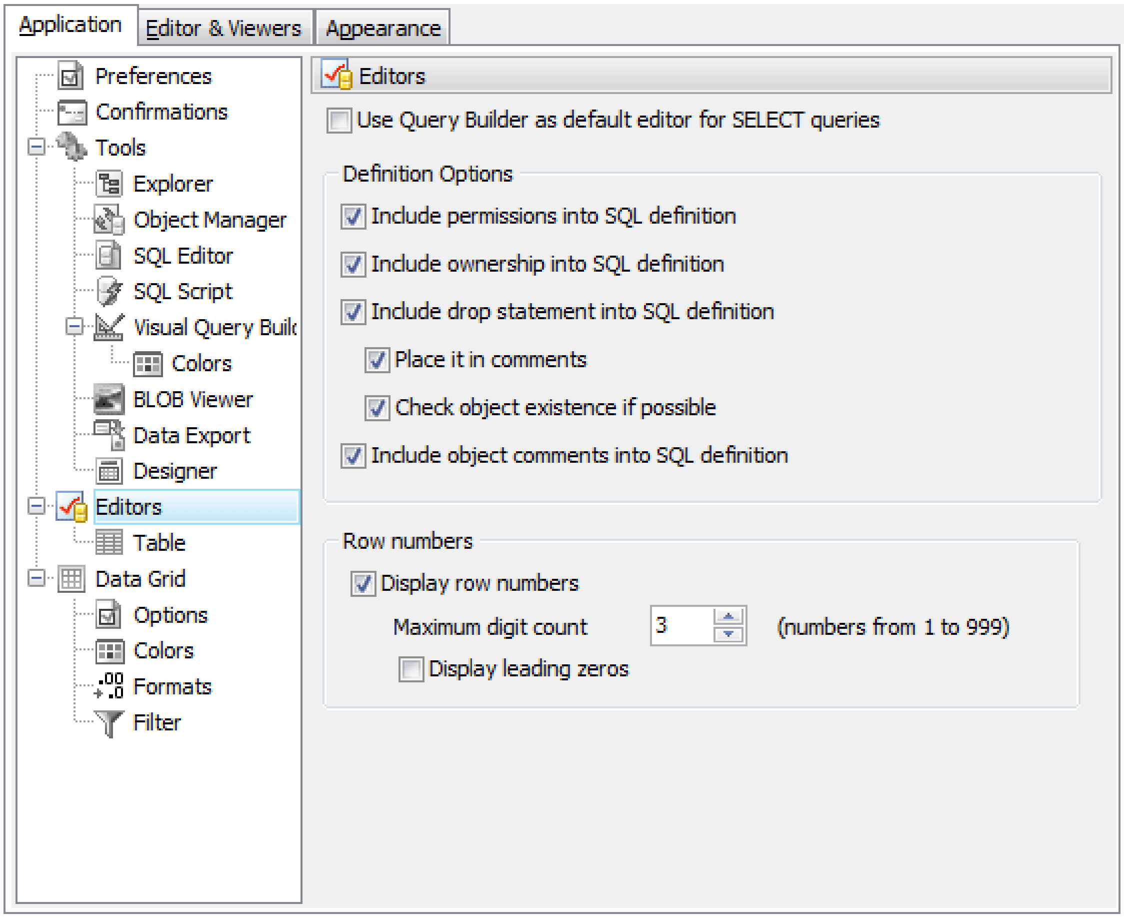
Image export

Default file format: Gif

☑ Use diagram background color as image background

10.1.5 Object Editors

Below you will find a detailed description of the following object editors options.



☐ Use Query Builder as default editor for SELECT queries

Definition Options

☑ Include permissions into SQL definition

☑ Include ownership into SQL definition

☑ Include drop statement into SQL definition

☑ Place it in comments

☑ Check object existence if possible

☑ Include object comments into SQL definition

Row numbers

☑ Display row numbers

Maximum digit count: 3 (numbers from 1 to 999)

☐ Display leading zeros

☑ Open each object editor in a new window

With this option checked a new child window opens each time you open an object for editing, otherwise the edited object is being changed in the existing object editor (except the existing object editor is in modified state).

☑ Use Query Builder as default editor for SELECT queries

With this option enabled all the SELECT queries will be opened in Visual Query Builder 189 instead of SQL Editor 184.

☑ Include drop statement

If checked, the SQL definition includes the drop statement.

☑ Place it in comments

With this option drop statement will be placed in comments of the SQL definition.

☑ Include object comments into SQL definition

With this option enabled comments that are specified for the object and object subitems are placed in SQL definition.

Row numbers

This options group allows you to manage the row numbering of the subobjects lists such as fileds, indexes, parameters and so on.

To enable/disable the numbering, use Display row numbers checkbox. You can set the

number columns width with Maximum digit count. (I.e. for the value '3' the max column number will be 999).
For uniformity you can use the Display leading zeros option. With this option enabled and maximum digit count '3' you numbering column will be of the form: '001, 002, 003, ...'.

10.1.5.1 Table

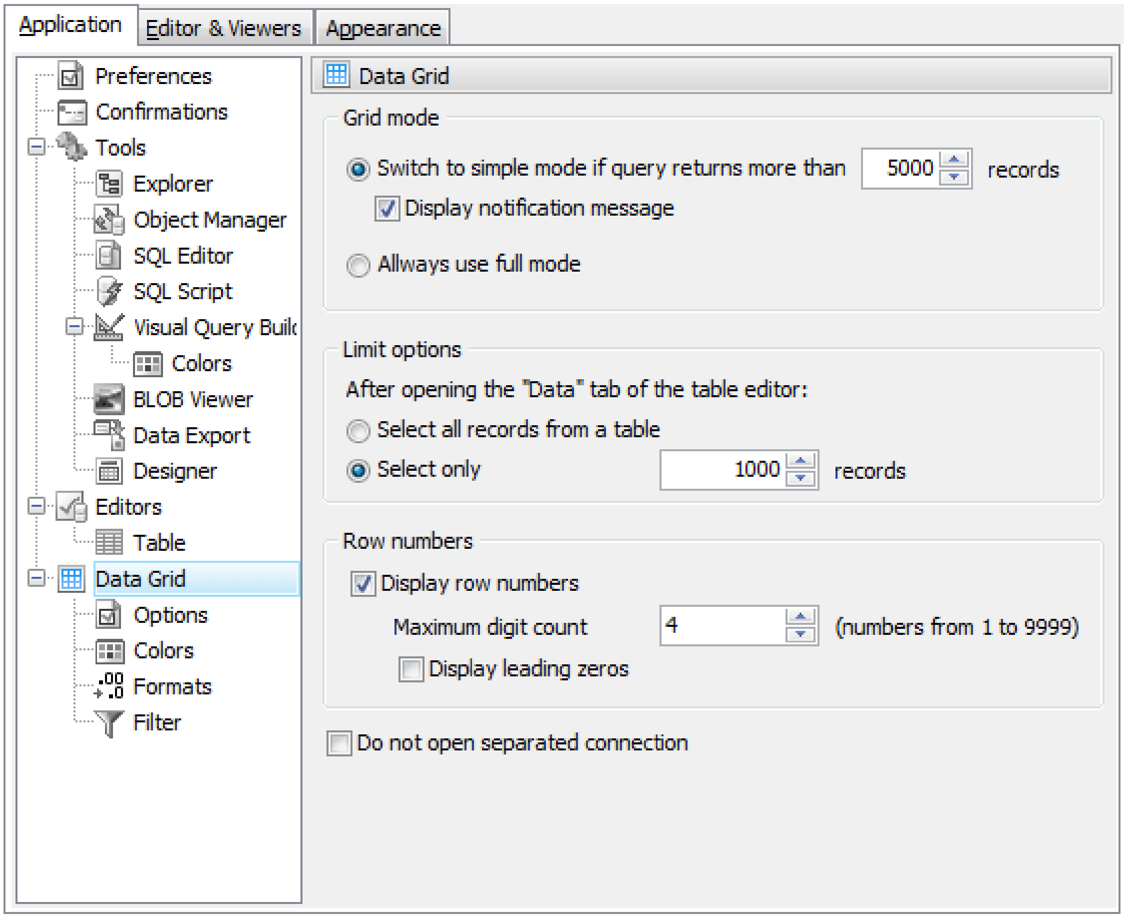
Initial tab
Specifies which tab of Table Editor 67 should be active when it is initially opened.

☑ Retrieve record count before loading data in the data grid
With this option enabled all the SELECT COUNT(*)... query is executed before loading data in the data grid.

Default field type
Specifies the field type appearing in Field Editor 71 by default.

10.1.6 Data Grid

Below you will find a detailed description of the following data grid options.



Grid mode
● Switch to simple mode if query returns more than 5000 records
☑ Display notification message
○ Allways use full mode

Limit options
After opening the "Data" tab of the table editor:
○ Select all records from a table
● Select only 1000 records

Row numbers
☑ Display row numbers
Maximum digit count 4 (numbers from 1 to 9999)
☐ Display leading zeros

☐ Do not open separated connection

DB2 Maestro provides you with two grid modes 200 of viewing data:
- Fool grid mode allows you to group, filter and sort data in a usual way.
- Simple mode is provided for working with large records number. For data fetching speed-up, filtering, sorting, and grouping features are not enabled in this mode.

You can use notification message to indicate simple mode.

Set the number of records to switch to simple mode automatically or select Always use full mode.

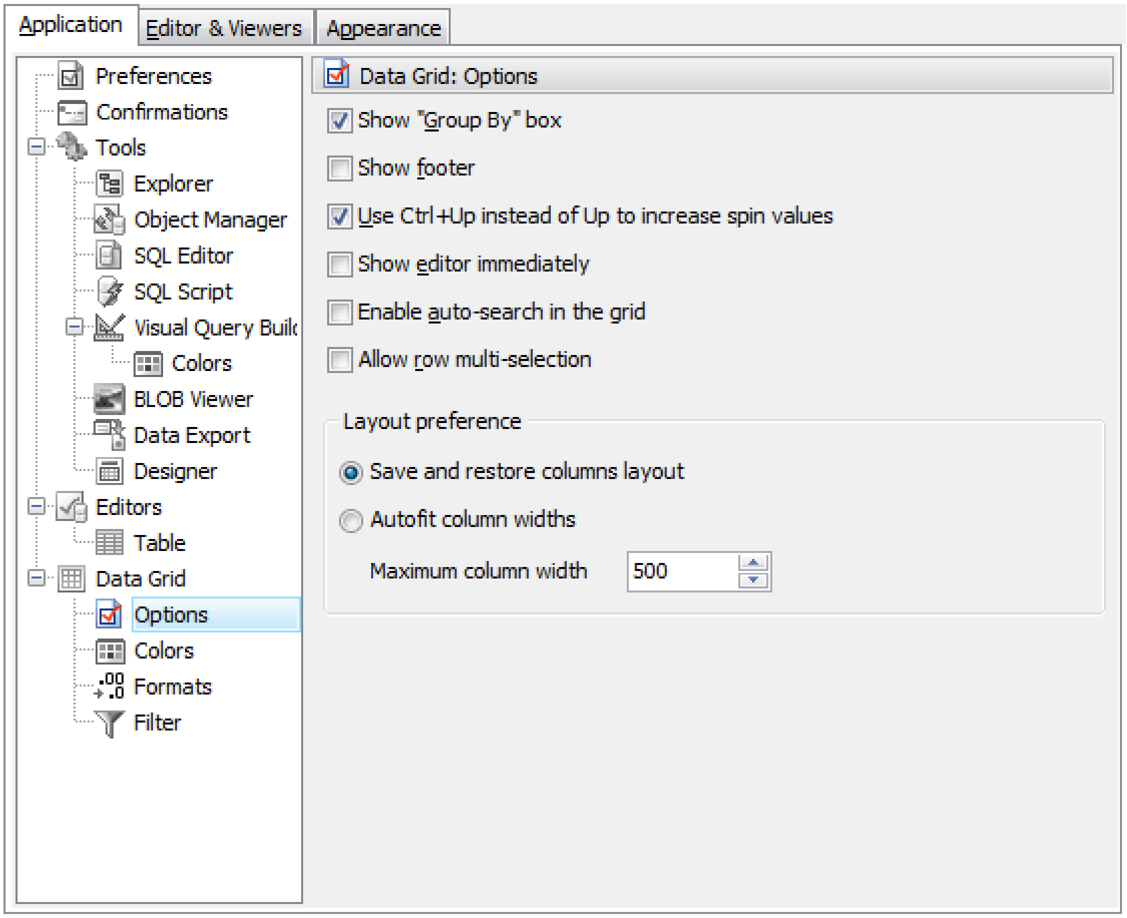
Limit options
Allows you either to select all records from table after opening the Data tab, or select only specified number of rows on one page with an ability to rotate pages and view all data.

Row numbers
This options group allows you to manage grid rows numbering.
To enable/disable the numbering, use Display row numbers checkbox. You can set the number columns width with Maximum digit count. (I.e. for the value '3' the max column number will be 999).
For uniformity you can use the Display leading zeros option. With this option enabled and maximum digit count '3' you numbering column will be of the form: '001, 002, 003, ...'.

☑ Do not open separated connection
With this option enabled a new connections for fetching data is not opened. This gives you an ability to work with data a little bit faster, because time for opening a new connections is not demanded.

10.1.6.1 Options

Below you will find a detailed decryption of the data grid options.



Data Grid: Options

☑ Show "Group By" box
☐ Show footer
☑ Use Ctrl+Up instead of Up to increase spin values
☐ Show editor immediately
☐ Enable auto-search in the grid
☐ Allow row multi-selection

Layout preference

● Save and restore columns layout
○ Autofit column widths

Maximum column width 500

☑ Show "Group By" box

Shows the box on the top of the grid view for grouping data by fields.

☑ Show footer

Shows the footer on the bottom of the grid view.

☑ Use Ctrl+Up instead of Up to increase spin values

Allows you to use Ctrl+Up and Ctrl+Down key combinations for editing the spin for numeric fields.

☑ Show editor immediately

Allows editing the cell value right after the cell is clicked.

☑ Enable auto-search in the grid

Allows you to search records in the grid by the first letters.

☑ Allow row multi-selection

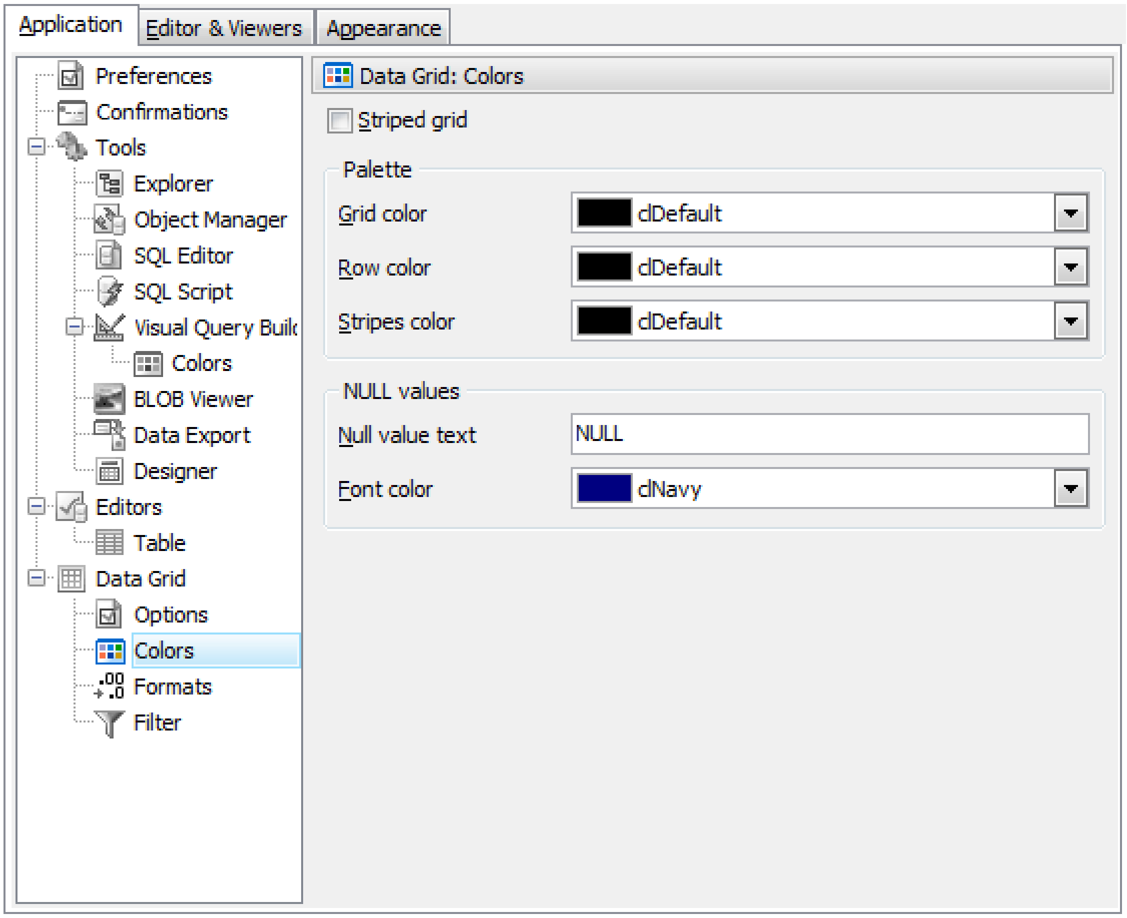
Allows you to select multiple records using the Ctrl and Shift keys.

Layout preference

Select whether DB2 Maestro should remember the column positions for the grids or fit them automatically.

10.1.6.2 Colors

Below you will find a detailed decryption of the following colors options.



☐ Striped grid

Palette

Grid color: clDefault

Row color: clDefault

Stripes color: clDefault

NULL values

Null value text: NULL

Font color: clNavy

☑ Striped grid
Displays the odd grid rows in a different color defined by the Stripes color option.

Grid color
Defines the background color of the data grid.

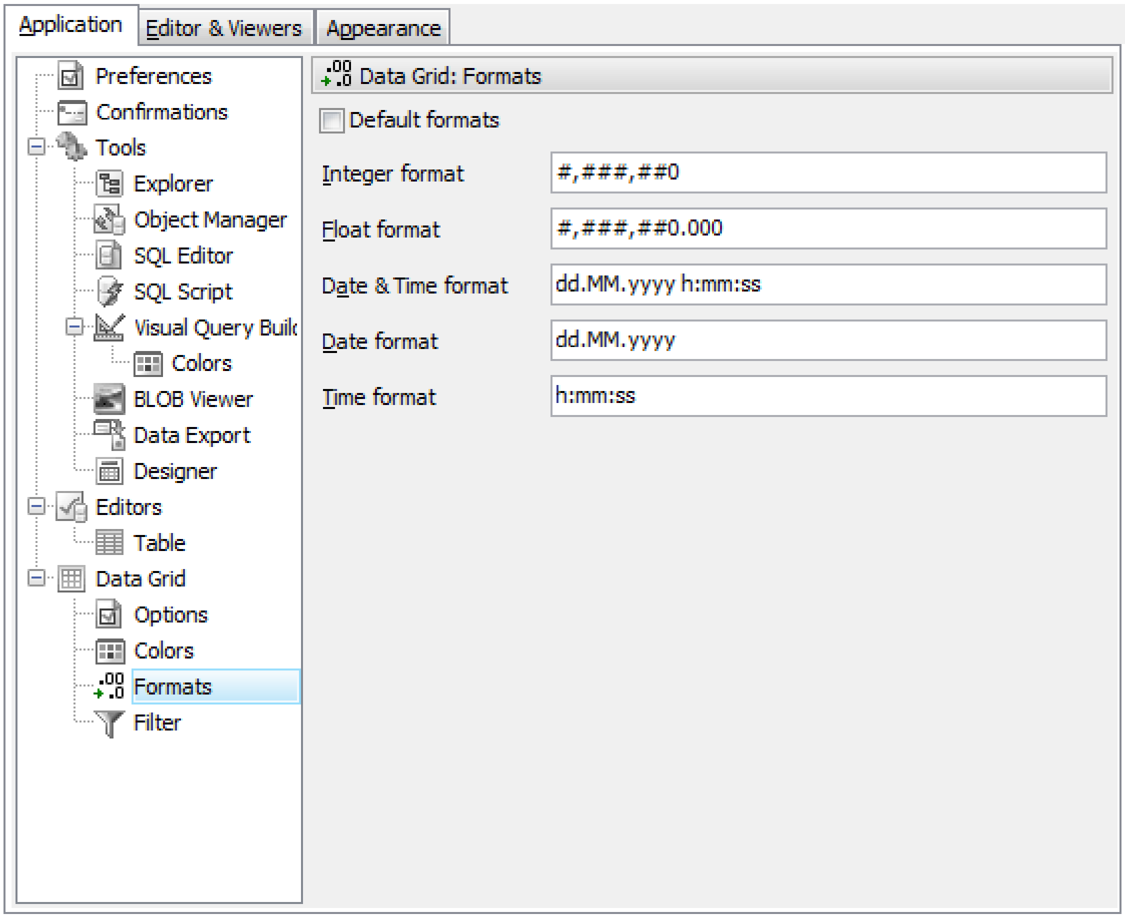
Row color
Defines the color of the selected row in the data grid.

Stripes color
Defines the color of the odd rows if the Striped Grid option is on.

Null values
Use Null value text to define the text that stand for the NULL value and use Font color to set the color for displaying this text.

10.1.6.3 Formats

Below you will find a detailed decryption of the following formats options.



☐ Default formats

Integer format: #,###,##0

Float format: #,###,##0.000

Date & Time format: dd.MM.yyyy h:mm:ss

Date format: dd.MM.yyyy

Time format: h:mm:ss

This window allows you to customize formats applied to data in grid. Edit the format masks to adjust the result format in the way you need.

In *numeric* formats using digit placeholder (# or 0) you can specify the format of number. For example, integer 1234567890 with # ### ##0 integer format is represented like 1 234 567 890. The locations of the leftmost '0' before the decimal point in the format string and the rightmost '0' after the decimal point in the format string determine the range of digits that are always present in the output string.

Conversion and their description for *date*, *time* and *date time* format:

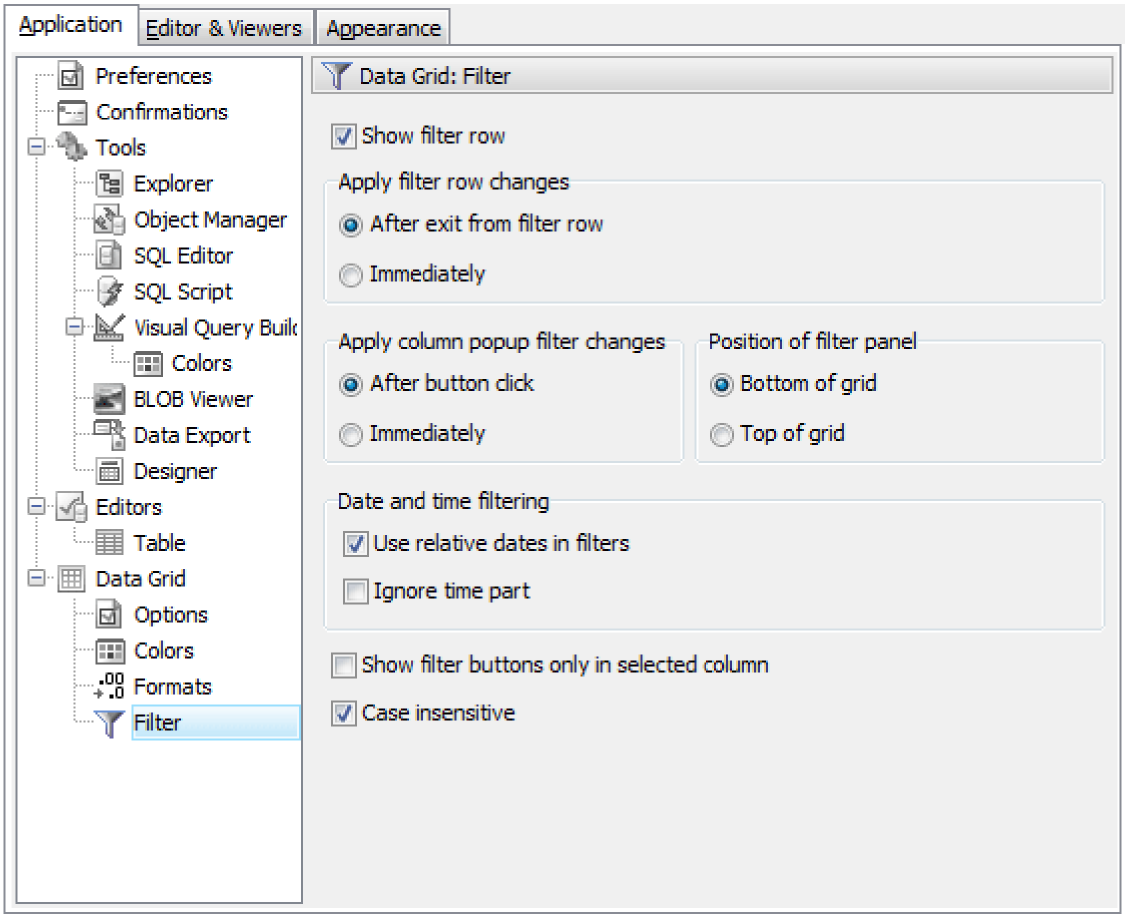
dd	day of the month, represented by 1 or 2 symbols. For example, the first day of month is 1
DD	day of the month, represented only by 2 symbols. For example, the first day of month is 01
mm	minutes
MM	month
yy	year, represented by 2 symbols. For example, 2006 year will be 06

yyyy	year, represented by 4 symbols. For example, 2006
h	hour, represented by 1 or 2 symbols. For example, 2
hh	hour, represented only by 2 symbols. For example, 02

"**.**", "**,**", "**:**" symbols can be placed as separators in format masks for *integer, float, date, time, date time, currency* types.

10.1.6.4 Filter

These options allows you to customize data filtering in grids.



Data Grid: Filter

☑ Show filter row

Apply filter row changes
● After exit from filter row
○ Immediately

Apply column popup filter changes
● After button click
○ Immediately

Position of filter panel
● Bottom of grid
○ Top of grid

Date and time filtering
☑ Use relative dates in filters
☐ Ignore time part

☐ Show filter buttons only in selected column
☑ Case insensitive

☑ Show filter row

When checked the filter row is always represented in the data grid as an additional row.

Apply filter row changes and Apply column popup filter changes allows you to manage the speed of the data filtering. To speed-up the process select Immediately as the time the filter you are set will be applied.

Change the Position of filter panel and customize timestamp data filtering: check the Use relative dates in filters box to include in column popup filter such options as "Yesterday", "Today", "Tomorrow", "Last 30 day", "Last week", "Next week", and others; check the Ignore time part box to neglect time part of timestamp data under the filtering.

By default filter buttons are shown at all columns header, to show filter button only in selected column, check the corresponding option.

You can specify the case sensitivity of the grid filter with the Case insensitive checkbox (ON by default).

10.2 Editors & Viewers

The Editors & Viewers section allows you to set the parameters of viewing and editing the SQL statements within DB2 Maestro.

- General 301
- Display 302
- SQL highlight 303
- PHP highlight 305
- XML highlight 304
- Code Insight 306
- Code Folding 307

See also: SQL Editor 184, SQL Script Editor 234, Visual Query Builder 189, Table Editor 67.

10.2.1 General

If the Auto indent option is checked, each new indention is the same as the previous when editing SQL text.

☑ Insert mode
If this option is checked, insert symbols mode is default on.

☑ Use syntax highlight
Enables syntax highlight in the object editor window.

☑ Always show links
If this option is checked, hyperlinks are displayed in the editor window. To open a link click it with the **Ctrl** button pressed.

☑ Show line numbers
If this option is checked, line numbers are displayed in the editor window.

☑ Show special chars
If this option is checked, special chars (like line breaks) are displayed in the editor window.

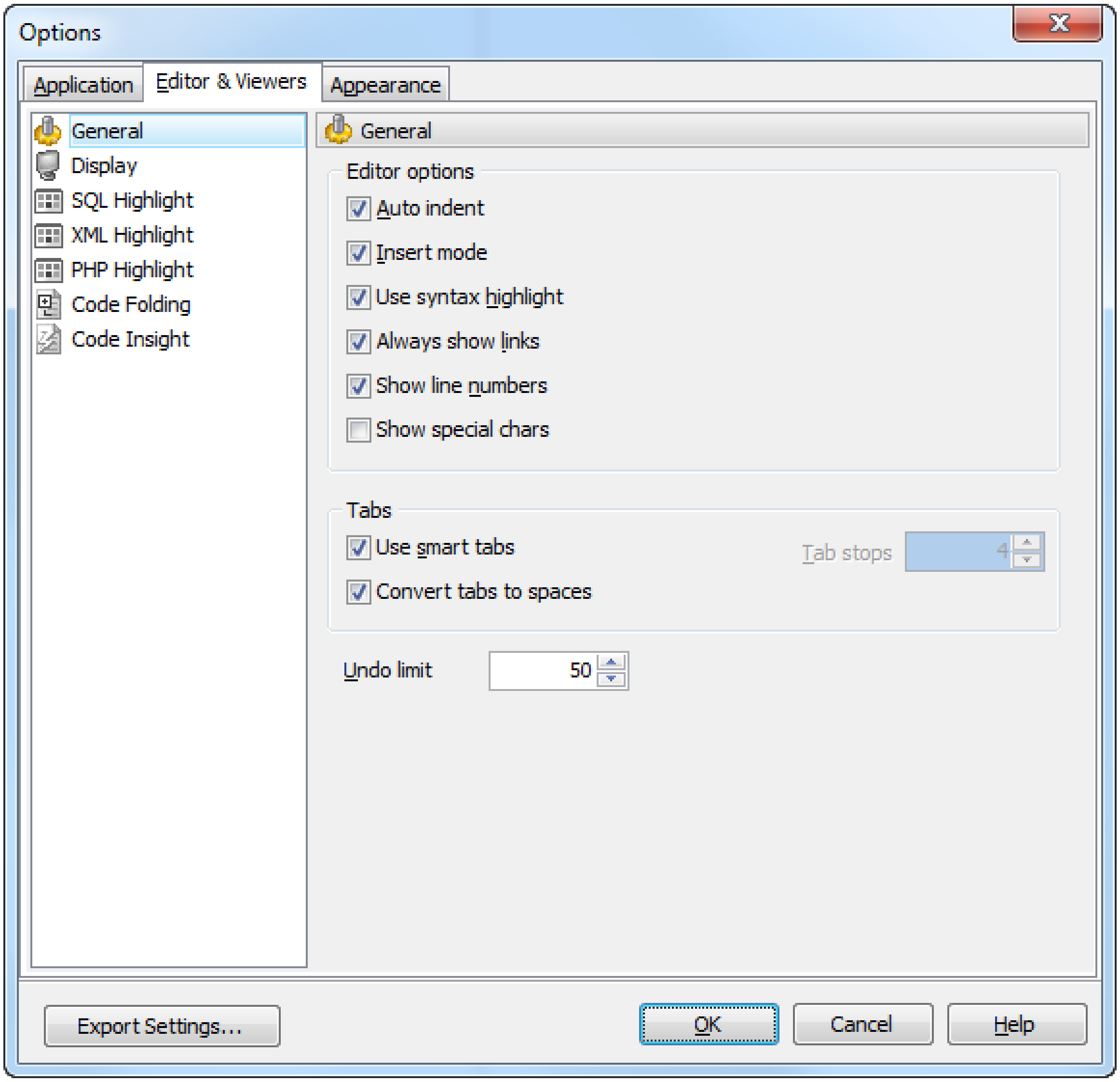
☑ Use smart tabs
With this option on the number of tab stops is calculated automatically, depending on the previous line tab.

☑ Convert tabs to spaces
If this option is checked, each time you press the Tab key, the appropriate number of spaces will be added to the edited text.

Tab Stops
Defines the tab length, used when editing text.

Undo Limit

Defines the maximum number of changes possible to be undone.



Editor options

☑ Auto indent

☑ Insert mode

☑ Use syntax highlight

☑ Always show links

☑ Show line numbers

☐ Show special chars

Tabs

☑ Use smart tabs

☑ Convert tabs to spaces

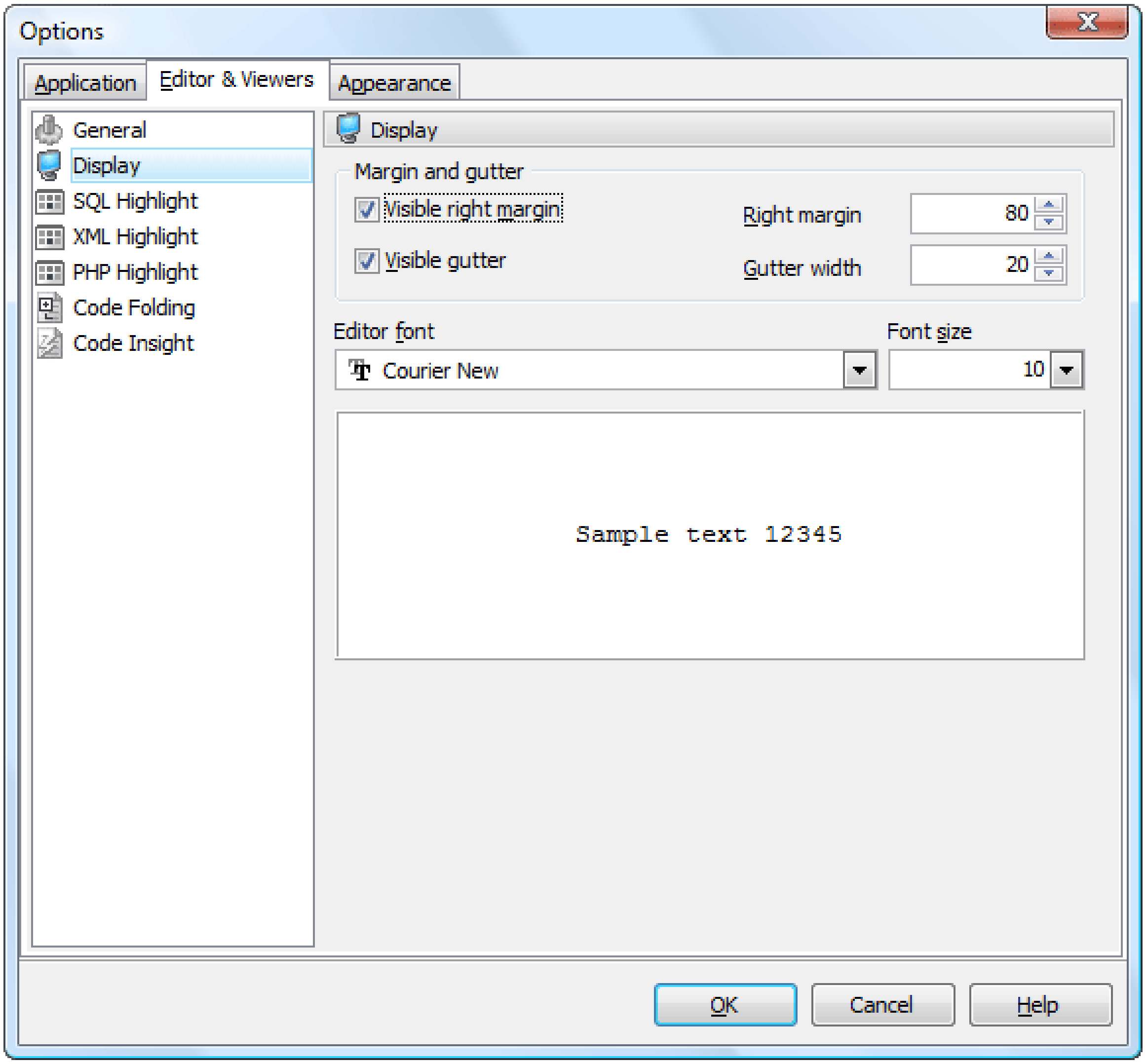
Tab stops 4

Undo limit 50

10.2.2 Display

You can disable/enable the right text margin and the gutter of the editor area, set the position of the right text margin as Right margin, and the Gutter width.

Use the Editor font and Font size to define the font used in all program editors and viewers. The panel below displays the sample of the selected font.



☑ Visible right margin

Right margin: 80

☑ Visible gutter

Gutter width: 20

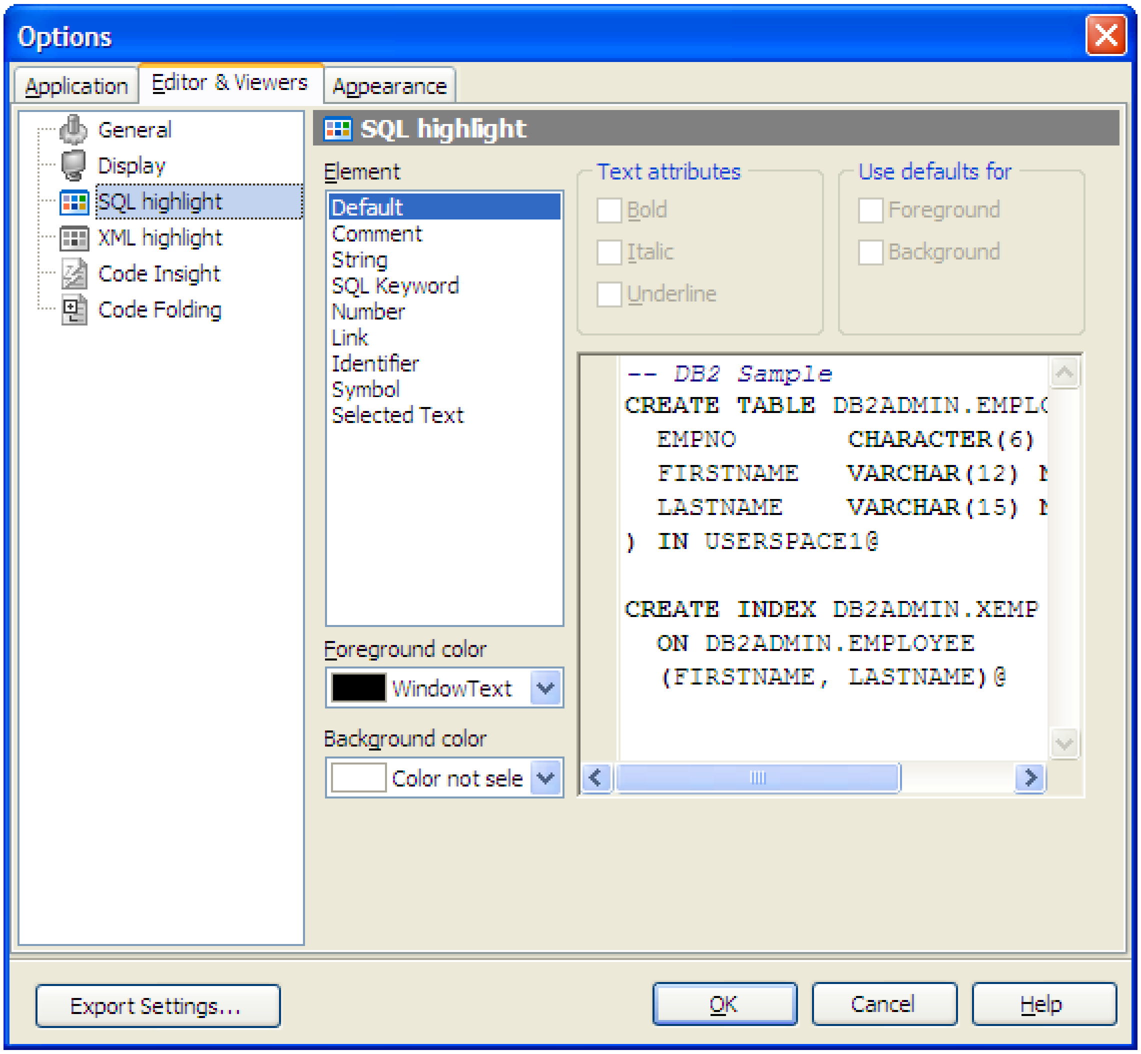
Editor font: Courier New

Font size: 10

Sample text 12345

10.2.3 SQL highlight

Use the SQL highlight item to customize syntax highlight in all SQL editors and viewers, e.g. in SQL Editor, Query Builder, Table Editor and others. Select the text element from the list, e.g. *comment* or *SQL keyword* and adjust its foreground color, background color and text attributes according to your preferences.



Element:
- Default
- Comment
- String
- SQL Keyword
- Number
- Link
- Identifier
- Symbol
- Selected Text

Text attributes: ☐ Bold ☐ Italic ☐ Underline

Use defaults for: ☐ Foreground ☐ Background

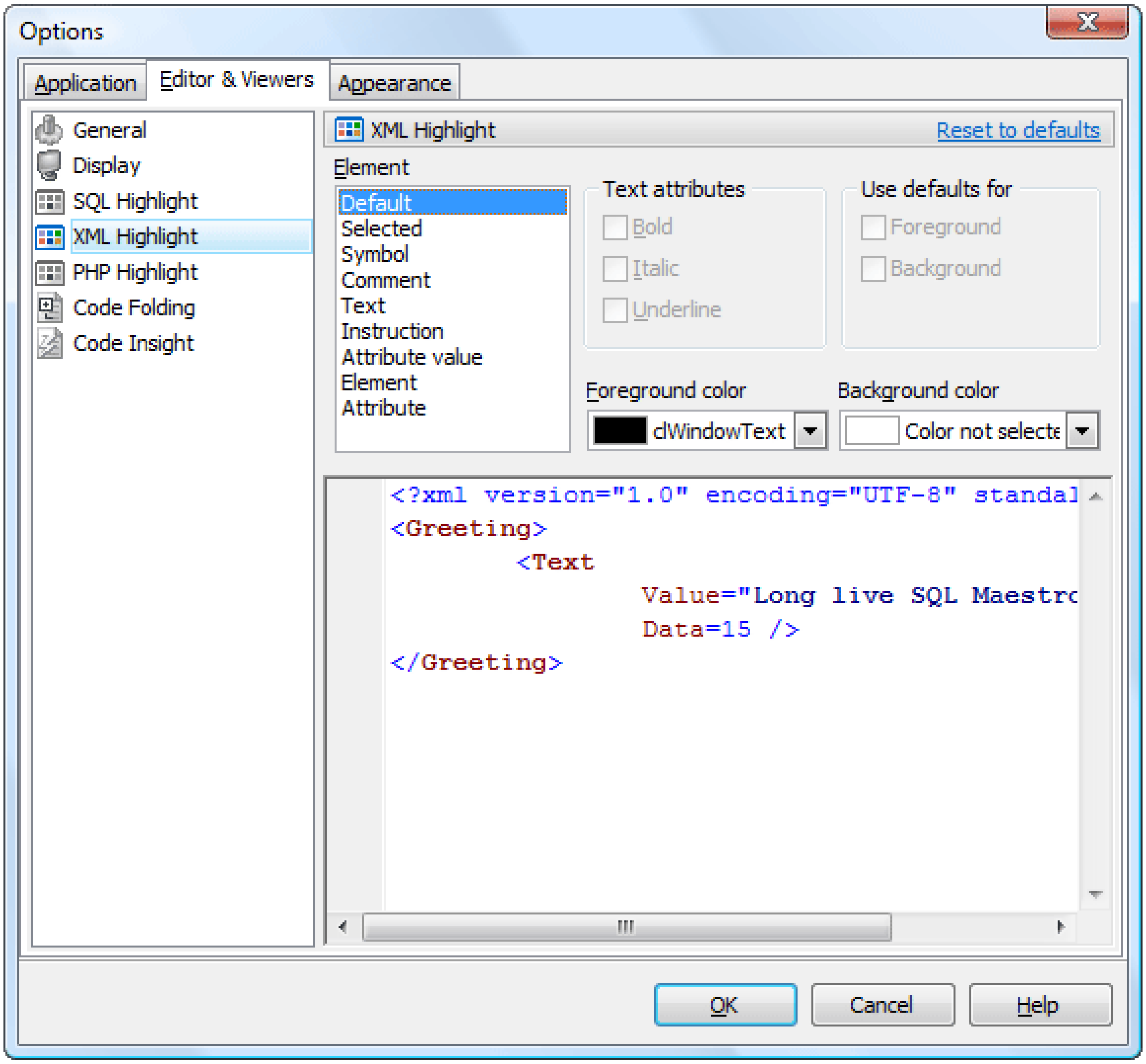
Foreground color: WindowText

Background color: Color not sele

```
-- DB2 Sample
CREATE TABLE DB2ADMIN.EMPL
  EMPNO        CHARACTER(6)
  FIRSTNAME    VARCHAR(12)
  LASTNAME     VARCHAR(15)
) IN USERSPACE1@

CREATE INDEX DB2ADMIN.XEMP
  ON DB2ADMIN.EMPLOYEE
  (FIRSTNAME, LASTNAME)@
```

10.2.4 XML highlight

Use the XML highlight item to customize XML syntax highlight for the text representation of BLOBs in BLOB Viewer/Editor. Select the text element from the list, e.g. attribute or attribute value and adjust its foreground color, background color and text attributes according to your wishes.



Element: Default

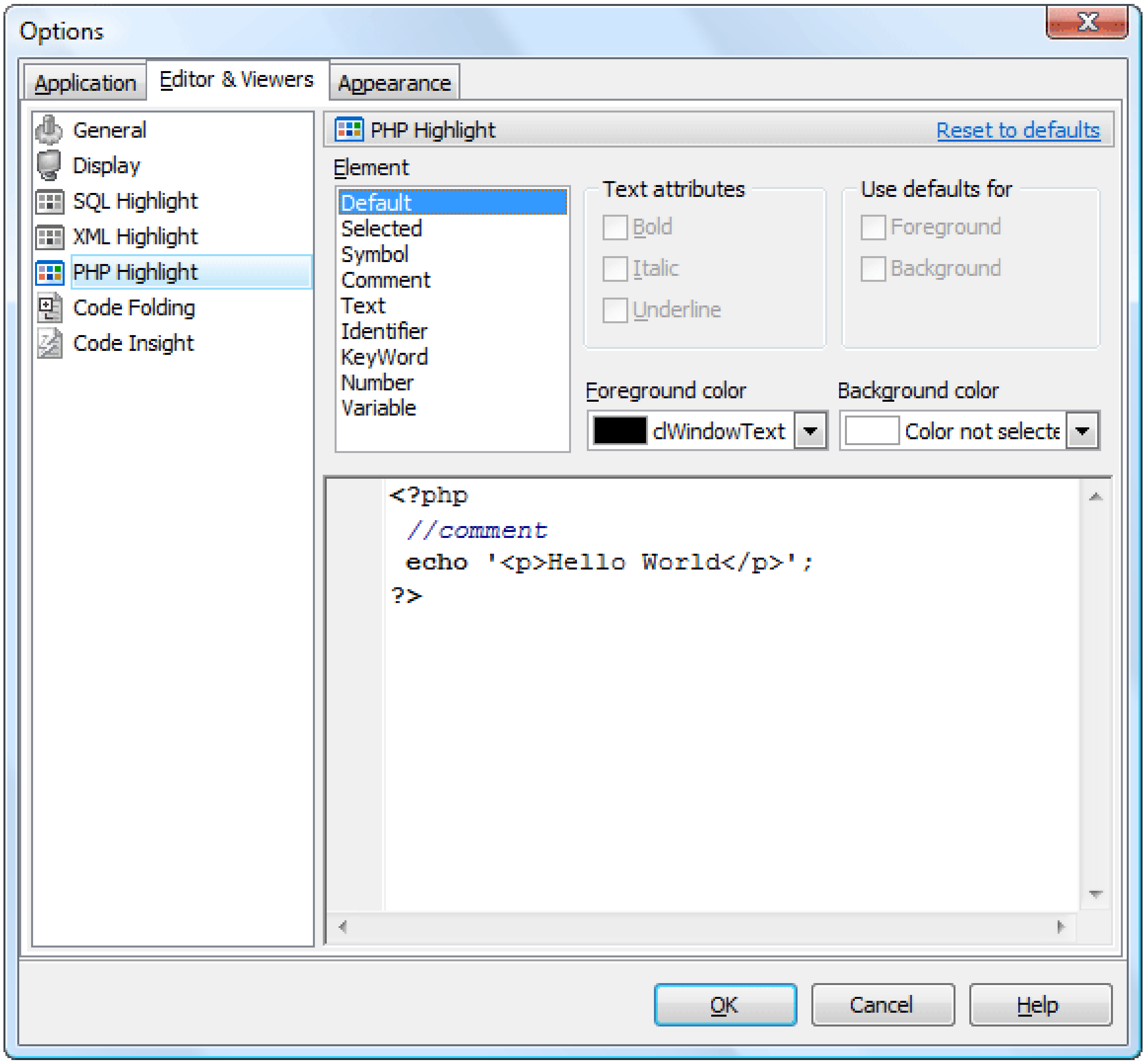
Foreground color: clWindowText

Background color: Color not selecte

```
<?xml version="1.0" encoding="UTF-8" standal
<Greeting>
        <Text
                Value="Long live SQL Maestr
                Data=15 />
</Greeting>
```

10.2.5 PHP highlight

Use the PHP highlight item to customize PHP syntax highlight for the text representation of BLOBs in BLOB Viewer/Editor. Select the text element from the list (e.g. Keyword, Comment, Identifier), and adjust its foreground color, background color and text attributes according to your wishes.



PHP Highlight

Element

- Default
- Selected
- Symbol
- Comment
- Text
- Identifier
- KeyWord
- Number
- Variable

Text attributes

☐ Bold
☐ Italic
☐ Underline

Use defaults for

☐ Foreground
☐ Background

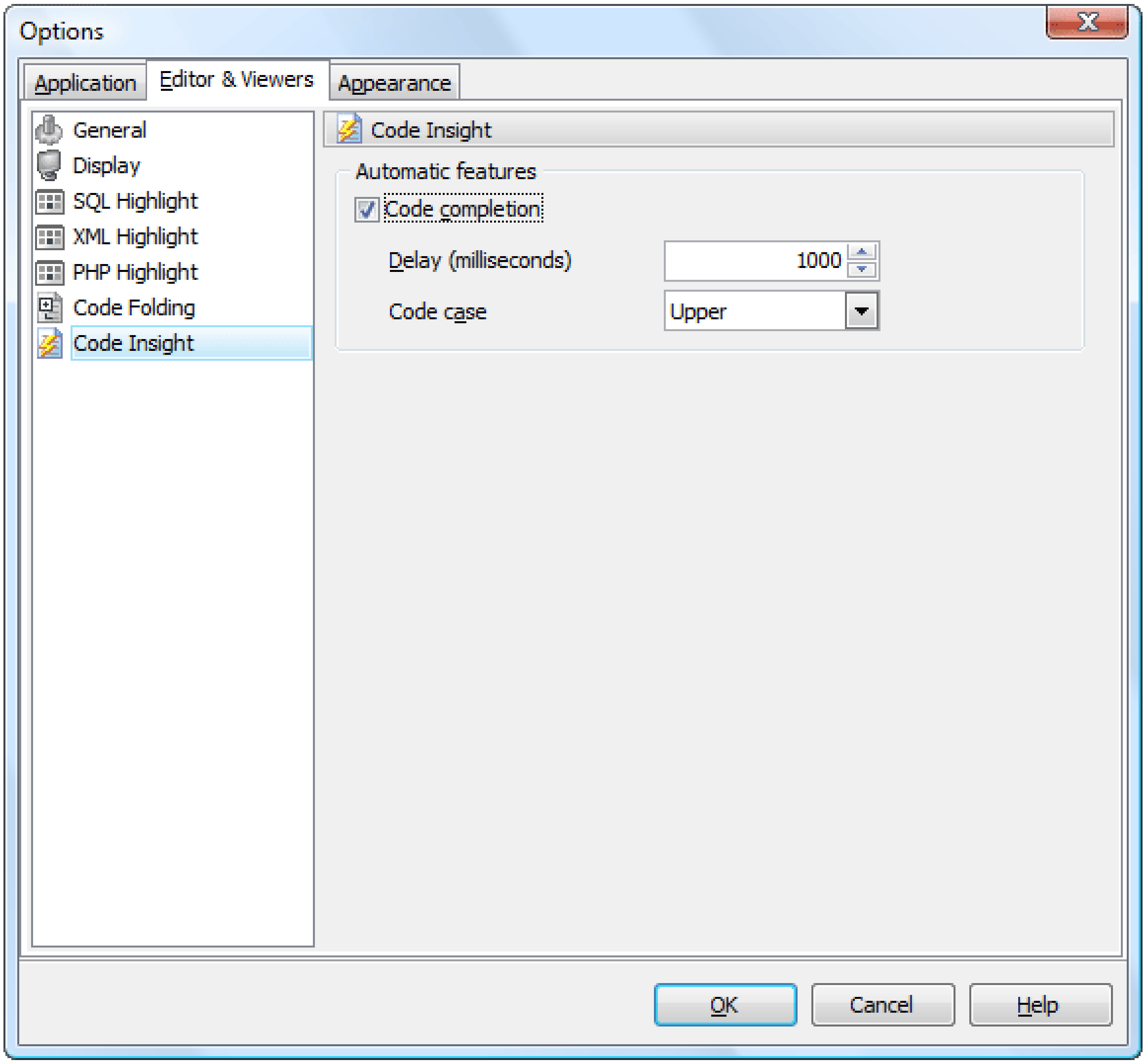
Foreground color: clWindowText

Background color: Color not selecte

```
<?php
 //comment
 echo '<p>Hello World</p>';
?>
```

10.2.6 Code Insight

You can disable/enable the code completion with the corresponding option and also set the time is appears as Delay, and case of words inserted automatically.



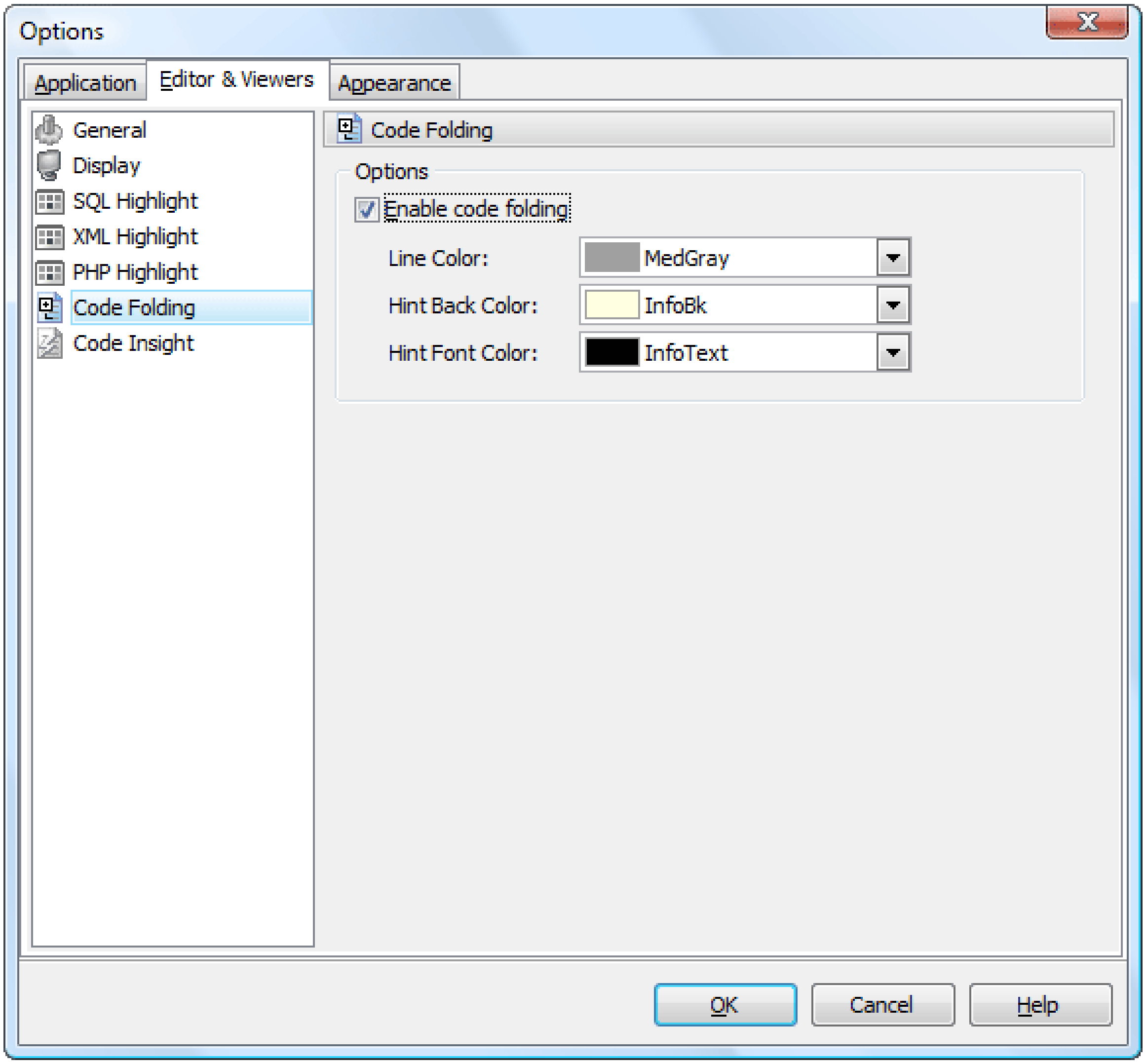
☑ Code completion

Delay (milliseconds) 1000

Code case Upper

10.2.7 Code Folding

The Code Folding item group makes it possible both to view the whole text and to divide it into logical parts (regions). Each part can be collapsed and extended. In extended mode the whole text is displayed (set by default), in collapsed mode the text is hidden behind one text line denoting the first line of the collapsed region.



☑ Enable code folding

Line Color: MedGray

Hint Back Color: InfoBk

Hint Font Color: InfoText

You can enable/disable code folding in SQL editors and viewers and customize the colors of its items.

10.3 Appearance

The Appearance section allows you to customize the application interface style to your preferences.

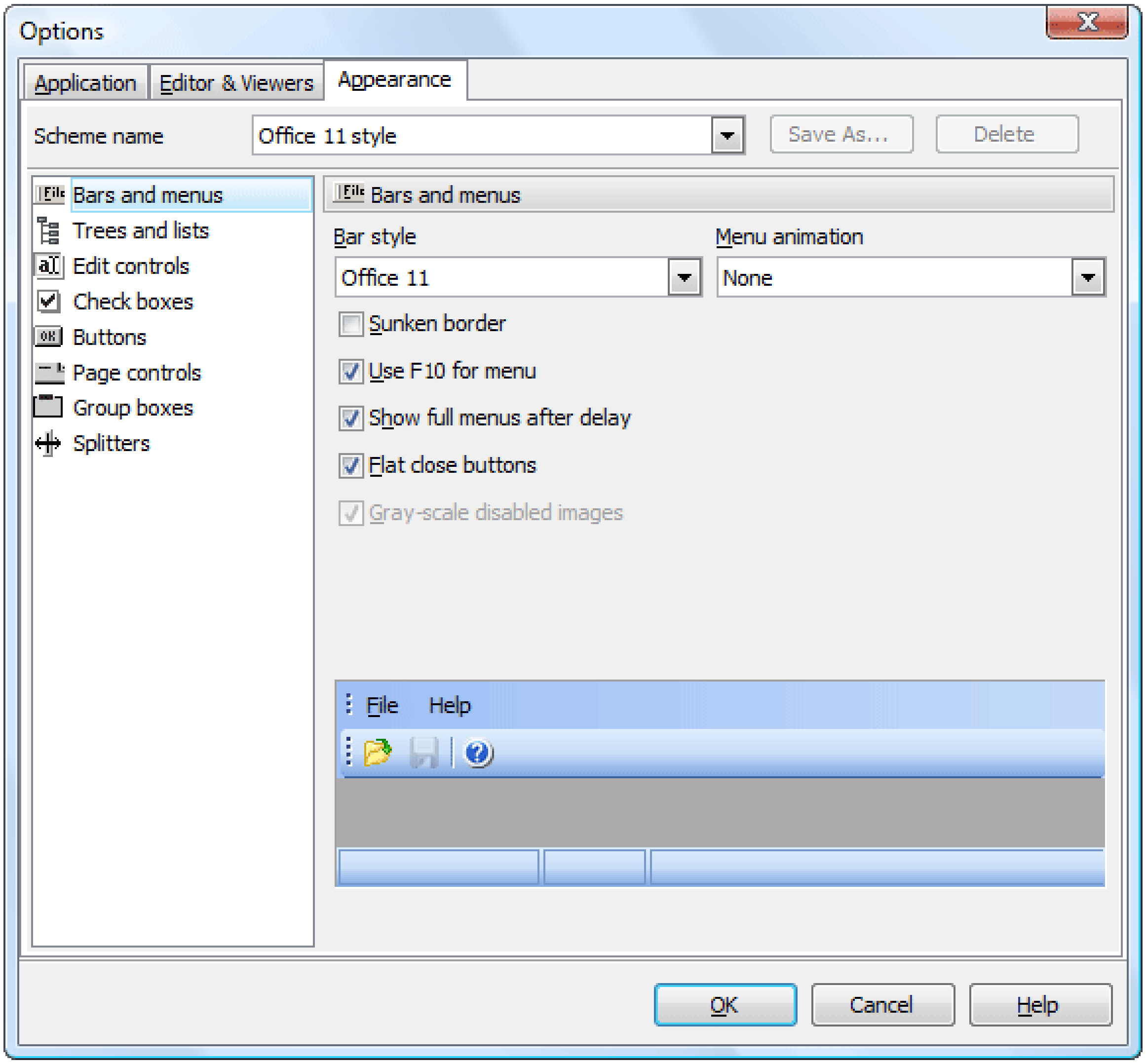
Use the Scheme name box to select the interface scheme you prefer: *Office XP style*, *Windows XP native style*, etc. You can create your own interface schemes by customizing any visual options (Bars and menus, Trees and lists, Edit controls, Check boxes, Buttons, etc.) and clicking the Save As button. All the customized options are displayed on the sample panel.

- Bars and menus 309
- Trees and lists 310
- Edit controls 311
- Check boxes 312
- Buttons 313
- Page controls 314
- Group boxes 315
- Splitters 316

10.3.1 Bars and menus

Use the Bars and menus item to customize DB2 Maestro toolbars style and menus animation.

The item allows you to select Bar style and menu animation from the corresponding drop-down lists and to enable or disable such options as sunken border, F10 key for opening menu, viewing full menus after delay, flat close buttons, gray-scale images.



Scheme name: Office 11 style

Bar style: Office 11

Menu animation: None

☐ Sunken border

☑ Use F10 for menu

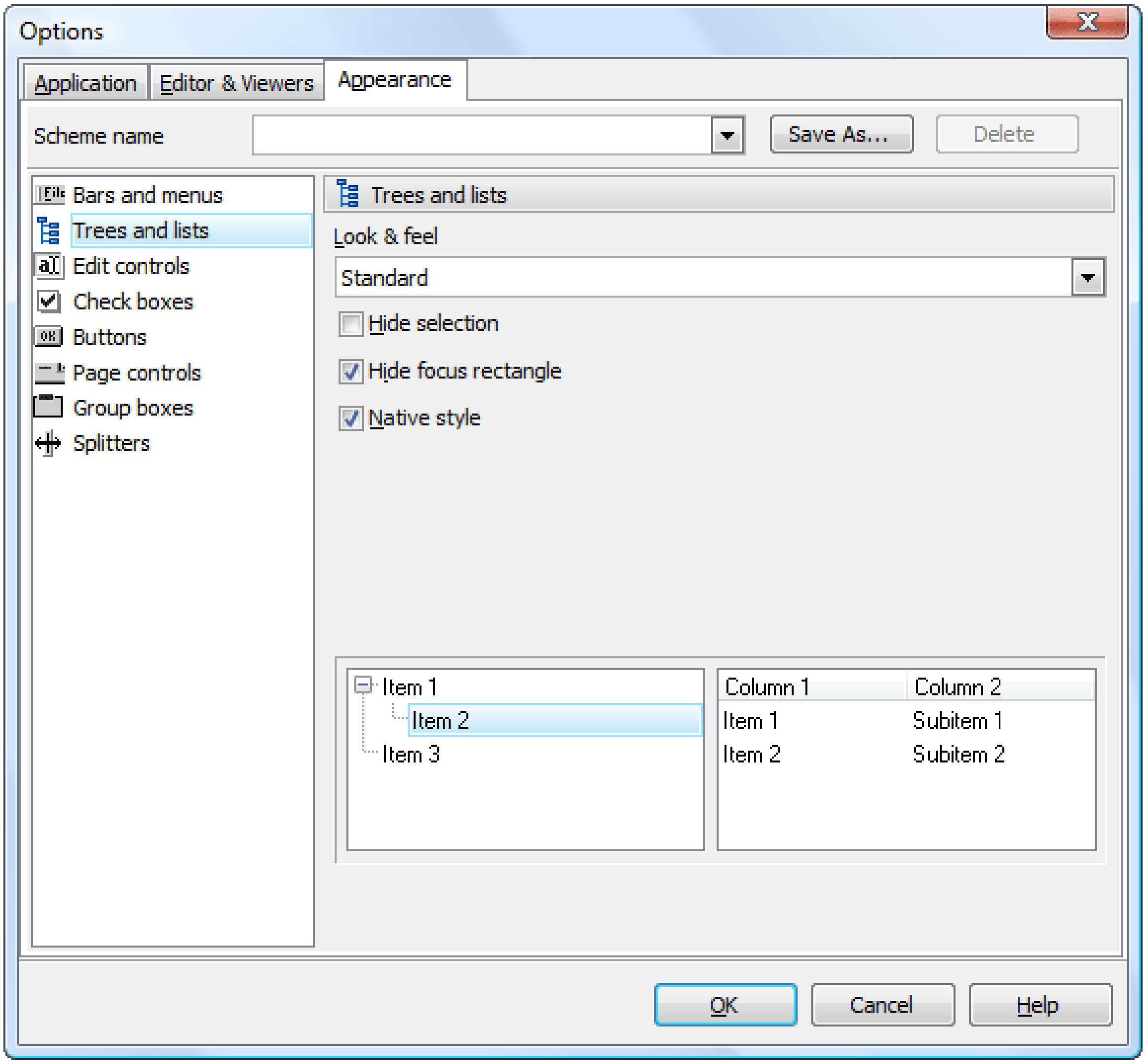
☑ Show full menus after delay

☑ Flat close buttons

☑ Gray-scale disabled images

10.3.2 Trees and lists

Use the Trees and lists item to select various tree view options. Use the item to select *standard*, *flat* or *ultraflat* styles, check or uncheck the *hide selection*, *hide focus rectangle* and *native style* options.



Scheme name

Look & feel: Standard

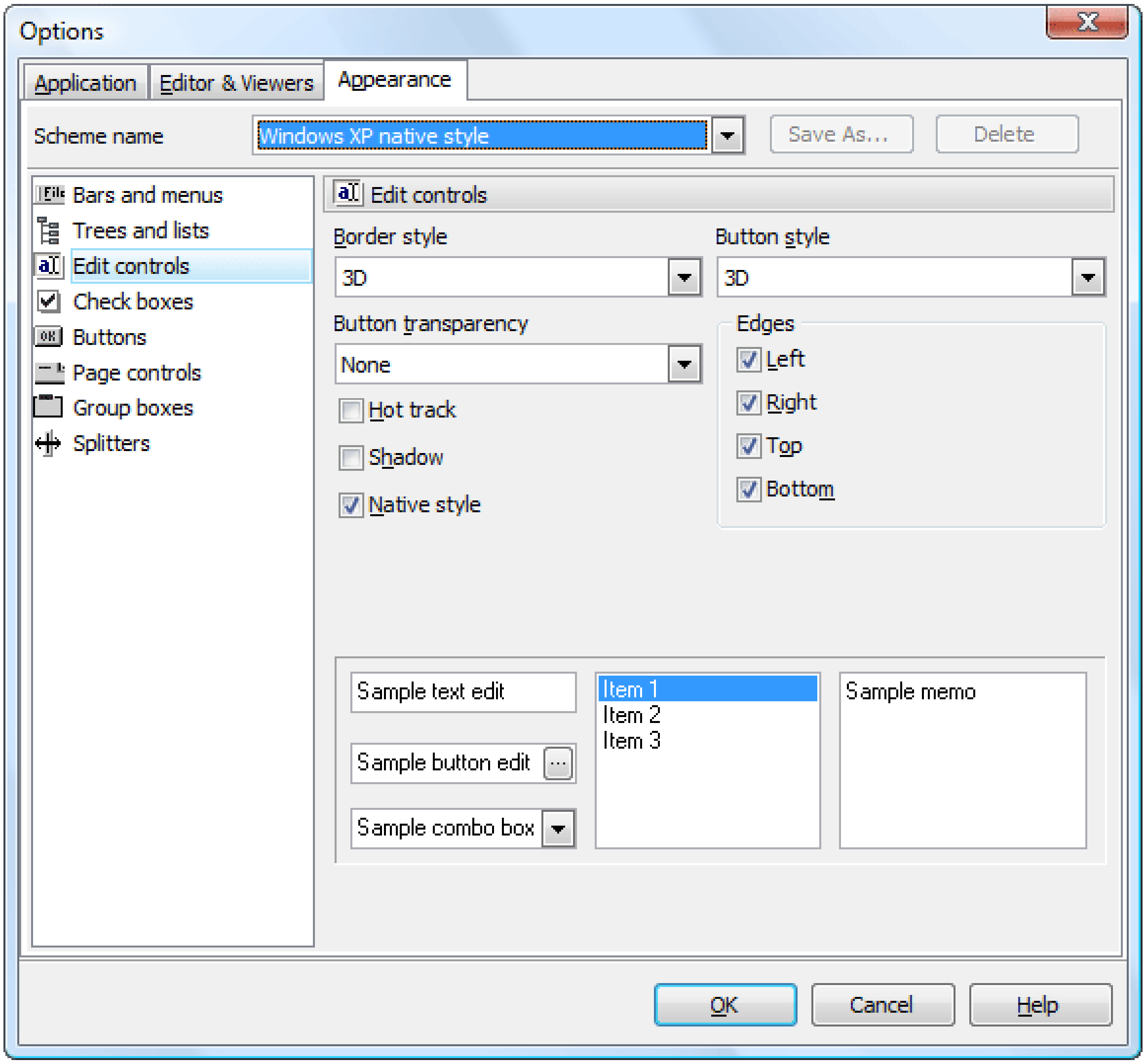
☐ Hide selection

☑ Hide focus rectangle

☑ Native style

10.3.3 Edit controls

Use the Edit controls item to customize the appearance of different DB2 Maestro edit controls. The tab allows you to select the edit controls border style, button style and transparency, enable/disable hot tracks, shadows, native style and customize edges. It is also possible to define samples for the text edit, button edit and combo box controls.



Scheme name: Windows XP native style

Border style: 3D

Button style: 3D

Button transparency: None

☐ Hot track

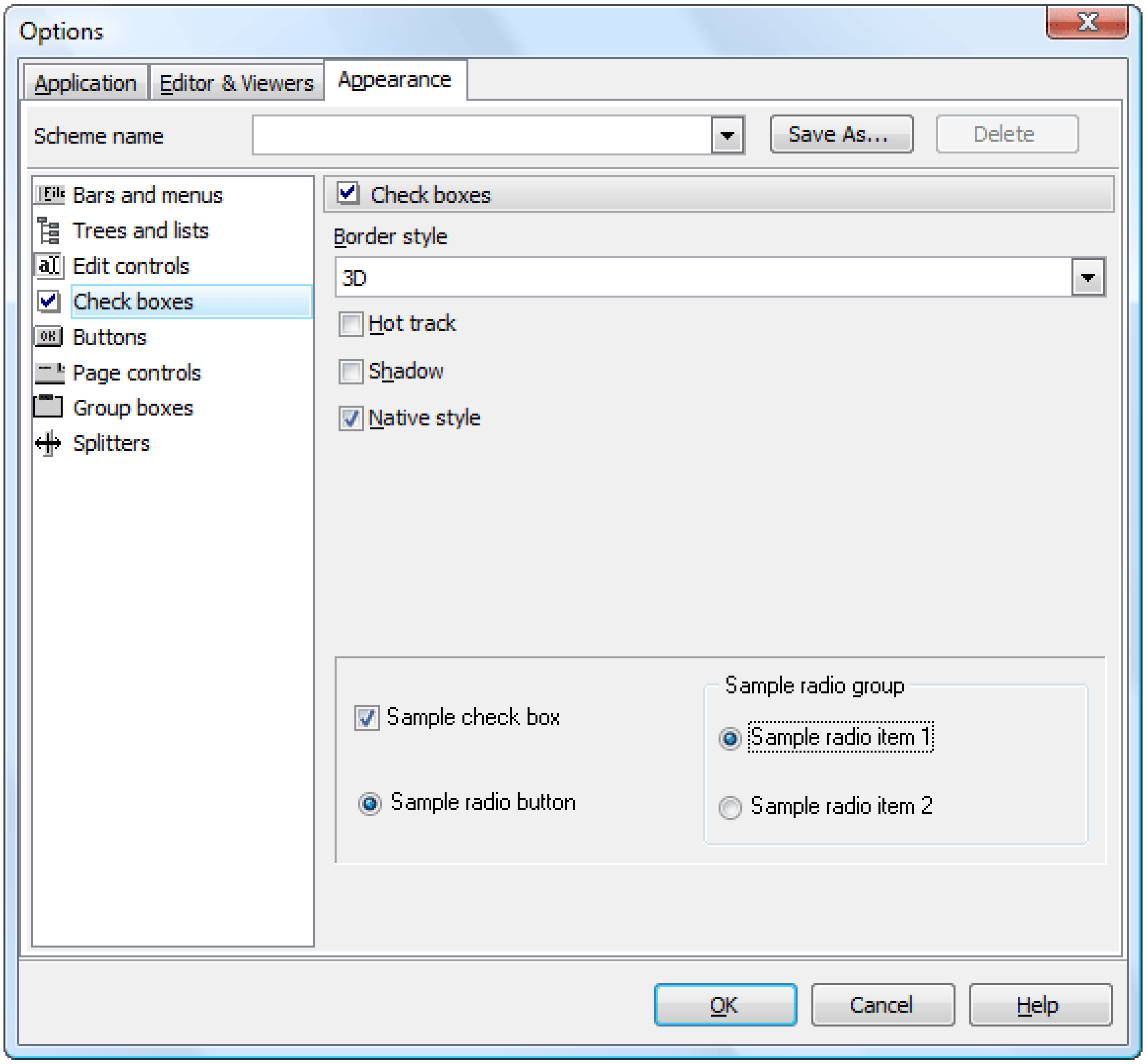
☐ Shadow

☑ Native style

Edges:
☑ Left
☑ Right
☑ Top
☑ Bottom

10.3.4 Check boxes

The Check boxes item allows you to customize the appearance of check boxes and radio buttons. The tab allows you to customize the appearance of check boxes: set border style, enable/disable hot tracks, shadows, native style. It is also possible to define samples for check boxes and radio buttons.



☑ Check boxes

Border style: 3D

☐ Hot track

☐ Shadow

☑ Native style

☑ Sample check box

● Sample radio button

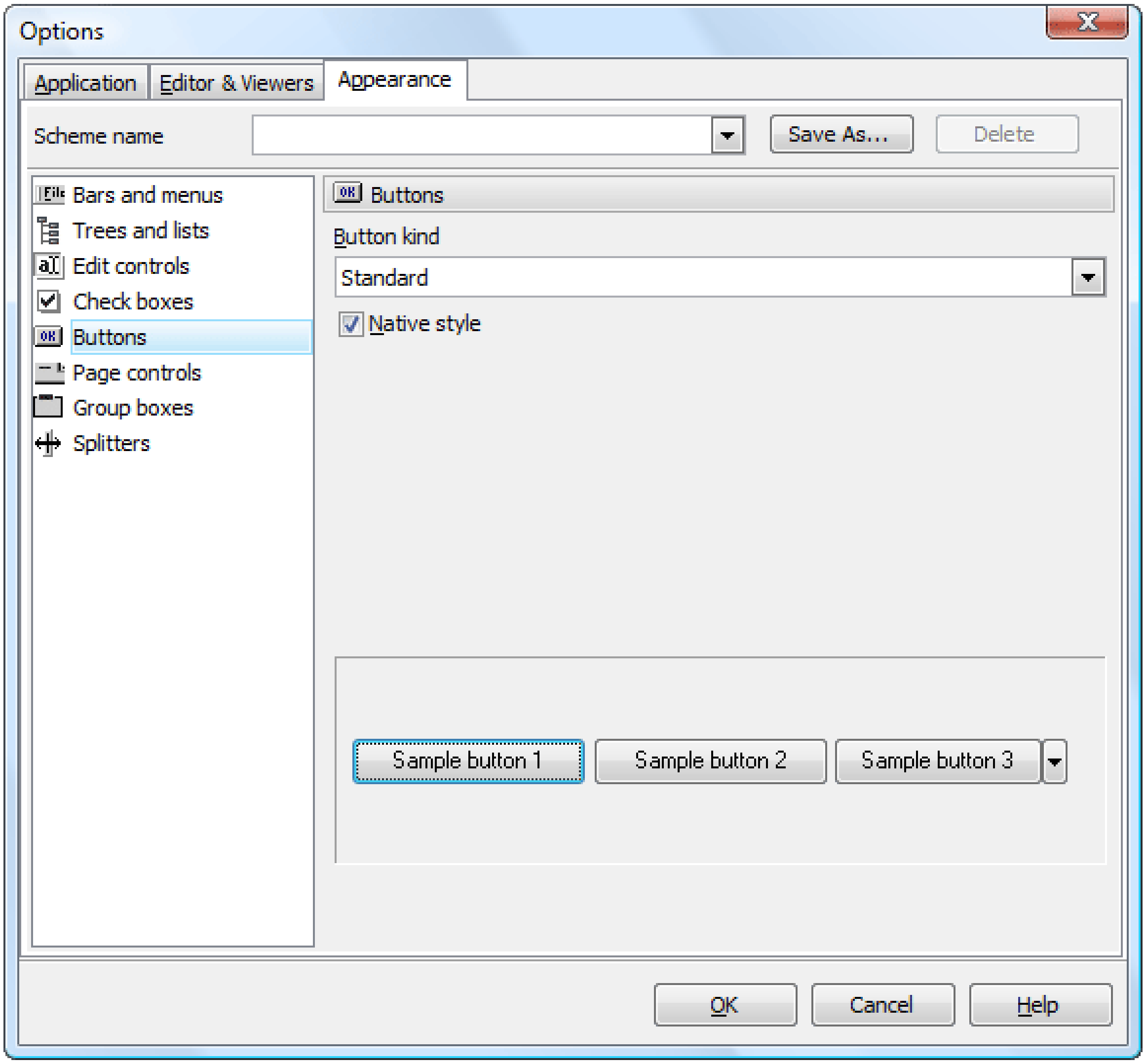
Sample radio group

● Sample radio item 1

○ Sample radio item 2

10.3.5 Buttons

Use the Buttons item to customize DB2 Maestro buttons. The tab allows you to adjust the appearance of buttons and define sample buttons as well.



Scheme name

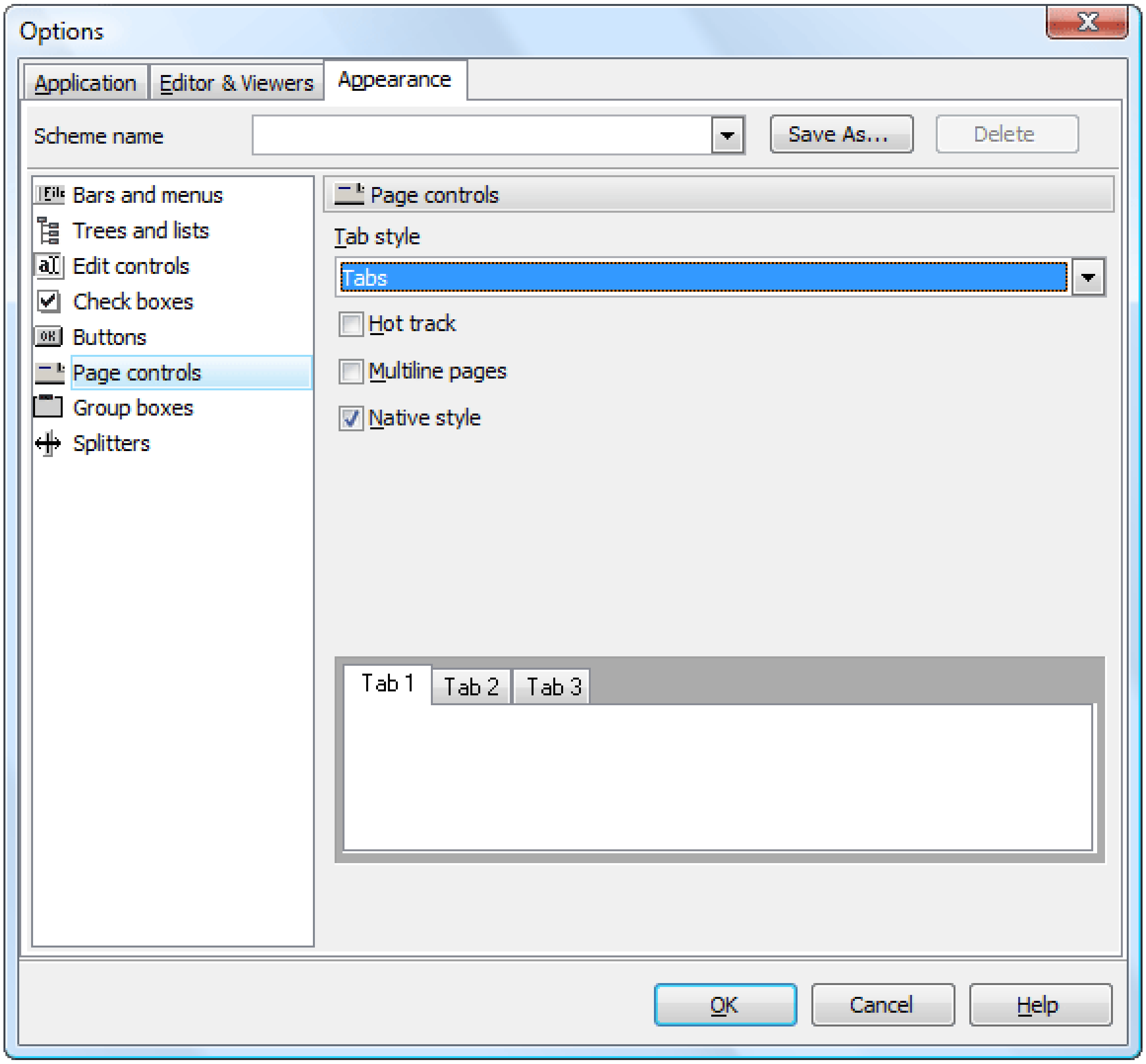
Buttons

Button kind: Standard

☑ Native style

10.3.6 Page controls

The Page controls item allows you to customize the style of all DB2 Maestro page controls. The tab allows you to select tab styles, enable/disable hot track, multi-line pages and native style.



Tab style: Tabs

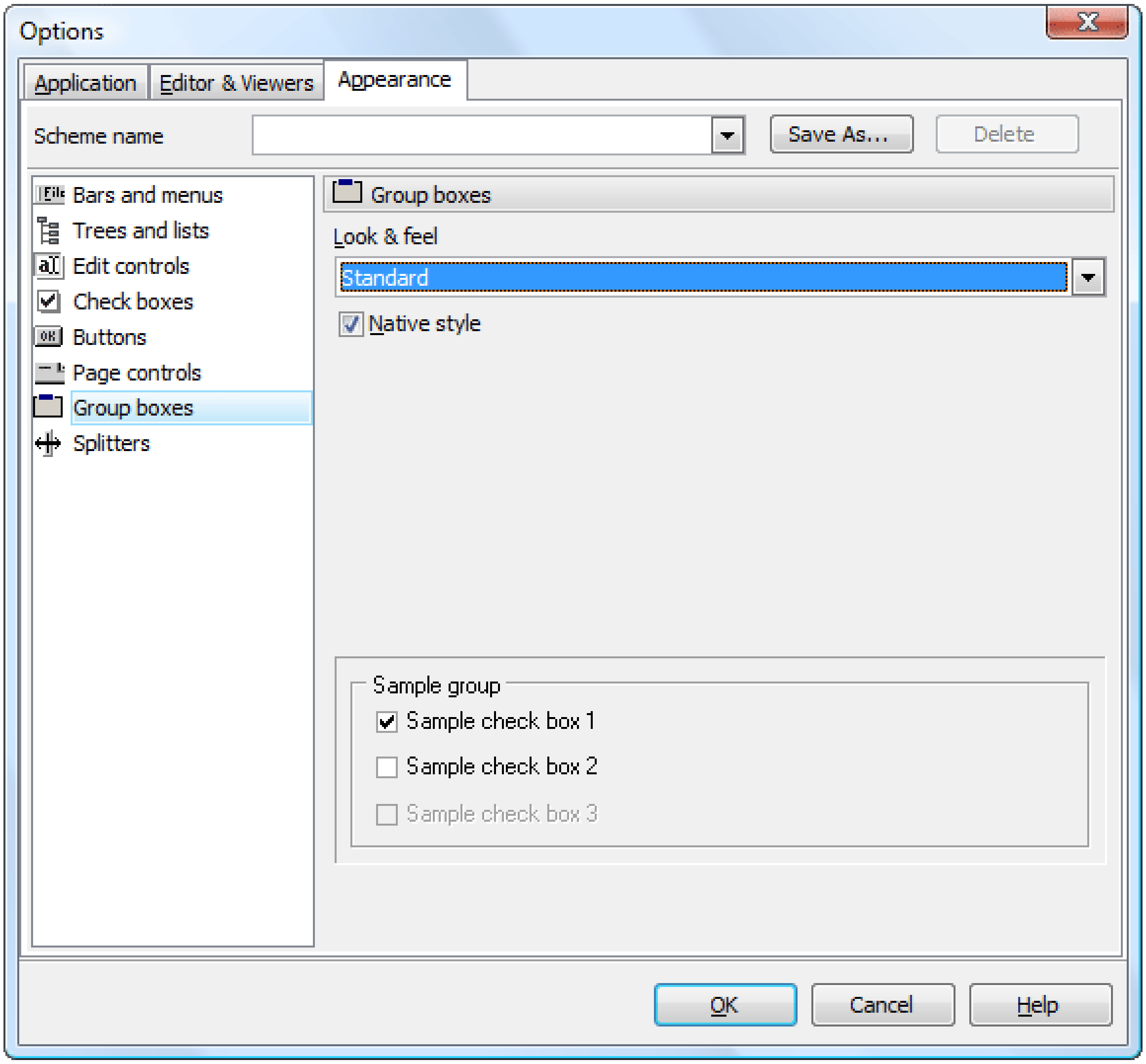
☐ Hot track

☐ Multiline pages

☑ Native style

10.3.7 Group boxes

Use the Group boxes item to customize all DB2 Maestro group boxes according to your preferences. Use tab to apply styles for group boxes, enable/disable native style and define samples.



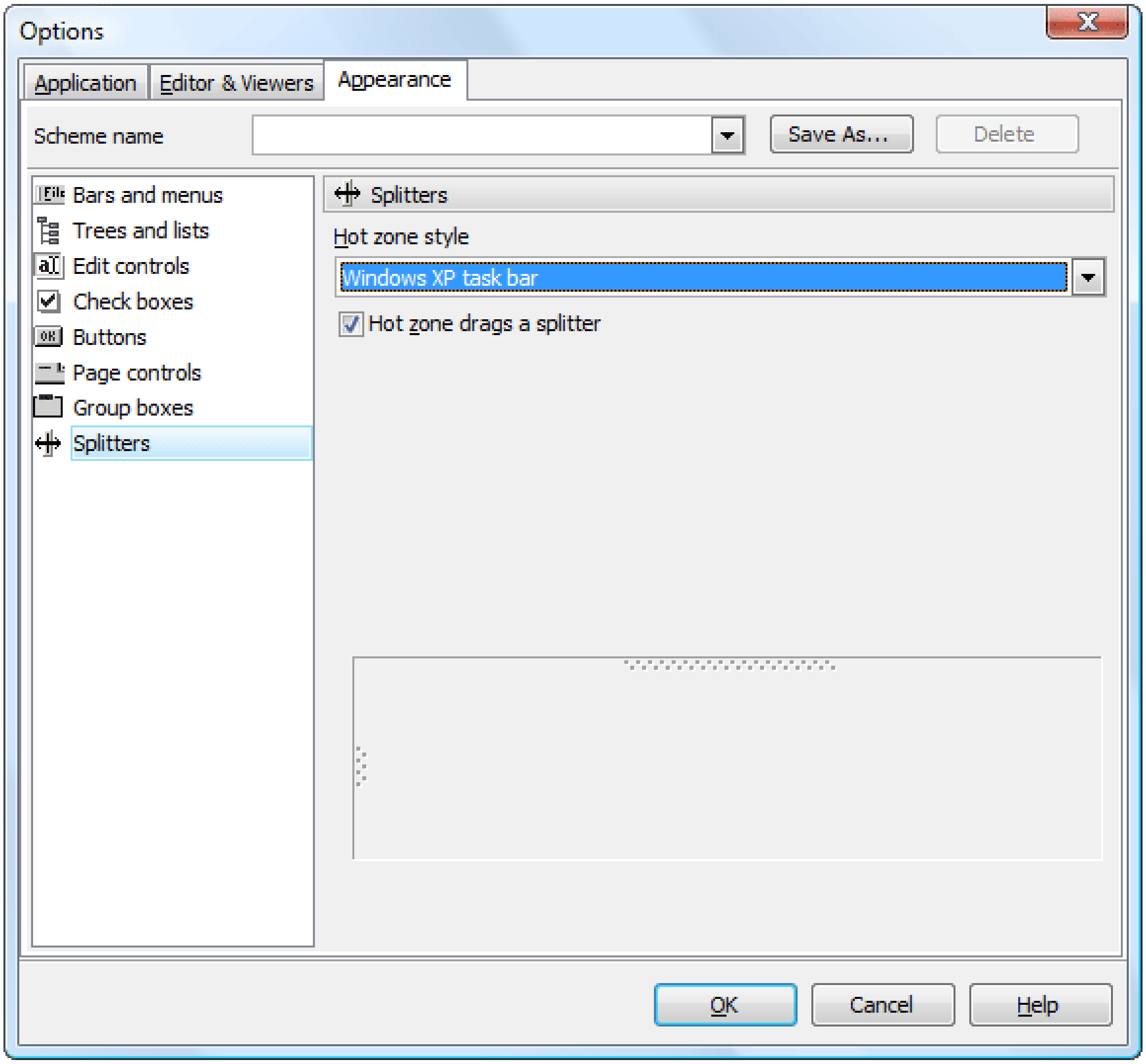
Scheme name:

Look & feel: Standard

☑ Native style

10.3.8 Splitters

Use the Splitters item to customize all DB2 Maestro splitters according to your preferences. Use the tab to select hot zone style (*Windows XP task bar*, *Media Player 8*, *Media Player 9*, *Simple* or *none*) and specify the Hot zone drags a splitter option.



Scheme name

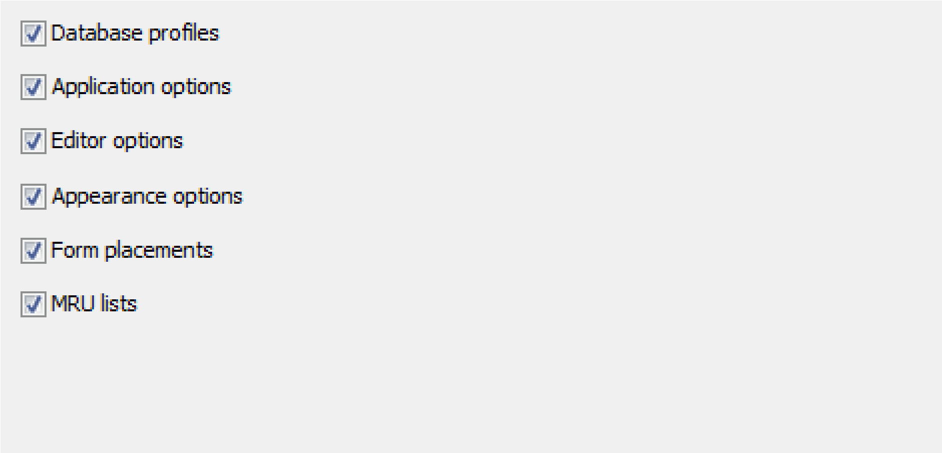
Hot zone style: Windows XP task bar

☑ Hot zone drags a splitter

10.4 Export Settings

Export Settings Wizard allows you to export all or partial DB2 Maestro settings to single *.*reg* file which can be applied to the application of DB2 Maestro installed on another machine or used to backup previous settings. To run the wizard, select the Tools | Options main menu item and click Export Settings in the Options 278 dialog.

- Specifying destination file to save settings to 318
- Specifying settings categories to save 318
- Select database profiles to save 319
- Saving settings 319



☑ Database profiles

☑ Application options

☑ Editor options

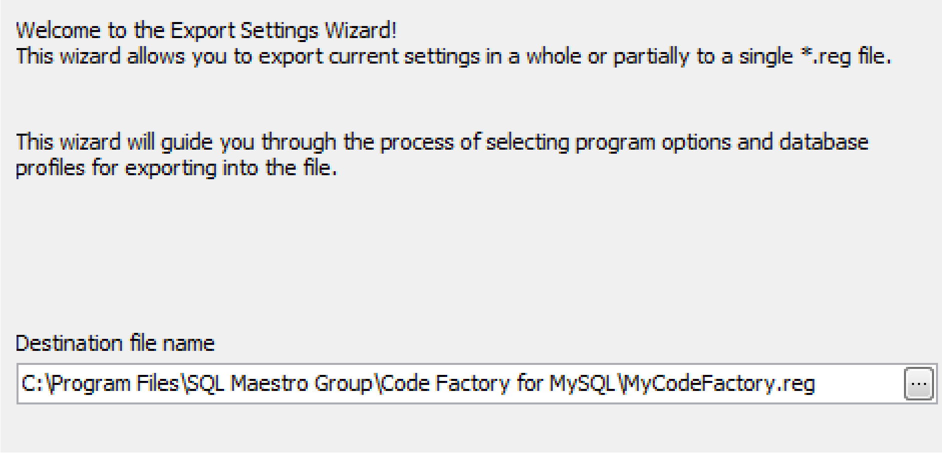
☑ Appearance options

☑ Form placements

☑ MRU lists

10.4.1 Specifying destination file

Specify a **.reg* file to extract DB2 Maestro setting to.



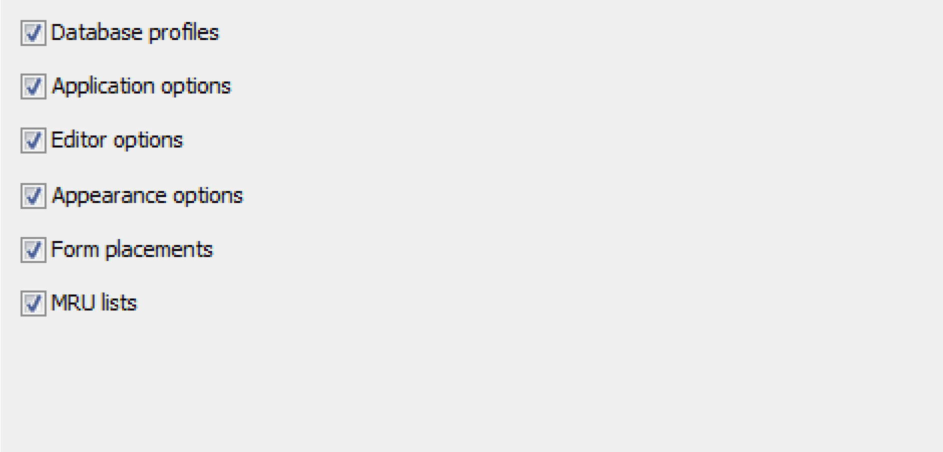
Welcome to the Export Settings Wizard!
This wizard allows you to export current settings in a whole or partially to a single *.reg file.

This wizard will guide you through the process of selecting program options and database profiles for exporting into the file.

Destination file name
C:\Program Files\SQL Maestro Group\Code Factory for MySQL\MyCodeFactory.reg

10.4.2 Selecting setting categories

The options of this step specify the information saved to the result file, e.g. Database profiles, Application options 279, etc.



☑ Database profiles

☑ Application options

☑ Editor options

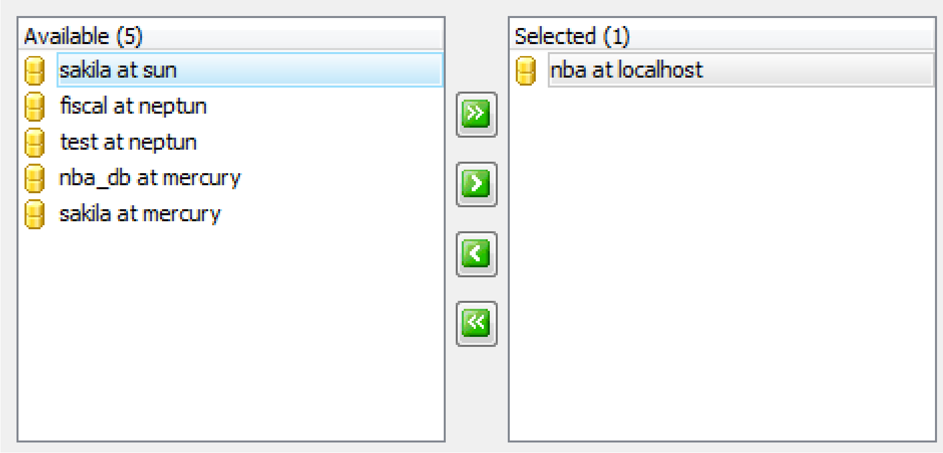
☑ Appearance options

☑ Form placements

☑ MRU lists

10.4.3 Selecting database profiles

Select database profiles to save their settings by moving them from the Available Databases list to the Selected Databases one.

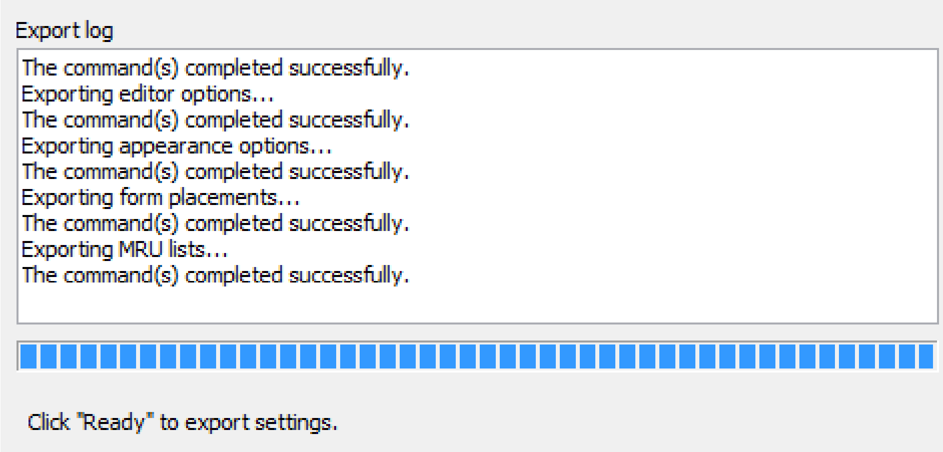


Available (5)
- sakila at sun
- fiscal at neptun
- test at neptun
- nba_db at mercury
- sakila at mercury

Selected (1)
- nba at localhost

10.4.4 Saving settings

Click the Ready button to start the extracting. The process log is displayed in the Export log box.


Export log

```
The command(s) completed successfully.
Exporting editor options...
The command(s) completed successfully.
Exporting appearance options...
The command(s) completed successfully.
Exporting form placements...
The command(s) completed successfully.
Exporting MRU lists...
The command(s) completed successfully.
```

Click "Ready" to export settings.

Index