



# SQL Maestro for MySQL

## **User's guide**

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# 1 Welcome to SQL Maestro for MySQL!

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

## **Basic SQL Maestro for MySQL features**

### **Support of the latest MySQL features**

Use SQL Maestro for MySQL to work with MySQL from 3.23. Among other features and objects implemented in the latest versions of the server, our software supports roles, stored procedures, functions, triggers, character sets, collations, check constraints, tables partitioning, and a lot of other useful things.

### **Easy database management**

SQL Maestro for MySQL allows you to work with [remote servers](#)<sup>[14]</sup> with restricted access via SSH or HTTP tunneling. SQL Maestro for MySQL allows you to create new databases and drop existing ones. Database profiles give you the opportunity to connect to databases in one touch and work with the selected databases only. See the [Database Management](#)<sup>[24]</sup> for details.

### **Powerful database object management**

SQL Maestro for MySQL 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](#)<sup>[60]</sup>, sort, group and filter the database objects within [Object Browser](#)<sup>[58]</sup>, 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](#)<sup>[63]</sup> section.

### **Working with tables and table subobjects**

SQL Maestro for MySQL 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](#)<sup>[64]</sup> section to learn more.

### **Building and executing queries**

SQL Maestro for MySQL 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](#)<sup>[15]</sup> section.

### **Powerful data management tools**

SQL Maestro for MySQL 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](#)<sup>[16]</sup> to learn the details.

### **Wide choice of additional tools**

SQL Maestro for MySQL 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, SQL Generator, Report Designer, and a lot of others. To learn more, see the [Database Tools](#)<sup>[20]</sup> section.



**Security management**

SQL Maestro for MySQL gives you a comfortable access to MySQL security features.

**Full customization according to your preferences and needs**

In SQL Maestro for MySQL 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](#)<sup>[255]</sup> dialog description.

## 1.1 System Requirements

### Client environment

- Pentium PC or higher;
- Windows NT4/2000/XP/Vista/Windows 7/Windows 8/Windows 10/Windows 11;
- 512 MB RAM (1 GB recommended);
- 25 MB of free hard disk space;
- SVGA-compatible video adapter.

### Server environment

- MySQL from 3.23.

## 1.2 Installation

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

- download the SQL Maestro for MySQL 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 SQL Maestro for MySQL shortcut in the corresponding program group of the Windows Start menu after the installation is completed.

To upgrade the installed copy of SQL Maestro for MySQL to the latest version:

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

You can also use the full distribution package to upgrade your current version of SQL Maestro for MySQL. 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 SQL Maestro for MySQL?

Thank you for your interest in purchasing **SQL Maestro for MySQL**!

You can select licensing options and register SQL Maestro for MySQL 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.

SQL Maestro for MySQL 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](mailto:support@sqlmaestro.com).

## 1.4 License Agreement

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  - delete an obsolete version of the UNREGISTERED SOFTWARE installation package immediately upon written email notice by SQL Maestro Group.

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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 MySQL 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 MySQL.

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](http://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 SQL Maestro for MySQL news at <http://www.sqlmaestro.com/products/mysql/maestro/news/>

## 2 Getting Started

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

### How to get started:

- [Connect to a database with SQL Maestro for MySQL](#)<sup>[13]</sup>
- [Explaining user interface](#)<sup>[18]</sup>
- [How SQL Maestro for MySQL looks when you start it for the first time](#)<sup>[19]</sup>
- [Shortcut keys](#)<sup>[23]</sup>

### Learning more:

- ❑ Study the [Overview of Database Object Management](#)<sup>[41]</sup> section for detailed instructions on using SQL Maestro for MySQL.
- ❑ See [Database Tools](#)<sup>[202]</sup> and [Queries](#)<sup>[151]</sup> sections for instructions on more advanced procedures!
- ❑ Find out more about [Working with Data in SQL Maestro for MySQL](#)<sup>[167]</sup>.
- ❑ Customize the way SQL Maestro for MySQL works, see [Program Options](#)<sup>[255]</sup> for full details.

## 2.1 Connect to a database

To manage an existing database with SQL Maestro for MySQL, you have to [create the according database profile](#)<sup>[26]</sup> 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](#)<sup>[30]</sup>).

When the profile is created you can connect to the database. To do so, select the database in the [Explorer tree](#)<sup>[35]</sup>, 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](#)<sup>[14]</sup>

## 2.2 Connection parameters

SQL Maestro for MySQL allows you to connect to MySQL databases directly, or via Secure SHell (SSH) tunnel or HTTP tunnel.

- **Direct connection**

It is the most natural and the most preferable connection mode. Use it each time it is possible. Most of hosting companies allow direct connections to databases. However in most cases you have to go to your control panel and add your home/office computer IP address or domain name to the Access List - list of IP addresses allowed accessing from outside. [More information.](#)

- **SSH tunnel connection**

If your MySQL server does not allow direct connections from your remote workstations, you can establish connection to an allowed intermediate SSH server and forward all MySQL commands through the [Secure SHell \(SSH\) tunnel](#).

- **HTTP tunnel connection**

[HTTP tunneling](#) is a technique used in conditions of restricted network connectivity including firewalled networks, networks behind proxy servers, and NATs. It is the slowest way and is recommended to use if the others are impossible.

Irrespectively of a connection mode you should specify common credentials as follows:

**Host**

The host name of the MySQL server.

**Port number**

The TCP/IP port to use (default MySQL port is 3306).

**User name**

The username used to connect to MySQL.

**Password**

The password for the user account on server.

**Allow old style password**

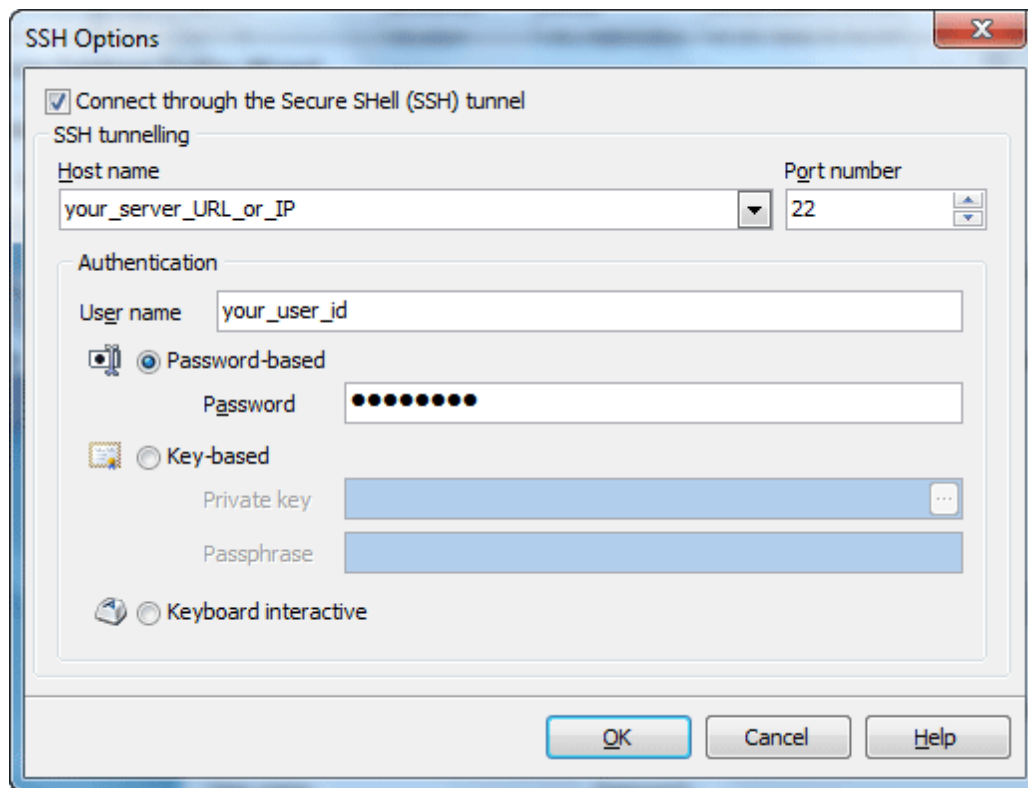
Turn this option ON only if your MySQL server still uses 16 bytes long password hashes.

[More information.](#)

### **More about SSH tunnel connection**

To establish connection to intermediate SSH server and forward all MySQL commands through the secure tunnel, you need to:

1. Check [I can connect to the server directly or via SSH tunneling](#).
2. Follow the [Configure SSH options](#) link to open the [SSH Options](#) window.



3. Check [Connect through the Secure Shell \(SSH\) tunnel](#) and complete the following fields:

#### Host name

Specify the host name or IP of your site. Note, that MySQL host name always should be set relatively to the SSH server. For example, if both of MySQL and SSH servers are located on the same computer, you should specify localhost as Host name instead of server's external host name or IP address.

#### Port number

Enter the port number for the SSH server.

4. Enter valid [User name](#) for the remote server and select the [Authentication](#) method and set corresponding credentials.

#### Password-based

Set the [password](#) corresponding to the specified user.

#### Key-based

Specify the path to the [Private key](#) file with the corresponding [Passphrase](#) to log in to the remote server. SQL Maestro for MySQL accepts keys in **ssh.com** or **OpenSSH** formats. To convert a private key from PuTTY's format to one of the formats supported by our software, [use the PuTTYgen utility](#) that can be freely downloaded from the [PuTTY website](#).

#### Keyboard interactive

Keyboard authentication is the advanced form of password authentication, aimed specifically at the human operator as a client. During keyboard authentication zero or more prompts (questions) is presented to the user. The user should give the answer to each prompt (question). The number and contents of the questions are virtually not limited, so certain types of automated logins are also possible.

### More about connection via HTTP tunnel

To connect to a remote server using an HTTP tunnel, you need to:

1. Upload the connection PHP script to your website. The installation folder, usually C:\Program Files\SQL Maestro Group\SQL Maestro for MySQL, contains two scripts: `mysqli_tunnel.php` and `mysql_tunnel.php`. We would recommend you to **use the `mysqli_tunnel.php` script always if possible** as it operates through the [MySQLi PHP extension](#) (available since PHP 5) while `mysql_tunnel.php` uses the [original MySQL PHP API](#) that is deprecated as of PHP 5.5.
2. Select the **I have to use HTTP tunneling** radio button.
3. Enter the connection PHP script URL, e.g. `www.yoursite.com/files/mysqli_tunnel.php`. You can test the connection before the profile is created. Just use **Test script using default browser** to open connection script in your browser, enter all the required connection parameters and click the **Test connection** button.

## Connection Script

Fields marked by \* are required.

Host/Server name (or IP) *:	<input type="text" value="localhost"/>
User *:	<input type="text" value="root"/>
Password:	<input type="text" value="mypass"/>
Port (if not 3306):	<input type="text"/>
Database *:	<input type="text" value="mydb"/>
	<input type="button" value="Get Database List"/>
	<input type="button" value="Test Connection"/>
	<input type="button" value="ShowTables"/>

4. In case using of a proxy server use **Configure tunnelling options** to open the **HTTP tunnelling options** window and specify your **proxy server** connection parameters and **HTTP authentication**.

**Note:** You are actually connecting to your database through the PHP script on the server, so in most cases the host/server name is "localhost" unless the target database server is not installed on the same computer as the Web server.

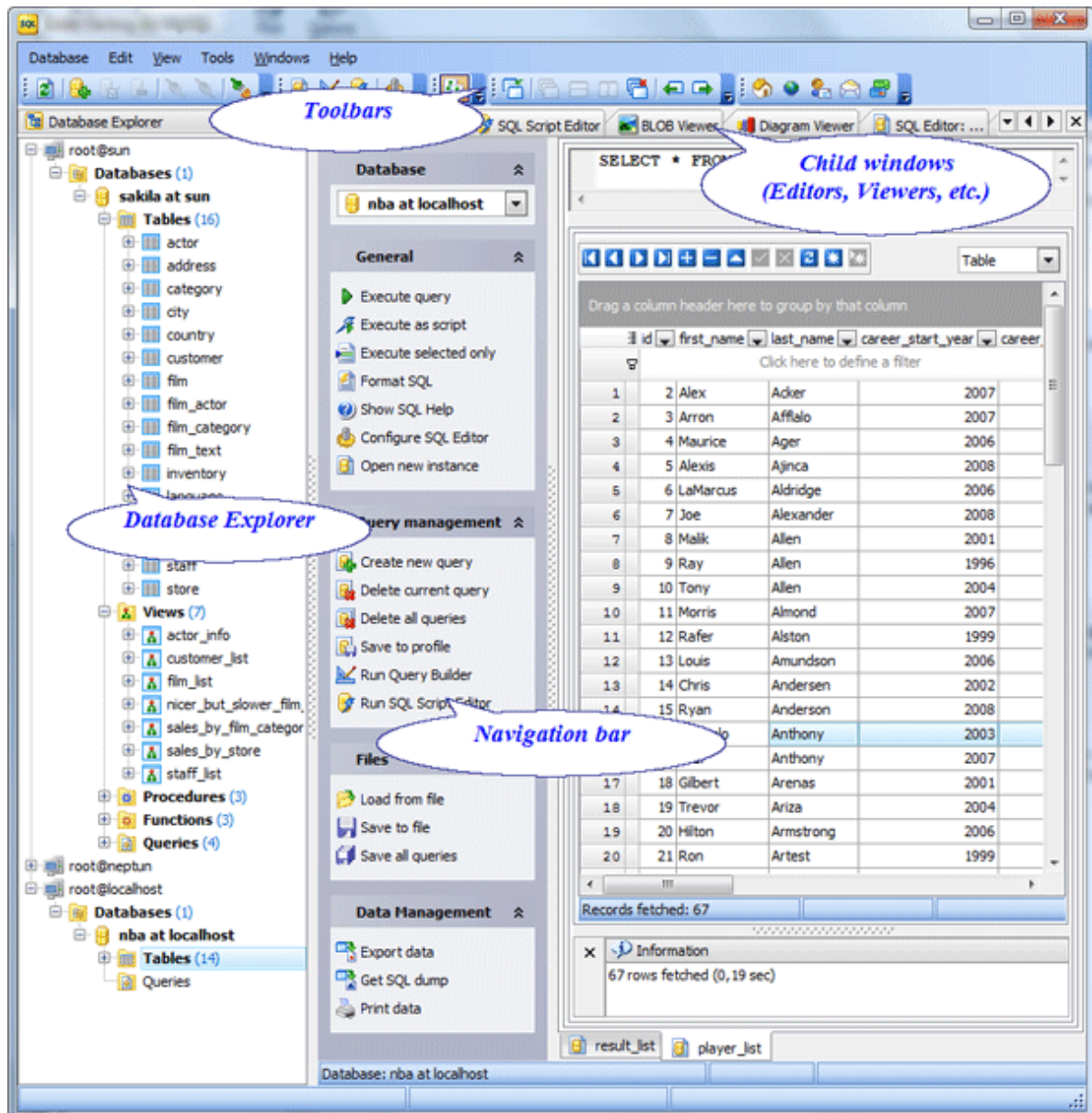




## 2.3 Explaining user interface

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 SQL Maestro for MySQL's user interface. For detailed descriptions, see below.



### Database Explorer

The [Database Explorer](#)<sup>[55]</sup> occupies the left side of SQL Maestro for MySQL main window. It represents all the connected databases objects [including system objects](#)<sup>[31]</sup>.

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](#)<sup>[58]</sup>

## Editors and Viewers

According to the MDI style implementation the SQL Maestro for MySQL 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](#)<sup>[22]</sup>, [Tabbed MDI](#)<sup>[20]</sup>

## 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](#)<sup>[23]</sup>

## 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 SQL Maestro for MySQL looks when you run it for the first time. The [Create new database](#)<sup>[37]</sup> and [Connect to database](#)<sup>[26]</sup> links allow you to start working with a new and existing databases.

The window provides you with quick access to the [Create Database Object](#)<sup>[42]</sup> dialog, [Schema Designer](#)<sup>[237]</sup>, [SQL Editor](#)<sup>[153]</sup>, and [SQL Script Editor](#)<sup>[204]</sup> recently used database profiles. At the bottom of the page the latest company news and current discount programs are represented.



### 2.3.2 Tabbed MDI

SQL Maestro for MySQL 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.

The screenshot displays the SQL Maestro for MySQL application window. The interface includes a sidebar with navigation options and a main area showing a query result.

**Database:** nba at localhost

**General:**

- Execute query
- Execute as script
- Execute selected only
- Format SQL
- Show SQL Help
- Configure SQL Editor
- Open new instance

**Query management:**

- Create new query
- Delete current query
- Delete all queries
- Save to profile
- Run Query Builder
- Run SQL Script Editor

**Files:**

- Load from file
- Save to file
- Save all queries

**Data Management:**

- Export data
- Get SQL dump
- Print data

**SQL Editor:** SELECT \* FROM player;

**Table View:**

	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	
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

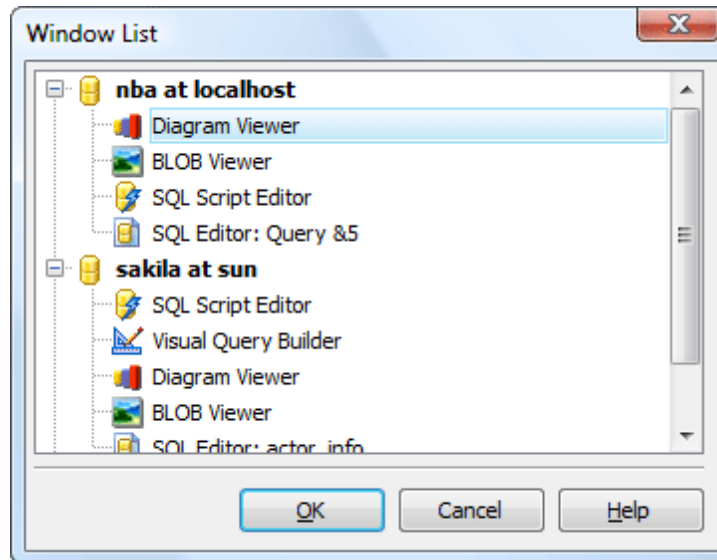
Information: 67 rows fetched (0,19 sec)

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+O** 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 SQL Maestro for MySQL.

<b>Interface</b> <sup>18</sup>	
Window list	<b>Alt+O</b>
Previous Window	<b>F6</b>
Next Window	<b>Ctrl+F6</b>
Show Database Explorer	<b>F11</b>
Refresh	<b>F5</b>
Exit	<b>Alt+F4</b>
SQL Maestro for MySQL help	<b>F1</b>
<b>Clipboard</b>	
Cut	<b>Ctrl+X</b>
Copy	<b>Ctrl+C</b>
Paste	<b>Ctrl+V</b>
Select all	<b>Ctrl+A</b>
Find	<b>Ctrl+F</b>
Replace	<b>Ctrl+H</b>
Search again	<b>F3</b>
Undo	<b>Ctrl+Z</b>
Redo	<b>Shift+Ctrl+Z</b>
<b>SQL Editors</b> <sup>153</sup>	
Open SQL Editor	<b>Ctrl+E</b>
Open SQL Script Editor	<b>Ctrl+R</b>
Open Visual Query Builder	<b>Ctrl+Q</b>
Execute query	<b>(F9) or (F8)</b>
Execute query as script	<b>(Shift+F9) or (Shift+F8)</b>
Execute selected only	<b>(Alt+F9) or (Alt +F8)</b>
Go to line	<b>Ctrl+G</b>
Format selected SQL	<b>Ctrl+Alt+F</b>
Create new query	<b>Ctrl+N</b>
Delete current query	<b>Ctrl+Alt+D</b>
Load script from file	<b>Ctrl+O</b>
<b>Database management</b> <sup>24</sup>	
Create a new database profile	<b>Shift+Ctrl+P</b>
Edit an existing database profile	<b>Shift+Ctrl+E</b>
Rename a database profile (object)	<b>F2</b>
Remove database profile	<b>Shift+Ctrl+R</b>
Connect to the database	<b>Shift+Ctrl+C</b>
Disconnect from the database	<b>Shift+Ctrl+D</b>
Create a database object	<b>Shift+Ctrl+N</b>
Object Browser	<b>Shift+Ctrl+O</b>
Open BLOB Viewer	<b>Ctrl+B</b>

### 3 Databases and Database Profiles

SQL Maestro for MySQL 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 SQL Maestro for MySQL startup, login prompt before connection, etc.). To start working with databases in SQL Maestro for MySQL, you should create database profile(s) first.

Use the following links for details:

#### ■ **How can I create a new database?**

Use for this purpose [Create Database Wizard](#)<sup>[37]</sup>. In order to run the wizard you should either

- select the [Database | Create New Database...](#) main menu item
- or
- use the [Create New Database...](#) item of the popup menu.

Using [Create Database Wizard](#) set the [Create profile after creating the database](#) option to create a new profile and open the [Database Profile Properties](#) dialog after the database is created.

#### ■ **How can I change attributes of an existing database?**

To edit a database:

- select the database to edit in the explorer tree;
- edit database properties within the appropriate tabs of [Database Editor](#)<sup>[38]</sup>.

#### ■ **How can I drop an existing database?**

In order to drop a database you should first select the database to drop in the explorer tree and establish connection (if you are not connected to the database yet), then either

- select the [Database | Drop Database](#) main menu item
- or
- use the [Drop Database](#) item of the popup menu

and confirm dropping in the dialog window to complete the operation.

#### ■ **How can I create new database profiles?**

In SQL Maestro for MySQL database profiles are created within [Create Database Profiles Wizard](#)<sup>[39]</sup>. 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](#)<sup>[30]</sup> 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

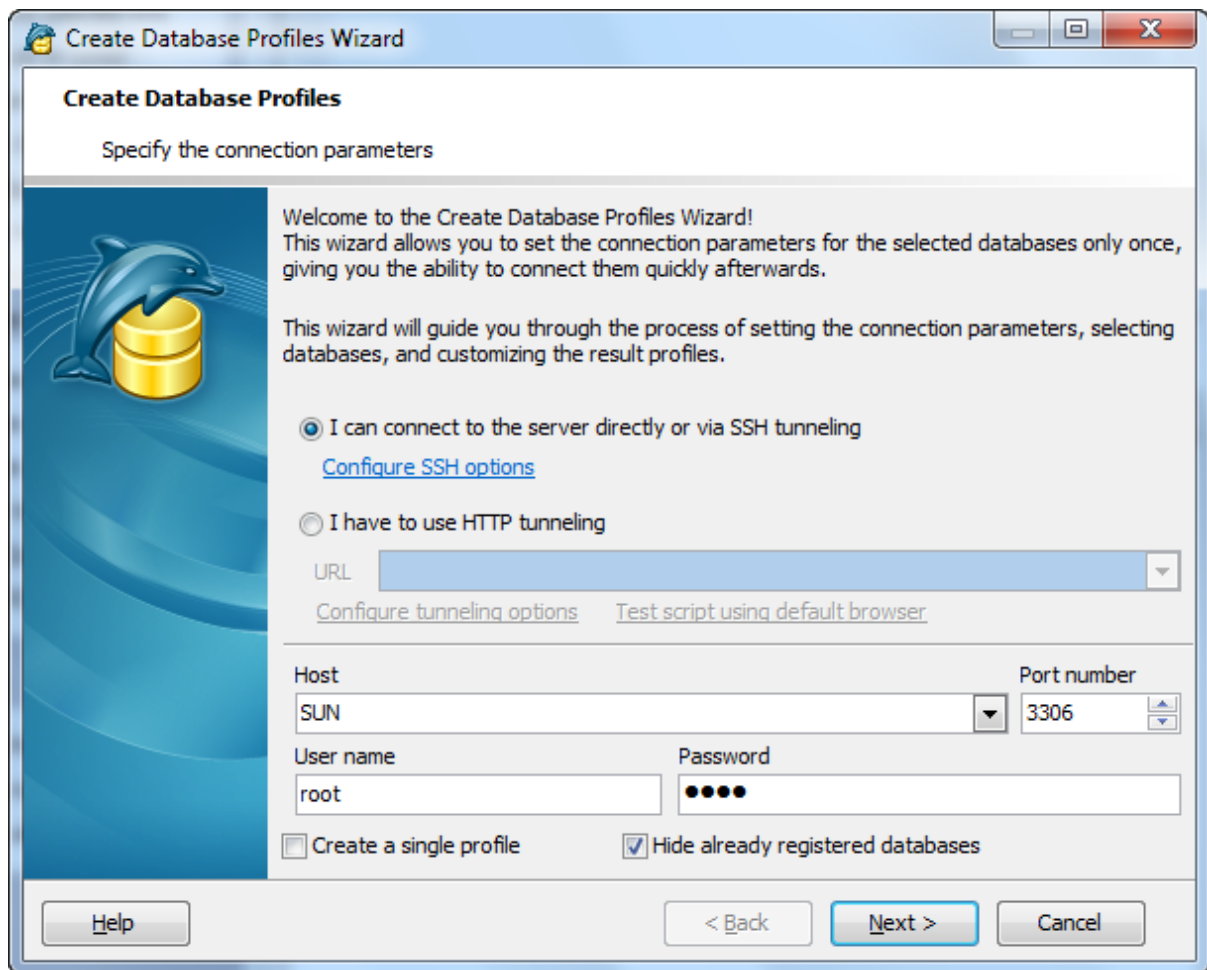
Create Database Profiles Wizard allows you to create a single database profile or several profiles from one host. To run the wizard, select the **Database | Create Database Profiles...** main menu item, or press the **Shift+Ctrl+P** hot keys combination. You can also use the Create Database Profiles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

- [Set connection properties](#)<sup>[26]</sup>
- [Specify database profile options](#)<sup>[27]</sup>

**See also:** [Edit Database Profile Dialog](#)<sup>[30]</sup>

### 3.1.1 Setting connection properties

Specify MySQL [connection properties](#)<sup>[14]</sup> to be used on further connections.



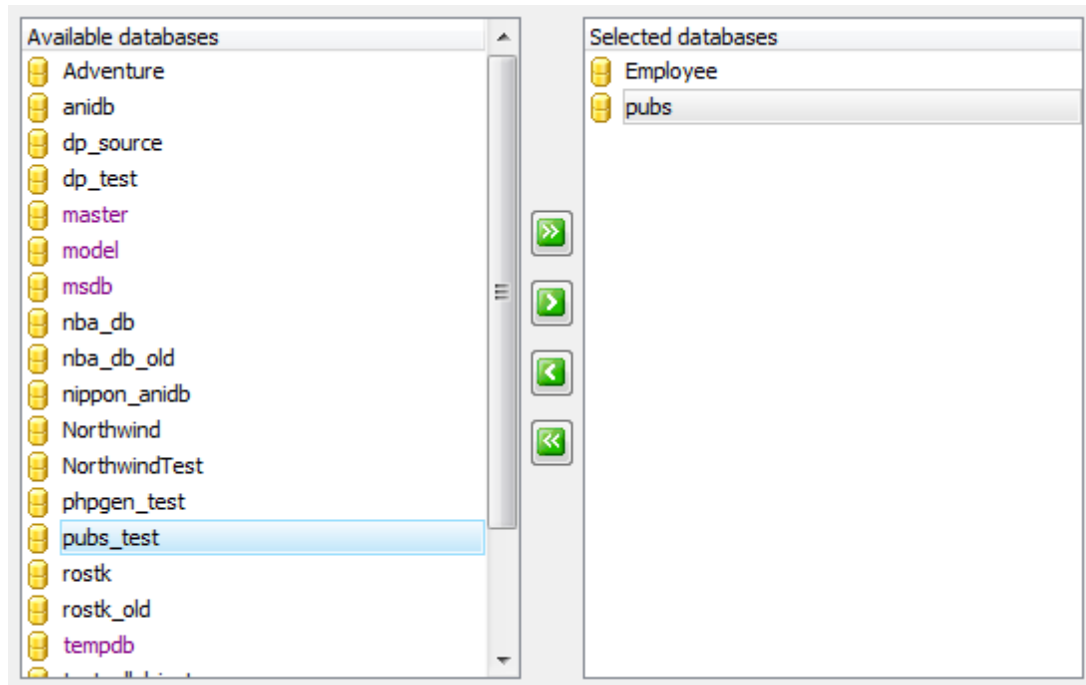
✓ Check the [Create a single profile](#) option to set the database name manually and create a single profile for this database.

✓ [Hide already registered databases](#)

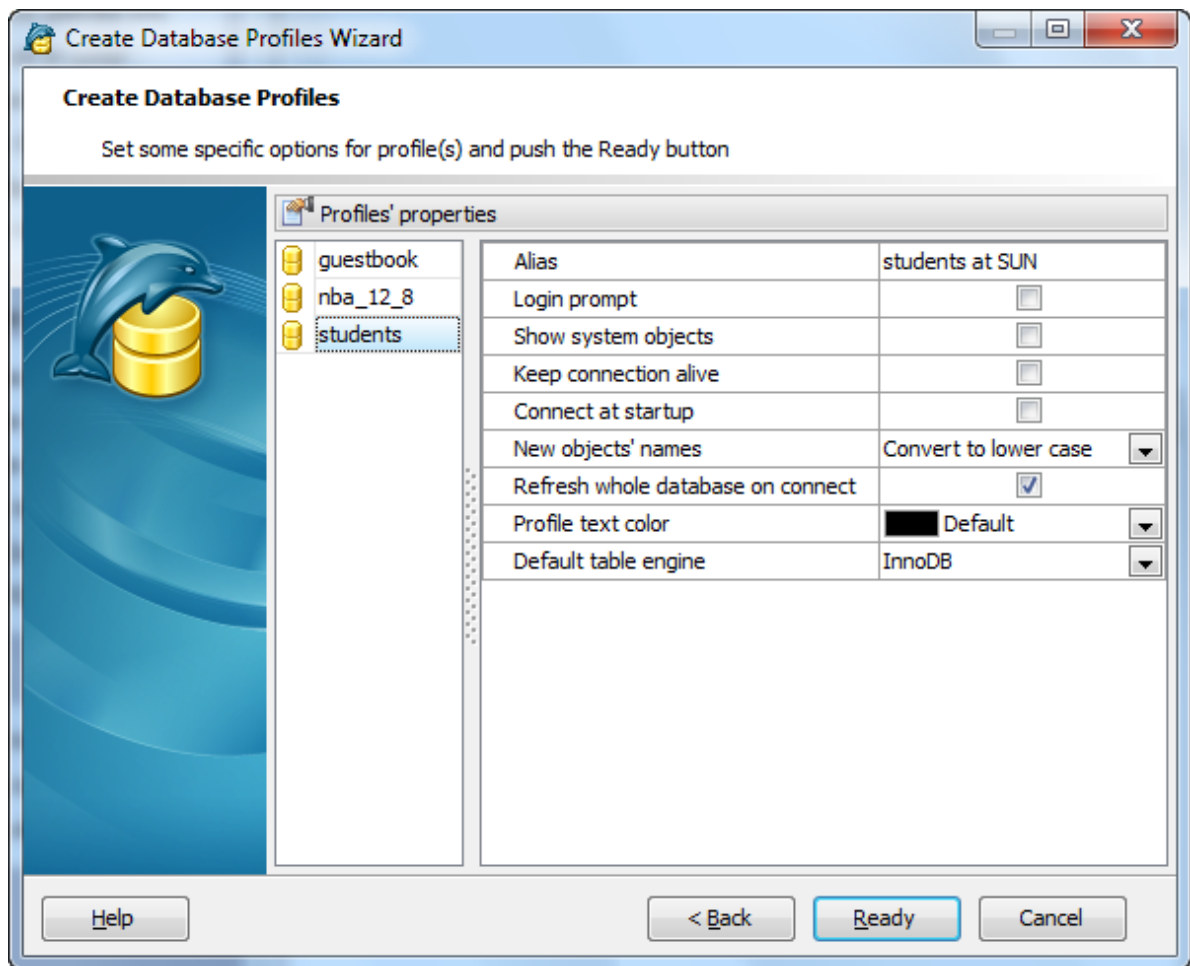
Check the box to shorten the databases list on the next wizard step.

### 3.1.2 Setting profile options

To create a new profile, select databases to be registered by moving them from the [Available databases](#) list to the [Selected databases](#) list. This step is available if the [Create a single profile](#) option is unchecked on the previous wizard step.



You can select several databases to set options for all the selected databases at once (except the alias which should be unique for each individual database).



☒ **Login prompt before connection**

Use the option to enable SQL Maestro for MySQL 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.

**Default table engine** (*MyISAM, InnoDB*)

Use the drop-down list to specify the storage engine to be the default engine for the database tables.

*MyISAM* manages non-transactional tables. It provides high-speed storage and retrieval, as well as fulltext searching capabilities.

The *InnoDB* storage engine provides transaction-safe tables.

Click the **Ready** button when done to start working with the selected databases in SQL Maestro for MySQL.

## 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.

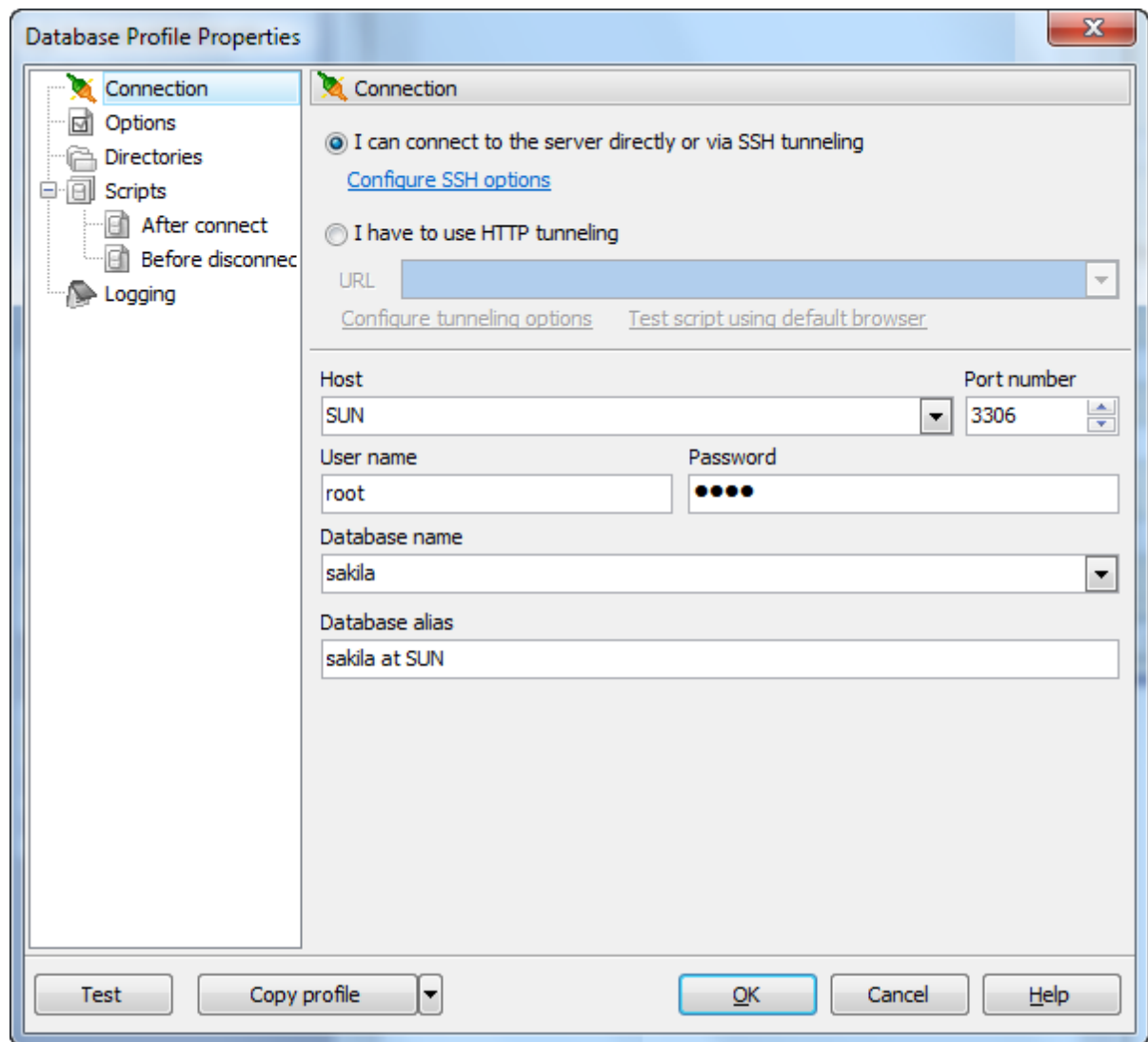
Instead of manual profile options editing you can copy all the options from the another existing profile with the [Copy profile](#) button.

- [Editing database connection properties](#) <sup>[30]</sup>
- [Settings database options](#) <sup>[31]</sup>
- [Setting default directories for database tools](#) <sup>[33]</sup>
- [Editing obligatory scripts to execute](#) <sup>[34]</sup>
- [Setting log options and file names](#) <sup>[36]</sup>

**See also:** [Create Database Profile Wizard](#) <sup>[26]</sup>

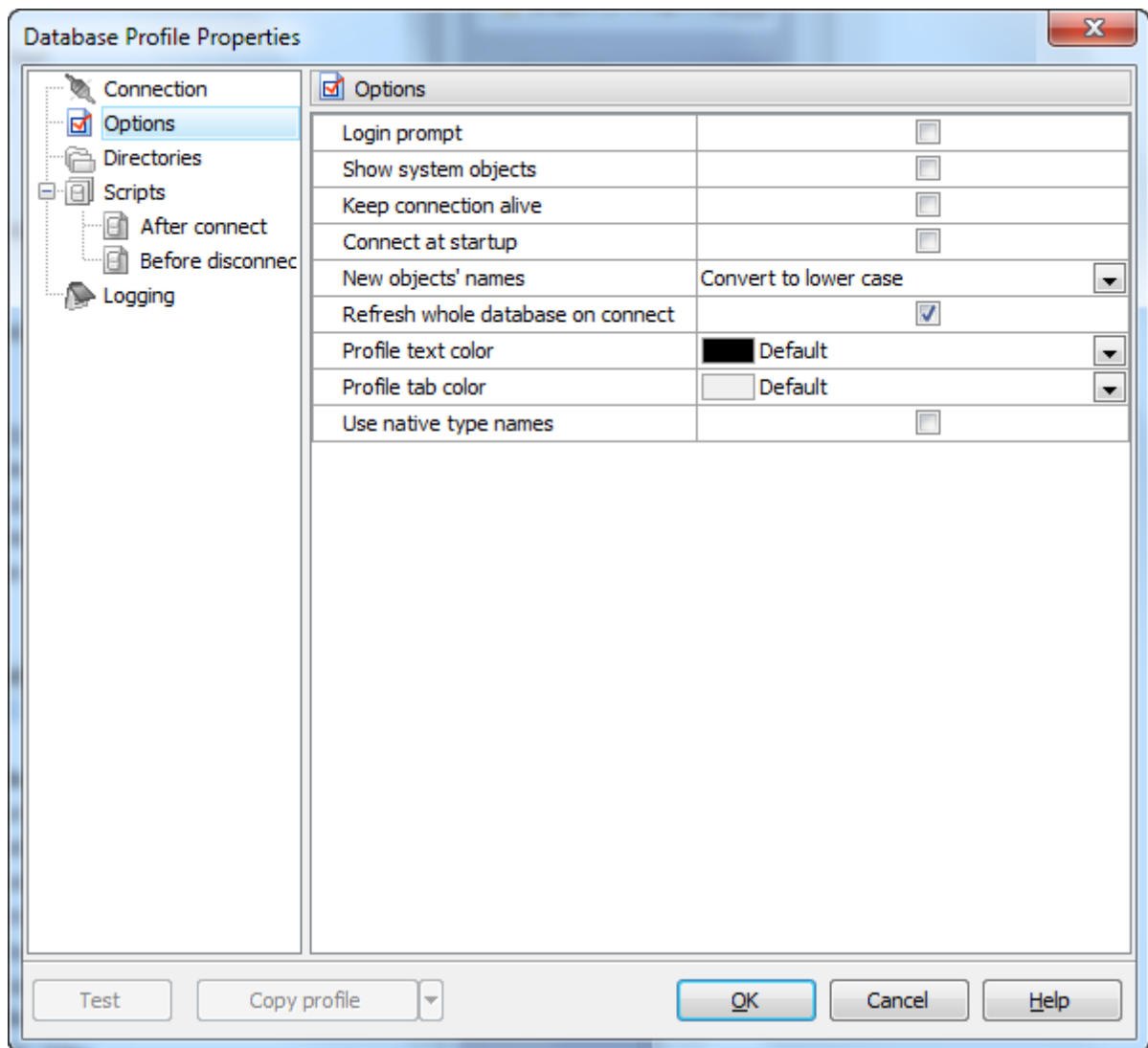
### 3.2.1 Editing connection properties

The tab allows you to change [connection properties](#) <sup>[14]</sup> 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.



### 3.2.2 Setting profile options

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



#### ☒ Login prompt

Use the option to enable SQL Maestro for MySQL 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.

**Default table engine** (*MyISAM, InnoDB*)

Use the drop-down list to edit the storage engine to be the default engine for the current database tables.

*MyISAM* manages non-transactional tables. It provides high-speed storage and retrieval, as well as fulltext searching capabilities.

The *InnoDB* storage engine provides transaction-safe tables.

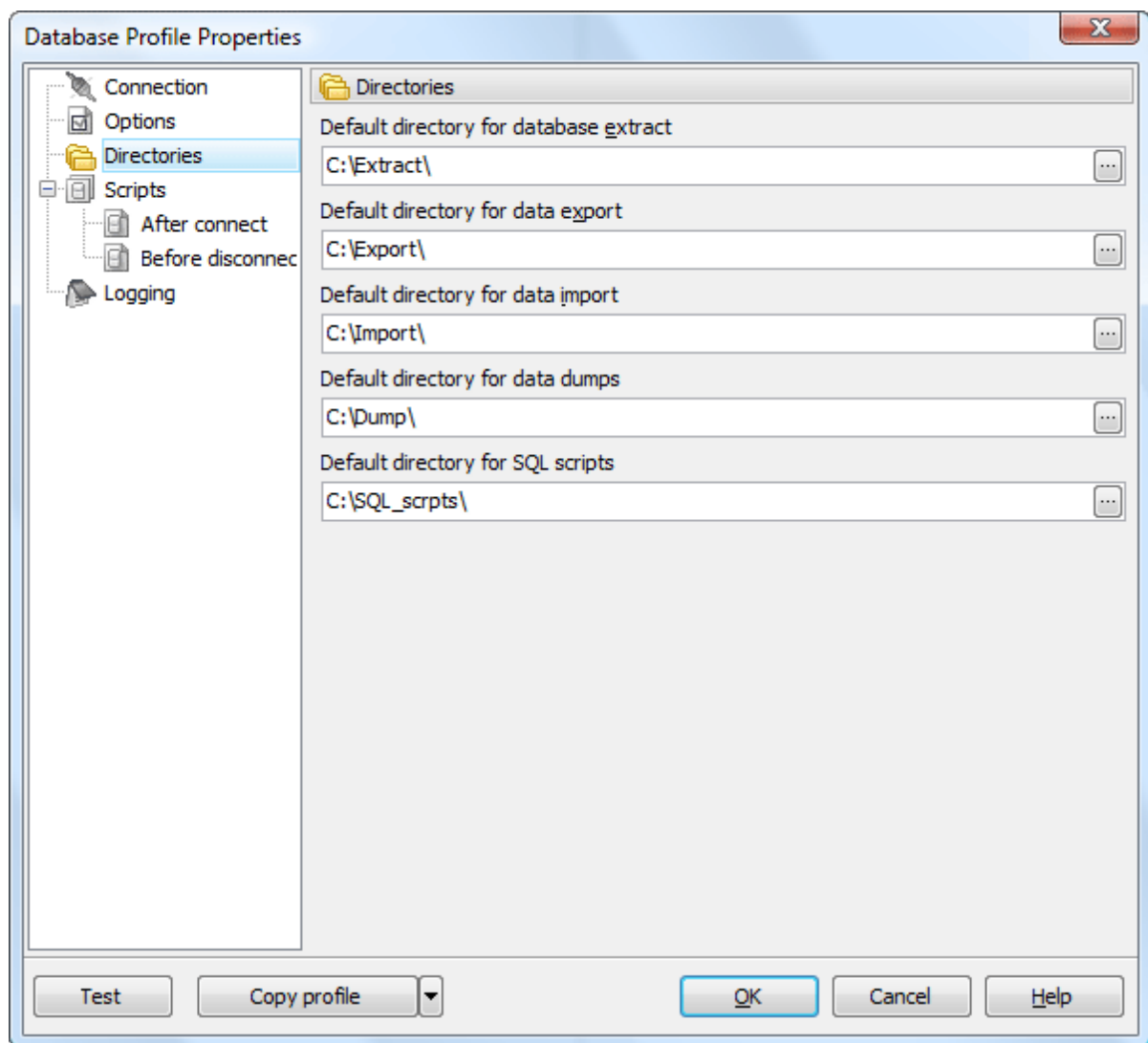
☒ [Refresh whole database on connect](#)

Use the option along with the [Show empty schemas](#)<sup>[26]</sup> 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

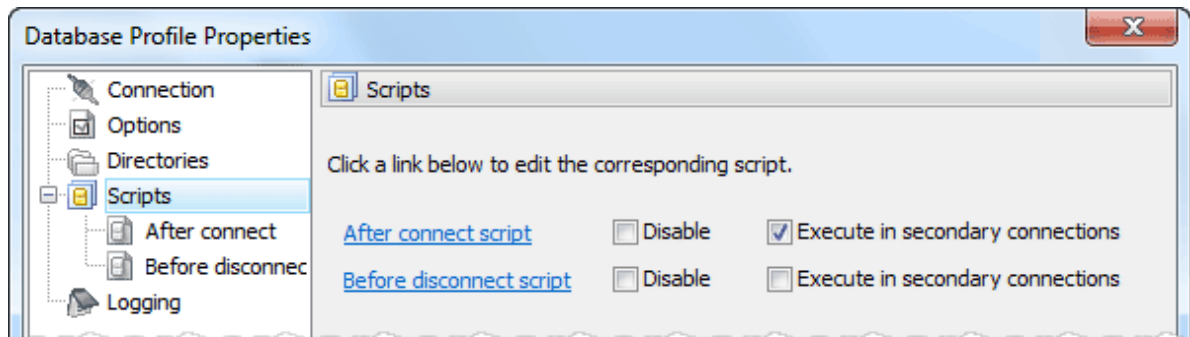
Use the tab to specify the [default directories](#) respectively for database extract, data export, data import, table backup/restore and data dump.



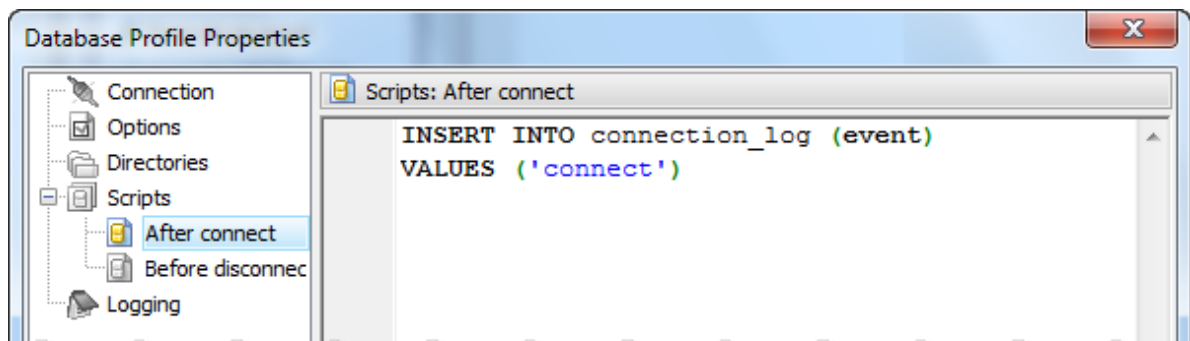


### 3.2.4 Editing obligatory scripts to execute

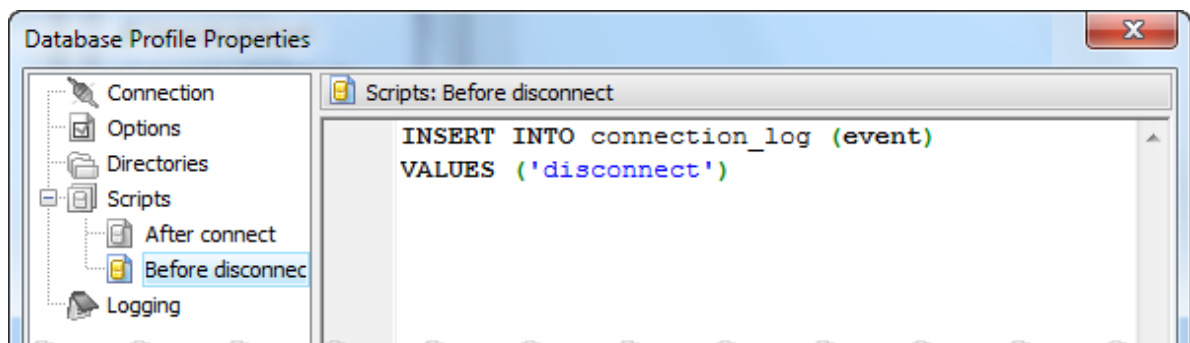
Use the tab to specify the obligatory scripts to execute in all database connections established by the software (on executing queries, browsing objects data, etc.). There is a possibility to enable/disable a written script.



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

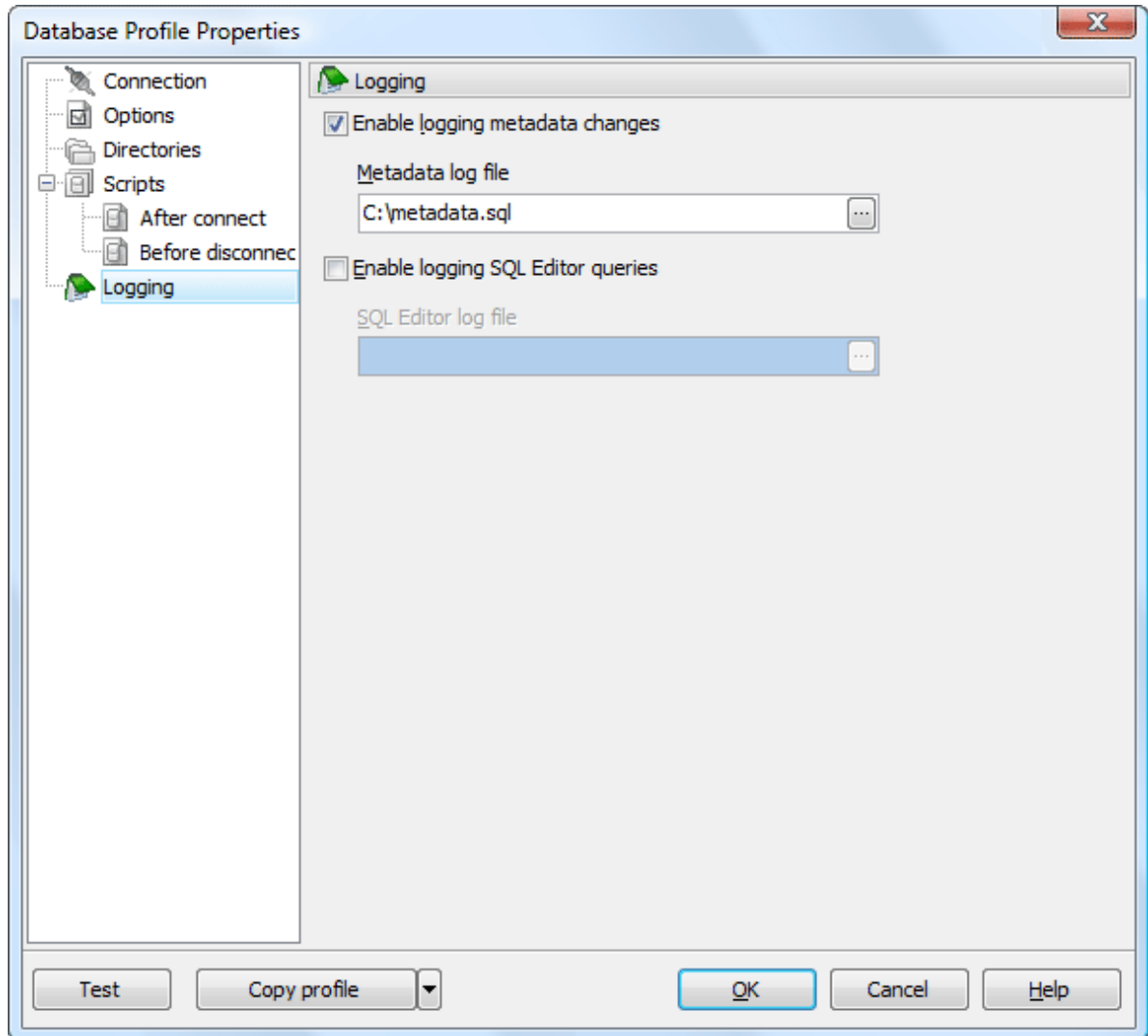


The next screen represents the example of an obligatory script to execute before SQL Maestro for MySQL will disconnect from the database. The script writes a disconnect time to the log table.




### 3.2.5 Setting log options


Enable/disable [metadata changes logging](#) and [SQL query logging](#) and specify the corresponding log file names if necessary.



### 3.2.6 Statistics

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

 Statistics

 **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

Reset statistics

## 3.3 Create Database Wizard

To run the [Create Database Wizard](#), select the [Database | Create New Database...](#) main menu item or click the [Create New Database](#) button on the main toolbar.

- [Setting database connection properties](#)<sup>[37]</sup>
- [Specifying database properties](#)<sup>[38]</sup>

**See also:** [Database Editor](#)<sup>[39]</sup>

### 3.3.1 Setting connection properties

Set the [connection properties](#)<sup>[14]</sup> of the new database. If the [Create profile after creating the database](#) option is checked, the [Edit Database Profile](#)<sup>[30]</sup> dialog is opened after the new database is created.

**Create Database Wizard**

Specify connection properties and the name for a new database

Welcome to the Create Database Wizard!  
This wizard allows you to create a new database and optionally create its profile in the Database Explorer.  
This wizard will generate the SQL statement for creating the database and execute it on the server.

☒ I can connect to the server directly or via SSH tunneling  
[Configure SSH options](#)

☐ I have to use HTTP tunneling  
URL:   
[Configure tunneling options](#) [Test script using default browser](#)

Host:  Port number:

User name:  Password:

Database name:

☒ Create profile after creating the database

[Help](#) [< Back](#) [Next >](#) [Cancel](#)

### 3.3.2 Specifying database properties

**The next wizard step** allows you to set common database options. All fields below are optional, i.e. it is not obligatory for you to fill them.

**Create Database Wizard**

**Create Database**

Set new database properties and click the Ready button

**Properties**

- Common**
  - Name: new\_database
- Database**
  - Character set: default (Server default)
  - Collation: default

Buttons: Help, < Back, Ready, Cancel

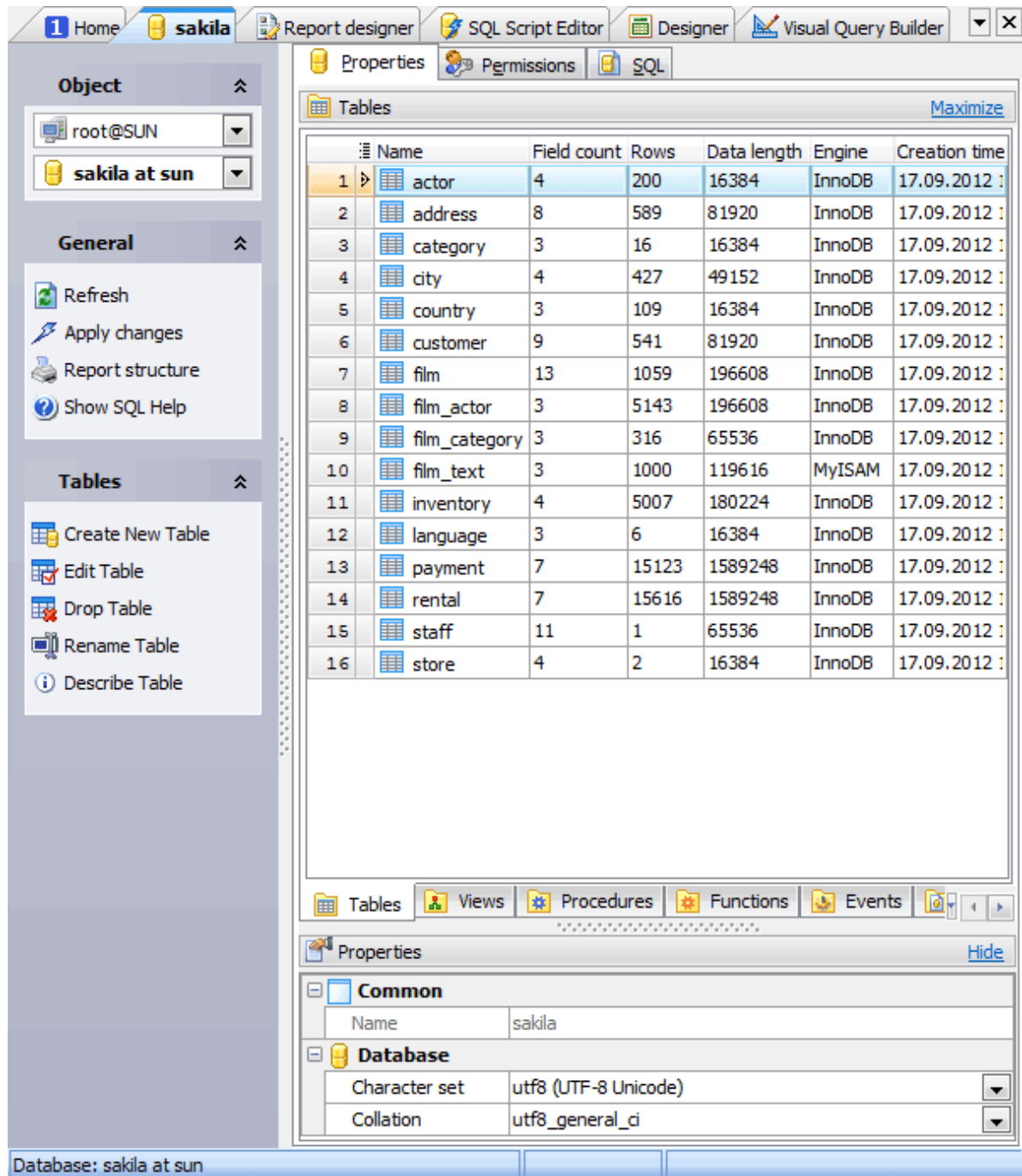
#### Collation

Use the field to specify the default collation for the database. Collation name can be either a Windows collation name or a SQL collation name.

## 3.4 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.



### 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.

The [Properties](#) tab displays available database parameters. Below you can find some of their descriptions.

#### Character set





Here it is represented the set of symbols and encodings using in the database.

#### Collation

The field contains the database collation name, the set of rules for comparing characters in a character set.

## 4 Database Object Management

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

- [Browse Database Objects](#) 
- [Create New Objects](#) 
- [Edit Existing Objects](#) 
- [Duplicate Objects](#) 

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



## 4.1 Create Objects

SQL Maestro for MySQL provides a number of [Create Object Wizards](#)<sup>42</sup> to accomplish the most facile MySQL object creation.

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

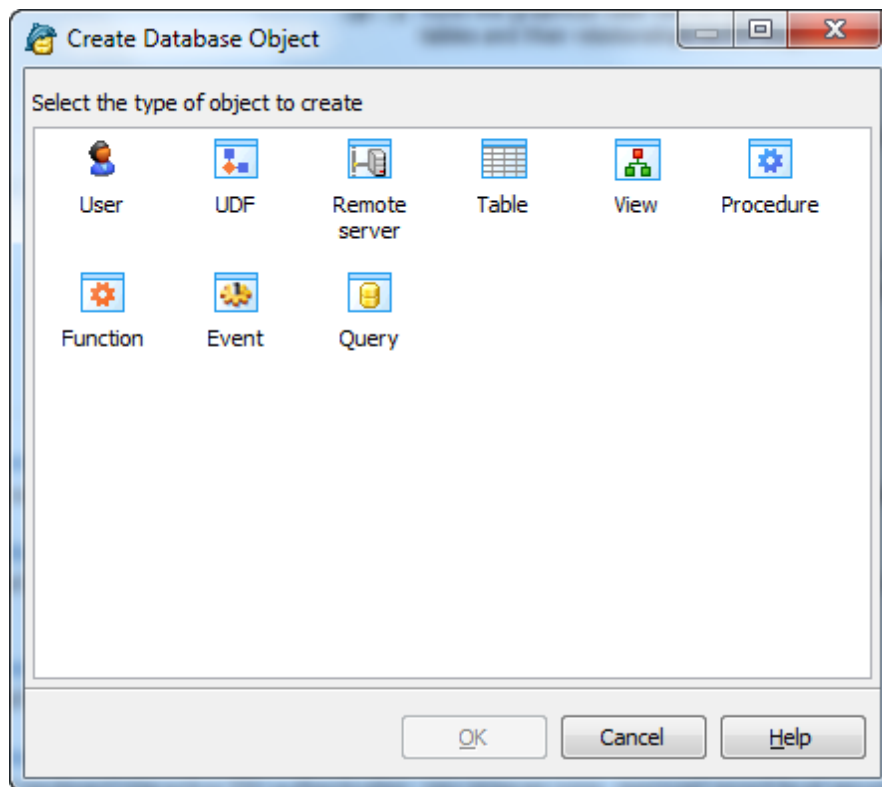
- select the **Object | Create Database Object...** main menu item;
- select the necessary icon (table, query, view, trigger, etc.) in the [Create Database Object](#)<sup>42</sup> dialog

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 SQL Maestro for MySQL. 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](#)<sup>[43]</sup> 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](#)<sup>[44]</sup> 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 Table Wizard](#)<sup>[66]</sup>
- [Create View Wizard](#)<sup>[96]</sup>
- [Create Function Wizard](#)<sup>[114]</sup>
- [Creation of a New Query](#)<sup>[151]</sup>
- [Create Procedure Wizard](#)<sup>[105]</sup>
- [Create Event Wizard](#)<sup>[121]</sup>

#### 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 MySQL 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

SQL Maestro for MySQL allows you to view and modify existing database objects in several ways:

- edit object comment with the [Describe Object](#)<sup>[49]</sup> dialog;
- briefly view and modify [object properties](#)<sup>[49]</sup>;
- view and modify the object including subitems within the object editor.

To open an [Object Editor](#)<sup>[46]</sup>, 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 SQL Maestro for MySQL 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](#)<sup>[55]</sup>, [Object Manager](#)<sup>[60]</sup> or [Object Browser](#)<sup>[58]</sup>.

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 SQL Maestro for MySQL](#).

- 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 MySQL 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](#)<sup>[46]</sup> 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](#)<sup>[46]</sup> 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](#)<sup>[47]</sup> 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](#)<sup>[48]</sup> 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.

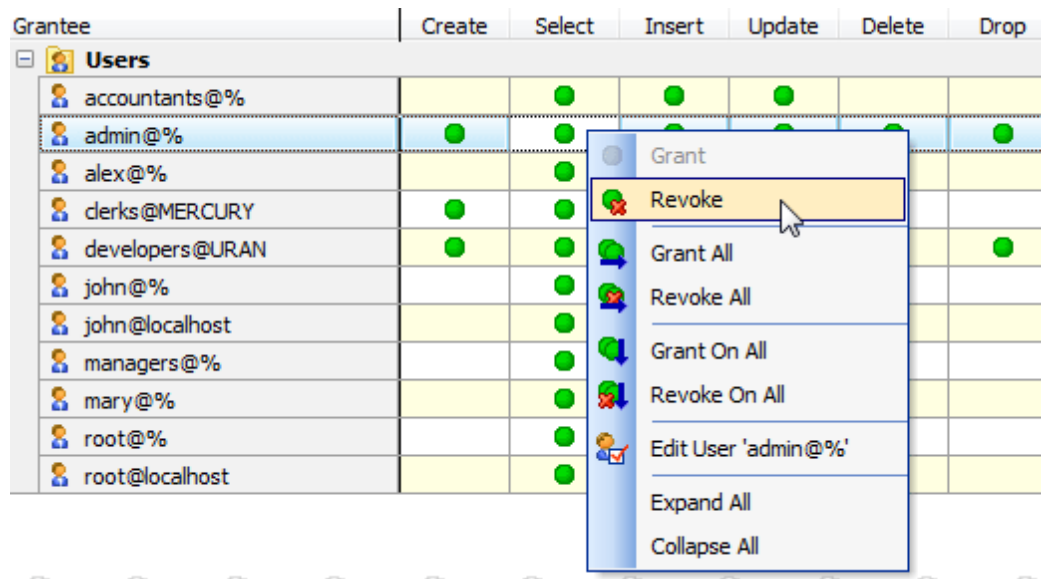
**See also:**

- [Table Editor](#)<sup>[70]</sup>
- [View Editor](#)<sup>[100]</sup>
- [Function Editor](#)<sup>[116]</sup>
- [Procedure Editor](#)<sup>[109]</sup>
- [Event Editor](#)<sup>[125]</sup>

#### 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 ( *table*, *view*, *query*, *database*, *function*, *procedure*, *etc.*) to one or more users.



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

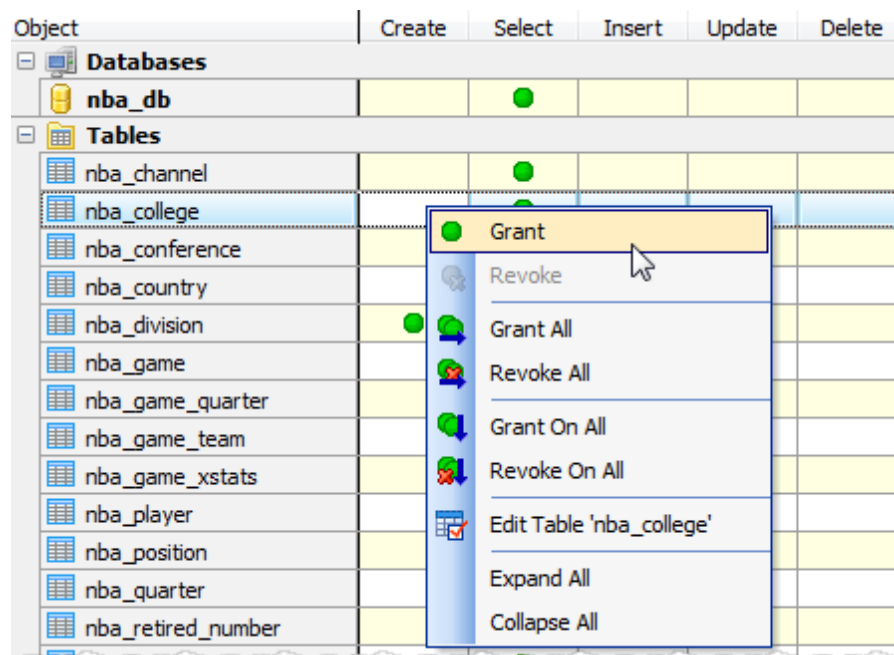
**See also:** [Users](#)<sup>[137]</sup>

#### 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;
- 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 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](#) <sup>278</sup> 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)

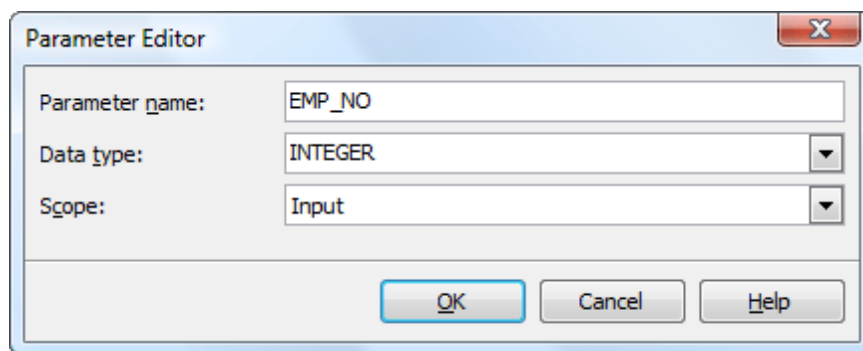
In [collapsed mode](#) the text is hidden behind one text line denoting the first line of the collapsed region.

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

#### 4.2.1.4 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*.



#### 4.2.1.5 Executing functions and procedures

[Function 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 Function has parameters, SQL Maestro for MySQL 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

SQL Maestro for MySQL 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 [Function 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 SQL Maestro for MySQL 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

SQL Maestro for MySQL 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](#)<sup>[50]</sup> 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](#)<sup>[52]</sup> you can find some additional info.
3. By [Drag-n-Drop](#)<sup>[53]</sup> 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 SQL Maestro for MySQL. 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](#)<sup>[50]</sup>
- [Selecting object to duplicate](#)<sup>[51]</sup>
- [Modifying definition of a new object](#)<sup>[52]</sup>

**See also:** [Create Database Object](#)<sup>[42]</sup>

#### 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](#)<sup>[24]</sup>).

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

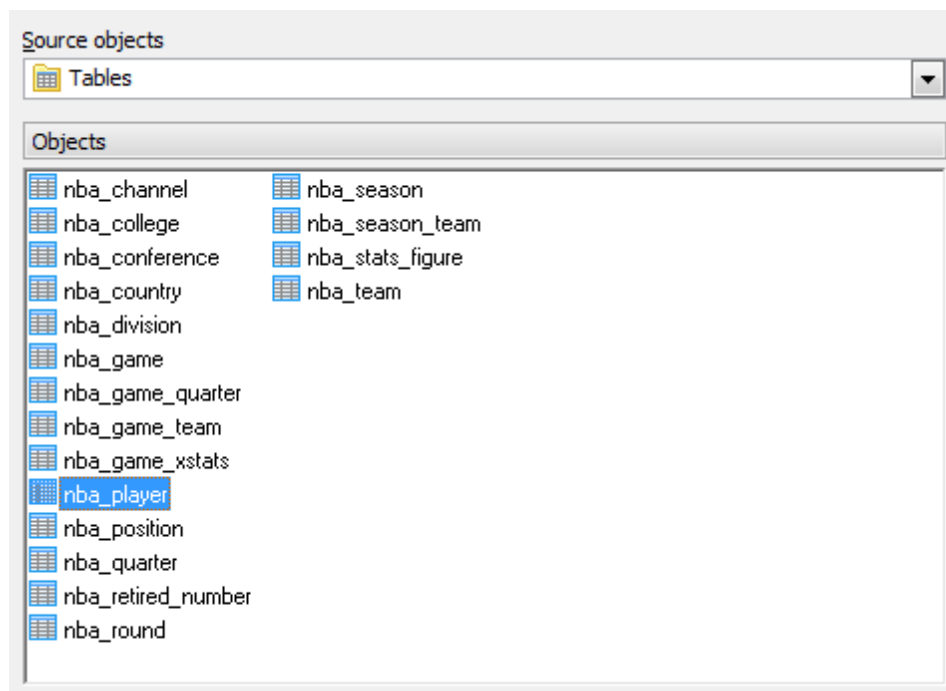
Destination database

 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.



#### 4.3.1.3 Modifying new object definition

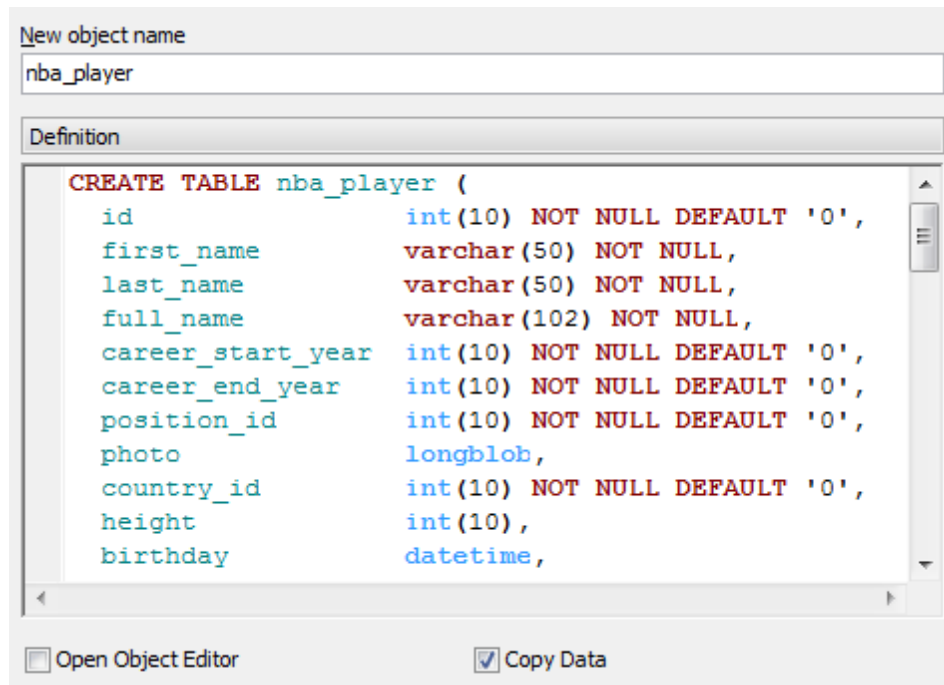
The last wizard step allows you to edit the new object definition directly.

Use this step to edit the name of object been creating ([New Object Name](#)). By default SQL Maestro for MySQL 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 MySQL 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

Definition

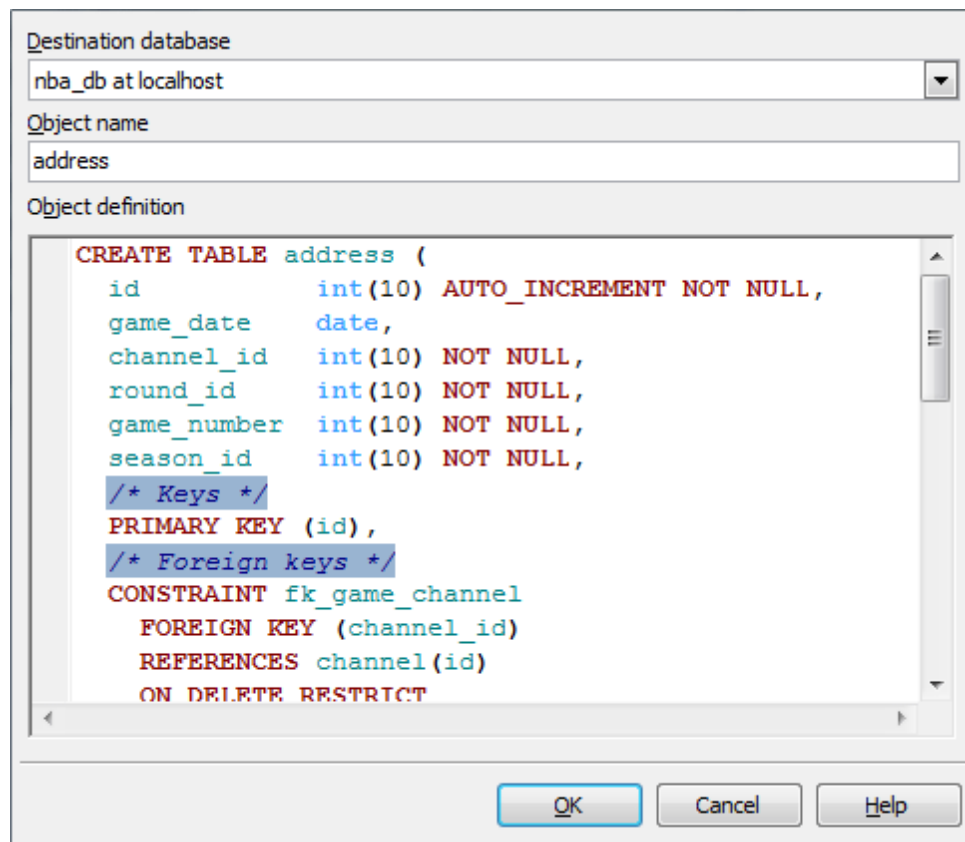
```
CREATE TABLE nba_player (  
  id                int(10) NOT NULL DEFAULT '0',  
  first_name        varchar(50) NOT NULL,  
  last_name         varchar(50) NOT NULL,  
  full_name         varchar(102) NOT NULL,  
  career_start_year int(10) NOT NULL DEFAULT '0',  
  career_end_year   int(10) NOT 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](#).



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 MySQL 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

SQL Maestro for MySQL 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

SQL Maestro for MySQL allows to browse objects stored in a Remote Server database in several ways:

- [Database Explorer](#)<sup>[55]</sup>: objects are represented as a hierarchy (grouped by kind and listed under the according MySQL servers/database node, provided with subobjects if exist)
- [Object Browser](#)<sup>[58]</sup>: an extension of explorer with ability to sort, group, filter and multiple select objects.
- [Object Manager](#)<sup>[60]</sup>: 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 SQL Maestro for MySQL which allows you to perform practically all necessary operations upon databases and their objects. The Database Explorer area occupies the left side of the SQL Maestro for MySQL main window. All the objects at the Explorer tree are grouped by kind and listed under the according MySQL servers/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.

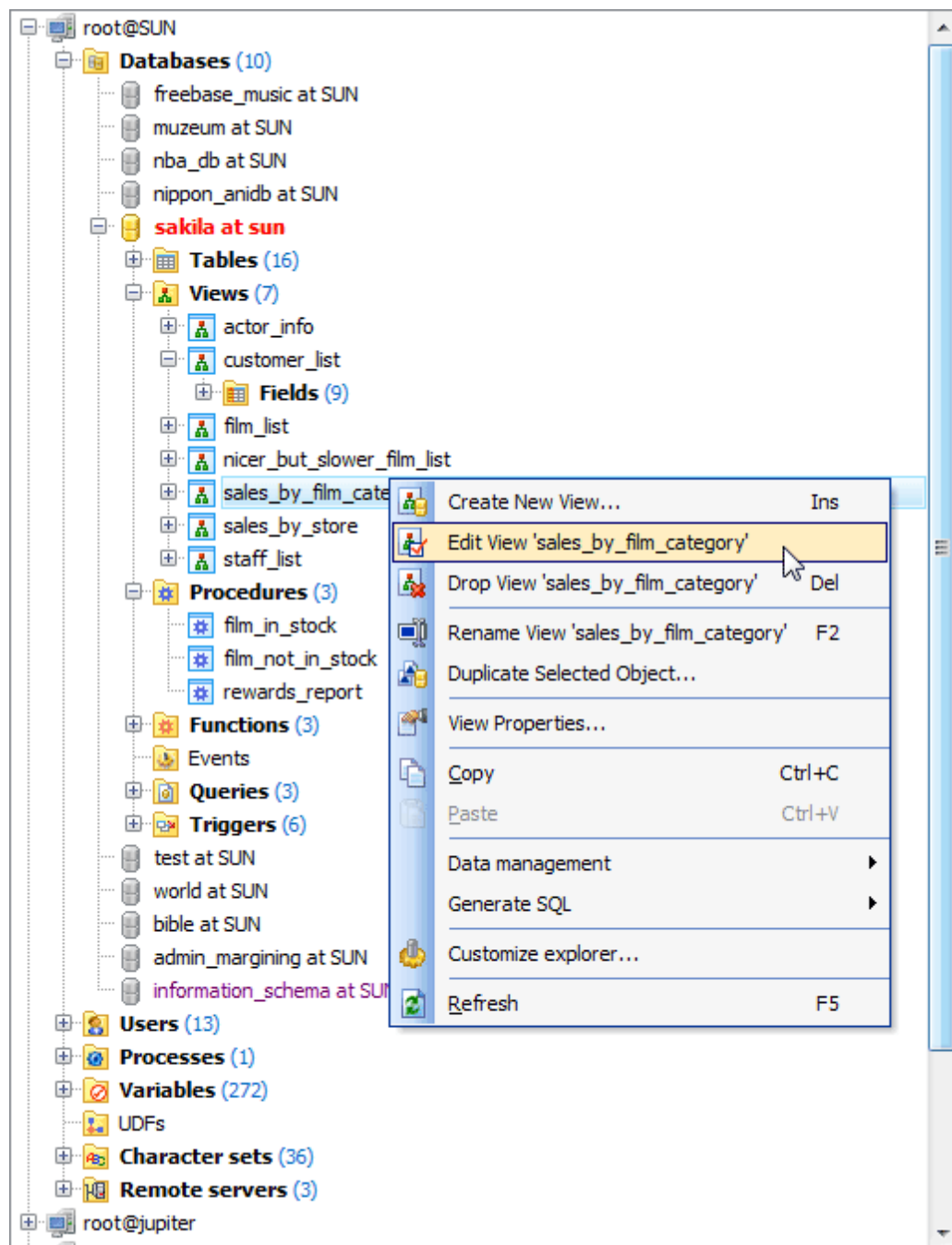
**See also:** [Object Manager](#)<sup>[60]</sup>, [Object Browser](#)<sup>[58]</sup>

**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](#)<sup>[26]</sup> 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?](#)<sup>[56]</sup>
- [How can I connect to a database?](#)<sup>[55]</sup>
- [How can I disconnect from a database?](#)<sup>[57]</sup>
- [What operations can I accomplish upon database objects within the Explorer Tree?](#)<sup>[57]</sup>
- [Can I copy a database object from one database to another?](#)<sup>[57]</sup>
- [Can I filter Explorer content?](#)<sup>[58]</sup>
- [How can I create new/drop a database?](#)<sup>[57]</sup>



### 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](#) <sup>[26]</sup> (the Create Database Profiles... item);
- rename currently selected database profile (the Rename Database Profile... item);
- [edit currently selected database profile](#) <sup>[30]</sup> (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).

#### **How can I create new/drop a database?**



To create a new MySQL database (not existing on your MySQL server) with Database Explorer, select the Create New Database... item from the popup menu and set all the necessary options within the [Create Database Wizard](#)<sup>[37]</sup>.

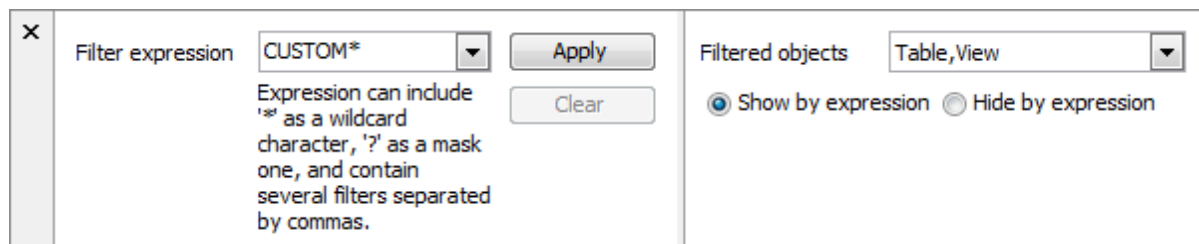
To drop an existing database using Database Explorer, connect to the database you wish to drop, select the Drop Database item from the popup menu of the database and confirm dropping in the dialog window.

**Note:** Alternatively, you can use the Database | Create New (Drop) Database main menu item to perform these operations.

#### 4.4.1.1 Filtering explorer content

SQL Maestro for MySQL 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.



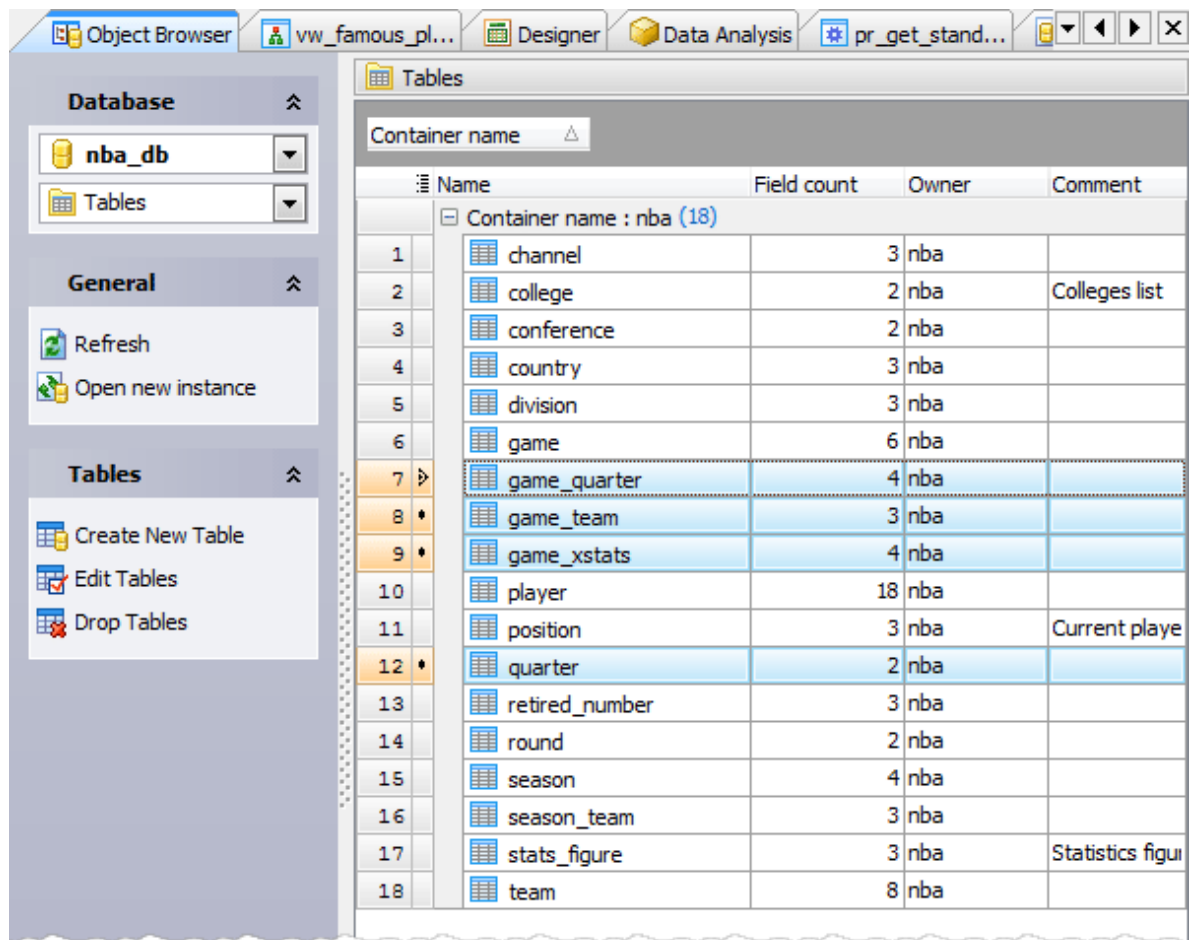
- Specify the Filter expression. The expression can contain any part of object name combined with an asterisk ('\*') as a wildcard character and a question-mark ('?') as a mask character.
- Define the Filtered objects, object types for filtering in the explorer tree.
- Check the according radio button (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](#)<sup>[38]</sup> and [Object Browser](#)<sup>[38]</sup> as well.

#### 4.4.2 Object Browser

[Object Browser](#) is a tool for operating on database objects designed as an extension of [Database Explorer](#)<sup>[35]</sup> 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.



### 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 SQL Maestro for MySQL 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

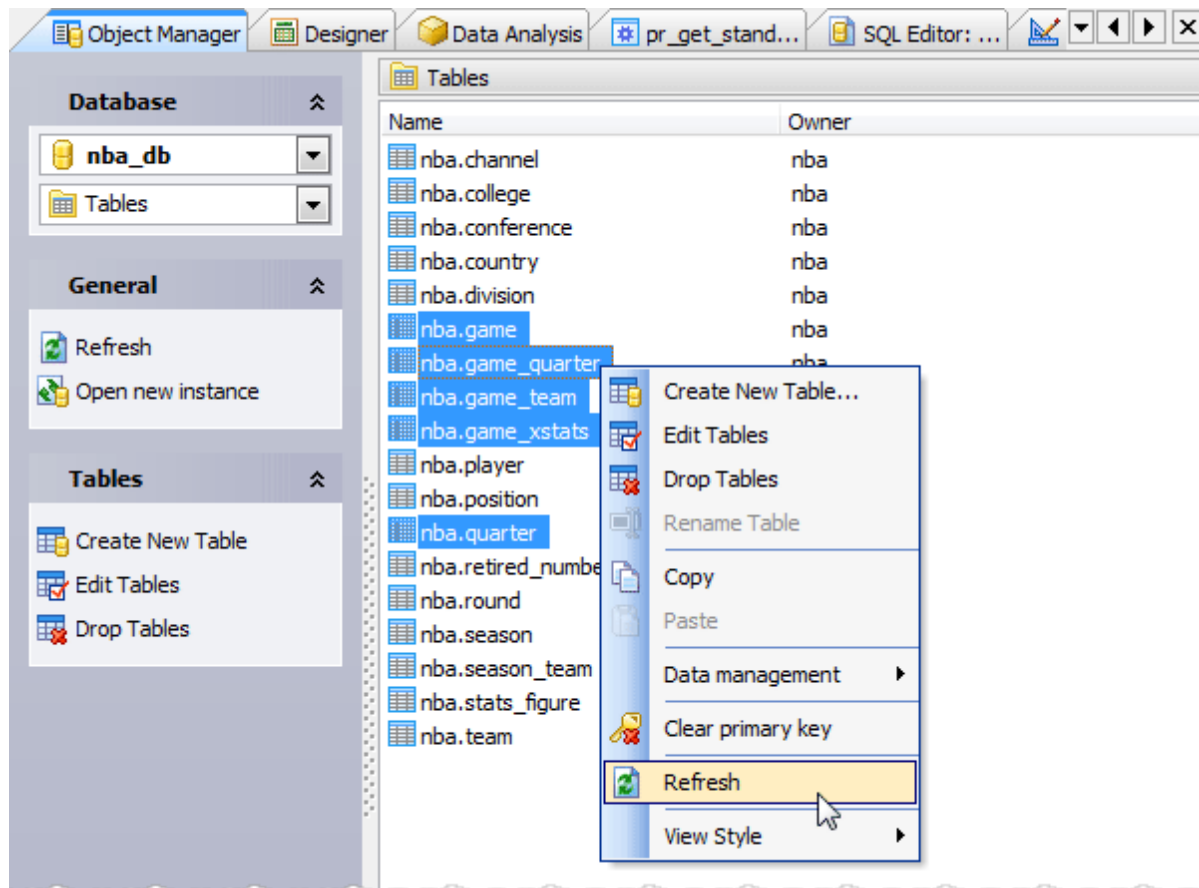
After you set a filter, the filtering panel becomes visible at the bottom of the grid where you can see the active filtering condition and easily enable or disable it by clicking the check box on the left. Using this panel you can also customize your filter in a more complicated way by clicking the [Customize](#)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

**See also:** [Object Manager](#)<sup>[60]</sup>, [Data View](#)<sup>[168]</sup>

### 4.4.3 Object Manager

[Object Manager](#) is a tool for operating on database objects designed as an extension of the [Database Explorer](#)<sup>[65]</sup> 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](#)

## 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 SQL Maestro for MySQL. To work with database objects you should [connect to the database](#) first.

- [Tables](#)
- [Views](#)
- [Functions](#)
- [Procedures](#)
- [Events](#)

## 5.1 Tables

SQL Maestro for MySQL 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](#)<sup>[66]</sup>. 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](#)<sup>[70]</sup>. 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](#)<sup>[74]</sup>, generate [simple SQL statements](#)<sup>[243]</sup>, [CRUD procedures](#)<sup>[244]</sup> to work with this table, and [split the table](#)<sup>[247]</sup> into two separate tables.

### 5.1.1 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 SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. 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 specify here the name of the MySQL 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.

#### [Engine](#)

Defines the type of the new table.



<i>MyISAM</i>	The new binary portable table handler that is replacing ISAM.
<i>InnoDB</i>	Transaction-safe tables with row locking and foreign key support (since MySQL version 3.23.44 only).
<i>Berkeley_db</i>	Transaction-safe tables with page locking.
<i>ISAM</i>	The original table handler. It is not supported in the latest versions of MySQL.
<i>MEMORY (HEAP)</i>	The data for this table is only stored in memory.
<i>MRG_MyISAM</i>	A collection of MyISAM tables used as one table.
<i>GEMINI</i>	Table type, developed by NuSphere Company. It is not supported in the latest versions of MySQL.
<i>FEDERATED</i>	The storage engine accesses data in tables of <a href="#">remote databases</a> <sup>[128]</sup> rather than in local tables.
<i>EXAMPLE</i>	It is a stub engine that does nothing. Its purpose is to serve as an example in the MySQL source code that illustrates how to begin writing new storage engines. As such, it is primarily of interest to developers.
<i>CSV</i>	The engine stores data in text files using comma-separated values format.
<i>BLACKHOLE</i>	The BLACKHOLE storage engine acts as a "black hole" that accepts data but throws it away and does not store it.
<i>ARCHIVE</i>	The ARCHIVE storage engine is used for storing large amounts of data without indexes in a very small footprint.

#### Connection (only for FEDERATED tables)

Specify here a connection string that indicates to the FEDERATED engine how to connect to the remote server.

The general form of the connection string is as follows:

```
scheme://user_name[:password]@host_name[:port_num]/db_name/tbl_name
```

Only mysql is supported as the scheme value at this point; the password and port number are optional.

Here are some example connection strings:

```
CONNECTION='mysql://username:password@hostname:port/database/tablename'
CONNECTION='mysql://username@hostname/database/tablename'
CONNECTION='mysql://username:password@hostname/database/tablename'
```

The use of [Connection](#) for specifying the connection string is non-optimal and is likely to

change in future. Keep this in mind for applications that use FEDERATED tables. Such applications are likely to need modification if the format for specifying connection information changes.

#### Insert method (Only for Mrg\_MYISAM tables)

You can optionally specify an **Insert method** option if you want inserts for the Mrg\_MYISAM table to take place in the first or last table of the **UNION** list. Use a value *FIRST* or *LAST* to cause inserts to be made in the first or last table, respectively. If you do not specify the option or if you specify it with a value *NO*, attempts to insert rows into the Mrg\_MYISAM table result in an error.

#### Union tables (Only for Mrg\_MYISAM tables)

Creates a collection of identical MyISAM tables as one. Click the ... button to edit the list of union tables in the Union Tables window.

#### Collation

The clause is specifying the table character set.

#### Partitioning type (Since MySQL 5.1)

The possibility of partitioning was implemented in MySQL 5.1. It allows you to distribute portions of individual tables across a filesystem according to rules which you can set largely as needed. In effect, different portions of a table are stored as separate tables in different locations.

Select the type of table partitioning from the drop-down list.

(none)	Use the clause to create a table without partitioning.
Range	In this case, <b>Expression</b> shows a range of values using a set of VALUES LESS THAN operators. When using range partitioning, you must define at least one partition using VALUES LESS THAN. You cannot use VALUES IN with range partitioning. VALUES LESS THAN can be used with either a literal value or an expression that evaluates to a single value.
List	List partitioning in MySQL is similar to range partitioning in many ways. In this case each partition also must be explicitly defined. The chief difference is that, in list partitioning, each partition is defined and selected based on the membership of a column value in one of a set of value lists, rather than in one of a set of contiguous ranges of values. <b>Expression</b> is a column value or an expression based on a column value and returning an integer value, and then defining each partition by means of a value list, a comma-separated list of integers.
Hash	The partitioning is used primarily to ensure an even distribution of data among a predetermined number of partitions. With range or list partitioning, you must specify explicitly into which partition ( <b>Partition count</b> ) a given column value or set of column values is to be stored; with hash partitioning, MySQL takes care of this for you, and you need only specify a column value or expression based on a column value to be hashed and the number of partitions into which the partitioned table is to be divided.
Linear hash	The partitioning type differs from regular hashing in that linear hashing

	utilizes a linear powers-of-two algorithm whereas regular hashing employs the modulus of the hashing function's value.
Key	Partitioning by key is similar to partitioning by hash, except that where hash partitioning employs a user-defined expression, the hashing function for key partitioning is supplied by the MySQL server.
Linear key	This type partitioning has the same effect on key partitioning as it does on hash partitioning, with the partition number being derived using a powers-of-two algorithm rather than modulo arithmetic.

#### Check sum

Maintains a checksum for all rows (makes table a little slower to update but makes it easier to find the corrupted tables).

#### Pack keys

Makes table indexes smaller. This usually makes updates slower and reads faster.

#### Delay key write

Delays key table updates until the table is closed.

#### Max rows

Minimum number of rows you plan to store in the table.

#### Min rows

Maximum number of rows you plan to store in the table.

#### Row format

Defines how the rows should be stored in the new table.

#### Avg row length

Use the option in case your table is larger than 4GB and your operating system supports large files among with [Max rows](#) options.

#### Auto increment (only to integer types)

Specify a special counter called the auto-increment counter that is used in assigning new values for the column.

**Create table wizard**

**Create New Table**

Edit table options

**Properties**

Name	customer
Comment	

**Table**

Engine	InnoDB
Connection	
Insert method	No
Union tables	
Collation	utf8_general_ci
Partitioning type	(none)
Expression	
Partition count	0

**Advanced**

Check sum	<input type="checkbox"/>
Pack keys	<input type="checkbox"/>
Delay key write	<input type="checkbox"/>
Max. rows	1000
Min. rows	0
Row format	Default
Avg row length	0
Auto increment	0

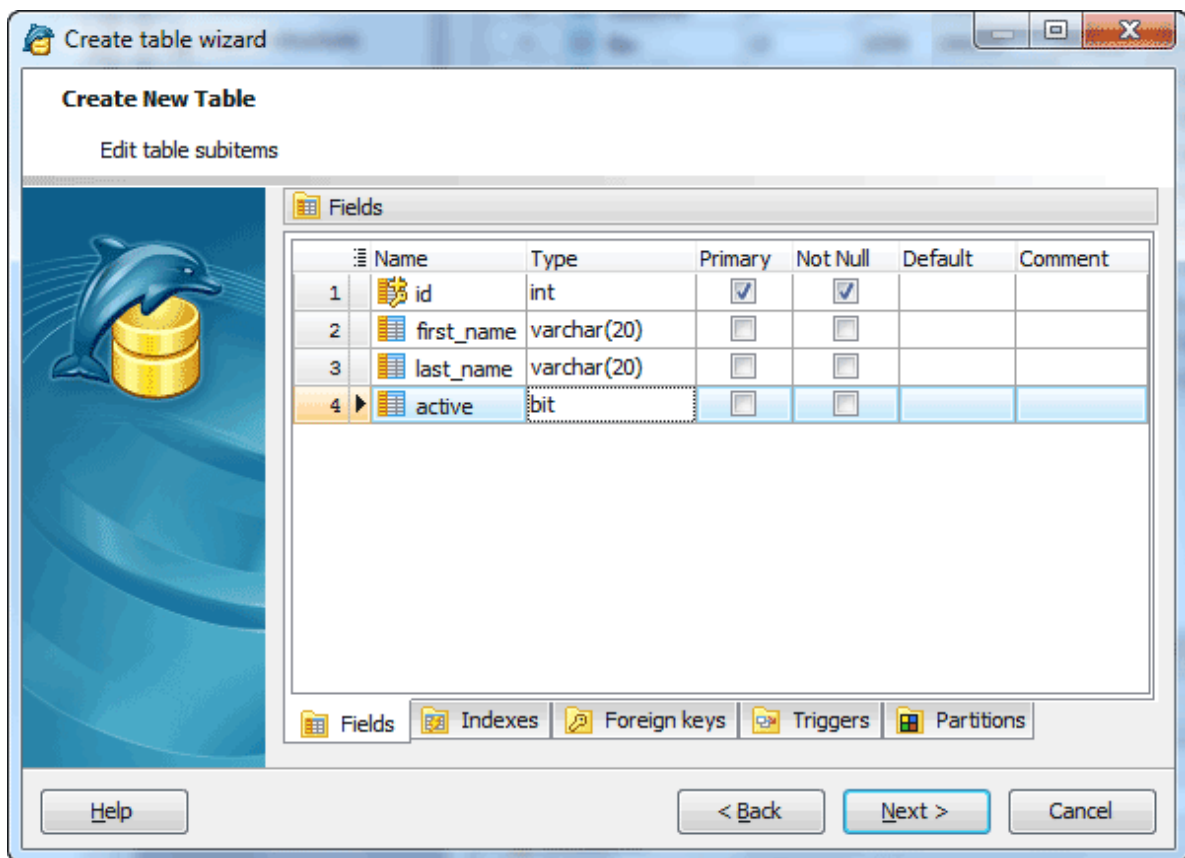
Help < Back Next > Cancel

### 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](#)<sup>[76]</sup>, [foreign\\_key](#)<sup>[81]</sup> (for InnoDB), [trigger](#)<sup>[88]</sup>, and [index](#)<sup>[79]</sup>, follow the according link.

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



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.

## 5.1.2 Table Editor

[Table Editor](#) allows you to create, edit and drop table fields, indexes, foreign keys, 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](#).

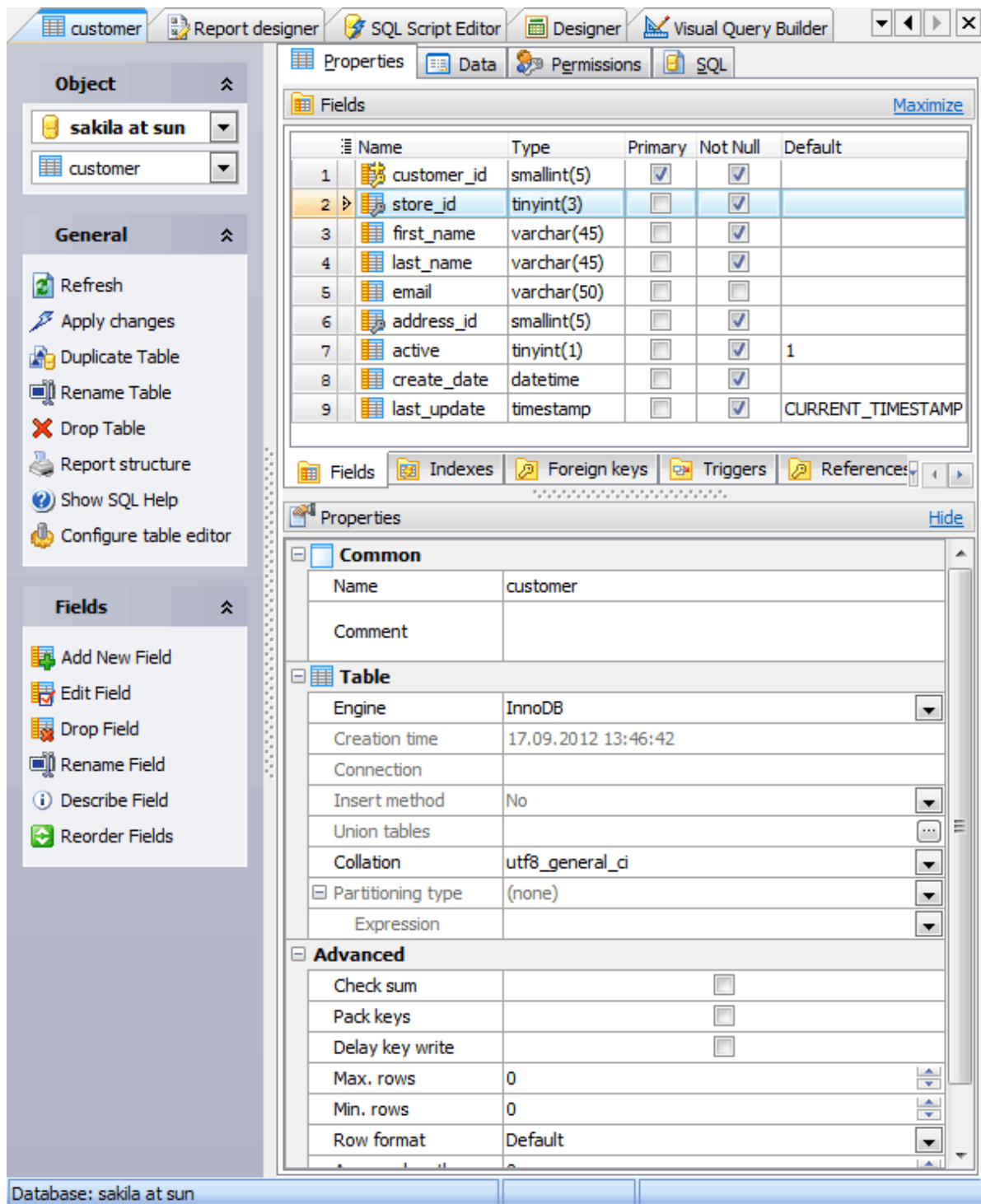
The basic principles of Object Editors in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[46]</sup>. Below you will find a description of editor tabs that are unique for the current object.

The Navigation bar of the editor provides you also to analyze, check, repair, and optimize current table.

- [Editing table properties](#)<sup>[70]</sup>
- [Viewing table data](#)<sup>[74]</sup>

### 5.1.2.1 Editing table properties

The [Properties](#) section allows you to view general table properties and also to modify the table name, and to add a comment for the table.



### 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](#), [Foreign Keys](#), [Triggers](#), and [Indexes](#).

Use the [Name](#) field to rename the table.

**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 MySQL server.

### Engine

Here you can change the table type.

<i>MyISAM</i>	The new binary portable table handler that is replacing ISAM.
<i>InnoDB</i>	Transaction-safe tables with row locking and foreign key support (since MySQL version 3.23.44 only)
<i>Berkeley_db</i>	Transaction-safe tables with page locking.
<i>ISAM</i>	The original table handler. It is not supported in the latest versions of MySQL.
<i>MEMORY (HEAP)</i>	The data for this table is only stored in memory.
<i>MRG_MyISAM</i>	A collection of MyISAM tables used as one table.
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<i>FEDERATED</i>	The storage engine accesses data in tables of remote databases rather than in local tables.
<i>EXAMPLE</i>	It is a stub engine that does nothing. Its purpose is to serve as an example in the MySQL source code that illustrates how to begin writing new storage engines. As such, it is primarily of interest to developers.
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### Connection (only for FEDERATED tables)

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The general form of the connection string is as follows:

scheme://user\_name[:password]@host\_name[:port\_num]/db\_name/tbl\_name

Only mysql is supported as the scheme value at this point; the password and port number are optional.

Here are some example connection strings:

```
CONNECTION='mysql://username:password@hostname:port/database/tablename'  
CONNECTION='mysql://username@hostname/database/tablename'  
CONNECTION='mysql://username:password@hostname/database/tablename'
```

The use of [Connection](#) for specifying the connection string is non-optimal and is likely to change in future. Keep this in mind for applications that use FEDERATED tables. Such applications are likely to need modification if the format for specifying connection information changes.

#### [Insert method \(Only for Mrg\\_MYISAM tables\)](#)

You can optionally specify an [Insert method](#) option if you want inserts for the Mrg\_MYISAM table to take place in the first or last table of the [UNION](#) list. Use a value *FIRST* or *LAST* to cause inserts to be made in the first or last table, respectively. If you do not specify the option or if you specify it with a value *NO*, attempts to insert rows into the Mrg\_MYISAM table result in an error.

#### [Union tables \(Only for Mrg\\_MYISAM tables\)](#)

Creates a collection of identical MyISAM tables as one. Click the ... button to edit the list of union tables in the Union Tables window.

#### [Collation](#)

The clause is specifying the table character set.

#### [Check sum](#)

Maintains a checksum for all rows (makes table a little slower to update but makes it easier to find the corrupted tables).

#### [Pack keys](#)

Makes table indexes smaller. This usually makes updates slower and reads faster.

#### [Delay key write](#)

Delays key table updates until the table is closed.

#### [Max rows](#)

Minimum number of rows you plan to store in the table.

#### [Min rows](#)

Maximum number of rows you plan to store in the table.

#### [Row format](#)

Defines how the rows should be stored in the new table.

#### [Avg row length](#)

Use the option in case your table is larger than 4GB and your operating system supports large files among with [Max rows](#) options.



Partition type (since MySQL 5.1.x)

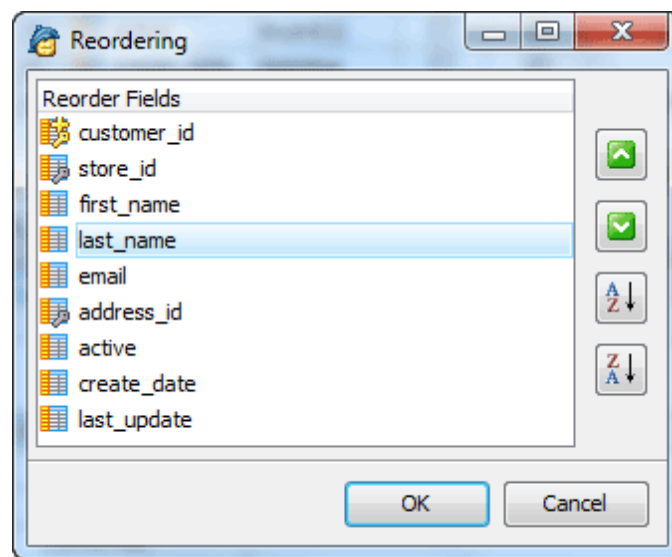
The field displays the type of current table partitioning type. For more information see [Specifying table options](#)<sup>[66]</sup>.

Auto increment (only to integer types)

Specify a special counter called the auto-increment counter that is used in assigning new values for the column.

With SQL Maestro for MySQL you can also analyse, check, repair and optimize your tables. Just use the appropriate link at [Navigation bar](#).

SQL Maestro for MySQL allows you to reorder columns for existing tables. To open the [Reorder fields](#) window, use the appropriate link of the popup menu or at the [Navigation bar](#).



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.

### 5.1.2.2 Managing table data

The [Data](#) tab displays the table data as a grid or as info cards (see [Data View](#)<sup>[168]</sup> 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](#)<sup>[179]</sup>.

#### Lookup editors

Lookup editor displays the content of parent table's columns within the drop-down window. SQL Maestro for MySQL 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
2		address_id	address	district	city_id postal_code
1	5	5	1913 Hanoi Way	Nagasaki	463 35200
2	6	6	1121 Loja Avenue	California	449 17886
2	7	7	692 Joliet Street	Attika	38 83579
1	8	8	1566 Inegl Manor	Mandalay	349 53561
2	9	9	53 Idfu Parkway	Nantou	361 42399
1	10	10	1795 Santiago de Compostela Way	Texas	295 18743
2	11	11	900 Santiago de Compostela Parkway	Central Serbia	280 93896
2	12	12	478 Joliet Way	Hamilton	200 77948
1					
2					
1	21	DONNA	THOMPSON	DONNA.THOMPSON@sakilacustomer.org	1

### 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)							
SalesOrderID SalesOrderDetailID OrderQty ProductID UnitPrice UnitPriceDisc							
Click here to define a filter							
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

SQL Maestro for MySQL 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

SQL Maestro for MySQL 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 file 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.

## 5.1.3 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](#)  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.

The screenshot shows the 'Field Editor' dialog box. The 'Field name' is 'stored\_full\_name'. The 'Field type' is 'varchar', with 'varchar(100)' highlighted as a suggestion. In the 'Parameters' section, 'Size' is 100 and 'Precision' is 0. The 'Field flags' section has 'Not null' checked. The 'Charset and collation' is 'utf8\_general\_ci'. The 'Formula' is 'concat(first\_name, '', last\_name)' and is marked as 'Stored'. The 'Comment' field is empty.

To specify the [Data Type](#), select it from the drop-down list or complete the appropriate field manually in case of data type lacking in this 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 MySQL 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.

### 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](#) or the appropriate step of [Create Table Wizard](#).

☒ **Autoincrement**

For *MyISAM* tables you can specify the option on a secondary column in a multiple-column index. In this case, the generated value for the *Autoincremented* column is calculated as **MAX(auto\_increment\_column) + 1 WHERE prefix=given-prefix**. This is useful when you want to put data into ordered groups.

☒ **Zerofill**

Check the box to set the default padding of spaces will be replaced with zeros. For example, for a column declared as INT(5) ZEROFILL, a value of 4 is retrieved as 00004.

**Note:** The attribute is stripped when a column is involved in expressions or *UNION* queries.

**Note:** If you specify the option for a numeric column, MySQL automatically adds the [Unsigned](#) attribute to the column

☒ **Unsigned**

If specified, disallows negative values. For example, if the signed range is -128 to 127 the unsigned range is 0 to 255.

☒ **Set to current timestamp to update**

This option is available for timestamp fields (all MySQL versions) as well as for datetime fields starting from MySQL 5.6.5. An auto-updated column is automatically updated to the current timestamp when the value of any other column in the row is changed from its current value.

Specify the column [character set](#) and [collation](#).

[Formula](#)

Expression to compute the value of generated columns. If the stored checkbox is turned ON, the value of the column will be persistently stored in the database.

[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.

## 5.1.4 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](#)  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](#)  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:

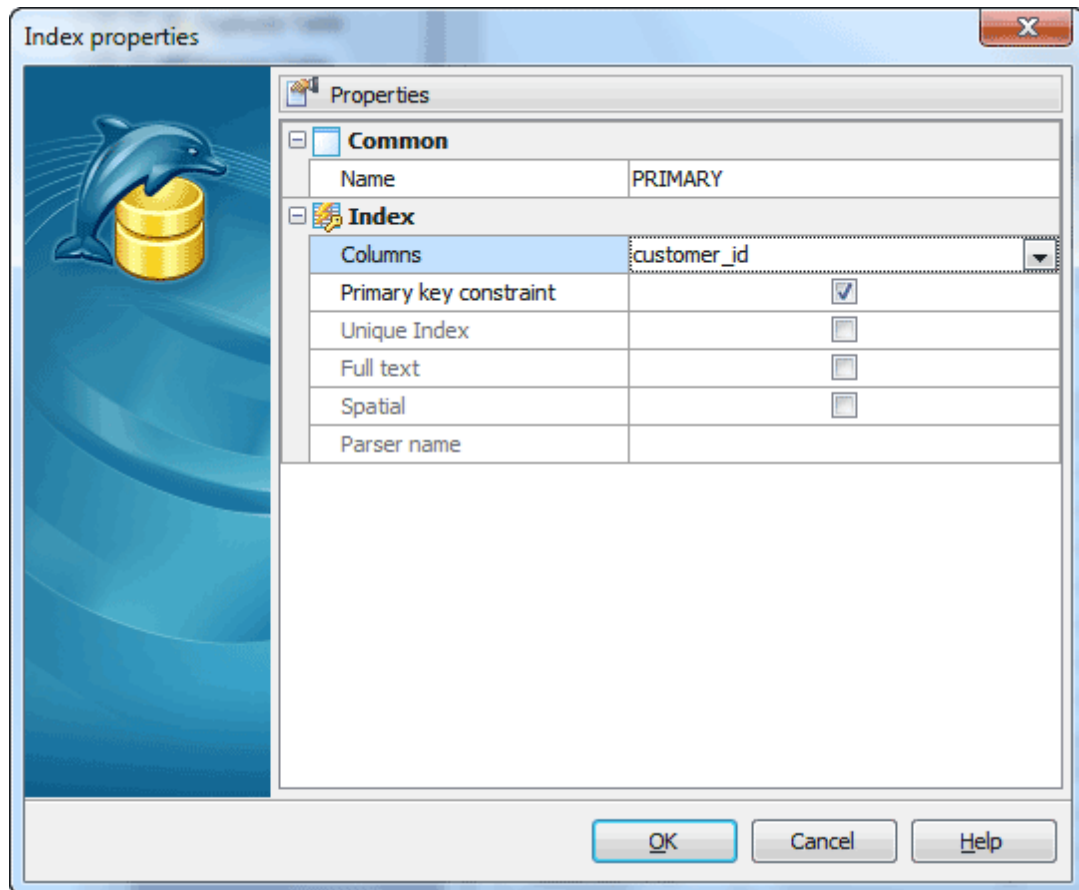
- select the index to drop in the explorer tree;
- select the [Drop Index](#) item from the popup menu

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.



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.


### 5.1.5 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](#)  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](#)  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?

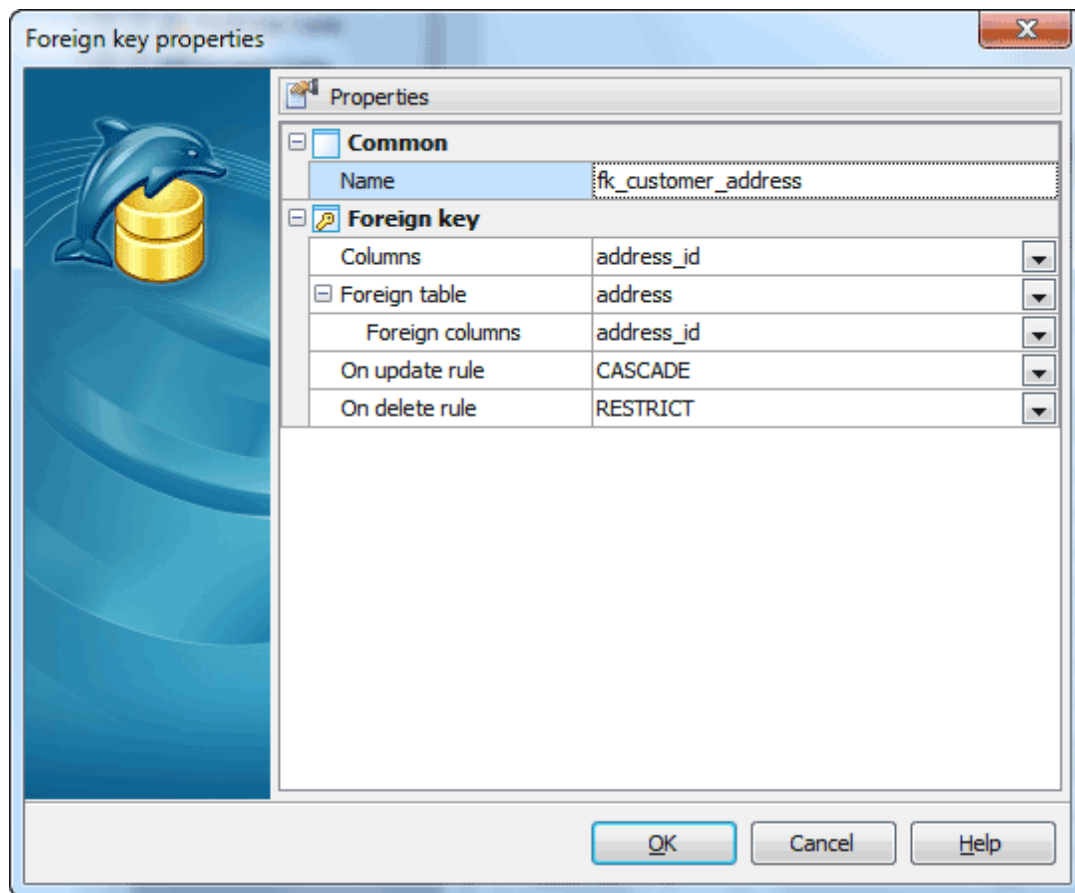
To drop the foreign key:


- 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.



All the fields which are included into the Foreign Key must be included into indexes as well. See [Indexes](#)  for details.

Set rules [ON DELETE](#) and [ON UPDATE](#) from the respective drop-down lists.

- **NO ACTION** Produce an error indicating that the deletion or update will create a foreign key constraint violation. If the constraint is deferred this error will be produced at constraint check time if there still exist any referencing rows. This is

the default action.

- **RESTRICT** Produce an error indicating that the deletion or update would create a foreign key constraint violation.
- **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.

### 5.1.6 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.

Check constraints are supported in MariaDB starting from the version 10.2.

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](#)<sup>[70]</sup>, 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](#)<sup>[84]</sup>. 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](#)<sup>[84]</sup> 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?**

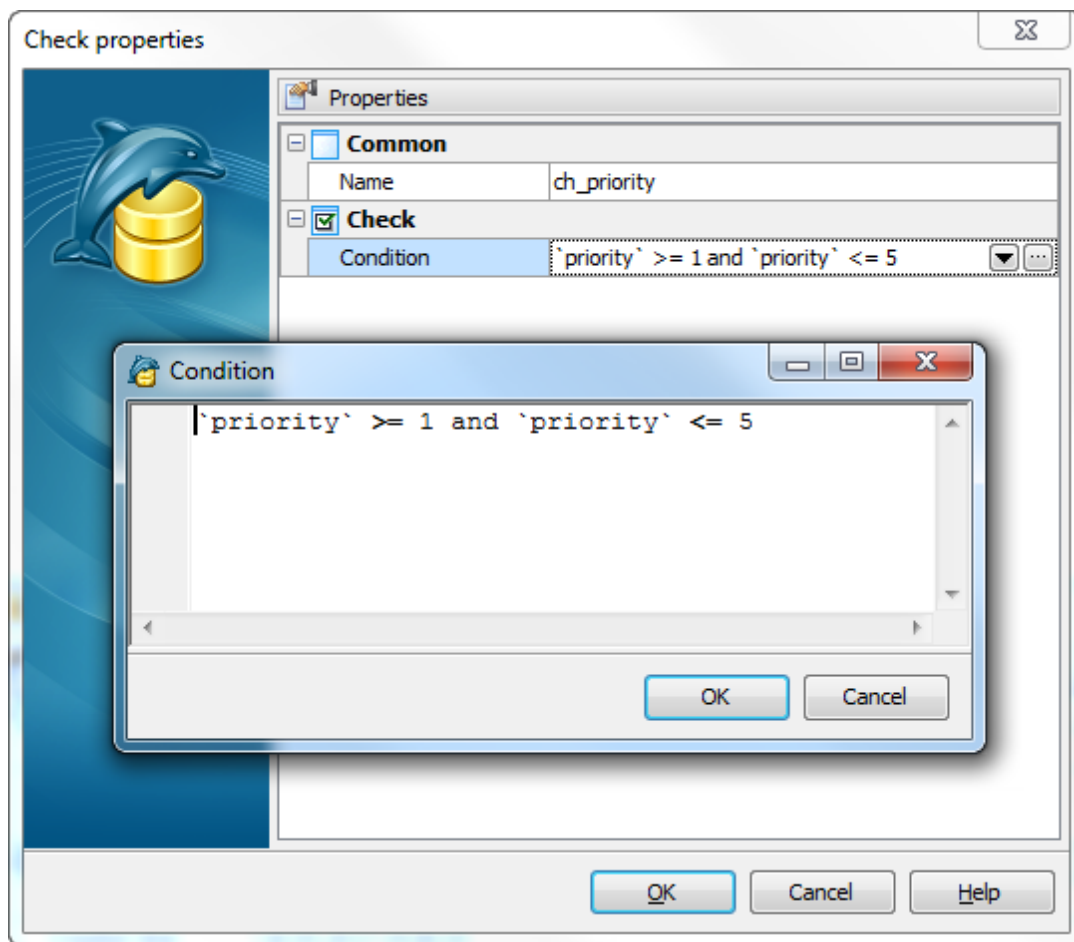
To drop the check:

- 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.



#### 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.

## 5.1.7 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. Triggers are actually supported since MySQL version 5.0.10. If a trigger event occurs, the trigger fires.

### ■ How can I add a new trigger?

Triggers are created within [Create Trigger Wizard](#)<sup>88</sup>. 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](#)  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.

### 5.1.7.1 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 SQL Maestro for MySQL are explained in a [separate topic](#)<sup>42</sup>. Below you will find a description of wizard steps that are unique for the current object.

#### Specifying trigger properties

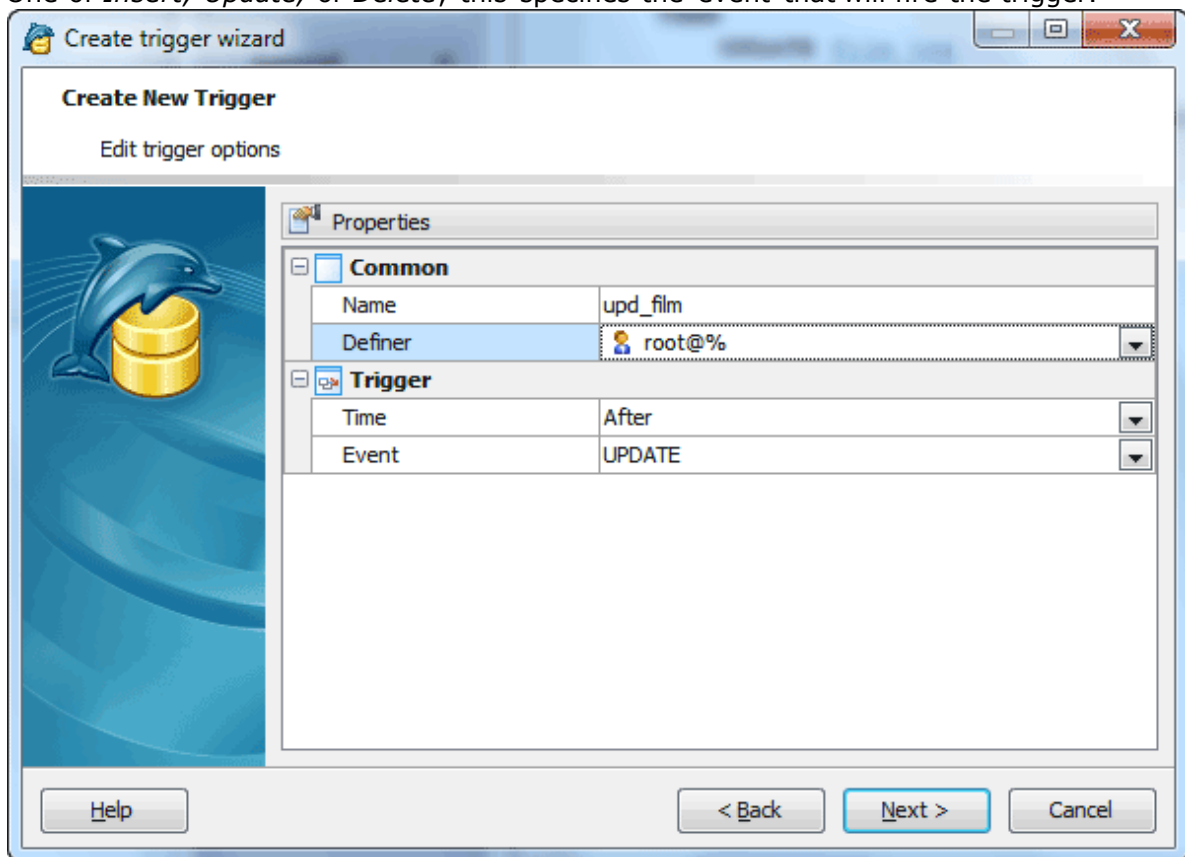
To define a new trigger, you need to set its **Name, Time** (*Before, After*). This option determines whether the function is called before or after the event.

##### Definer

Here the trigger creator is displayed.

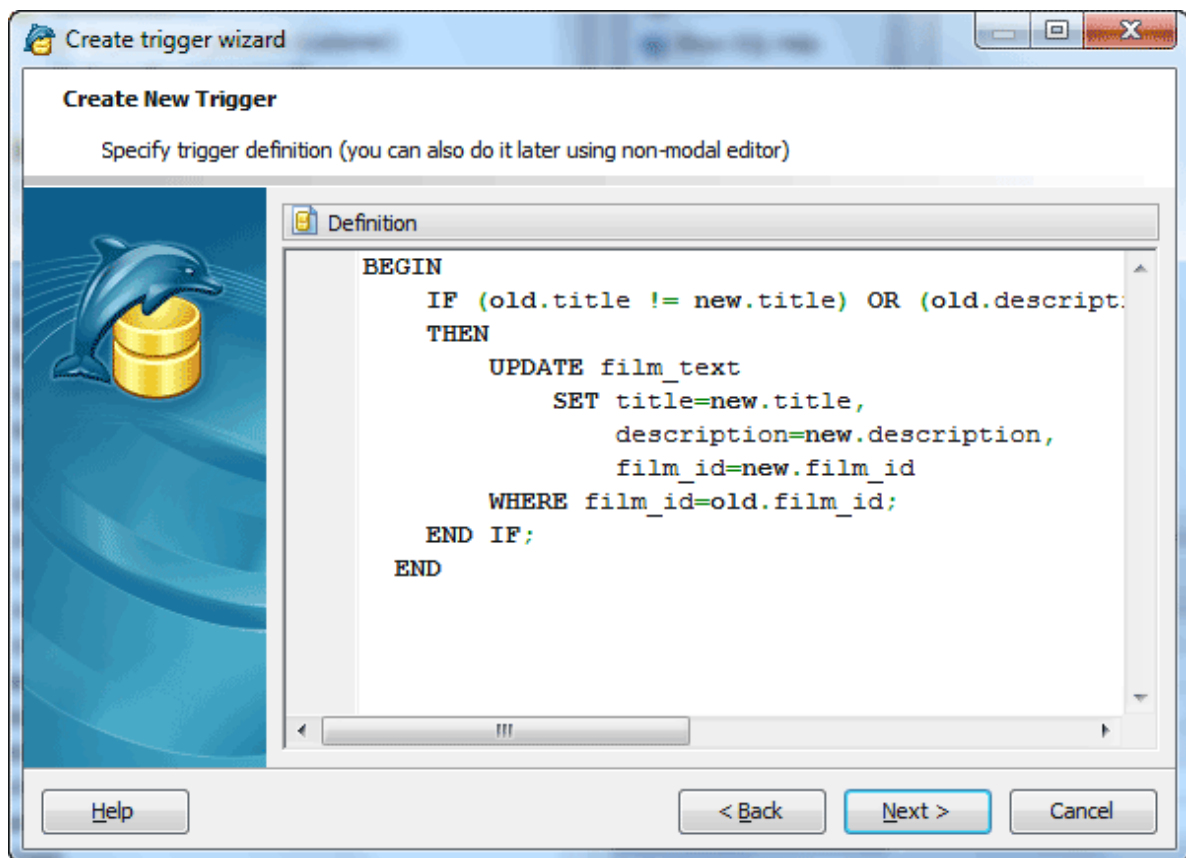
##### Event

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



#### 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.

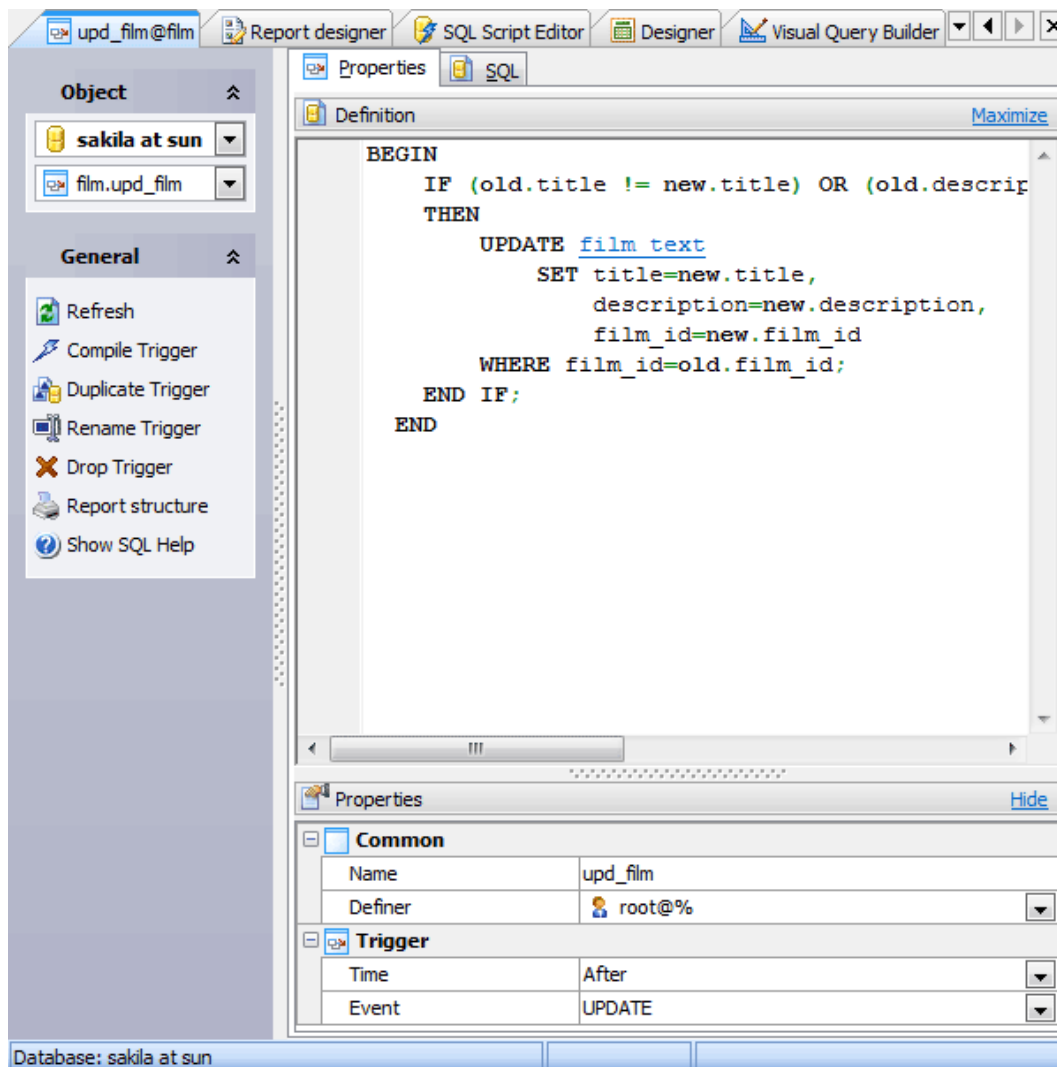


### 5.1.7.2 Trigger Editor

[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 SQL Maestro for MySQL are explained in a [separate topic](#)<sup>46</sup>. Below you will find a description of editor tabs that are unique for the current object.





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 MySQL server.

#### Comment

This field contains a comment to the trigger.

#### Time(*Before, After*)

Determines whether the function is called before or after the event.

**Event** (*Insert, Update, or Delete*)

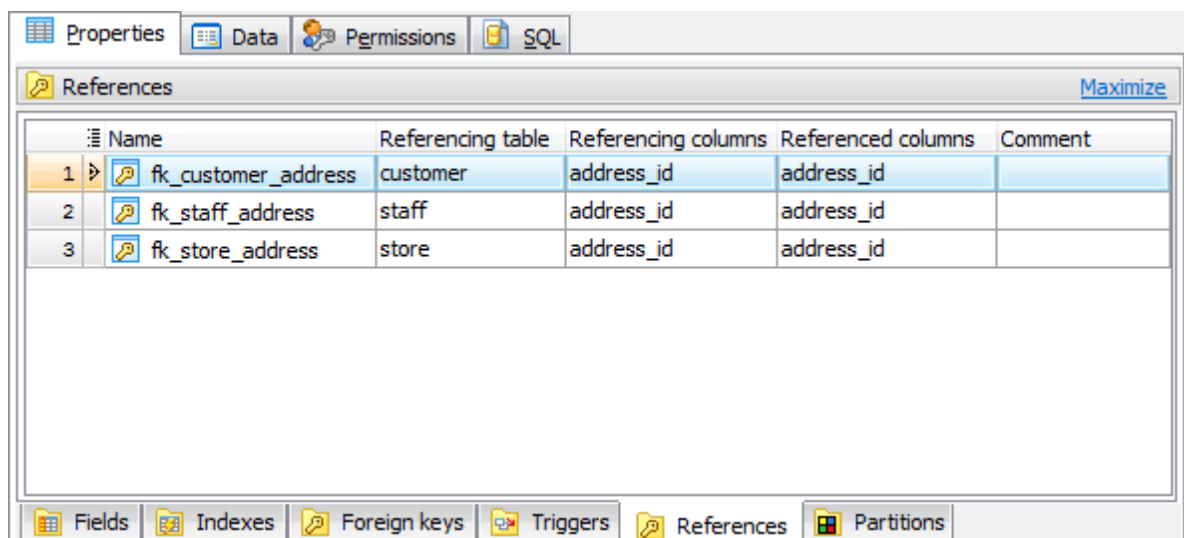
Specifies the event that will fire the trigger.

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.

## 5.1.8 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](#) [70]. 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.



**See also:** [Foreign Keys](#) [81]

### ■ How can I add a new foreign key reference?

Table foreign key references are edited within the [Foreign Key Editor](#) [81] 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](#) 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

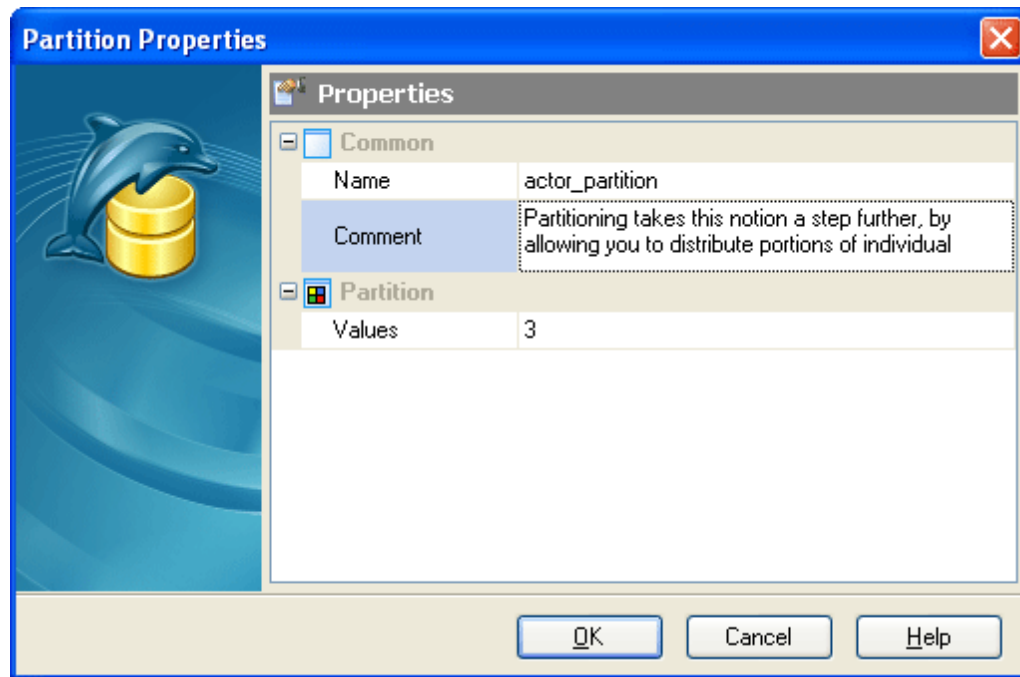
- select the foreign key to drop in the appropriate table group of the explorer tree and use the [Drop Foreign Key](#) popup menu item.

and confirm dropping in the dialog window.

## 5.1.9 Partitions

Partitioning (implemented in MySQL 5.1) allows you to distribute portions of individual tables across a filesystem according to rules which you can set largely as needed. In effect, different portions of a table are stored as separate tables in different locations. For more information about partitioning type see: [Create Table Wizard](#).

The [Partition Properties](#) window orders to define all necessary options for the new partition such as partition [Name](#), [Comment](#), [Value](#) and [Max Value](#) for LESS THAN operator (*Range* partitions). You can also set here a comma-separated list of integers as [Values](#) of *List* partition.



## 5.2 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](#)<sup>[95]</sup>. 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](#)<sup>[100]</sup>. 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.

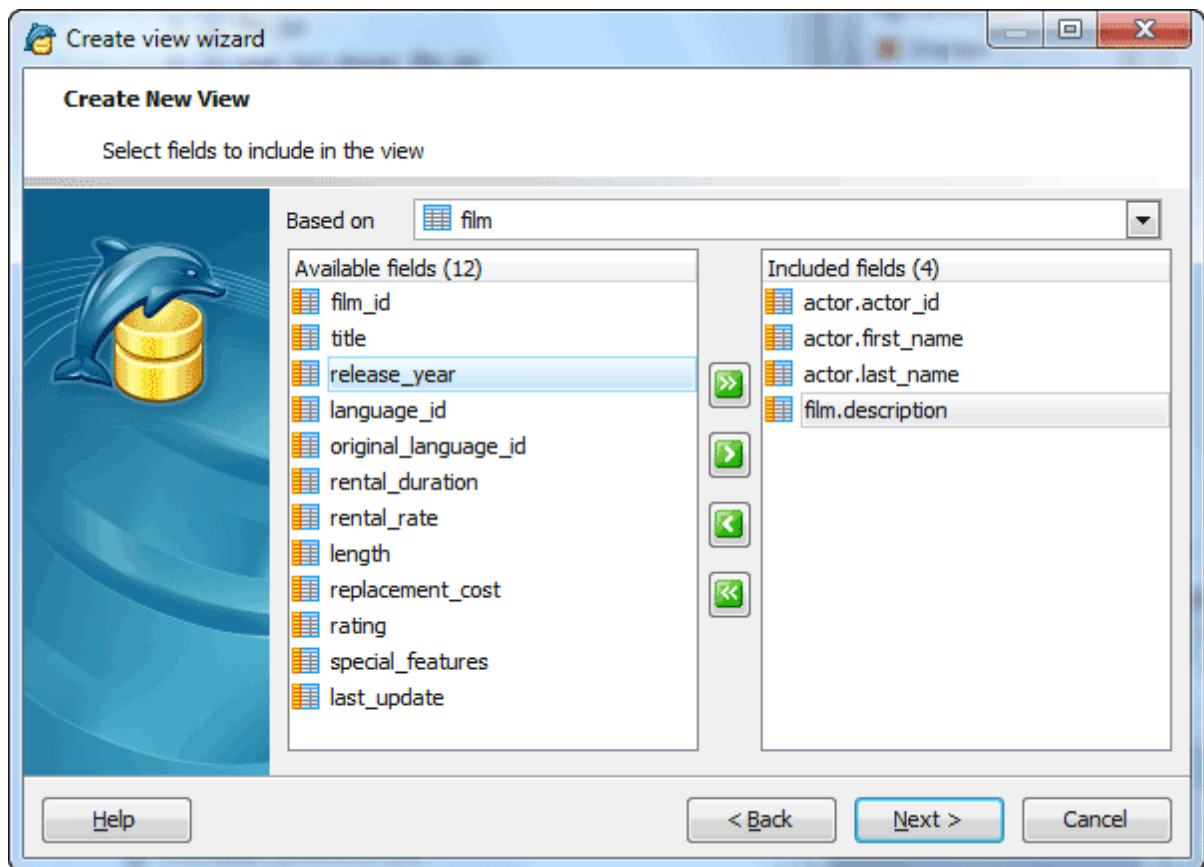
### 5.2.1 Create View Wizard

[Create View Wizard](#) guides you through the process of creating a new view. See [How To Create View](#)<sup>[94]</sup> to learn how to run this wizard.

The basic principles of Create Object Wizards in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. 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.

#### SQL Security (*Definer, Invoker*)

These values indicate that the view must be executable by the user who defined it or invoked it, respectively. The default value is *Definer*. The feature was added in MySQL 5.1.2.

#### Algorithm (*Undefined, Merge, Temporary Table*)

The algorithm affects how MySQL processes the view.

##### Merge

The text of a statement that refers to the view and the view definition are merged such that parts of the view definition replace corresponding parts of the statement.

*Temporary Table* The results from the view are retrieved into a temporary table, which then is used to execute the statement.

*Undefined* MySQL chooses which algorithm to use. It prefers MERGE over TEMPTABLE if possible, because MERGE is usually more efficient and because a view cannot be updatable if a temporary table is used.

A reason to choose *Temporary Table* explicitly is that locks can be released on underlying tables after the temporary table has been created and before it is used to finish processing the statement. This might result in quicker lock release than the *Merge* algorithm so that other clients that use the view are not blocked as long.

#### ☑ With 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.

#### Check option kind (*Cascaded*, *Local*)

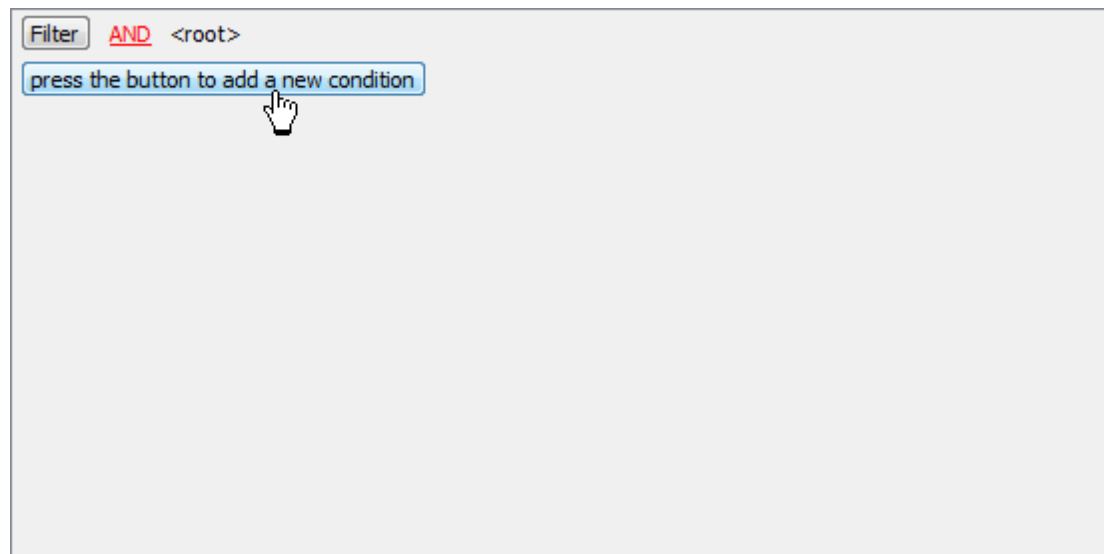
The clause is available if [With Check Option](#) is 'on'. It allows to determine the scope of check testing when the view is defined in terms of another view. The *Local* restricts the [Check option](#) only to the view being defined. *Cascaded* causes the checks for underlying views to be evaluated as well. When neither keyword is given, the default is *Cascaded*.

### Specifying the WHERE condition

SQL Maestro for MySQL provides the [Filter Builder](#) dialog to facilitate a creating of the WHERE condition.

#### ■ Adding a new condition to the filter

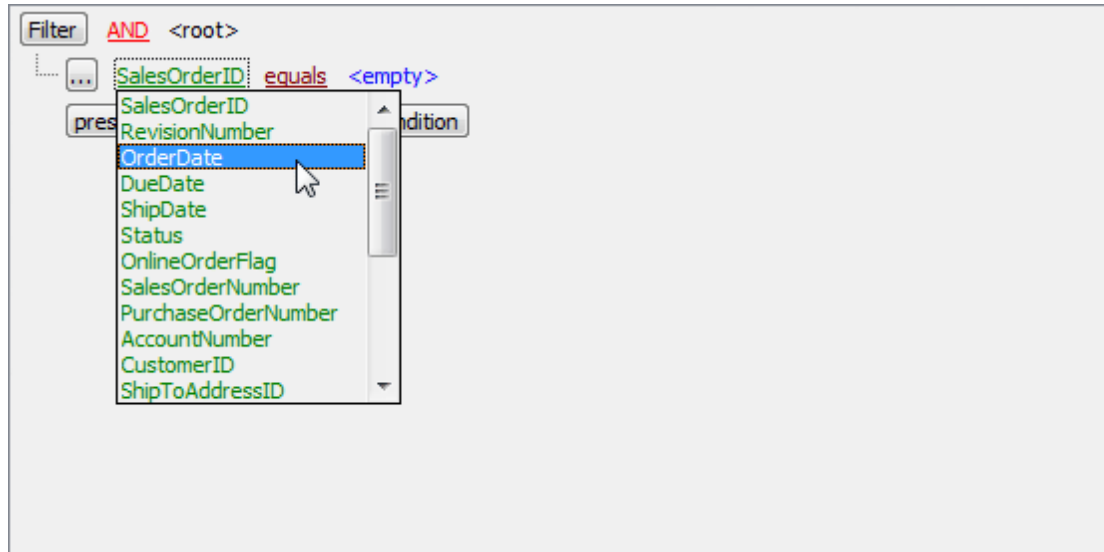
Suppose we need to select orders from the sample table *Orders* made between 01.02.2010 and 10.02.2010. These criteria are applied to the *OrderDate* column. Press the button to add this condition. Alternatively, you can use the [Filter](#) button and select the [Add Condition](#) option from the drop-down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



#### ■ Setting a filter criteria in the condition

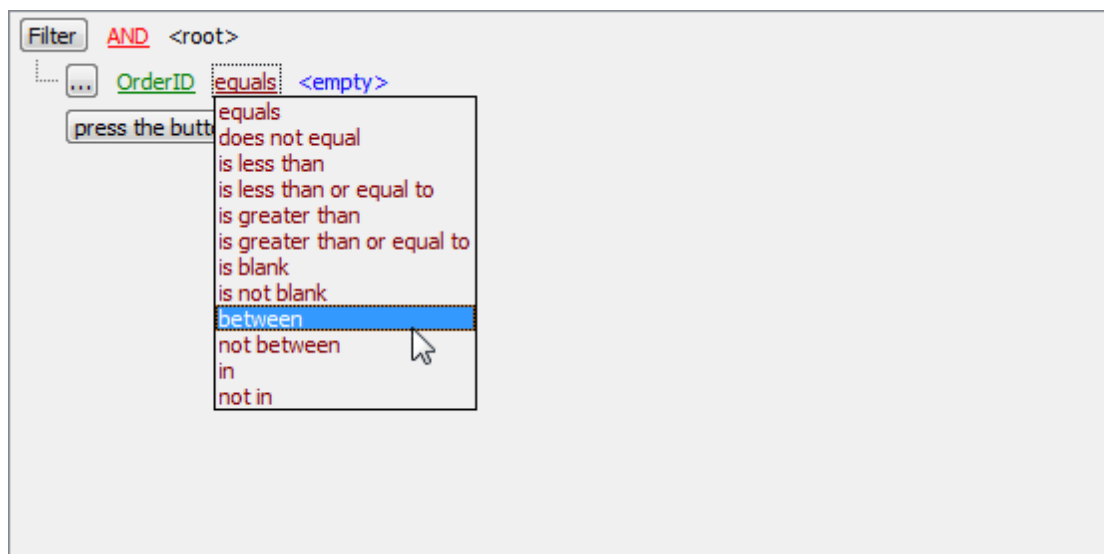


Select the *OrderDate* column in the drop-down list of the available columns.



#### ■ 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.

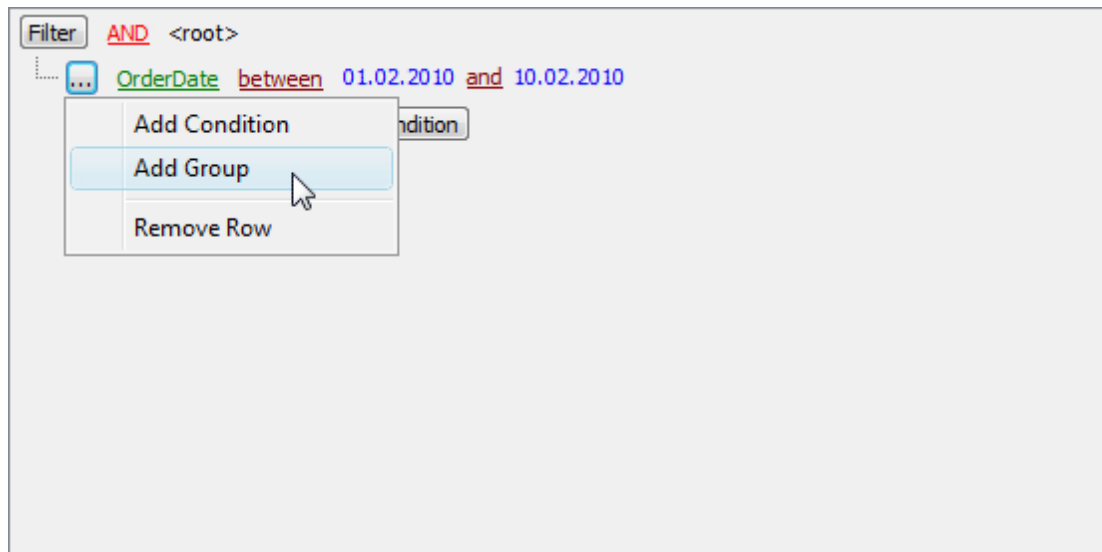


Now use the [Apply](#) button to see the filter result.

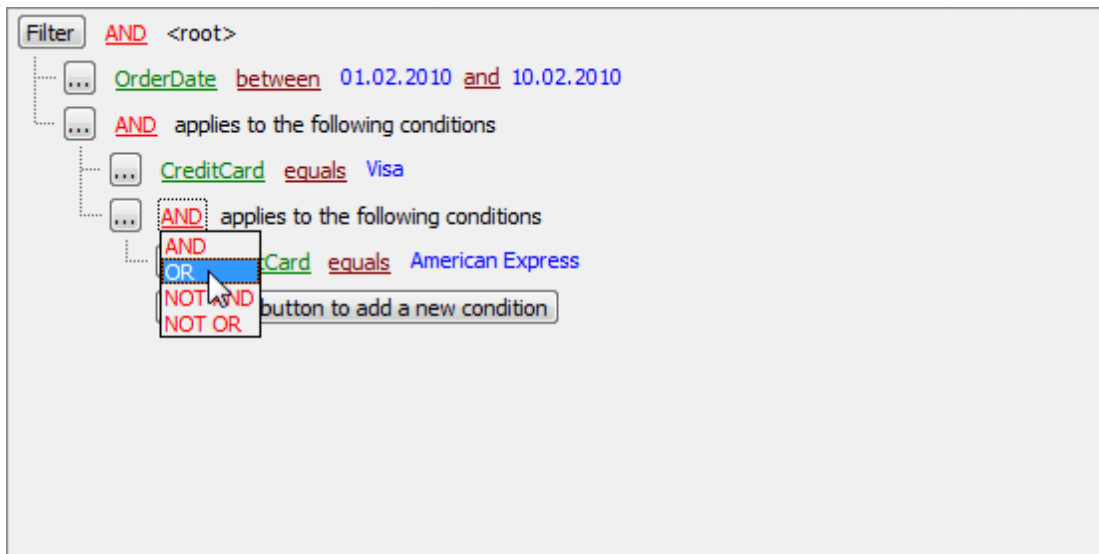
You can add additional conditions to the same root level to be combined by the AND operator.

#### Adding a new group

Suppose we need to select orders made between 01.02.2010 and 10.02.2010 and paid 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.



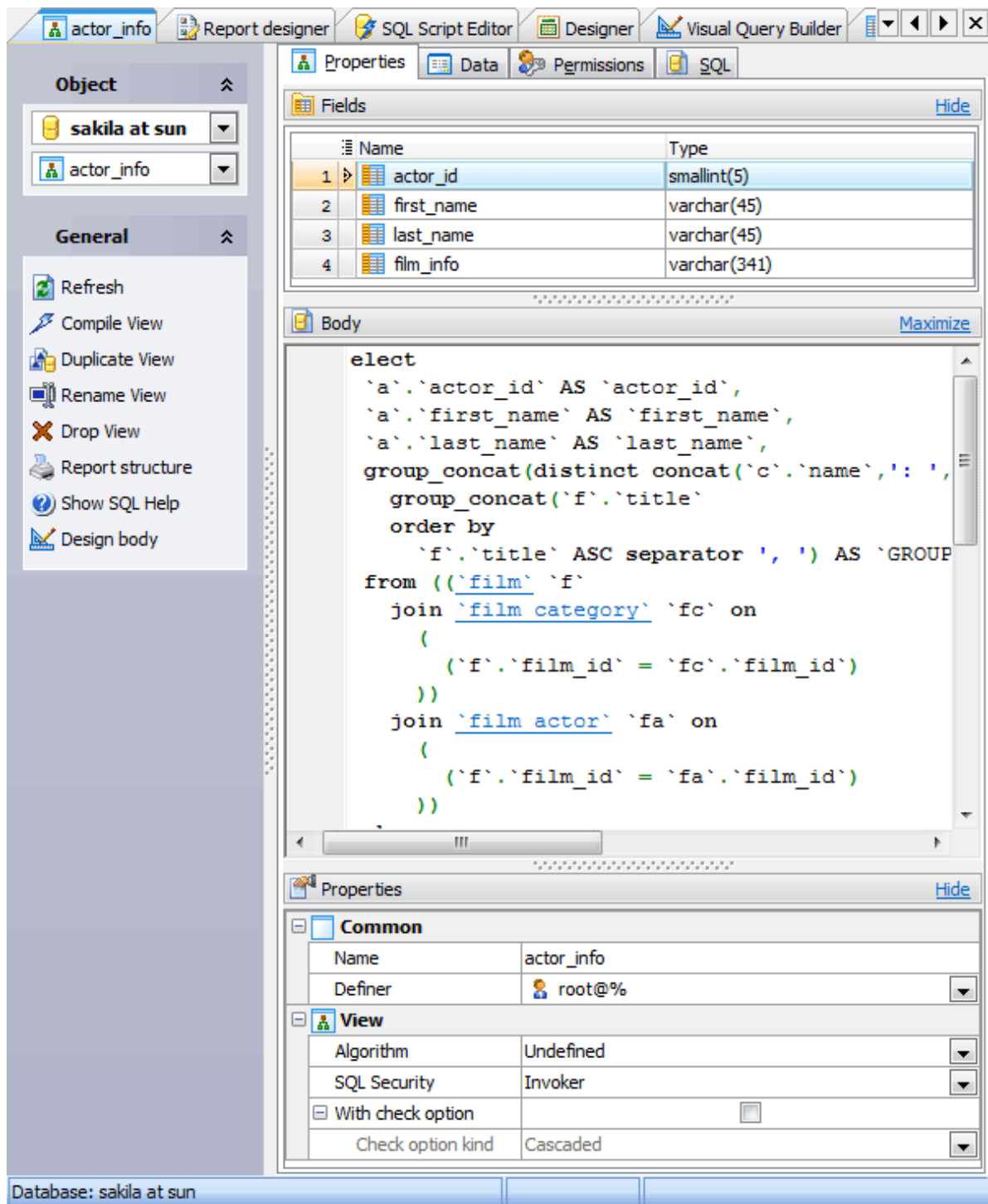
## 5.2.2 View Editor

[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 SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[45]</sup>. Below you will find a description of editor tabs that are unique for the current object.

- [Editing view properties](#)<sup>[101]</sup>
- [Viewing data](#)<sup>[103]</sup>

**See also:** [Create View Wizard](#)<sup>[95]</sup>



### 5.2.2.1 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, the view owner and the comment for the view.

#### Subitems

Every tab is intended for managing some view [subitems](#) (e.g. MySQL provides only the one view subitem type - *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](#) 

### 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 MySQL server.

### Owner

Represents the view owner. 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 stores a comment to the view.

### SQL Security (*Definer, Invoker*)

The field allows you to change the view security (It will be executable by the user who defined it or invoked it respectively). Only for MySQL versions since 5.1.2.

### Algorithm (*Undefined, Merge, Temporary Table*)

Edit here the view algorithm affecting how MySQL processes the view.

**Merge** The text of a statement that refers to the view and the view definition are merged such that parts of the view definition replace corresponding parts of the statement.

**Temporary Table** The results from the view are retrieved into a temporary table, which then is used to execute the statement.

**Undefined** MySQL chooses which algorithm to use. It prefers MERGE over TEMPTABLE if possible, because MERGE is usually more efficient and because a view cannot be updatable if a temporary table is used.

A reason to choose *Temporary Table* explicitly is that locks can be released on underlying tables after the temporary table has been created and before it is used to finish processing the statement. This might result in quicker lock release than the *Merge* algorithm so that other clients that use the view are not blocked as long.

### With 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.

#### Check option kind (*Cascaded*, *Local*)

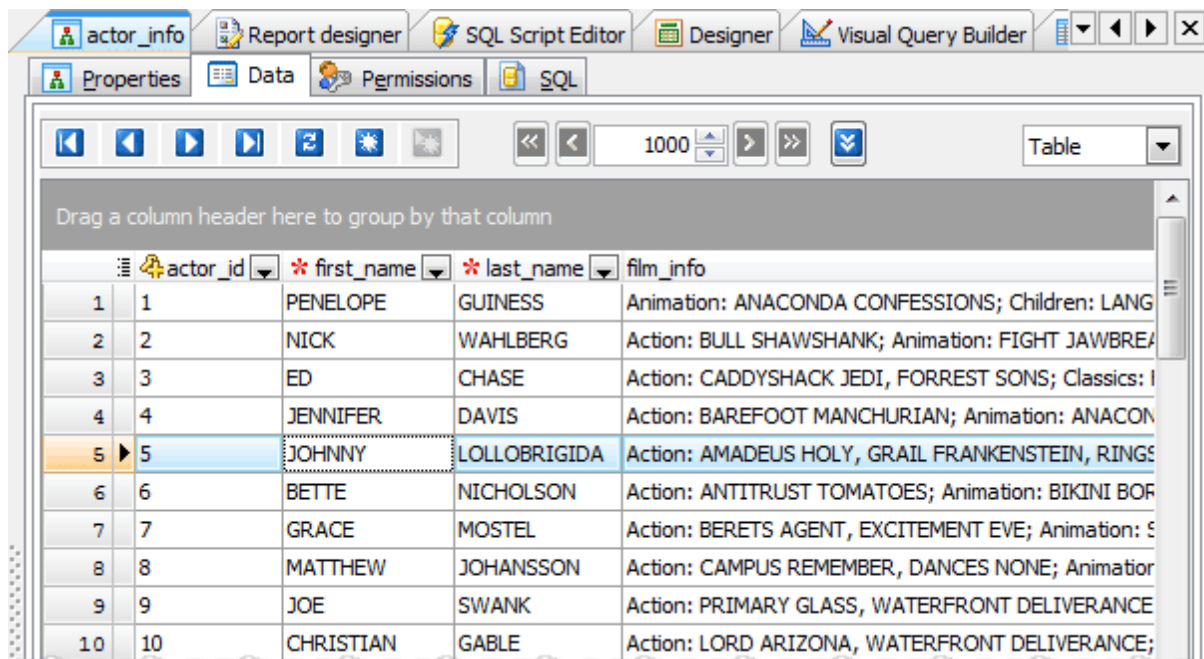
The clause is available if **With Check Option** is 'on'. It allows to determine the scope of check testing when the view is defined in terms of another view. The *Local* restricts the **Check option** only to the view being defined. *Cascaded* causes the checks for underlying views to be evaluated as well. When neither keyword is given, the default is *Cascaded*.

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 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.



	actor_id	first_name	last_name	film_info
1	1	PENELOPE	GUINNESS	Animation: ANACONDA CONFESSIONS; Children: LANG
2	2	NICK	WAHLBERG	Action: BULL SHAWSHANK; Animation: FIGHT JAWBREA
3	3	ED	CHASE	Action: CADDYSHACK JEDI, FORREST SONS; Classics: I
4	4	JENNIFER	DAVIS	Action: BAREFOOT MANCHURIAN; Animation: ANACON
5	5	JOHNNY	LOLLOBRIGIDA	Action: AMADEUS HOLY, GRAIL FRANKENSTEIN, RINGS
6	6	BETTE	NICHOLSON	Action: ANTITRUST TOMATOES; Animation: BIKINI BOR
7	7	GRACE	MOSTEL	Action: BERETS AGENT, EXCITEMENT EVE; Animation: S
8	8	MATTHEW	JOHANSSON	Action: CAMPUS REMEMBER, DANCES NONE; Animation
9	9	JOE	SWANK	Action: PRIMARY GLASS, WATERFRONT DELIVERANCE
10	10	CHRISTIAN	GABLE	Action: LORD ARIZONA, WATERFRONT DELIVERANCE;

## 5.3 Procedures

Stored routines (procedures and functions) are supported in MySQL 5.1. A stored procedure is a set of SQL statements that can be stored in the server. Once this has been done, clients don't need to keep reissuing the individual statements but can refer to the stored procedure instead.

### ■ How can I create a new procedure?

New procedures are created within [Create Procedure Wizard](#)<sup>[105]</sup>. 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](#)<sup>[106]</sup>. 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.

### 5.3.1 Create Procedure Wizard

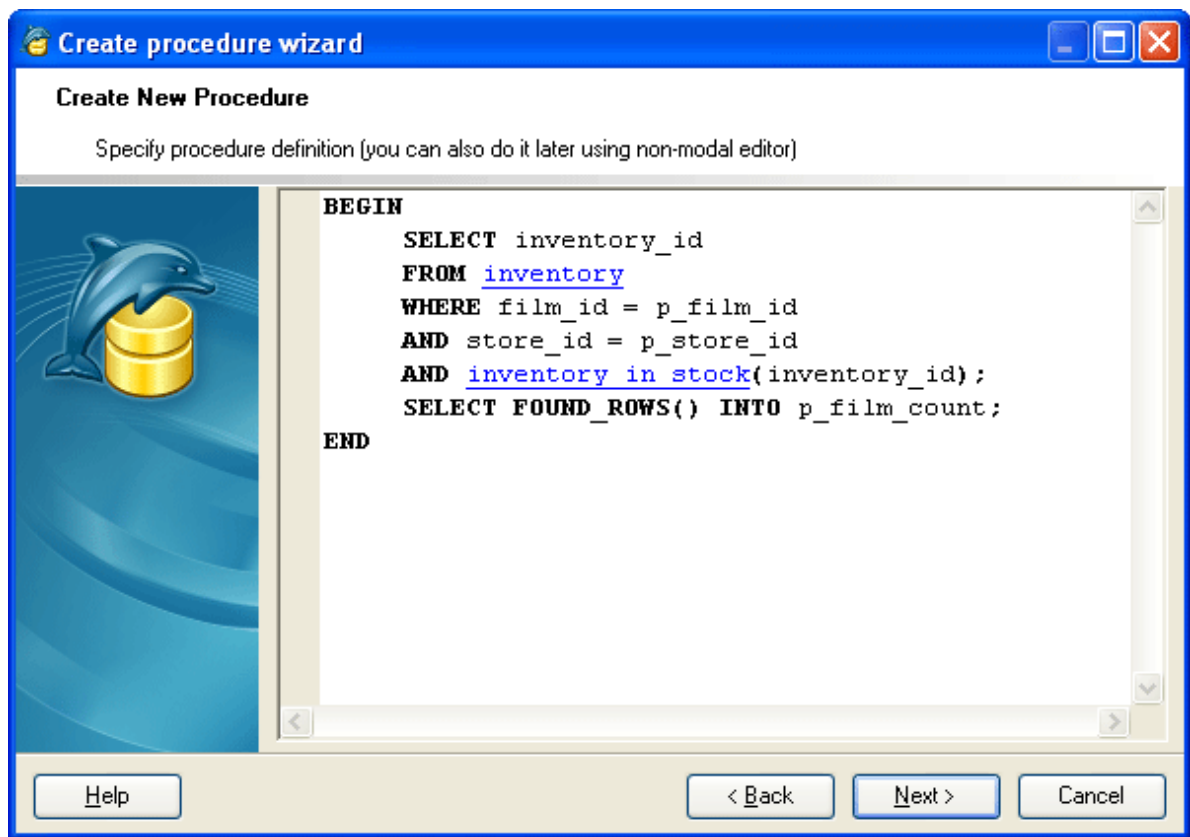
[Create Procedure Wizard](#) guides you through the process of creating a new procedure. See [How To Create Procedure](#)<sup>[104]</sup> for instructions on running this wizard.

The basic principles of Create Object Wizards in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. Below you will find a description of wizard steps that are unique for the current object.

- [Specifying procedure options](#)<sup>[106]</sup>
- [Managing parameters of a new procedure](#)<sup>[108]</sup>
- [Specifying procedure definition](#)<sup>[108]</sup>

**See also:** [Procedure Editor](#)<sup>[109]</sup>





#### 5.3.1.1 Specifying procedure options

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

**Create procedure wizard**

**Create New Procedure**

Edit procedure options

**Properties**

**Common**

Name	film_in_stock
Definer	root@%
Comment	

**Procedure**

Data access	Contains SQL
Deterministic	<input type="checkbox"/>
SQL security	Definer

Buttons: Help, < Back, Next >, Cancel

#### 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.

#### Data access (Contains SQL, No SQL, Reads SQL, Modifies SQL)

Select the clause to provide information about the nature of data use by the routine.

**Contains SQL** - indicates that the routine does not contain statements that read or write data.

**No SQL** - indicates that the routine contains no SQL statements.

**Reads SQL** - indicates that the routine contains statements that read data, but not statements that write data.

**Modifies SQL** - indicates that the routine contains statements that may write data.

-

These characteristics are advisory only. The server does not use them to constrain what kinds of statements a routine will be allowed to execute.

☒ **Deterministic**

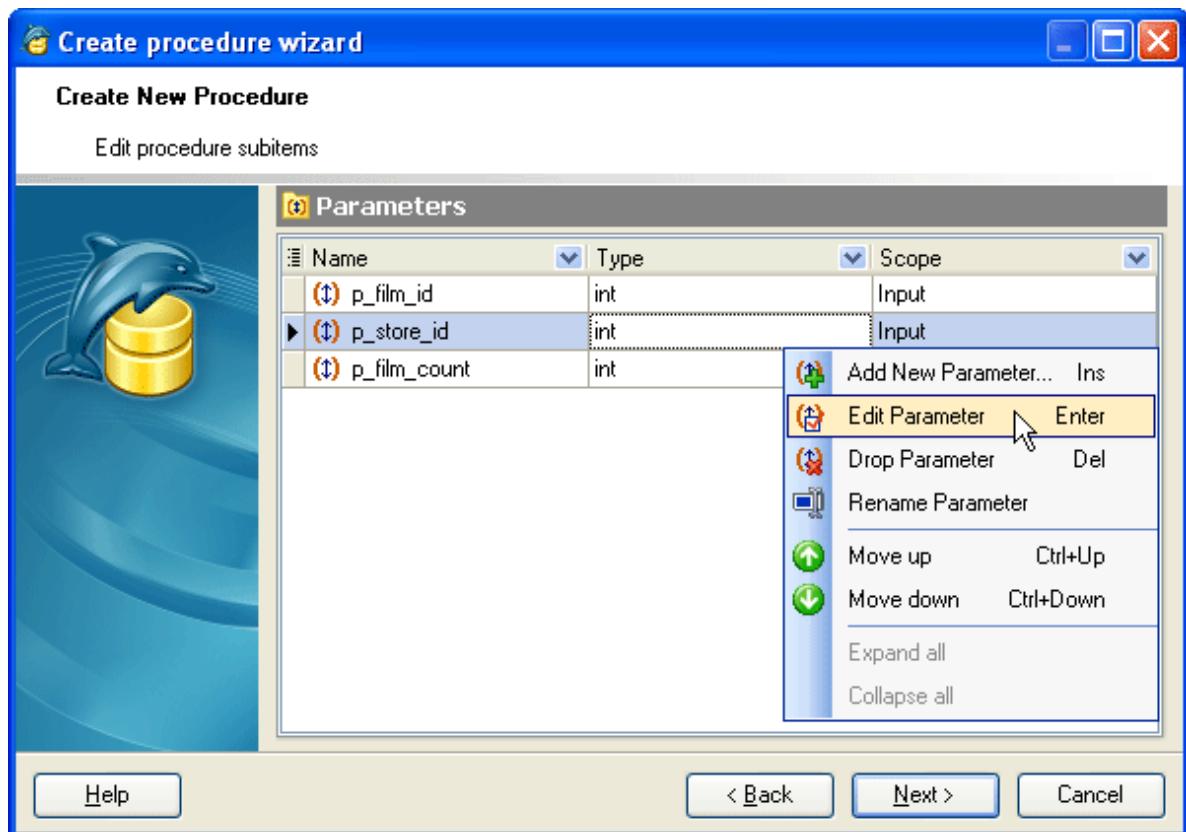
Check the option if the procedure always produces the same result for the same input parameters, and uncheck otherwise.

#### SQL security

Use the characteristic to specify whether the routine should be executed using the permissions of the user who creates the routine or the user who invokes it. The creator or invoker must have permission to access the database with which the routine is associated. It is necessary to have the EXECUTE privilege to be able to execute the routine. The user that must have this privilege is either the definer or invoker, depending on how the [SQL security](#) characteristic is set. The clause was added in MySQL 5.1.8.

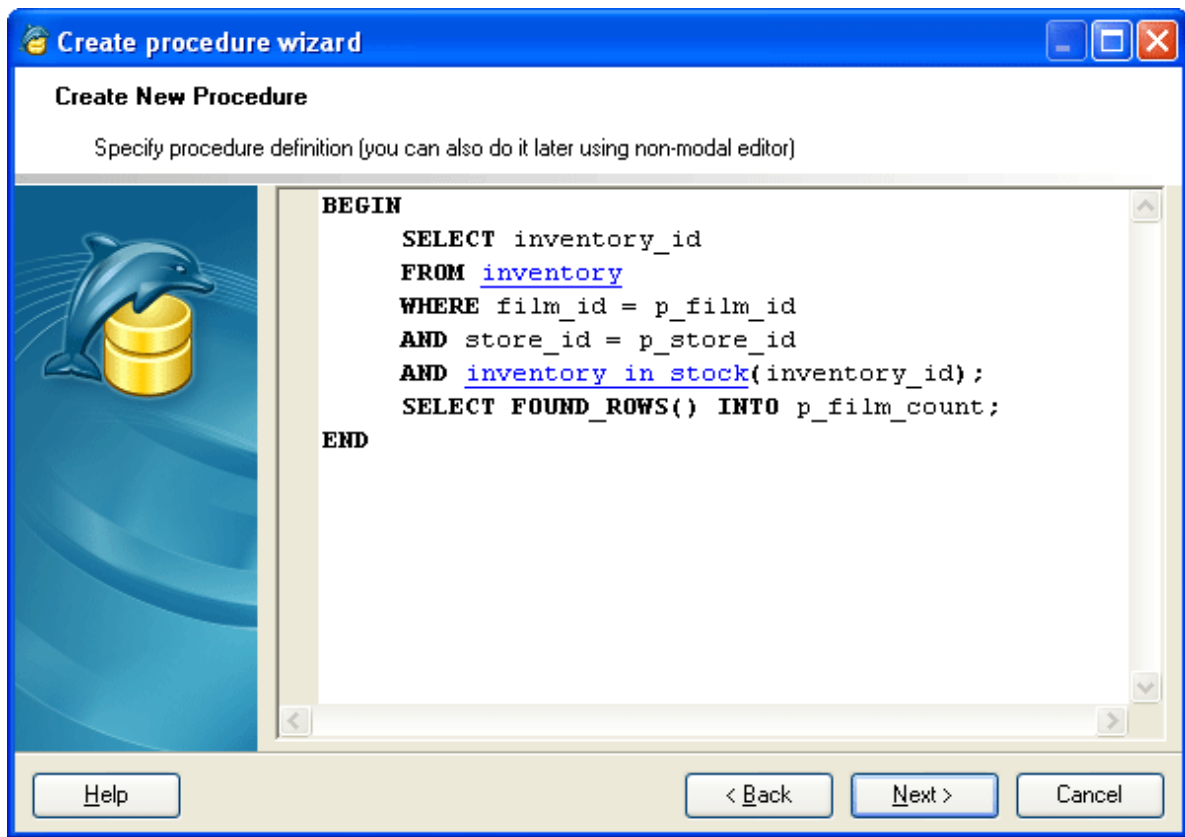
#### 5.3.1.2 Managing parameters

Use the pop-up menu or press **Insert** to add a new parameter and set its properties in [Parameter Editor](#)<sup>46</sup>. Press **Enter** or use the appropriate pop-up menu item to edit the selected parameter, or the **Delete** to delete one.



#### 5.3.1.3 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.



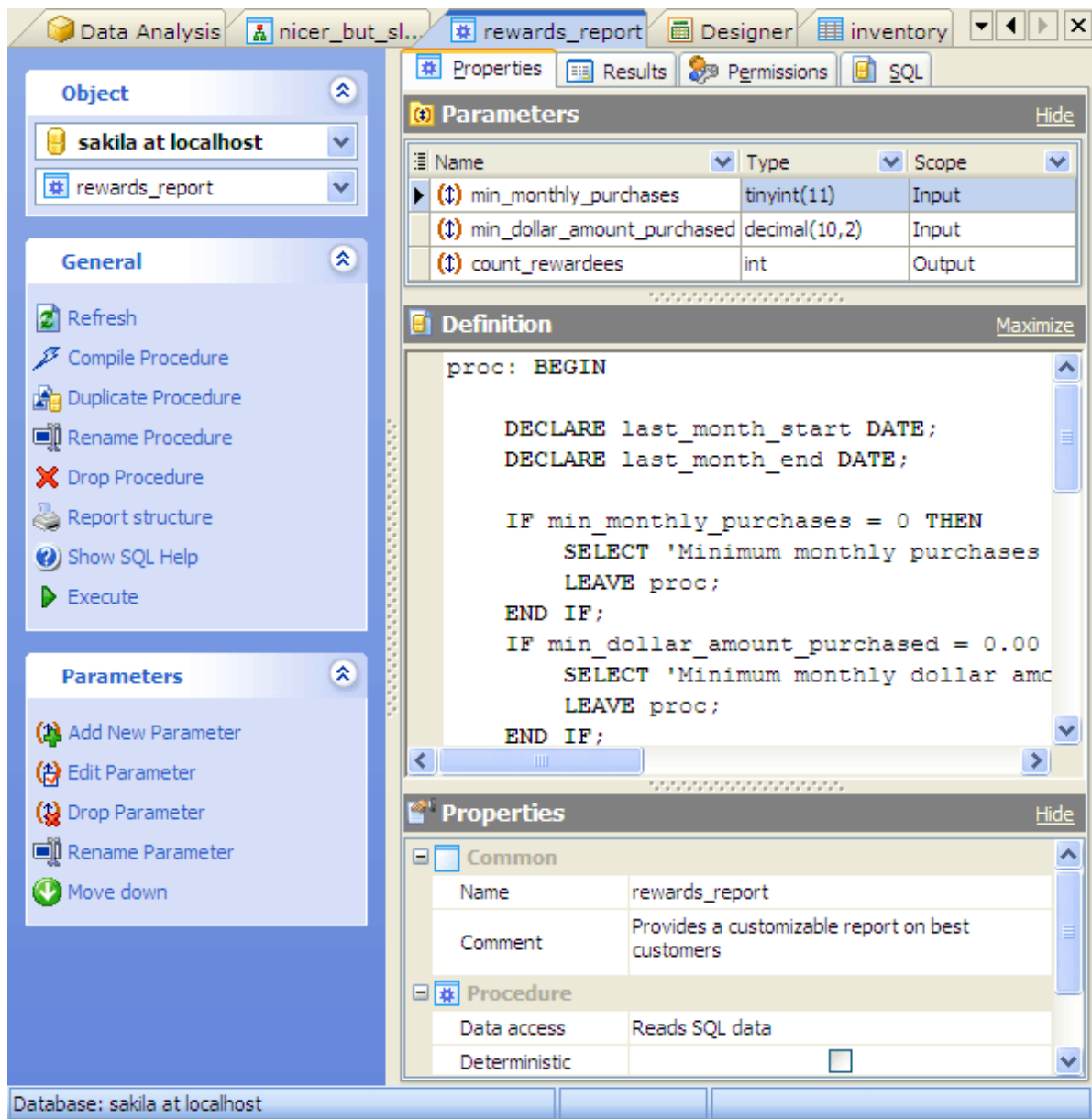
### 5.3.2 Procedure Editor

[Procedure Editor](#) allows you to execute the existing procedures or edit their 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](#)<sup>[104]</sup> for details).

The basic principles of Object Editors in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[46]</sup>. Below you will find a description of editor tabs that are unique for the current object.

- [Editing procedure properties](#)<sup>[110]</sup>
- [Viewing procedure results](#)<sup>[111]</sup>

**See also:** [Create Procedure Wizard](#)<sup>[105]</sup>



### 5.3.2.1 Editing properties

The **Parameters** tab contains the list of the current procedure parameters with its options. Here you can view the **Name** and the **Type** of each parameter of the procedure. Use grid's popup menu to add, edit parameters in **Parameter Editor**. It also allows you to drop and rename procedure parameters.

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 procedure.

#### 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 MySQL 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.

#### Data access (*Contains SQL, No SQL, Reads SQL, Modifies SQL*)

Use the clause to change the information about the nature of data use by the routine.

*Contains* indicates that the routine does not contain statements that read or write data.

*No SQL* - indicates that the routine contains no SQL statements.

*Reads SQL* - indicates that the routine contains statements that read data, but not statements that write data.

*Modifies SQL* indicates that the routine contains statements that may write data.

-

#### Deterministic

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

#### SQL security

Use the characteristic to specify whether the routine should be executed using the permissions of the user who creates the routine or the user who invokes it. The creator or invoker must have permission to access the database with which the routine is associated. It is necessary to have the EXECUTE privilege to be able to execute the routine. The user that must have this privilege is either the definer or invoker, depending on how the [SQL security](#) characteristic is set. The clause was added in MySQL 5.1.8.

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 procedure results

The [Results](#) tab represents the result of the successfully executed procedure, if it returns a data that is represented as a grid (see [Data View](#) for details). Use grid's popup menu to export data, get SQL dump. In result with BLOB fields you can also call the [BLOB Editor](#) to view the BLOB fields. The data in result set is always read-only.

See also: [Executing procedure](#)

The screenshot displays a database application interface with the following components:

- Top Bar:** Contains tabs for 'Data Analysis', 'nicer\_but\_sl...', 'rewards\_report', 'Designer', and 'inventory'. Below these are buttons for 'Properties', 'Results', 'Permissions', and 'SQL'.
- Navigation:** A set of navigation icons and a 'Table' dropdown menu.
- Table View:**
  - Filter:** A dropdown menu set to 'store\_id : 1'.
  - Columns:** A row of column headers: 'customer\_id', 'first\_name', 'last\_name' (highlighted), 'email', 'address\_id', 'active', and 'creation\_date'.
  - Data Rows:** A list of 19 customer records for store\_id 1, including names like RAFAEL ABNEY, NATHANIEL ADAM, DIANA ALEXANDER, etc.
- Footer:**
  - Records:** 'Records fetched: 599' and 'LIMIT 1000 OFFSET 0'.
  - Information:** A box showing '599 rows fetched ( 0,53 sec)'.
  - Database:** 'Database: sakila at localhost'.

## 5.4 Functions

Stored routines (procedures and functions) are supported in MySQL 5.1. A stored procedure is a set of SQL statements that can be stored in the server. Once this has been done, clients don't need to keep reissuing the individual statements but can refer to the stored procedure instead. 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](#)<sup>114</sup>. 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 [Functions](#) 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](#)<sup>116</sup>. 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 [Functions](#) 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 [Schema Editor](#) 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](#))

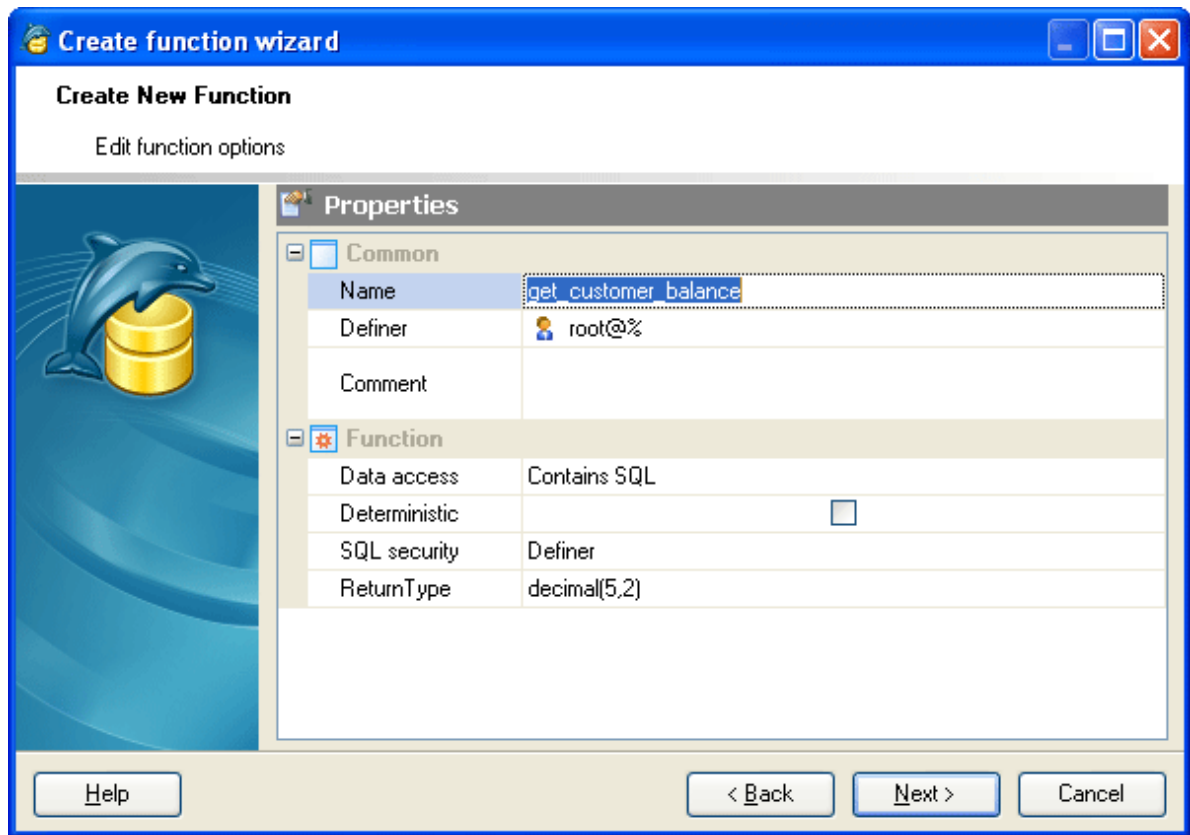
and confirm dropping in the dialog window.

## 5.4.1 Create Function Wizard

[Create Function Wizard](#) guides you through the process of creating a new Function. See [How To create Function](#)<sup>[113]</sup> for instructions on running this wizard.

The basic principles of Create Object Wizards in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. 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.



### Specifying Function properties

#### Name

Specify a name for the function.

#### Owner

Select the owner of the Function from the drop-down list. 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.

#### Return type

Defines the data type of the function result.

#### Data access (Contains SQL, No SQL, Reads SQL, Modifies SQL)

Select the clause to provide information about the nature of data use by the routine.

**Contains SQL** - indicates that the routine does not contain statements that read or write data.

**No SQL** - indicates that the routine contains no SQL statements.

**Reads SQL** - indicates that the routine contains statements that read data, but not statements that write data.

**Modifies SQL** indicates that the routine contains statements that may write data.

-

These characteristics are advisory only. The server does not use them to constrain what kinds of statements a routine will be allowed to execute.

#### Deterministic

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

#### SQL security

Use the characteristic to specify whether the routine should be executed using the permissions of the user who creates the routine or the user who invokes it. The creator or invoker must have permission to access the database with which the routine is associated. It is necessary to have the EXECUTE privilege to be able to execute the routine. The user that must have this privilege is either the definer or invoker, depending on how the [SQL security](#) characteristic is set. The clause was added in MySQL 5.1.8.

### 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](#)<sup>[48]</sup>. Use the [Edit](#) and [Delete](#) items to manage Function parameters.

### Specifying Function Definition

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

## 5.4.2 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 [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 SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[46]</sup>. Below you will find a description of editor tabs that are unique for the current object.

- [Editing Function properties](#)<sup>[116]</sup>
- [Viewing Function results](#)<sup>[118]</sup>

### 5.4.2.1 Editing properties

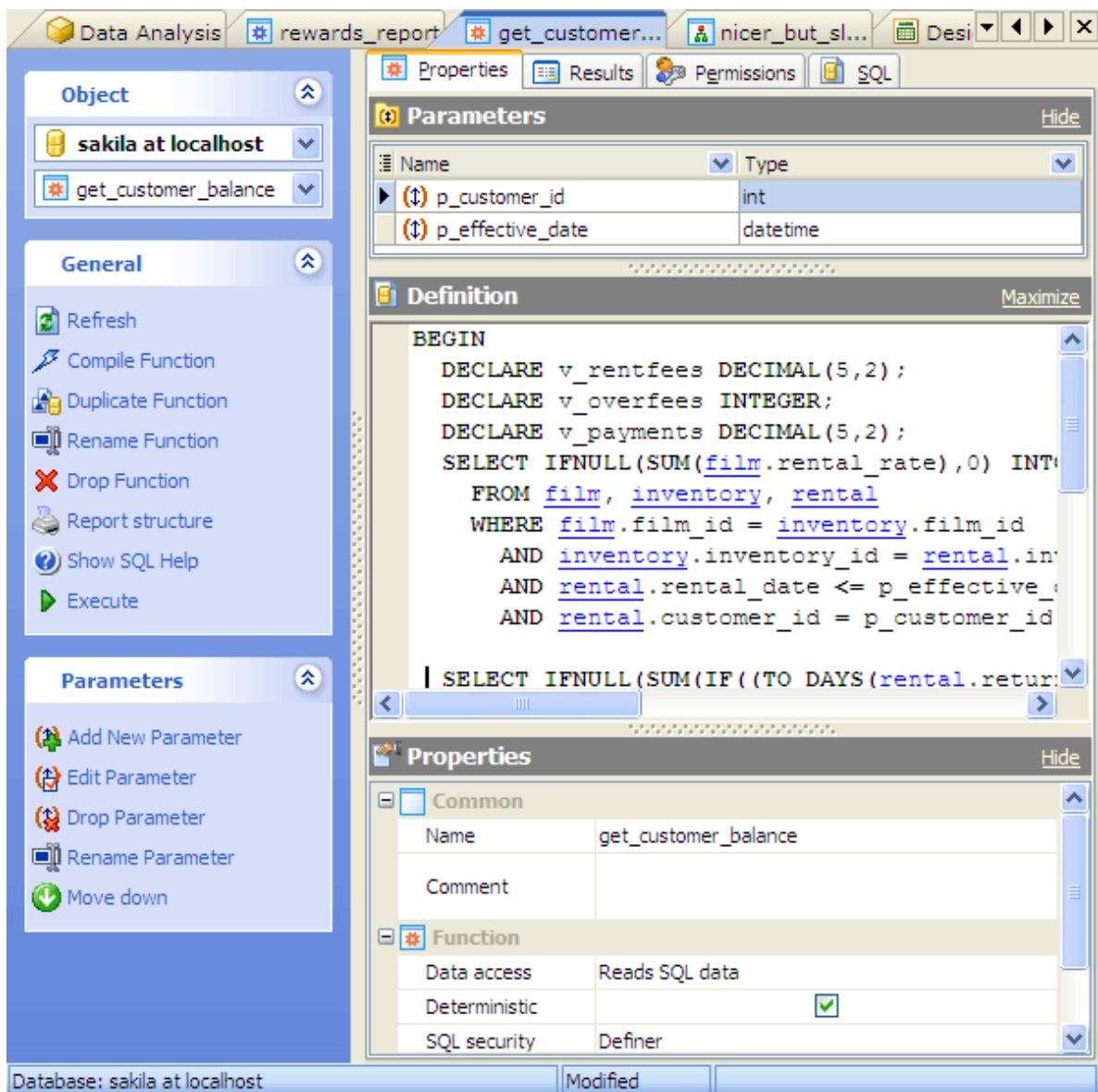
The [Parameters](#) tab contains the list of the current Function parameters with its options. Here you can view the [Name](#) and the [Type](#) of each Function parameter and also supply a [Comment](#) for the parameter.

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

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.

### Data access (*Contains SQL, No SQL, Reads SQL, Modifies SQL*)

Use the clause to change the information about the nature of data use by the routine.

*Contains SQL* - indicates that the routine does not contain statements that read or write data.

*No SQL* - indicates that the routine contains no SQL statements.

*Reads SQL* - indicates that the routine contains statements that read data, but not statements that write data.

*Modifies SQL* - indicates that the routine contains statements that may write data.

-

### Deterministic

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

### SQL security

Use the characteristic to specify whether the routine should be executed using the permissions of the user who creates the routine or the user who invokes it. The creator or invoker must have permission to access the database with which the routine is associated. It is necessary to have the EXECUTE privilege to be able to execute the routine. The user that must have this privilege is either the definer or invoker, depending on how the [SQL security](#) characteristic is set. The clause was added in MySQL 5.1.8.

### Return type

The field defines the data type of the function result.

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.

#### 5.4.2.2 Viewing Function results

[Function 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 Function has parameters, SQL Maestro for MySQL 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

SQL Maestro for MySQL 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 [Function 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](#).

## 5.5 Events

MySQL 5.1.6 and later provides several SQL statements for working with scheduled events. The events are tasks that run according to a schedule. Therefore, sometimes they are named as scheduled events. When you create an event, you are creating a named database object containing one or more SQL statements to be executed at one or more regular intervals, beginning and ending at a specific date and time. Conceptually, this is similar to the idea of the Unix crontab (also known as a "cron job") or the Windows Task Scheduler. MySQL [Events](#) can be used in two main ways:

- *Scheduling actions* The database server carries out a set of actions on a schedule of times. You could use this capability to schedule backups, validity checks, queries to fill up reporting tables, and so on.
- *Event handling actions* The database server carries out a set of actions when a predefined event occurs. The events that can be handled include disk space restrictions (when a disk fills beyond a specified percentage), when the database server is idle, and so on. The actions of an event handler are committed if no error is detected during execution, and rolled back if errors are detected.

### ■ How can I create a new event?

New events are created within [Create Event Wizard](#)<sup>[121]</sup>. In order to run the wizard you should either

- select the [Object | Create Database Object...](#) main menu item;
- select the [Event](#) icon in the Create Database Object dialog

or

- select the [Events](#) list or any object from that list in the explorer tree;
- select the [Create New Event...](#) item from the popup menu

or

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

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

- select the [Object | Duplicate Database Object...](#) main menu item;
- follow the instructions of [Duplicate Object Wizard](#).

### ■ How can I edit an existing event?

Events can be edited within [Event Editor](#)<sup>[125]</sup>. In order to run the editor you should either

- select the event for editing in the explorer tree (type the first letters of the event name for quick search);
- select the [Edit Event ...](#) item from the popup menu

or

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

#### ■ **How can I drop a event?**

To drop a event:

- select the event to drop in the explorer tree;
- select the [Drop Event](#) item from the popup menu

or

- open the database in [Database Editor](#) and the [Events](#) tab there;
- select the event to drop;
- press the **Delete** key or select the [Drop Event](#) 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 Event Wizard**

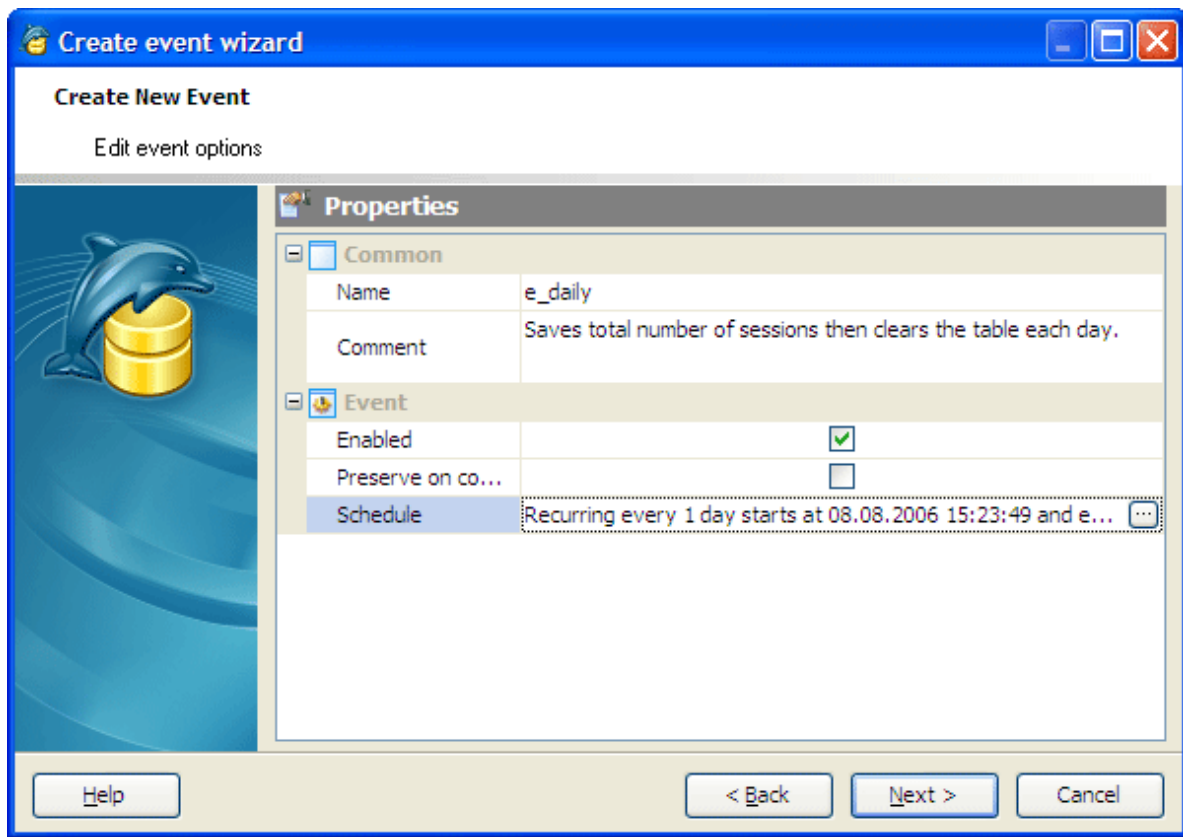
[Create Event Wizard](#) guides you through the process of creating a new scheduled event. See [How To Create Event](#)<sup>[120]</sup> for instructions on running this wizard.

The basic principles of Create Object Wizards in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. Below you will find a description of wizard steps that are unique for the current object.

- [Setting event properties](#)<sup>[122]</sup>
- [Specifying event definition](#)<sup>[124]</sup>
- [Schedule properties](#)<sup>[123]</sup>

**See also:** [Event Editor](#)<sup>[125]</sup>





#### 5.5.1.1 Setting event properties

This step is provided for specifying the new event properties in the most convenient way.

##### Name

The field contains the new scheduled event name as it was set on the previous step.

##### Comment

Specify a comment to the event or leave it blank.

##### Enabled

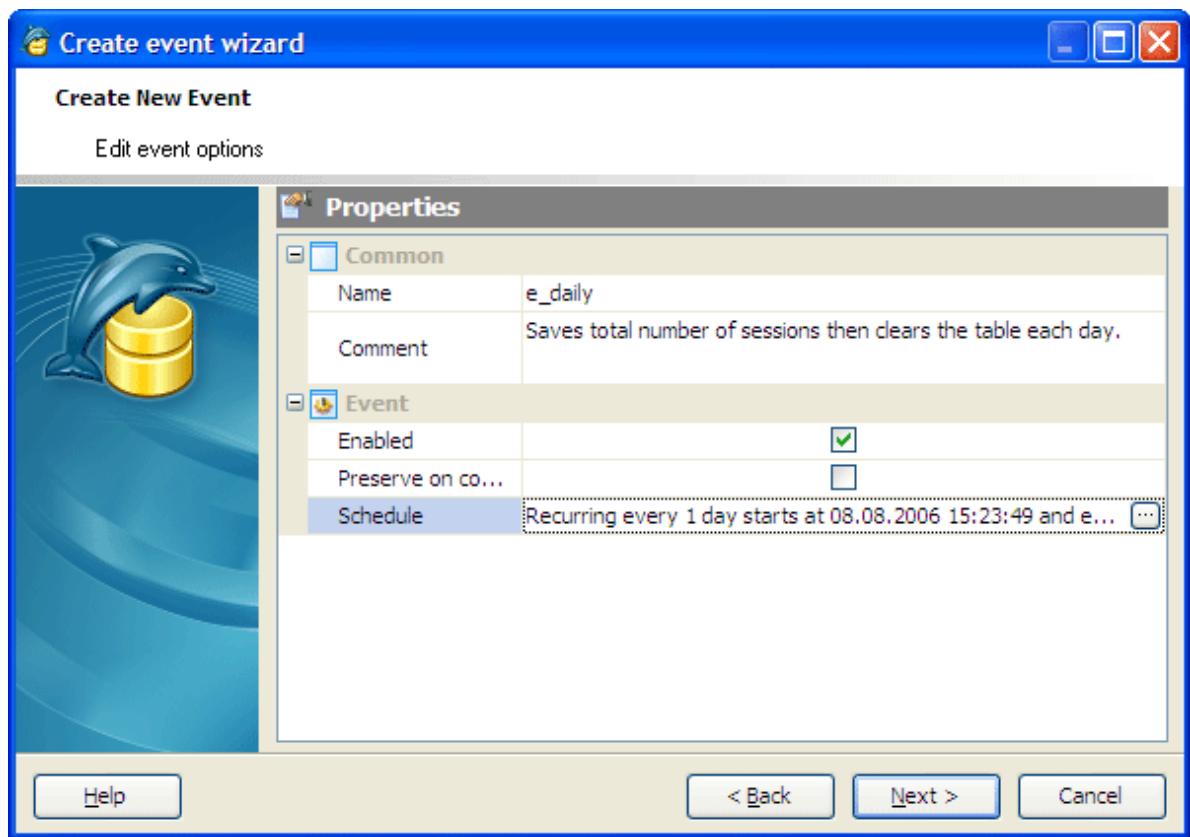
Uncheck the option to keep the event been created from being active.

##### Preserve on completion

Normally, once an event has expired, it is immediately dropped. You can override this behavior by checking the option. Uncheck it merely to make the default non-persistent behavior explicit.

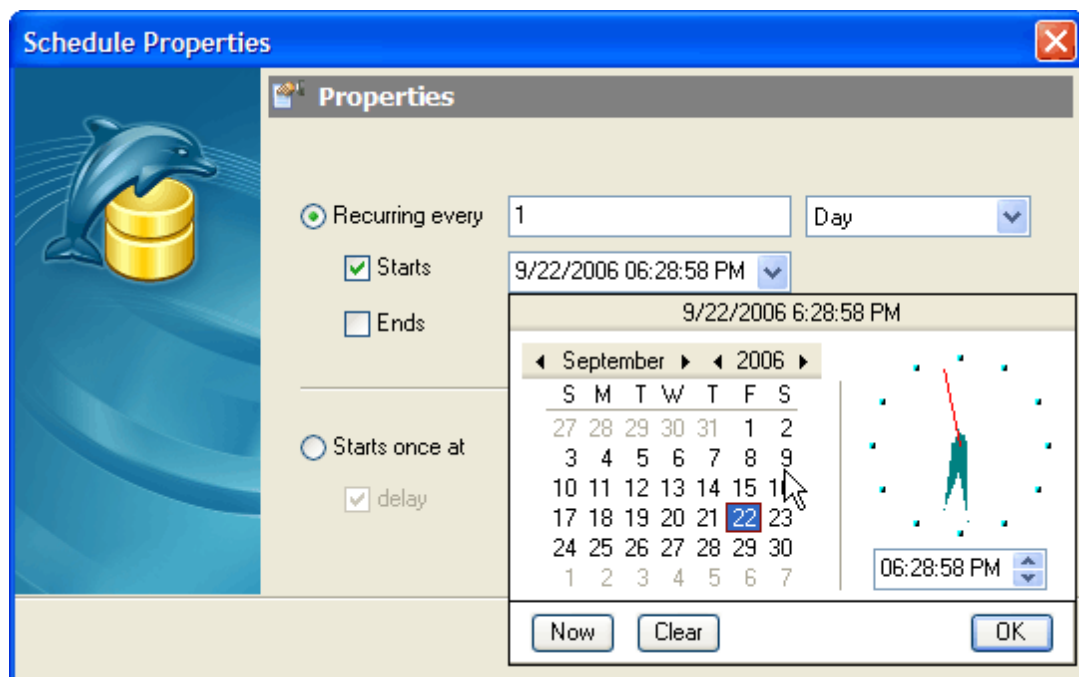
##### Schedule

Determine here the frequency and the duration for the SQL statement defined for the event repeats. For more information see [Schedule properties](#) <sup>123</sup>.



#### 5.5.1.2 Schedule properties

The schedule must be one of two forms (the detailed description you can find below):



- **Recurring every (number) hours/days/weeks/etc.**

Use the clause for actions which are to be repeated at a regular interval.

#### Starts

Set the first time of the event executing.

#### Ends

Specify the last time for the event executing.

**Schedule Properties**

**Properties**

☐ Recurring every 1 Day

☒ Starts 9/22/2006 6:27:17 PM

☐ Ends 9/22/2006 6:27:40 PM

☒ Starts once at 2/31/2006 01:00:00 PM

☒ delay 1 Hour

OK Cancel Help

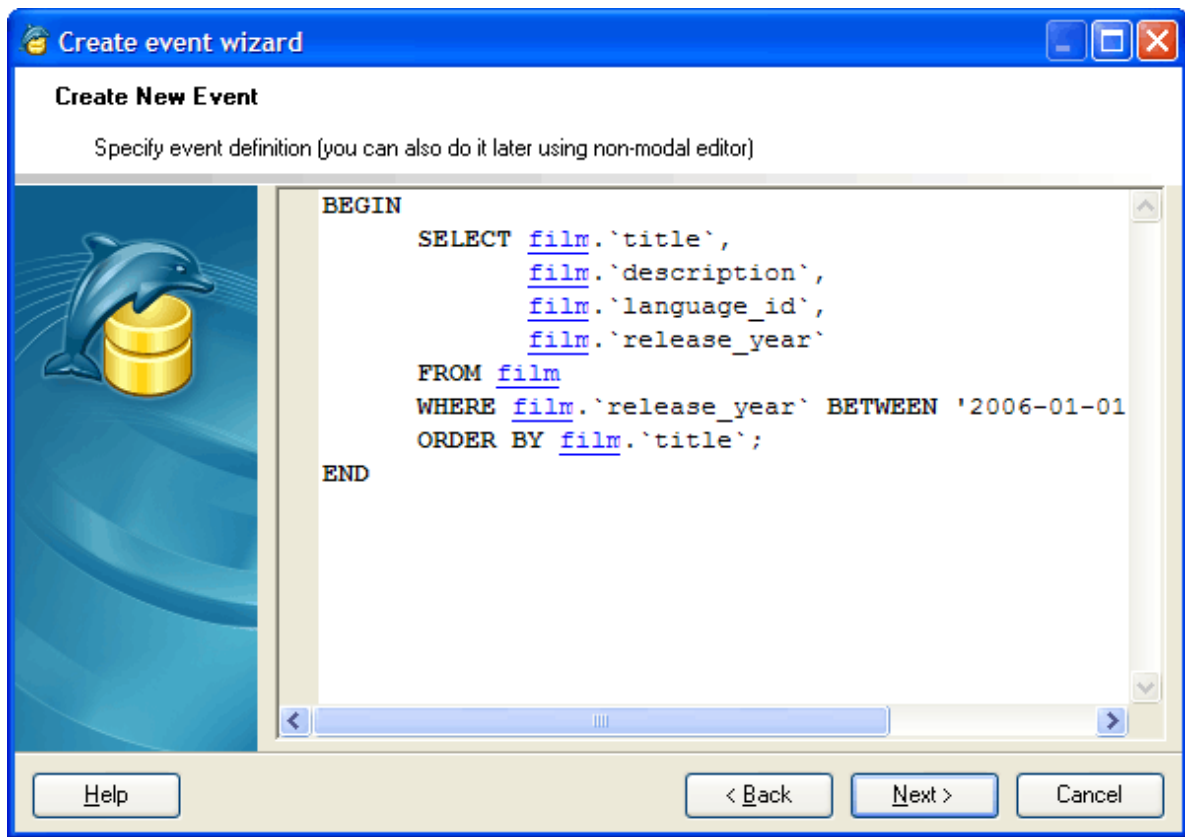
- **Starts once at**

Use the clause for a one-time event.

The **Delay (number) hours/days/weeks/etc.** option 'off' specifies that the event executes one time only at the date and time. Check this option to create an event which occurs at some point in the future relative to the current date and time — such as that expressed by the phrase "three weeks from now".

#### 5.5.1.3 Specifying event definition

Here you can specify the scheduled event [definition](#). This step is optional. You can do it later in non-modal editor.

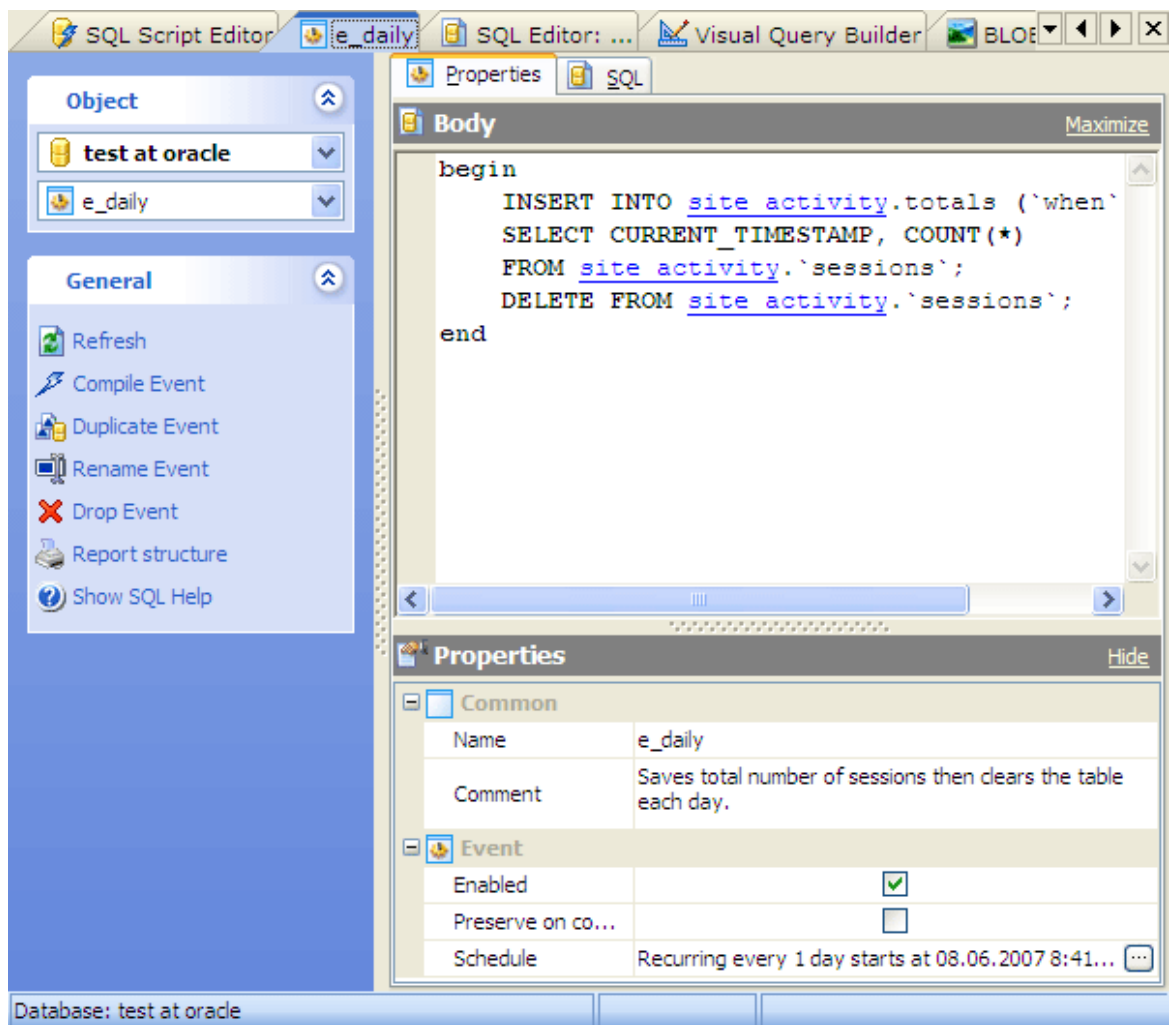


### 5.5.2 Event Editor

[Event Editor](#) allows you to edit all scheduled event properties, view the SQL statement for creating the event. It can be opened when you create a new scheduled event or edit the existing one (see [How to edit event](#)<sup>[120]</sup> for details).

The basic principles of Object Editors in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[46]</sup>. Below you will find a description of editor tabs that are unique for the current object.

**See also:** [Create Event Wizard](#)<sup>[121]</sup>



### Schedules

Determine here the frequency and the duration for the SQL statement defined for the event repeats. For more information see [Schedule properties](#)<sup>[123]</sup>.

### Body

The field contains the SQL statement executing within the scheduled event.

### Name

The field contains the new scheduled event name as it was set on the previous step.

### Comment

Specify a comment to the event or leave it blank.

### Enabled

Uncheck the option to keep the event been created from being active. Alternatively, you may check it to make explicit the default status, which is active.

### Preserve on completion

Normally, once an event has expired, it is immediately dropped. You can override this behavior by checking the option. Uncheck it merely to make the default non-persistent

behavior explicit.

## 5.6 Remote servers

The FEDERATED storage engine accesses data in tables of remote databases rather than in local tables. Use [remote servers](#) to lighten such table creating. The local server connects to a remote server, and uses the MySQL client API to read, delete, update, and insert data in the remote table.

To create a FEDERATED table using such a server, set the [Connection](#) property to `'remote_server_name/table_name'` within the [Create Table wizard](#)<sup>[129]</sup>.

### ■ How can I add a new remote server?

New remote servers are added within [Create Remote Server Wizard](#)<sup>[129]</sup>. In order to run the wizard you should either

- select the [Object | Create Database Object...](#) main menu item;
- select the Remote Servers icon in the Create Database Object dialog

or

- select the Remote Servers list or any object from that list in the explorer tree;
- select the [Create New Remote Server...](#) item from the popup menu

To create a new remote server with the same properties as one of the existing one has:

- select the [Object | Duplicate Database Object...](#) main menu item;
- follow the instructions of [Duplicate Object Wizard](#).

### ■ How can I edit an existing remote server?

Remote servers can be edited within [Remote Server Editor](#)<sup>[129]</sup>. In order to run the editor you should either

- select the remote server for editing in the explorer tree (type the first letters of the server name for quick search);
- select the [Edit Remote Server...](#) item from the popup menu

### ■ How can I drop a remote server?

To drop a remote server:

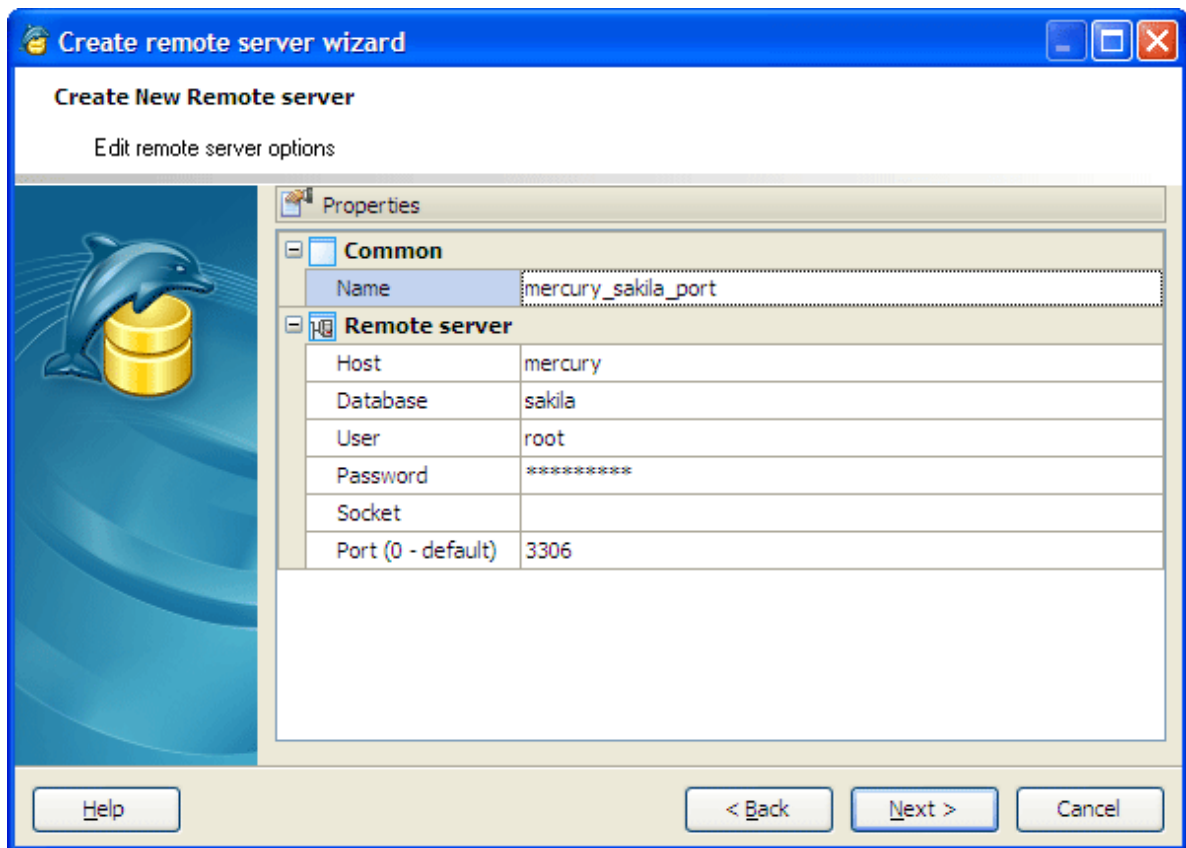
- select the server to drop in the explorer tree;
- select the [Drop Remote Server](#) item from the popup menu

and confirm dropping in the dialog window.

### 5.6.1 Create Remote Server Wizard

Create Remote Server Wizard allows you to set up a Remote Server definition. All the information how to run the wizard you can find [here](#)<sup>[128]</sup>.

The basic principles of Create Object Wizards in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. Below you will find a description of wizard steps that are unique for the current object.



First of all set the new remote server [name](#). It is the name by which the remote server is known within this database.

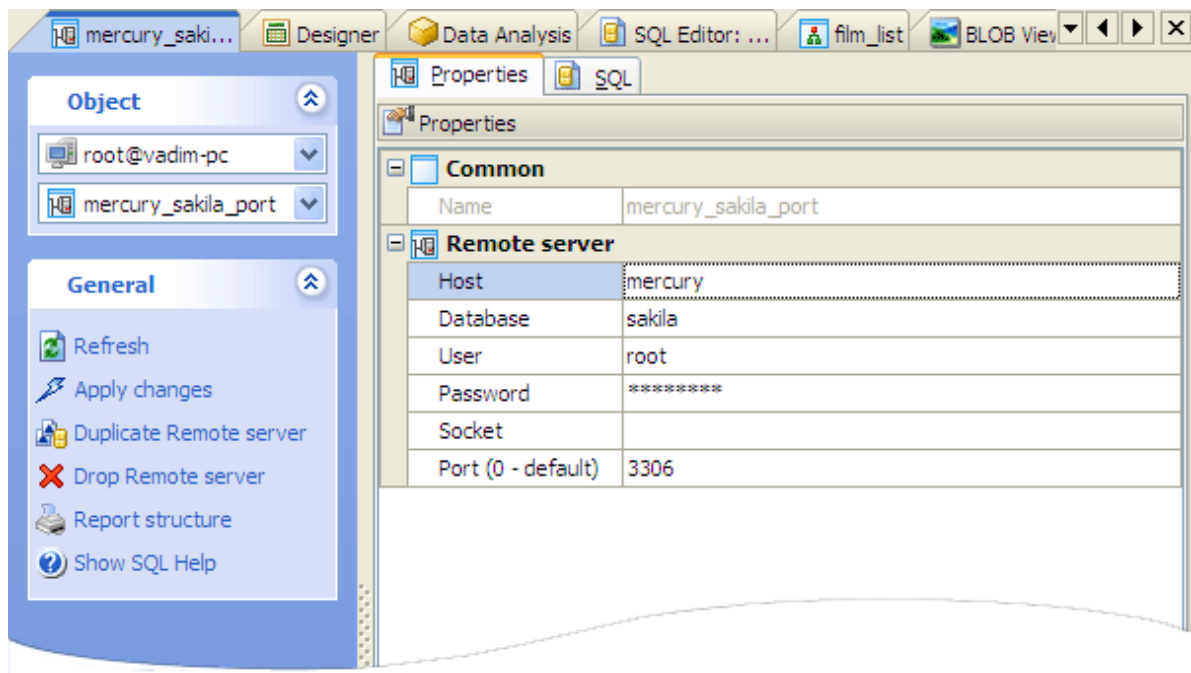
The remote [host](#) information indicates the remote server to which your local server connects, and the [database](#) and [user/password](#) information indicates which remote database to use as the data source with corresponding permissions.

### 5.6.2 Remote Server Editor

Remote Server Editor allows you to view the remote server definition and manage its logins. To open the editor, use the popup menu of the corresponding node on the Explorer tree.

The basic principles of Object Editors in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[46]</sup>. Below you will find a description of editor tabs that are unique for the current object.





The remote [host](#) information indicates the remote server to which your local server connects, and the [database](#) and [user/password](#) information indicates which remote database to use as the data source with corresponding permissions.

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 Server Objects

With SQL Maestro for MySQL 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](#)<sup>[24]</sup>).

The following list contains the most common server objects supported by SQL Maestro for MySQL.

- [Databases](#)<sup>[134]</sup>;
- [User](#)<sup>[137]</sup>;
- [Character sets](#)<sup>[150]</sup>;
- [Processes](#)<sup>[242]</sup>;
- [Server Variables](#)<sup>[136]</sup>.

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](#)<sup>[133]</sup> 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.

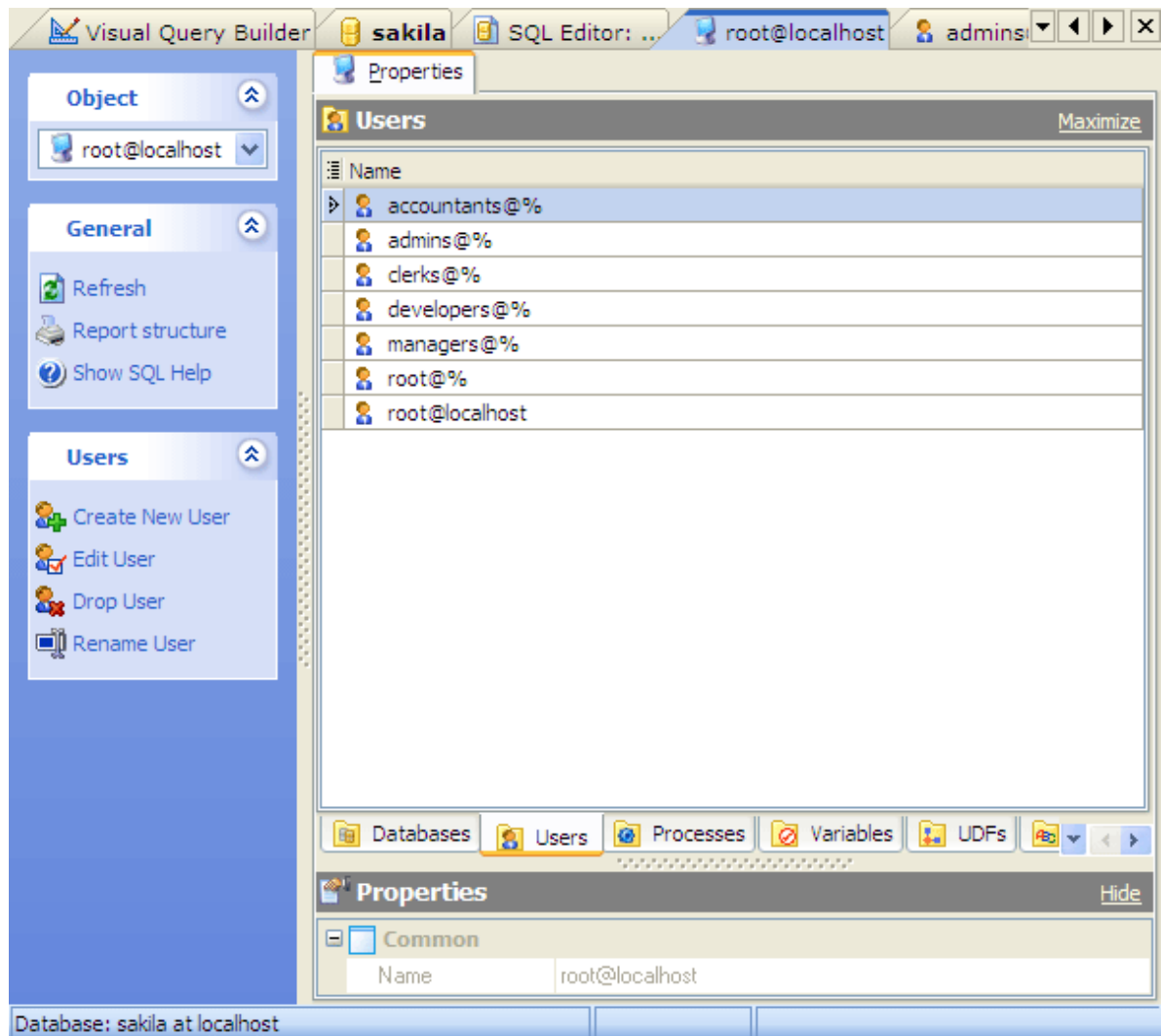
## 6.1 Server Editor

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*, 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.



## 6.2 Databases

SQL Maestro for MySQL 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 SQL Maestro for MySQL startup, login prompt before connection, etc.). To start working with databases in SQL Maestro for MySQL, you should create database profile(s) first.

Use the following links for details:

### ■ **How can I create a new database?**

Use for this purpose [Create Database Wizard](#)<sup>[37]</sup>. In order to run the wizard you should either

- select the [Database | Create New Database...](#) main menu item
- or
- use the [Create New Database...](#) item of the popup menu.

Using [Create Database Wizard](#) set the [Create profile after creating the database](#) option to create a new profile and open the [Database Profile Properties](#) dialog after the database is created.

### ■ **How can I change attributes of an existing database?**

To edit a database:

- select the database to edit in the explorer tree;
- edit database properties within the appropriate tabs of [Database Editor](#)<sup>[38]</sup>.

### ■ **How can I drop an existing database?**

In order to drop a database you should first select the database to drop in the explorer tree and establish connection (if you are not connected to the database yet), then either

- select the [Database | Drop Database](#) main menu item
- or
- use the [Drop Database](#) item of the popup menu

and confirm dropping in the dialog window to complete the operation.

### ■ **How can I create new database profiles?**

In SQL Maestro for MySQL database profiles are created within [Create Database Profiles Wizard](#)<sup>[36]</sup>. 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](#)<sup>[30]</sup> 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.

## 6.3 Server Variables

There are a lot of configuration parameters that affect the behavior of the database system. All parameter (server variables) names are case-insensitive.

Server variables are edited within [Server Variable Editor](#)<sup>136</sup>. In order to open the editor you should either

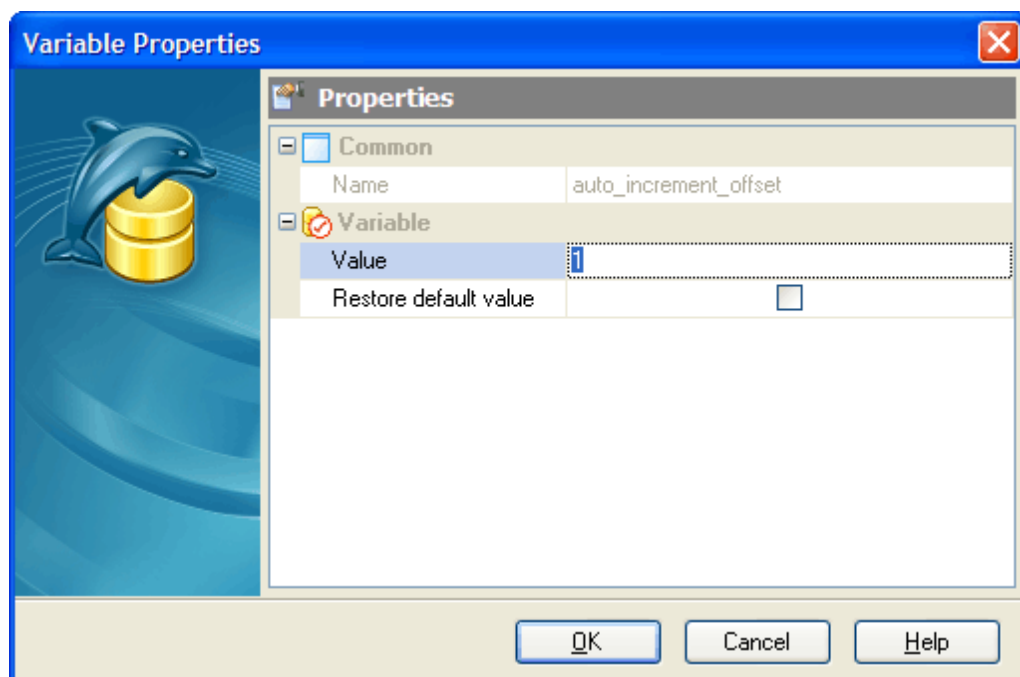
- select the server variables for editing in the explorer tree (type the first letters of the server variable name for quick search);
- select the [Edit Server Variable](#) item from the popup menu

or

- open the server in [Server Editor](#) and the [Server Variables](#) tab there;
- select the server variables to edit;
- press the **Enter** key or select the [Edit Server Variable](#) item from the popup menu (alternatively, you can use the corresponding link of the [Navigation Bar](#)).

### 6.3.1 Variable Editor

You can change the [Value](#) of server variable.



Here you can also edit the variable [Name](#), the current [Value](#) of the configuration option, [Min Value](#) and [Max Value](#)

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 Users

The primary function of the MySQL privilege system is to authenticate a user who connects from a given host and to associate that user with privileges on a database such as SELECT, INSERT, UPDATE, and DELETE. Additional functionality includes the ability to have anonymous users and to grant privileges for MySQL-specific functions such as LOAD DATA INFILE and administrative operations.

The MySQL privilege system ensures that all users may perform only the operations allowed to them.

### ■ How can I create a new user?

New users are created within [Create User Wizard](#)<sup>[137]</sup>. 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](#)<sup>[138]</sup>. 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.

### 6.4.1 Create User Wizard

[Create User Wizard](#) guides you through the process of creating a new user. See [How To Create User](#)<sup>[137]</sup> to learn how to run this wizard.

The basic principles of Create Object Wizards in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. Below you will find a description of wizard steps that are unique for the current object.

The field [Name](#) contains the new user name as it was set on the previous wizard step. Use it to edit the name of user being made.



Use this step also to specify the new user [Password](#) and confirm it.

The [Max queries per hour](#) count, [Max updates per hour](#) count, and [Max connection per hour](#) count options limit the number of queries, updates, and logins a user can perform during any given one-hour period. (Queries for which results are served from the query cache do not count against the [Max queries per hour](#) limit.) If count is 0 (the default), this means that there is no limitation for that user.

The [Max connection per hour](#) count option limits the maximum number of simultaneous connections that the account can make. If count is 0 (the default), the `max_user_connections` system variable determines the number of simultaneous connections for the account.

MySQL can check X509 certificate attributes in addition to the usual authentication that is based on the username and password. To specify SSL-related options for a MySQL account, use the following [Require](#) options.

#### Authentication (None, SSL, X509)

Use [None](#) to indicate that the account has no SSL or X509 requirements. Select [SSL](#) option to allow only SSL-encrypted connections for the account. [X509](#) means that the client must have a valid certificate but that the exact certificate, issuer, and subject do not matter. The only requirement is that it should be possible to verify its signature with one of the CA certificates.

[Cipher](#) is needed to ensure that ciphers and key lengths of sufficient strength are used. SSL itself can be weak if old algorithms using short encryption keys are used. Using this option, you can ask that a specific cipher method is used to allow a connection.

[Issuer](#) places the restriction on connection attempts that the client must present a valid X509 certificate issued by CA 'issuer'. If the client presents a certificate that is valid but has a different issuer, the server rejects the connection. Use of X509 certificates always implies encryption, so the SSL option is unnecessary in this case.

[Subject](#) places the restriction on connection attempts that the client must present a valid X509 certificate containing the subject subject. If the client presents a certificate that is valid but has a different subject, the server rejects the connection.

#### User permission

The wizard step allows you to define actions the user can do with database objects. Just check the necessary box to set the corresponding permission. Actions are arranged alphabetically.

MySQL allows to set following user permissions: *Alter, Alter routine, Create, Create routine, Create temporary tables, Create view, Create user, Delete, Drop, Execute, File, Grant option, Index, Insert, Lock tables, Process, References, Reload, Replication client, Replication slave, Select, Show databases, Show view, Shutdown, Super, and Update.*

## 6.4.2 User Editor

[User Editor](#) is the basic SQL Maestro for MySQL 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](#)<sup>[137]</sup> for details).

The basic principles of Object Editors in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[46]</sup>. 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.

#### Password

Here you can change the user's password.

The **Max queries per hour** count, **Max updates per hour** count, and **Max connection per hour** count options limit the number of queries, updates, and logins a user can perform during any given one-hour period. (Queries for which results are served from the query cache do not count against the **Max queries per hour** limit.) If count is 0 (the default), this means that there is no limitation for that user.

The **Max connection per hour** count option limits the maximum number of simultaneous connections that the account can make. If count is 0 (the default), the *max\_user\_connections* system variable determines the number of simultaneous connections for the account.

MySQL can check X509 certificate attributes in addition to the usual authentication that is based on the username and password. To specify SSL-related options for a MySQL account, use the following **Require** options.

#### Authentication (None, SSL, X509)

Use **None** to indicate that the account has no SSL or X509 requirements. Select **SSL** option to allow only SSL-encrypted connections for the account. **X509** means that the client must have a valid certificate but that the exact certificate, issuer, and subject do not matter. The only requirement is that it should be possible to verify its signature with one of the CA certificates.

**Cipher** is needed to ensure that ciphers and key lengths of sufficient strength are used. SSL itself can be weak if old algorithms using short encryption keys are used. Using this option, you can ask that a specific cipher method is used to allow a connection.

**Issuer** places the restriction on connection attempts that the client must present a valid X509 certificate issued by CA 'issuer'. If the client presents a certificate that is valid but has a different issuer, the server rejects the connection. Use of X509 certificates always implies encryption, so the SSL option is unnecessary in this case.

**Subject** places the restriction on connection attempts that the client must present a valid X509 certificate containing the subject subject. If the client presents a certificate that is valid but has a different subject, the server rejects the connection.

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.

## 6.5 Roles

A role bundles a number of privileges together. It assists larger organizations where, typically, a number of users would have the same privileges, and, previously, the only way to change the privileges for a group of users was by changing each user's privileges individually.

Alternatively, multiple external users could have been assigned the same user, and there would have been no way to see which actual user was responsible for which action.

With roles, managing this is easy. For example, there could be a number of users assigned to a journalist role, with identical privileges. Changing the privileges for all the journalists is a matter of simply changing the role's privileges, while the individual user is still linked with any changes that take place.

Roles are supported as of MySQL 8.0 and MariaDB 10.0.5.

### ■ How can I create a new role?

New roles are created within [Create Role Wizard](#)<sup>142</sup>. In order to run the wizard you should either

- select the [Roles](#) list or any object from that list in the explorer tree and then use the [Create New Role](#) item from the popup menu

or

- open the server in [Server Editor](#) and the [Roles](#) tab there and press **Insert** or select the [Create New Role](#) item from the popup menu (Alternatively, use the corresponding link of the Navigation Bar).

### ■ How can I edit an existing role?

Roles are edited within [Role Editor](#)<sup>143</sup>. In order to open the editor you should either

- select the role for editing in the explorer tree (type the first letters of the role name for quick search);
- select the [Edit Role](#) item from the popup menu

or

- open the server in [Server Editor](#) and the [Roles](#) tab there;
- select the role to edit;
- press the **Enter** key or select the **Edit Role** item from the popup menu (alternatively, you can use the corresponding link of the **Navigation Bar**).

### ■ How can I drop a role?

To drop the existing role:

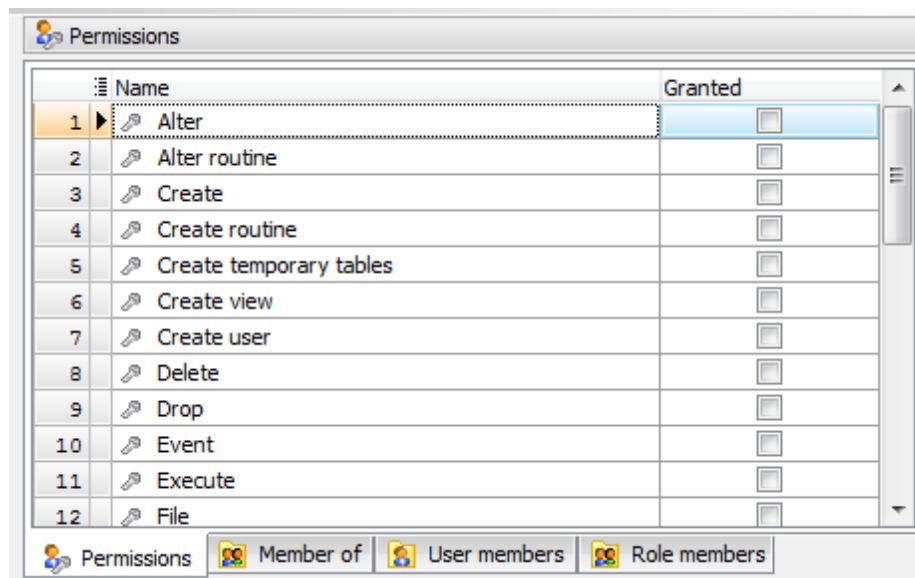
- select the role to drop in the explorer tree;
- select the [Drop Role](#) item from the popup menu (alternatively, you may use the corresponding link of the [Navigation Bar](#))

and confirm dropping in the dialog window.

### 6.5.1 Create Role Wizard

[Create Role Wizard](#) guides you through the process of creating a new role. See [How To Create Role](#)<sup>[141]</sup> to learn how to run this wizard.

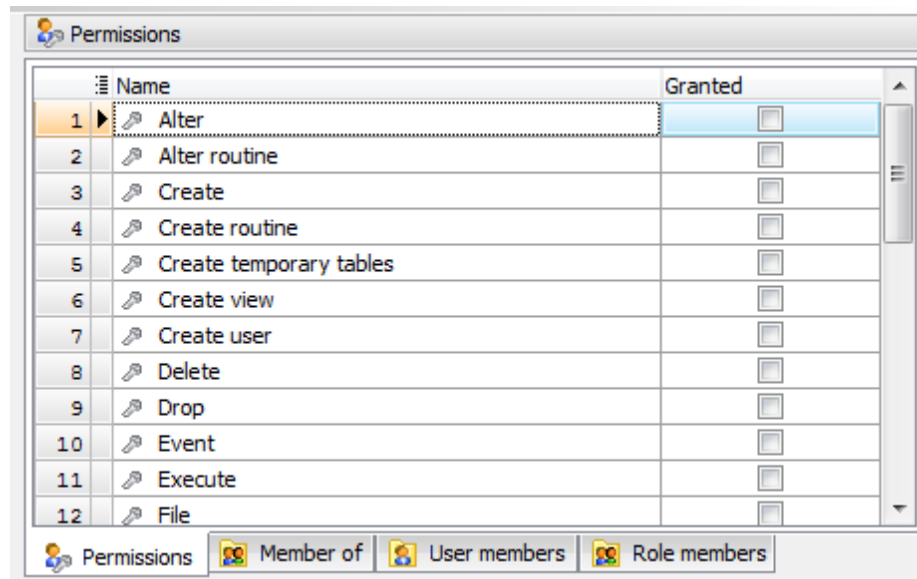
The basic principles of Create Object Wizards in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. Below you will find a description of wizard steps that are unique for the current object.



[Managing role membership and permissions](#)<sup>[142]</sup>

#### 6.5.1.1 Membership and environment

The wizard step allows you to define the new role members, to specify roles the role being made is a member of and provide the role permissions.



#### Role Members

Specify here one or more existing roles which are automatically added as members of the new role. [Admin option](#) gives to the role the right to grant membership in this role to others.

#### User Members

Specify here one or more existing users which are automatically added as members of the new role. [Admin option](#) gives to the user the right to grant membership in this role to others.

#### Member of

The tab lists one or more existing roles to which the new role will be immediately added as a new member.

#### Permissions

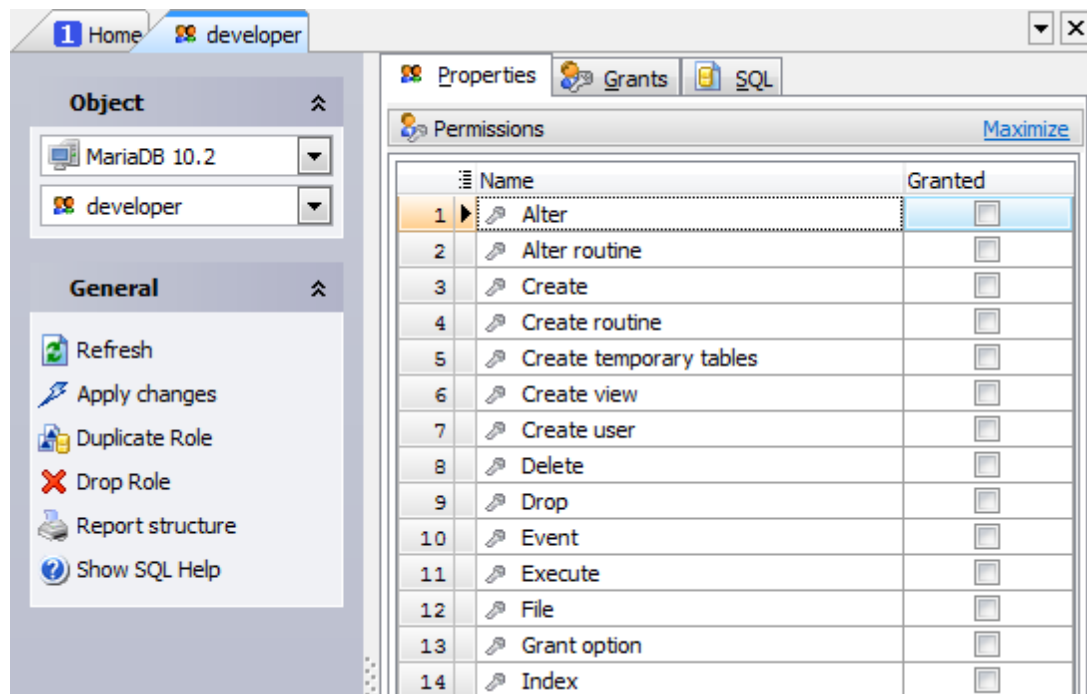
Here you can provide default server-level permissions for users belonging to this role.

## 6.5.2 Role Editor

[Role Editor](#) is the basic SQL Maestro for MySQL tool for working with existing roles. It can be opened automatically after the role is created and is available on editing the role (see [How to edit role](#)<sup>[141]</sup> for details).

The basic principles of Object Editors in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[45]</sup>. Below you will find a description of editor tabs that are unique for the current object.

[Editing role properties](#)<sup>[144]</sup>



### 6.5.2.1 Editing role properties

**Role Editor** provides you with an ability to edit role properties and membership. The detailed description is given below.

#### Role Members

Specify here one or more existing roles which are automatically added as members of the new role. **Admin option** gives to the role the right to grant membership in this role to others.

#### User Members

Specify here one or more existing users which are automatically added as members of the new role. **Admin option** gives to the user the right to grant membership in this role to others.

#### Member of

The tab lists one or more existing roles to which the new role will be immediately added as a new member.

#### Permissions

Here you can provide default server-level permissions for users belonging to this role.

## 6.6 UDFs

There are two ways to add a new function to MySQL: to create user-defined function (UDF), a function compiled as object file and then added to and removed from the server dynamically, or to add [function](#)<sup>[113]</sup> as native (built-in) MySQL function. Unlike to UDFs, native functions are compiled into the mysql server and become available on a permanent basis.

### ■ How can I create a new user-defined function?

New UDFs are created within [Create UDF Wizard](#)<sup>[146]</sup>. In order to run this wizard you should either

- select the [UDFs](#) list or any object from that list and then use the [Create New UDF](#) item from the popup menu
- or
- open the server in [Server Editor](#) and the [UDFs](#) tab there and press **Insert** or select the [Create New UDF](#) item from the popup menu (Alternatively, use the corresponding link of the [Navigation Bar](#)).

### ■ How can I edit an existing user-defined function?

UDFs are edited within [UDF Editor](#)<sup>[147]</sup>. In order to open the editor you should either

- select the UDF for editing in the explorer tree (type the first letters of the UDF name for quick search);
  - select the [Edit UDF](#) item from the popup menu
- or
- open the server in [Server Editor](#) and the [UDFs](#) tab there;
  - select the UDF to edit;
  - press the **Enter** key or select the [Edit UDF](#) item from the popup menu (alternatively, you can use the corresponding link of the [Navigation Bar](#)).

### ■ How can I drop a user-defined function?

To drop the existing UDF:

- select the UDF to drop in the explorer tree;
  - select the [Drop UDF](#) item from the popup menu
- or
- open the server in [Server Editor](#) and the [UDFs](#) tab there;
  - select the UDF to drop;
  - press the **Delete** key or select the [Drop UDF](#) item from the popup menu (alternatively, you may use the corresponding link of the [Navigation Bar](#))

and confirm dropping in the dialog window.



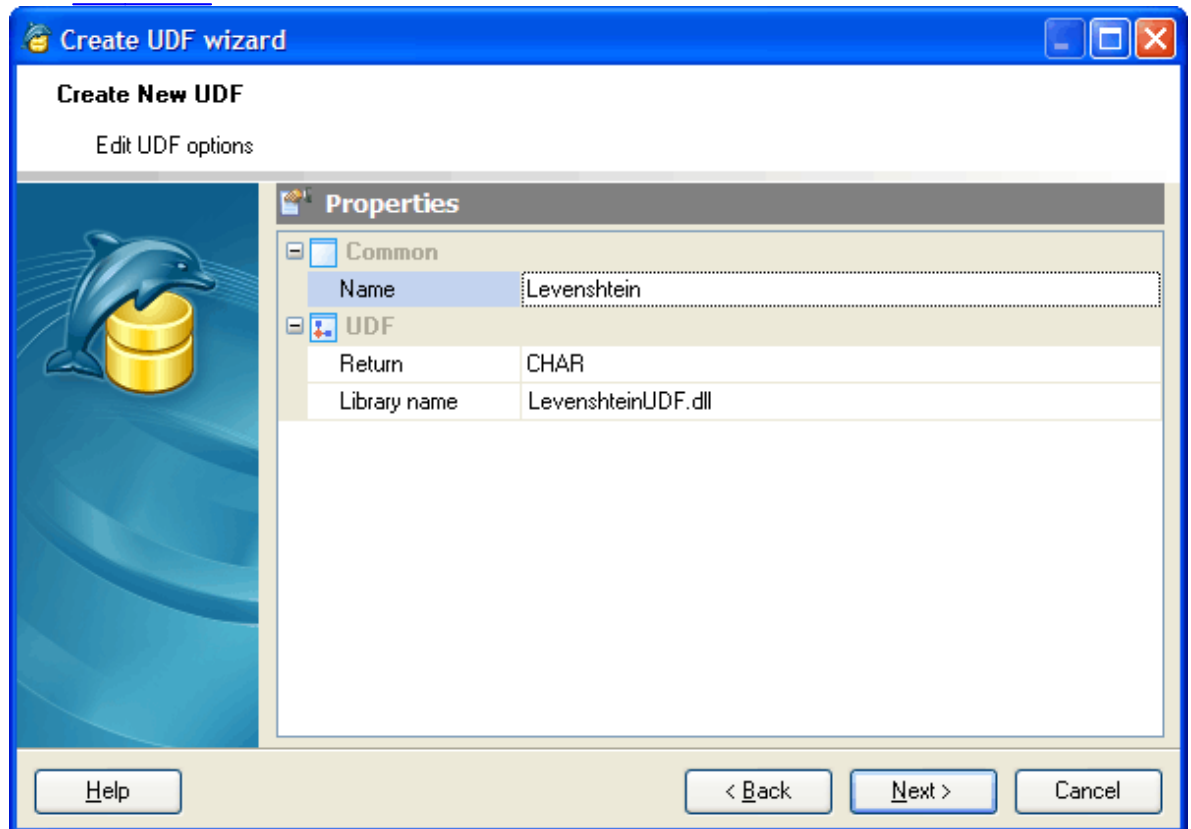
## 6.6.1 Create UDF Wizard

Create UDF Wizard guides you through the process of creating a new user-defined function. See [How To Create UDF](#)<sup>[145]</sup> to learn how to run this wizard.

The basic principles of Create Object Wizards in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[42]</sup>. Below you will find a description of wizard steps that are unique for the current object.

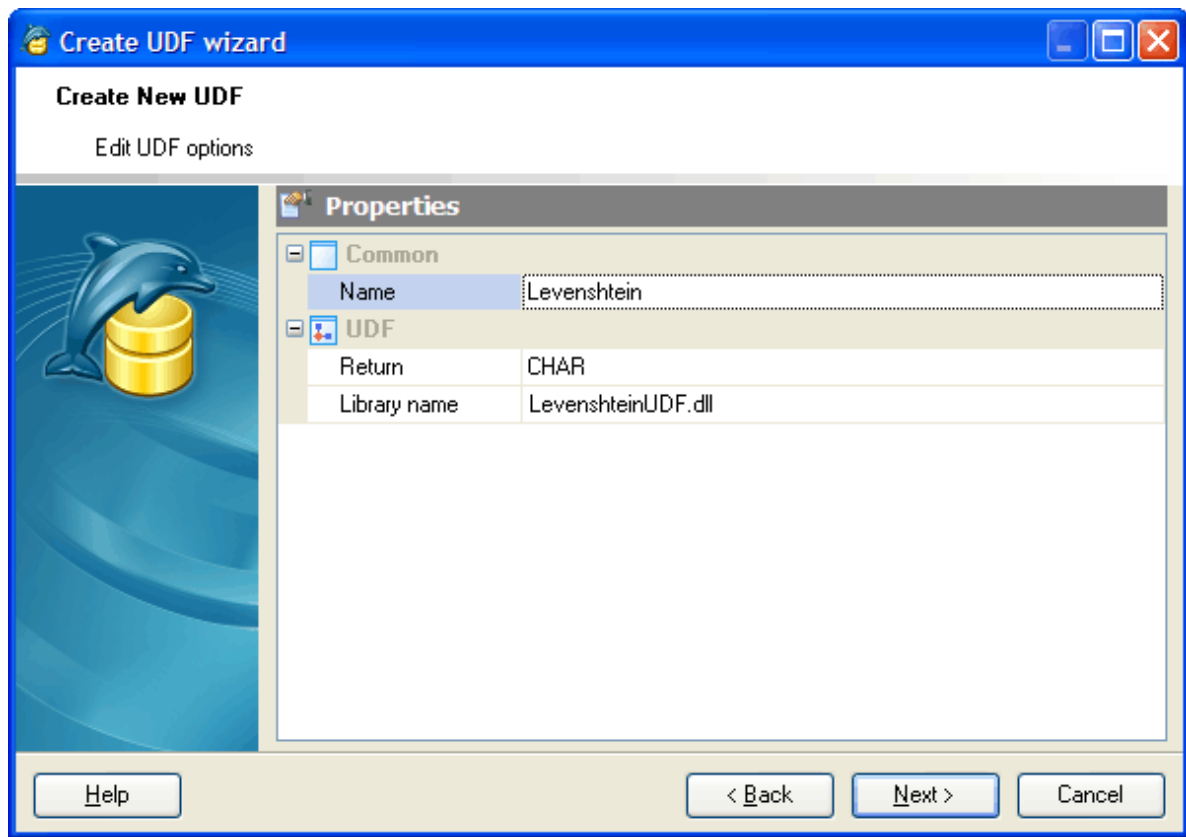
- [Specifying UDF options](#)<sup>[146]</sup>

**See also:** [UDF Editor](#)<sup>[147]</sup>



### 6.6.1.1 Specifying UDF options

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



#### Name

Set here the name that should be used in SQL statements to invoke the function .

#### Return

Use the drop-down list to specify the function return value.

#### Library name

Enter the basename of the shared object file that contains the code that implements the function. The file must be located in the plugin directory. This directory is given by the value of the *plugin\_dir* system variable.

## 6.6.2 UDF Editor

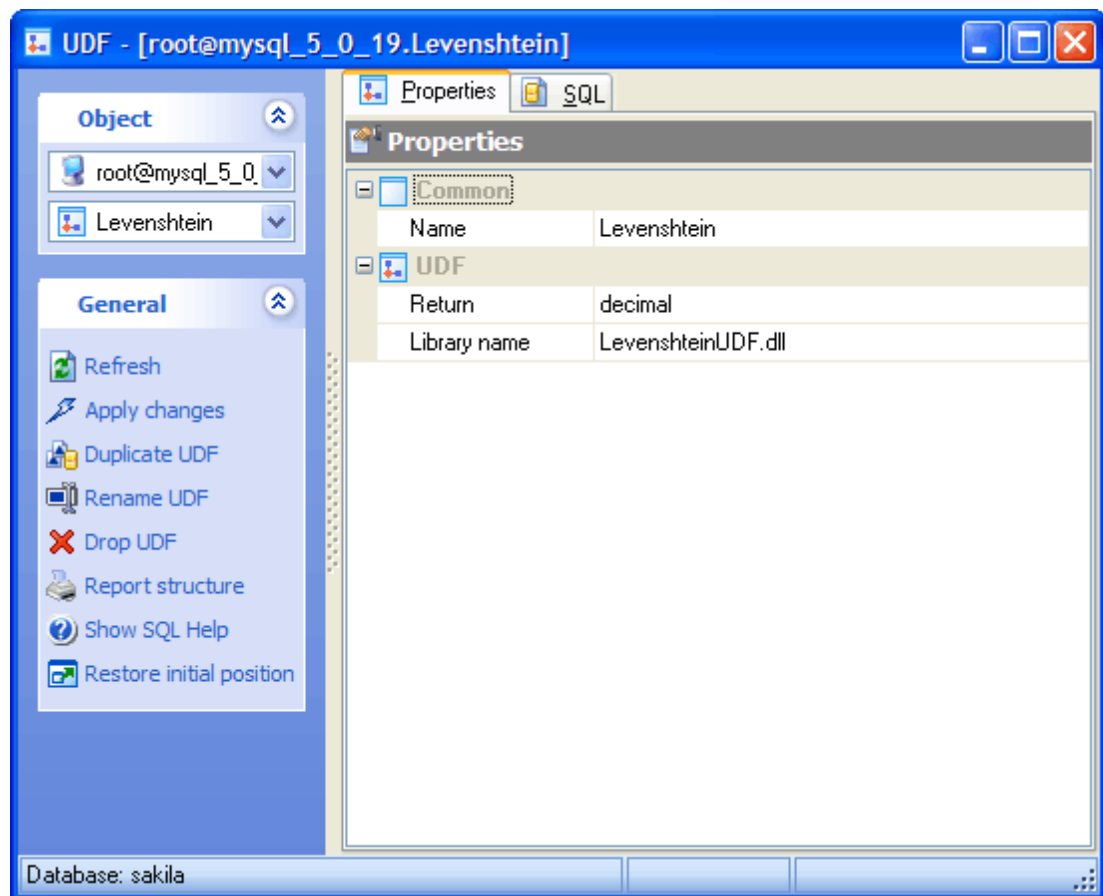
[UDF Editor](#) is the basic SQL Maestro for MySQL tool for working with existing user-defined functions. It can be open automatically after the UDF is created and is available on editing the UDF (see [How to edit UDF](#)<sup>[145]</sup> for details).

You can open necessary function in [UDF Editor](#) from the [Explorer Tree](#) or [Object Manager](#) .

The basic principles of Object Editors in SQL Maestro for MySQL are explained in a [separate topic](#)<sup>[46]</sup>. Below you will find a description of editor tabs that are unique for the current object.

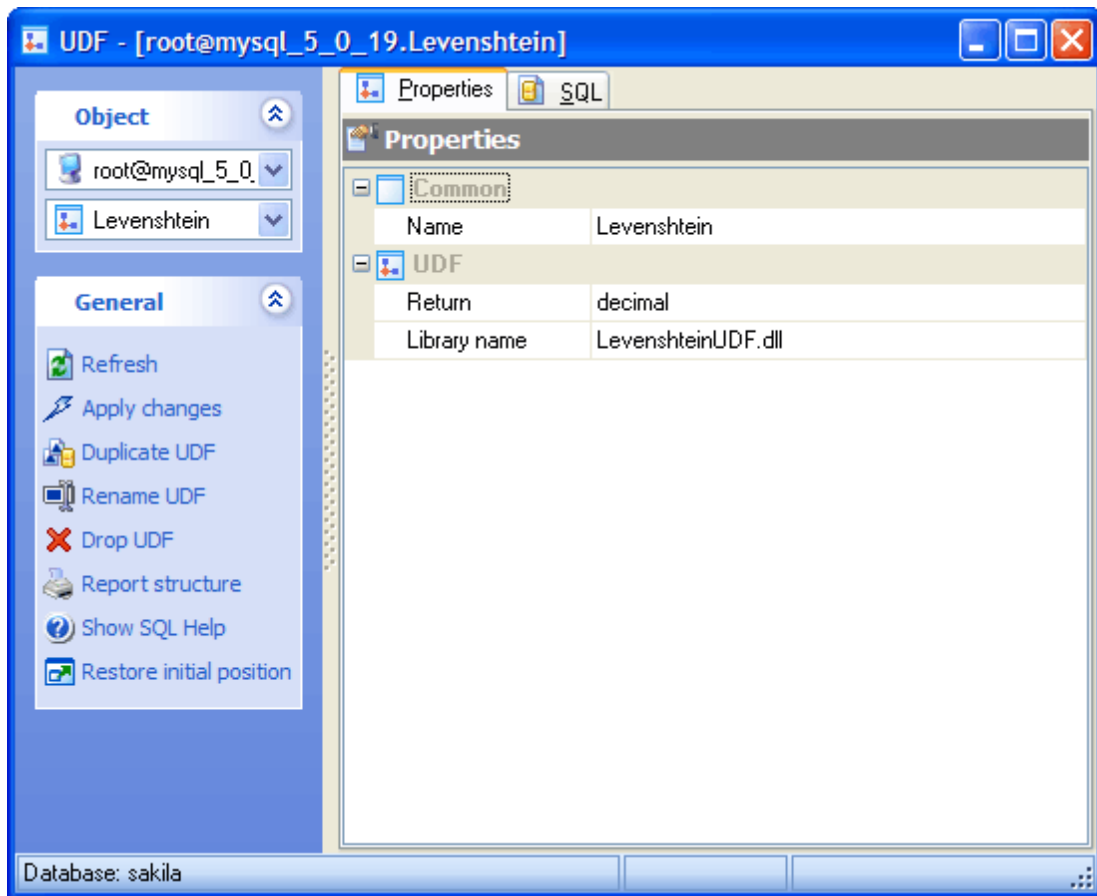
- [Editing UDF properties](#)<sup>[148]</sup>

**See also:** [Create UDF Wizard](#)<sup>[146]</sup>



#### 6.6.2.1 Editing UDF properties

UDF Editor provides you with an ability to edit UDF properties.



#### Name

Use the field to edit the UDF name that should be used in SQL statements to invoke the function.

#### Return

Use the drop-down list to change the function return value.

#### Library name

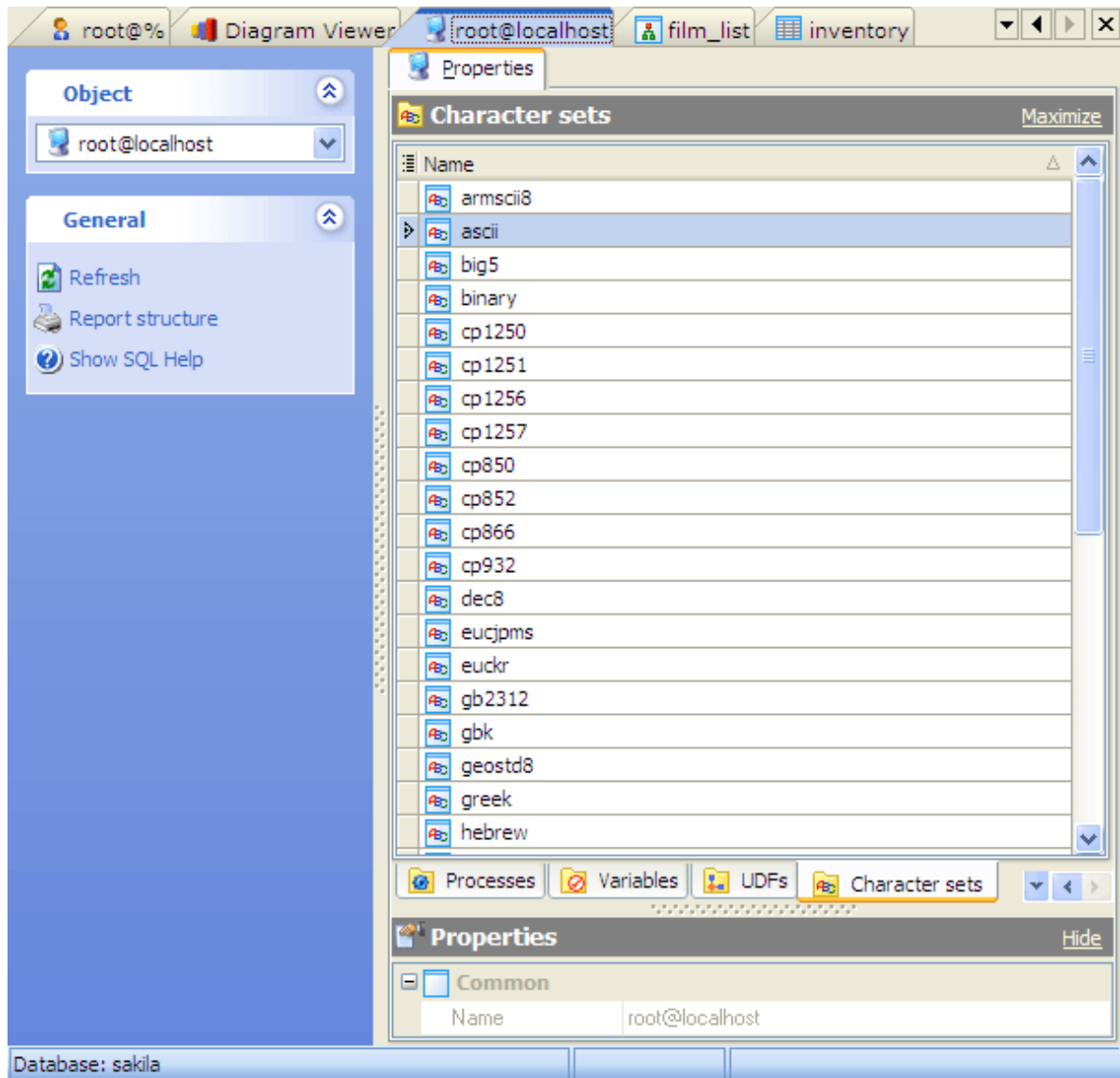
The field contains the basename of the shared object file that contains the code that implements the function.

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.

## 6.7 Character sets

MySQL supports more than 70 [Collations](#) for more than 30 [Character sets](#). Use the list to define which character sets your MySQL server supports. For each character set, the allowable [Collations](#) are listed in the corresponding node of the [Explorer](#) tree.



## 7 Queries

SQL Maestro for MySQL provides several tools for working with SQL queries:

- [SQL Editor](#)<sup>[153]</sup> for editing the query text directly and executing SELECT queries;
- [Visual Query Builder](#)<sup>[158]</sup> for building SELECT, INSERT, UPDATE and DELETE queries visually;
- [SQL Script Editor](#)<sup>[204]</sup> for executing SQL scripts.

Both SQL Editor and Visual Query Builder supports [parameters in queries](#)<sup>[157]</sup>

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](#).

SQL Maestro for MySQL 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](#)<sup>[151]</sup>.

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 be](#)<sup>[262]</sup> 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](#)<sup>[155]</sup>.

### 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](#)<sup>[154]</sup> is also at your disposal.

SQL Editor allows you to use [Visual Query Builder](#)<sup>[158]</sup> 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

SQL Maestro for MySQL 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](#)<sup>[282]</sup>.

### 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.

### Transaction management

SQL Editor supports the explicit transaction management. You can execute queries either in [autocommit mode](#) (default behavior) or [manage transactions manually](#). In the second case you have to issue the *BEGIN* statement to start a transaction and explicitly end the transaction by *COMMIT* or *ROLLBACK* statements (it is also possible to use the corresponding links at the editor's navigation bar).

### 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.

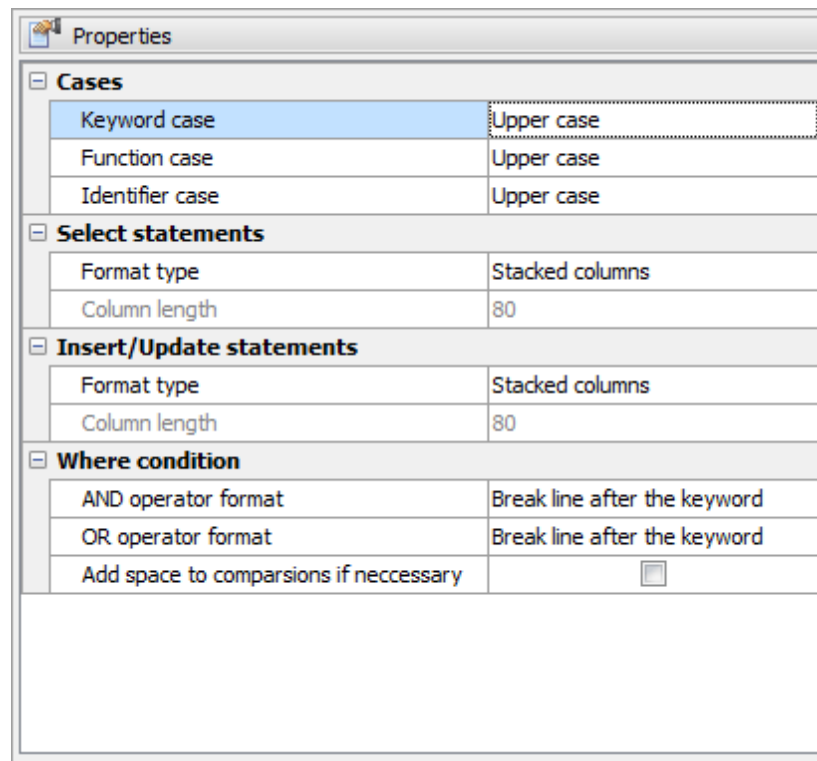
**See also:** [Visual Query Builder](#)<sup>[158]</sup>, SQL Script Editor, [SQL Editor Options](#)<sup>[262]</sup>

## 7.1.1 SQL Formatter

SQL Maestro for MySQL 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). Also it is used for view body formatting (MySQL stores such bodies as a single line)

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.



## 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](#)<sup>167)</sup> section.

SQL Editor: ... BLOB Viewer Dependency tracker Visual Query Builder GAME@

**Database**

sdb\_demo at sun

**General**

- Execute query
- Execute as script
- Execute selected only
- Format SQL
- Show SQL Help
- Configure SQL Editor
- Open new instance

**Query management**

- Create new query
- Delete current query
- Delete all queries
- Save to profile
- Run Query Builder
- Run SQL Script Editor

**Files**

- Load from file
- Save to file
- Save all queries

**Data management**

- Export data
- Get SQL dump
- Print data

```

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
  WHERE
    (NBA.GAME_QUARTER.GAME_ID = NBA.GAME.ID)
    (NBA.GAME_QUARTER.TEAM_ID = HOME_TEAM.ID)
  )

```

Result 1 Result 2

Table

Drag a column header here to group by that column

	GAME_DATE	HOME_TEAM	HOME_TEAM_SCORE
	Click here to define a filter		
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)

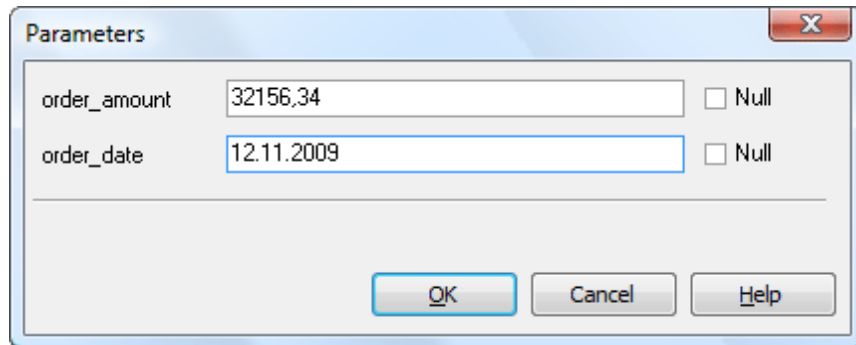
RESULT\_LIST Query 5 Query 1

Database: sdb\_demo at sun

### 7.1.3 Query Parameters

Both [SQL\\_Editor](#)<sup>[153]</sup> and [Visual\\_Query\\_Builder](#)<sup>[158]</sup> 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.



**Note:** To allow use parameters in query text, check the corresponding option at the [Tools](#)<sup>[259]</sup> tab of SQL Maestro for MySQL 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.

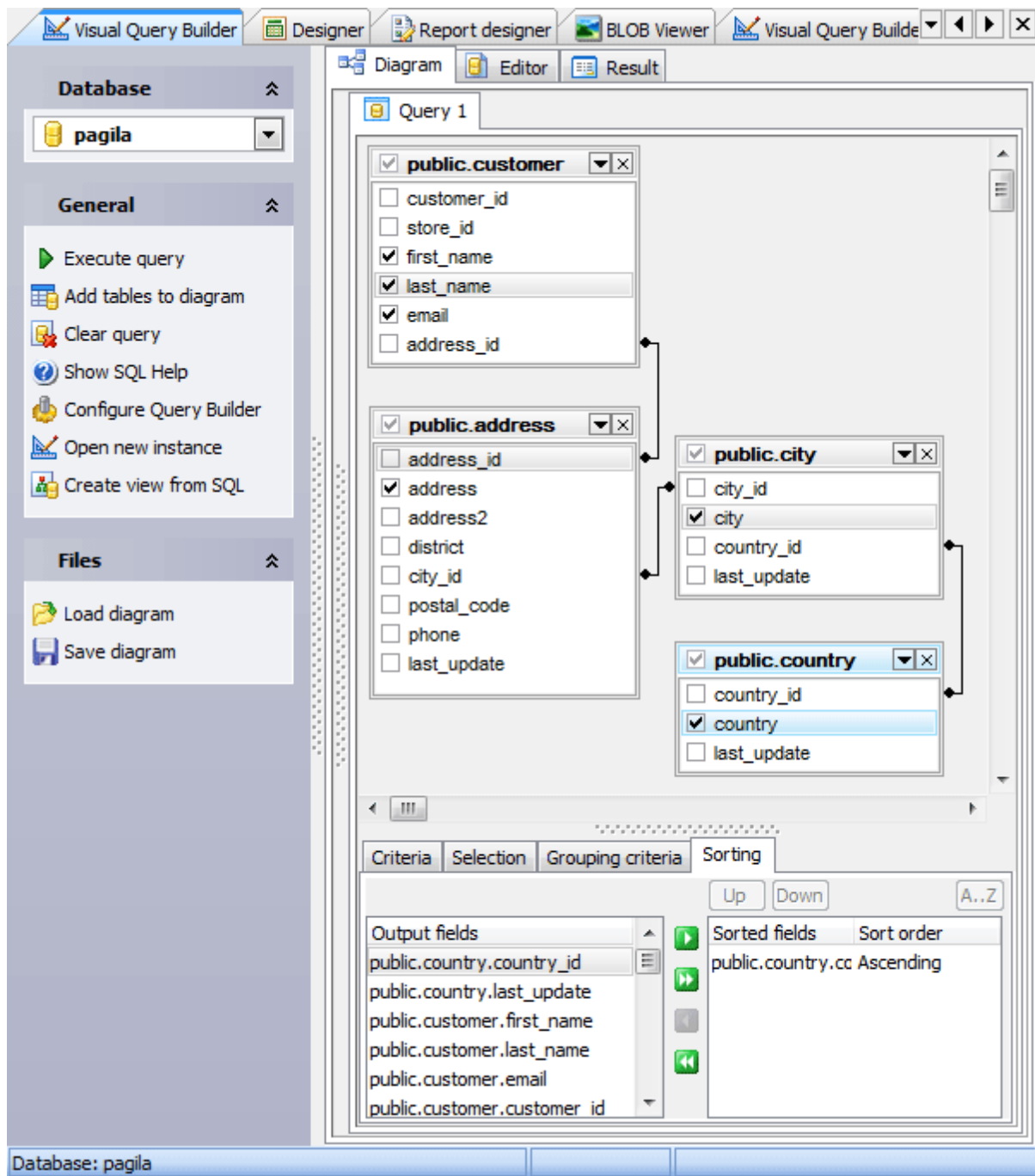
The most popular query management actions (creating, editing, deleting) are covered by the corresponding [topic](#)<sup>[151]</sup>.

Builder consists of 3 tabs:

- [Diagram](#)<sup>[159]</sup> - to create a query from a graphical interface,
- [Editor](#)<sup>[164]</sup> - to modify the query text before its executing,
- [Result](#)<sup>[165]</sup> (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](#)<sup>[95]</sup>.

**See also:** [SQL Editor](#)<sup>[153]</sup>, [Visual Query Builder Options](#)<sup>[264]</sup>, [Query Parameters](#)<sup>[157]</sup>



### 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.**

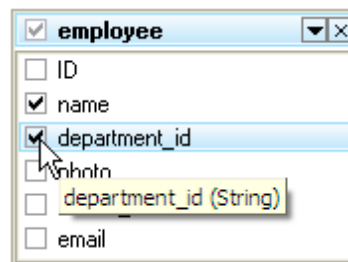
Use the [Add Table\(s\)](#) link of the area popup menu and select tables from the opened window (Use **Ctrl** or **Shift** pressed to select several tables).

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.

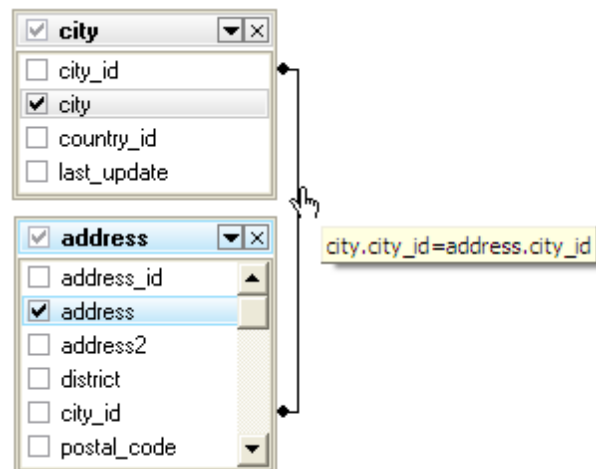


To include all the table fields, tick off the option box to the left of the table caption. In case none fields is included, the SQL statement is generated as `SELECT * FROM <Table_Name>`, i.e. all the fields are selected.

To remove the fields from the query, uncheck the corresponding boxes.

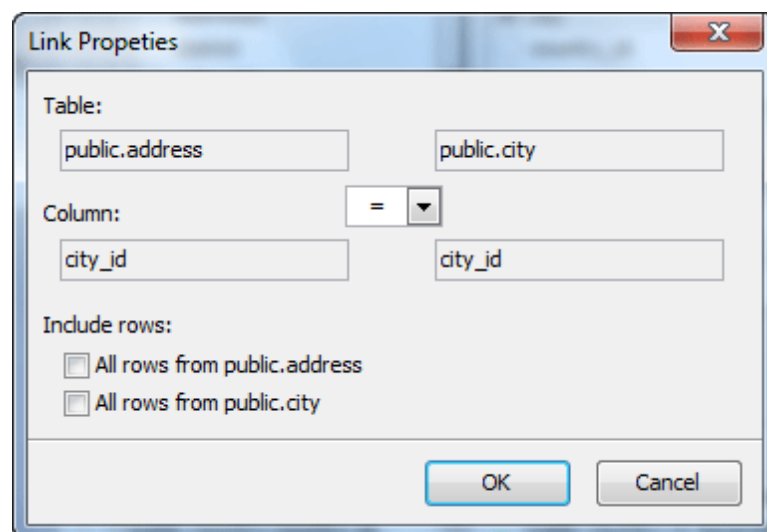
#### ■ **Join tables if necessary**

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.



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.

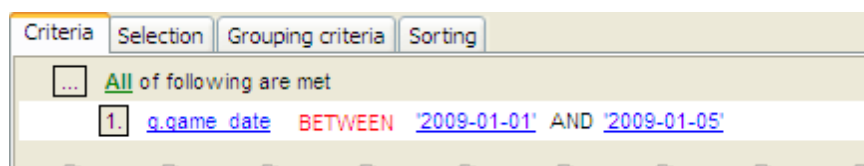
#### Specify WHERE condition



**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.



### **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.

Criteria	Selection	Grouping criteria	Sorting
<input type="checkbox"/> 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.

<i>AVG</i>	Returns the average of the values in a group
<i>BIT_AND</i>	Returns the bitwise AND of all bits in the expression.
<i>BIT_OR</i>	Returns the bitwise OR of all bits in the expression.
<i>COUNT</i>	Returns the total number of items in a column. This function does not ignore NULL values when calculating results.
<i>GROUP_CONCAT</i>	Returns a string result with the concatenated non-NULL values from a group.
<i>MAX</i>	Returns the maximum value for the column.
<i>MIN</i>	Returns the minimum value for the column.
<i>STD</i>	Returns the population standard deviation of the expression.
<i>STDDEV</i>	Returns the sample standard deviation of a numeric expression evaluated over a set.
<i>SUM</i>	Returns the sum of all the values in the expression.
<i>VARIANCE</i>	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 field 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.

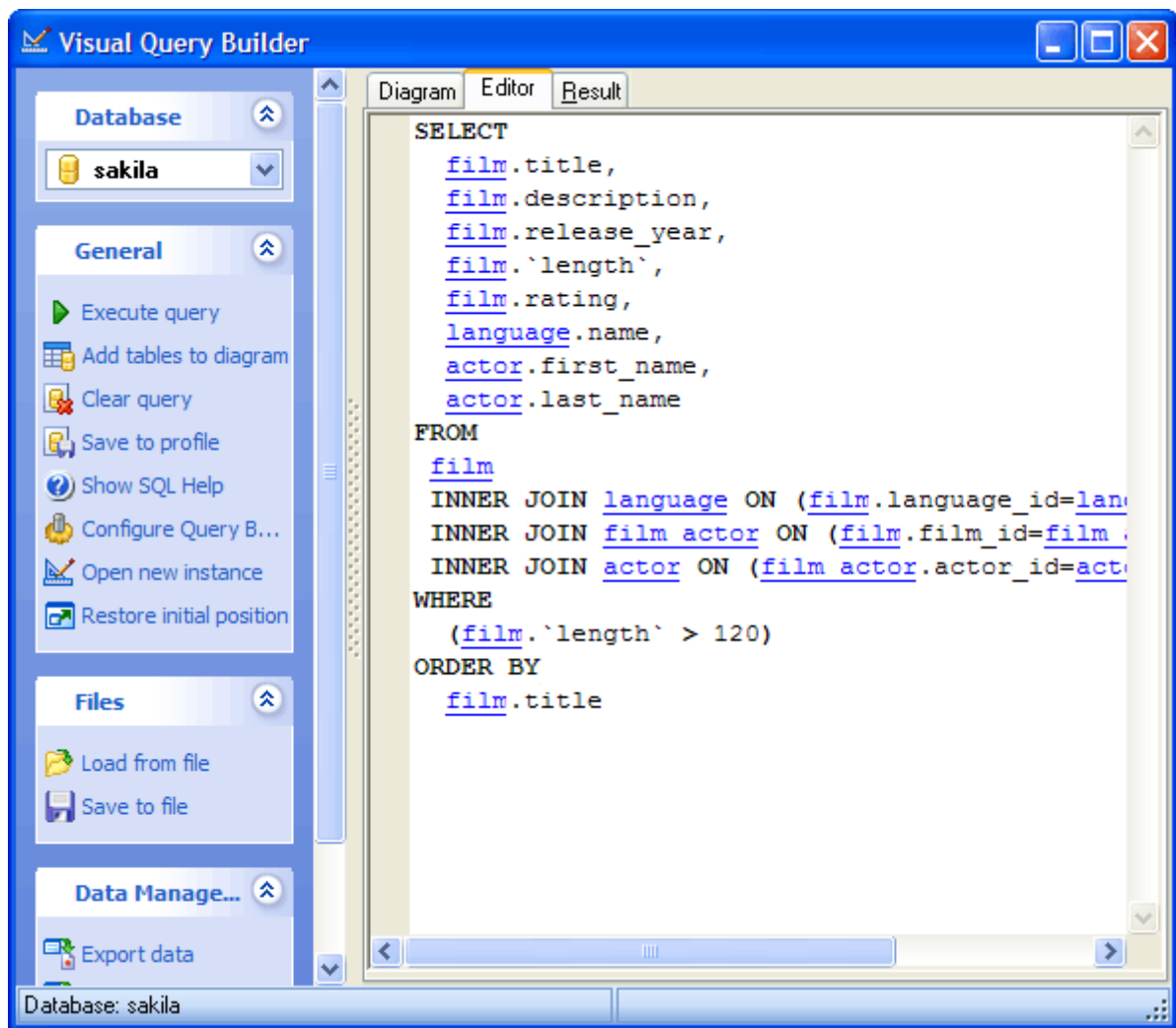
**Note:** The column names from the first `SELECT` statement are used as the column names for the results returned.

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](#).



### 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.

Visual Query Builder Designer Report designer BLOB Viewer Visual Query Builder

Database **pagila**

General

- Show SQL Help
- Configure Query Builder
- Open new instance
- Create view from SQL

Data Management

- Export data
- Get SQL dump
- Print data

Diagram Editor Result

Table

\* country

	* first_name	* last_name	email
	NULL	NULL	NULL
country : United Kingdom (9)			
1	ANNE	POWELL	ANNE.POWELL@sakilacustomer.org
2	APRIL	BURNS	APRIL.BURNS@sakilacustomer.org
3	ARMANDO	GRUBER	ARMANDO.GRUBER@sakilacustomer.org
4	CECIL	VINES	CECIL.VINES@sakilacustomer.org
5	DAN	PAINE	DAN.PAINE@sakilacustomer.org
6	GILBERT	SLEDGE	GILBERT.SLEDGE@sakilacustomer.org
7	MARSHALL	THORN	MARSHALL.THORN@sakilacustomer.org
8	MATTIE	HOFFMAN	MATTIE.HOFFMAN@sakilacustomer.org
9	SANDRA	MARTIN	SANDRA.MARTIN@sakilacustomer.org
country : United States (36)			
1	ALICE	STEWART	ALICE.STEWART@sakilacustomer.org
2	ANA	BRADLEY	ANA.BRADLEY@sakilacustomer.org
3	ASHLEY	RICHARDSON	ASHLEY.RICHARDSON@sakilacustomer.org
4	BETTY	WHITE	BETTY.WHITE@sakilacustomer.org
5	BILL	GAVIN	BILL.GAVIN@sakilacustomer.org
6	BRANDY	GRAVES	BRANDY.GRAVES@sakilacustomer.org
7	BRYAN	HARDISON	BRYAN.HARDISON@sakilacustomer.org
8	CAROLE	BARNETT	CAROLE.BARNETT@sakilacustomer.org
9	CAROLINE	BOWMAN	CAROLINE.BOWMAN@sakilacustomer.org
10	CASSANDRA	WALTERS	CASSANDRA.WALTERS@sakilacustomer.org
11	CLINTON	BUFORD	CLINTON.BUFORD@sakilacustomer.org
12	DIANA	ALEXANDER	DIANA.ALEXANDER@sakilacustomer.org
13	EVA	RAMOS	EVA.RAMOS@sakilacustomer.org
14	IAN	STILL	IAN.STILL@sakilacustomer.org

Records fetched: 599

Information

599 rows fetched (0,19 sec)

Database: pagila

## 8 Data Management

Query results and table data are displayed on the [Data](#)<sup>[74]</sup> or [Result](#)<sup>[155]</sup> tabs of [Table Editor](#)<sup>[70]</sup>, [SQL Editor](#)<sup>[153]</sup> or [Visual Query Builder](#)<sup>[158]</sup>.

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](#)<sup>[168]</sup> 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](#)<sup>[184]</sup> allows you to export data to various formats, including MS Excel, MS Access, RTF, HTML, PDF and more.
- [Get SQL Dump](#)<sup>[191]</sup> exports data to the SQL script as a number of INSERT statements.
- [Import Data](#)<sup>[194]</sup> provides you with possibility to import data from MS Excel, MS Access, DBF, XML, TXT, and CSV.
- [Edit BLOB](#)<sup>[179]</sup> allows you to view and edit the content of BLOB and TEXT fields.

## 8.1 Data View

SQL Maestro for MySQL represents all data (stored in tables and views, results of queries and procedures) in [grid](#)<sup>[169]</sup> or in [info cards](#)<sup>[174]</sup>. 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.

	CUST_NO	CUSTOMER	CONTACT_FIRST	CONTACT_LAST	PHONE_NO	ADDRESS
1	1001	Signature Design	Dale J.	Little	(619) 530-2710	150
2	1002	Dallas Technologies	Glen	Brown	(214) 960-2233	P. 4
3	1003	Buttle, Griffith and Co.	James	Buttle	(617) 488-1864	230
4	1004	Central Bank	Elizabeth	Brocket	61 211 99 88	66
5	1005	DT Systems, LTD.	Tai	Wu	(852) 850 43 98	400
6	1006	DataServe International	Tomas	Bright	(613) 229 3323	200
7	1007	Mrs. Beauvais	NULL	Mrs. Beauvais	NULL	P.C
8	1008	Anini Vacation Rentals	Leilani	Briggs	(808) 835-7605	330
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](#)<sup>[175]</sup> 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](#)<sup>[271]</sup>.

### Navigation bar

The Data management group of the Navigation bar allows to invoke [Data Input Form](#)<sup>[175]</sup>, [SQL Editor](#)<sup>[153]</sup> with SELECT query, [Data Export](#)<sup>[184]</sup>, and [Data Import](#)<sup>[194]</sup> modules using corresponding links, also get [SQLdump](#)<sup>[191]</sup> of the current data set and print current data with enabled preview in WYSIWYG mode.

**See also:** [Table Editor](#)<sup>[70]</sup>, [SQL Editor](#)<sup>[153]</sup>, [Visual Query Builder](#)<sup>[156]</sup>

### 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.



Result 1 Result 2 Result 3

Table

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](#) | [Always 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)

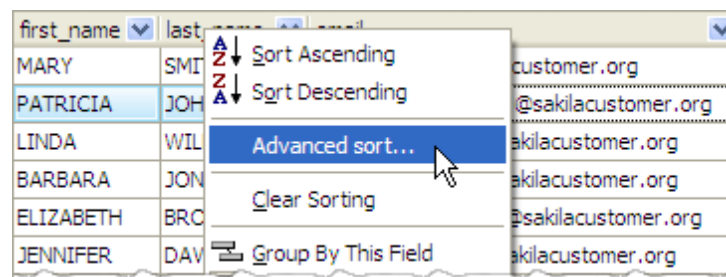
By default, the grid automatically switches to the simple mode for queries returning more than 5000 records (the number can be customized in the [Options](#) <sup>27th</sup> dialog).

The following abilities are not available in the simple grid mode:

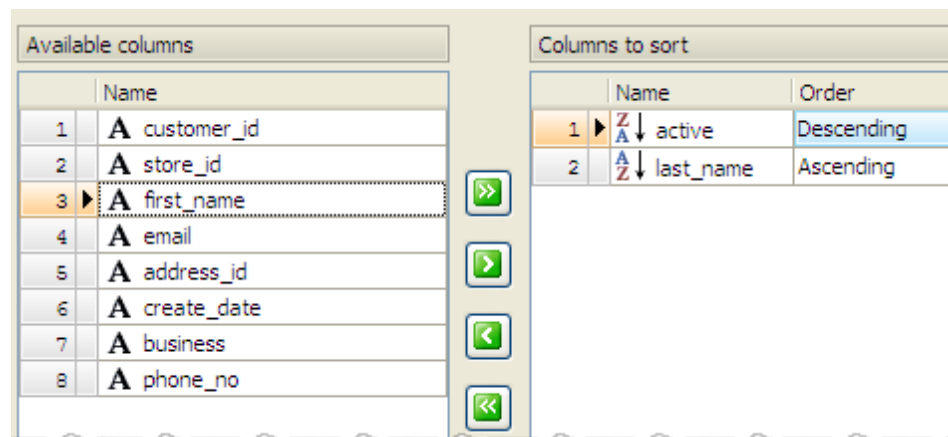
■ **Sorting data (only in the full grid mode)**

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.



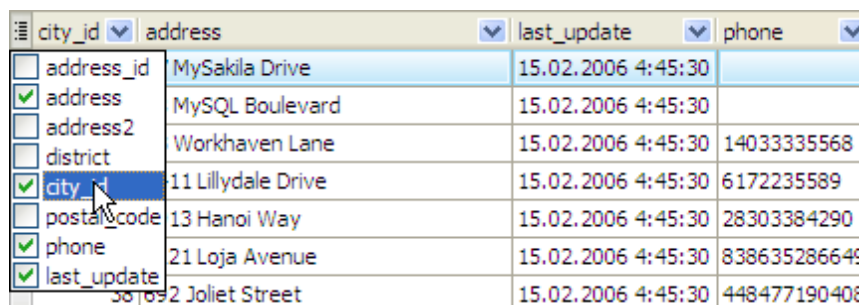
To cancel the sorting order, press **Ctrl** and click on the sorted column caption.

#### ■ Filtering represented records (only in the full grid mode)

There are several ways to filter data represented in grid. See [the corresponding topic](#)<sup>[176]</sup> 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.

The screenshot shows a data grid application with a toolbar at the top containing navigation and action icons. Below the toolbar, there are tabs for 'Result 1', 'Result 2', and 'Result 3'. The main area displays a table with columns: ID, team1ID, team2ID, score1, score2, refereeID, and comments. The data is grouped by 'round' and 'date'. The 'round' column has values 1, 2, 3, 4, 5, and 6. The 'date' column has values 24.08.2004, 25.08.2004, 30.08.2004, 14.12.2004, 11.09.2004, 12.09.2004, 13.09.2004. The table shows 380 records fetched. An 'Information' panel at the bottom indicates '380 rows fetched ( 0,64 sec)'.

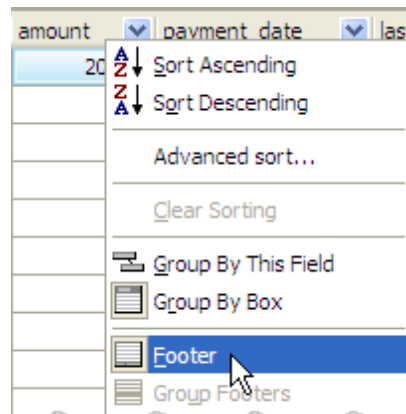
ID	team1ID	team2ID	score1	score2	refereeID	comments
round : 1						
round : 2						
round : 3						
date : 24.08.2004						
date : 25.08.2004						
24	6	2	3	0	8	Jeffers brukte 34 minutter på å vinne
22	1	4	3	0	17	I den hundrede kampen i alle konkurranse
29	16	5	1	2	19	Southamptons slapp inn mål i sin 11. li
27	9	13	0	2	0	Fulhams første tap denne sesongen,
28	14	18	2	2	18	Newcastle skuffer i årets Premier League
26	19	17	1	1	12	Det ble uavgjort på Hawthornes etter
date : 30.08.2004						
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

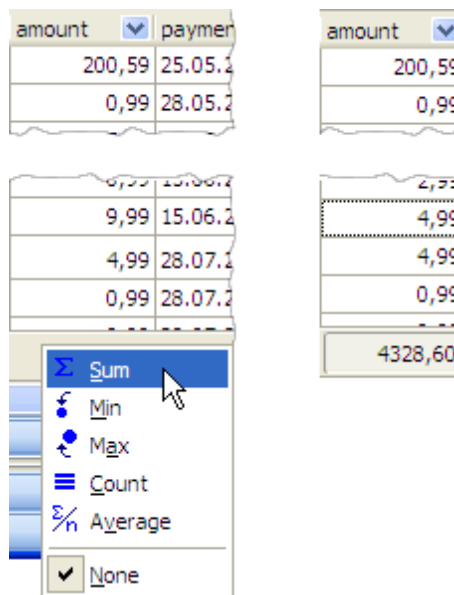
**Information**  
380 rows fetched ( 0,64 sec)

### ■ 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.



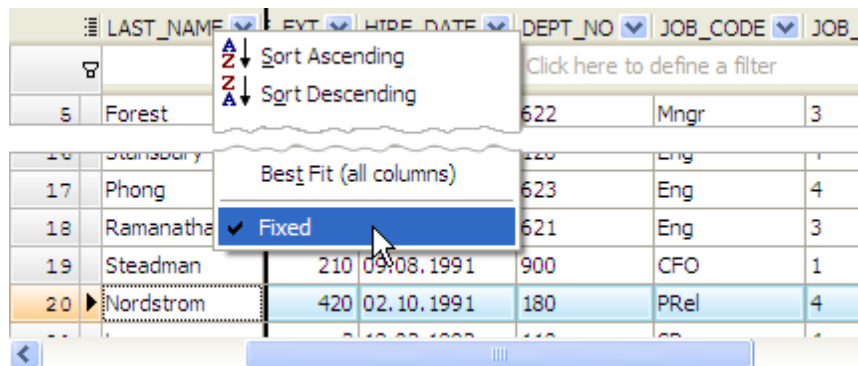
For grouped data use [Group Footers](#).

### ■ 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.

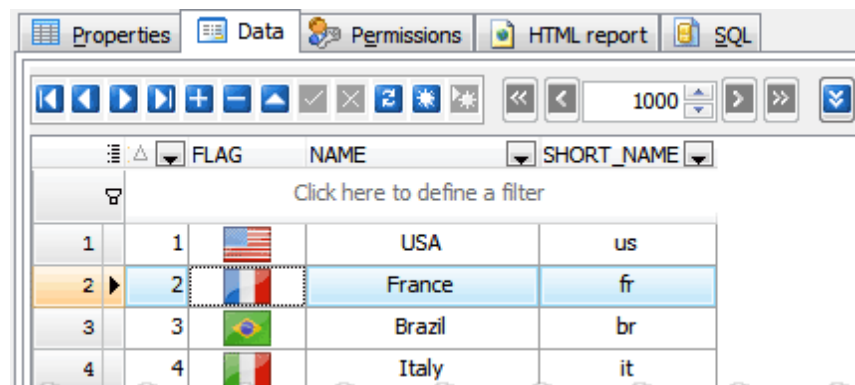


### ■ Row numbering

There is also a possibility to display row numbers in grids. You can [adjust](#)<sup>[272]</sup> the corresponding column to yours liking.

### ■ Inline images

It is possible to display images directly in the grid as on the picture below.



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](#)<sup>[179]</sup> (see below).

### ■ Working with BLOBs

To [edit a BLOB field](#)<sup>[179]</sup>, 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](#)<sup>[176]</sup> and edit data directly in info cards or with [Data Input Form](#)<sup>[175]</sup>.

The screenshot displays the 'Data Input Form' in SQL Maestro, showing a grid of six player records. Each record is presented as a form with fields for various attributes. The records are for players with IDs 18, 20, 21, 19, 21, and 21 (likely a typo for 22 in the original image). The fields include personal information (name, birthday, height, weight), career details (start/end years, position, current team), and other identifiers (country, college, current number). Each record also has a 'photo' field with a placeholder icon.

id:	first_name:	last_name:	career_start_year:	career_end_year:	position_id:	photo:	country_id:	height:	birthday:	weight:	college_id:	current_team_id:	current_number:
18	Gilbert	Arenas	2001	0	6		1	193	06.01.1982	97,5	15	12	0
20	Hilton	Armstrong	2006	0	11		1	211	11.11.1984	106,6	7	27	12
	Darrell	Arthur							25.03.198				
19	Trevor	Ariza	2004	0	10		1	203	30.06.1985	95,3	2	5	3
21	Ron	Artest	1999	0	10		1	201	13.11.1979	117,9	16	22	96
21	D.J.	Augustin							10.11.198				

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.

language_id	* name	* last_update
1	English	15.02.2006 10
2	Italian	15.02.2006 10
3	Japanese	15.02.2006 10
4	Mandarin	15.02.2006 10
5	French	15.02.2006 10
6	German	15.02.2006 10

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

SQL Maestro for MySQL 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**

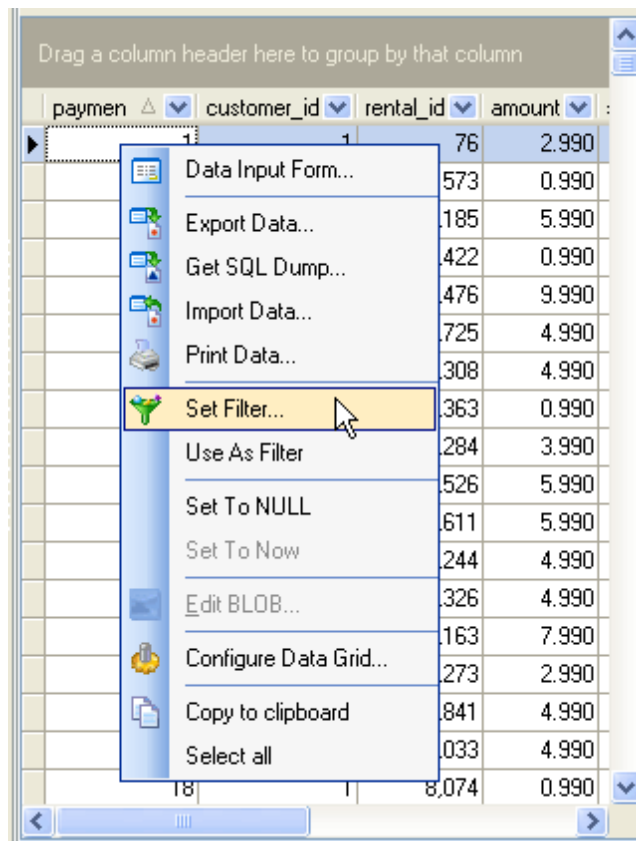
Use the drop-down button in the column caption area to filter records by the selected column value(s) or enter the filter condition directly in [the filter row](#)<sup>276</sup>.

### 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](#)<sup>[276]</sup>.

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](#)<sup>[153]</sup> and save as a query. You can also use [Generate query](#) link on the Navigation bar.

**See also:** [Data View](#)<sup>[168]</sup>, [Table Editor](#)<sup>[70]</sup>, [SQL Editor](#)<sup>[153]</sup>, [Visual Query Builder](#)<sup>[158]</sup>

## 8.2 BLOB Editor

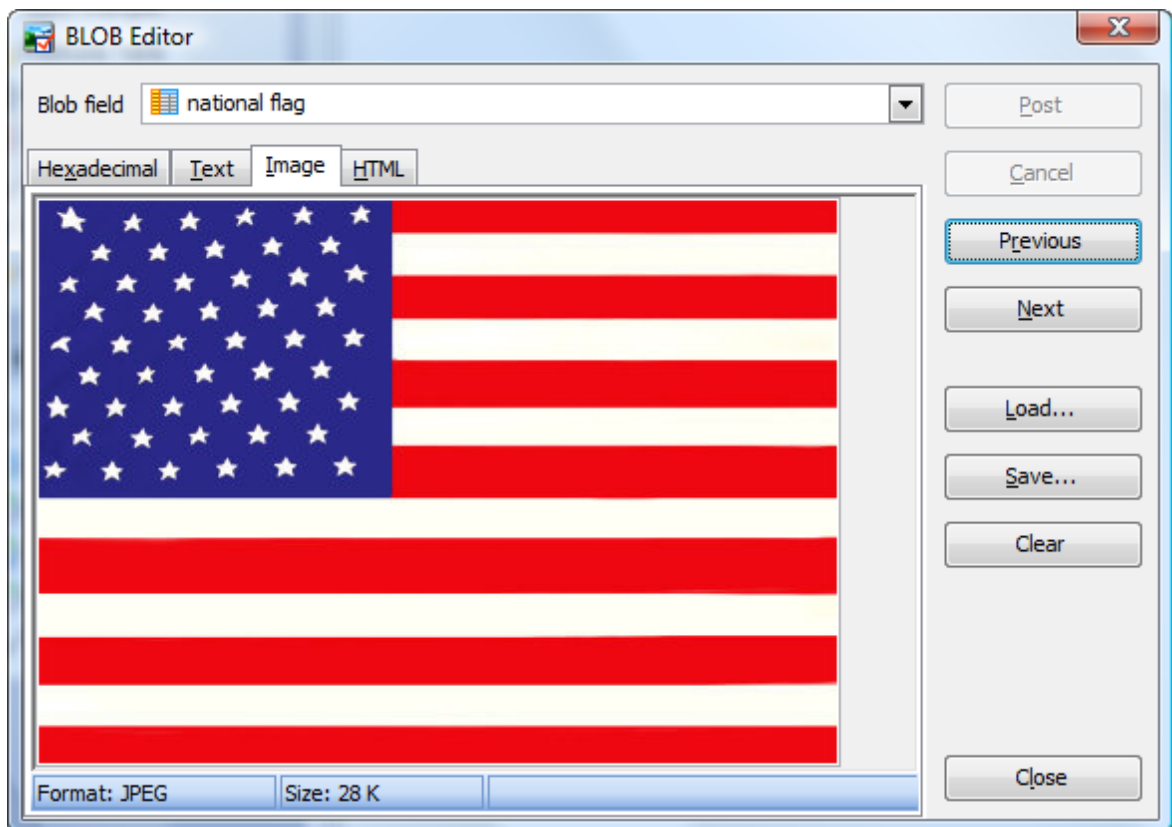
BLOB Editor is a tool to view and edit BLOB data in the following ways: [hexadecimal dump](#)<sup>[180]</sup>, [plain text](#)<sup>[180]</sup>, [graphical image](#)<sup>[179]</sup>, [HTML page](#)<sup>[181]</sup>, or [PDF document](#)<sup>[182]</sup>. BLOB Editor is invoked from [data grid](#)<sup>[168]</sup> of any [table editor](#)<sup>[70]</sup> or the result tab of [SQL Editor](#)<sup>[153]</sup> and [Visual Query Builder](#)<sup>[158]</sup> 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](#)<sup>[215]</sup> 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.

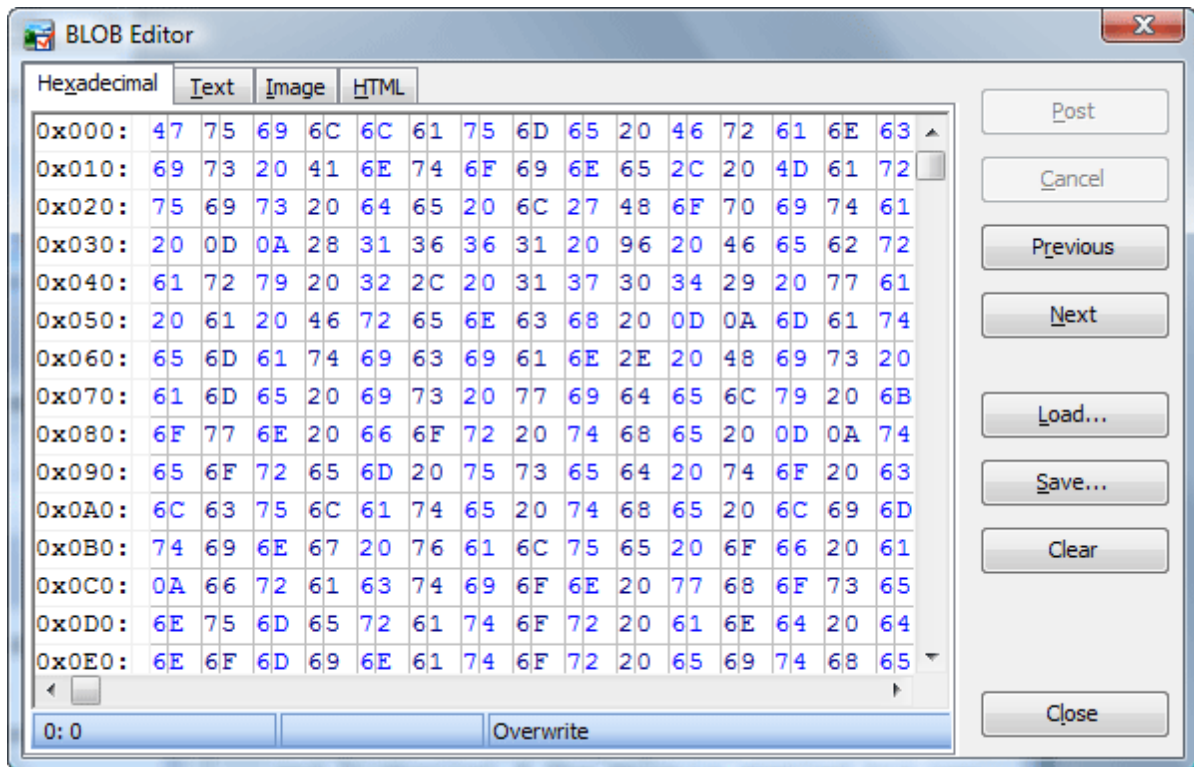
### 8.2.1 Editing as image

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.



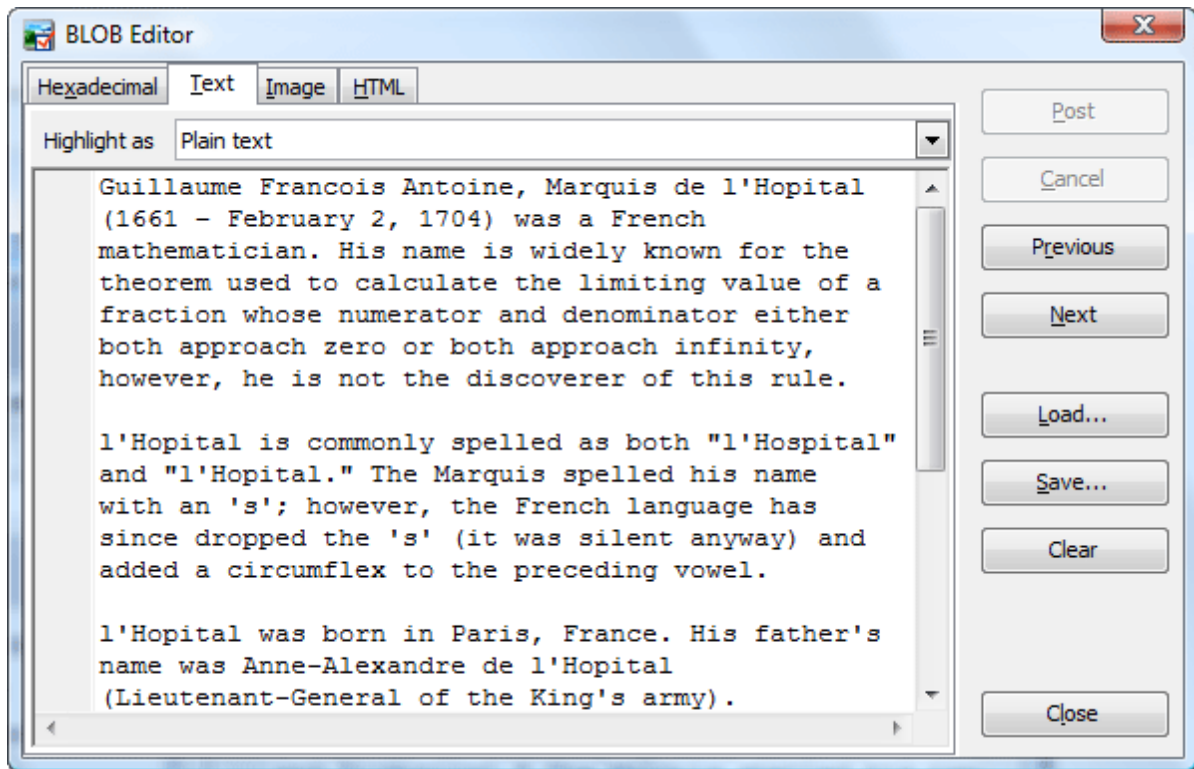
## 8.2.2 Editing as hexadecimal dump

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.



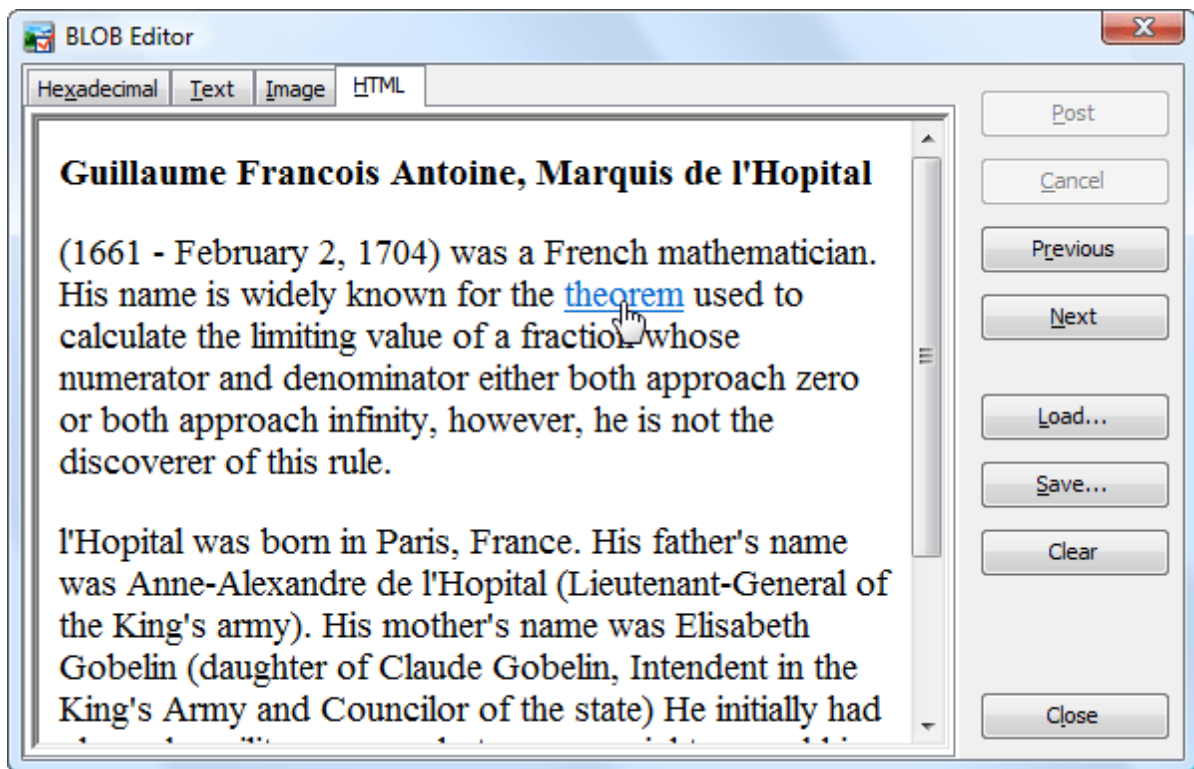
## 8.2.3 Editing as plain text

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.



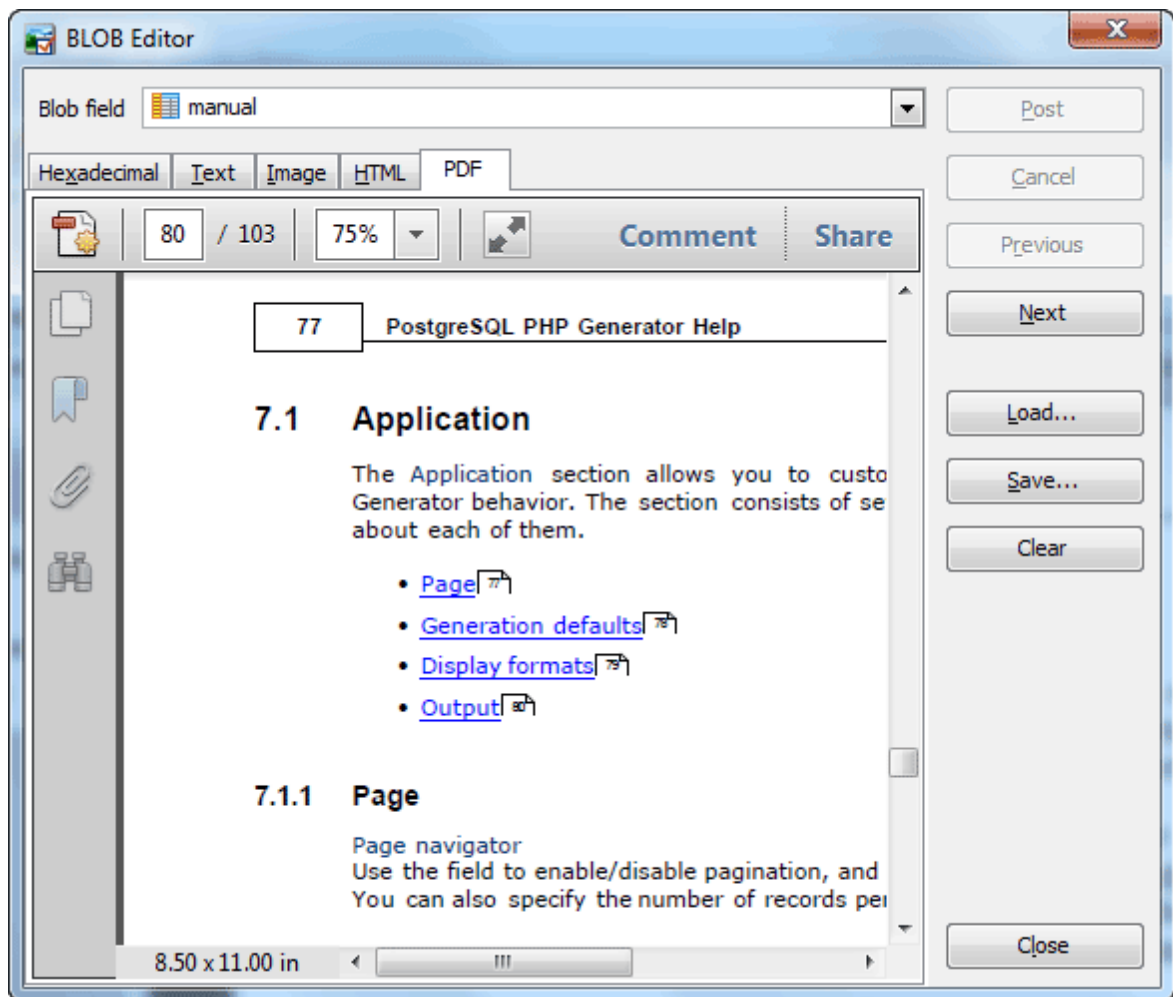
#### 8.2.4 Editing as HTML

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.



### 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.



## 8.3 Export Data Wizard

Data Export wizard is a tool to save data from MySQL 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](#)<sup>[184]</sup> of the destination file;
- Specify such additional options of the result file as [header and footer](#)<sup>[185]</sup>, [formats applied to exported data](#)<sup>[186]</sup> and [some format-specific options](#)<sup>[187]</sup>;
- [Select columns](#)<sup>[186]</sup> you want to include into result files;
- [Specify other export options](#)<sup>[190]</sup>.

**See also:** Get SQL Dump, [Import Data Wizard](#)<sup>[194]</sup>

### 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

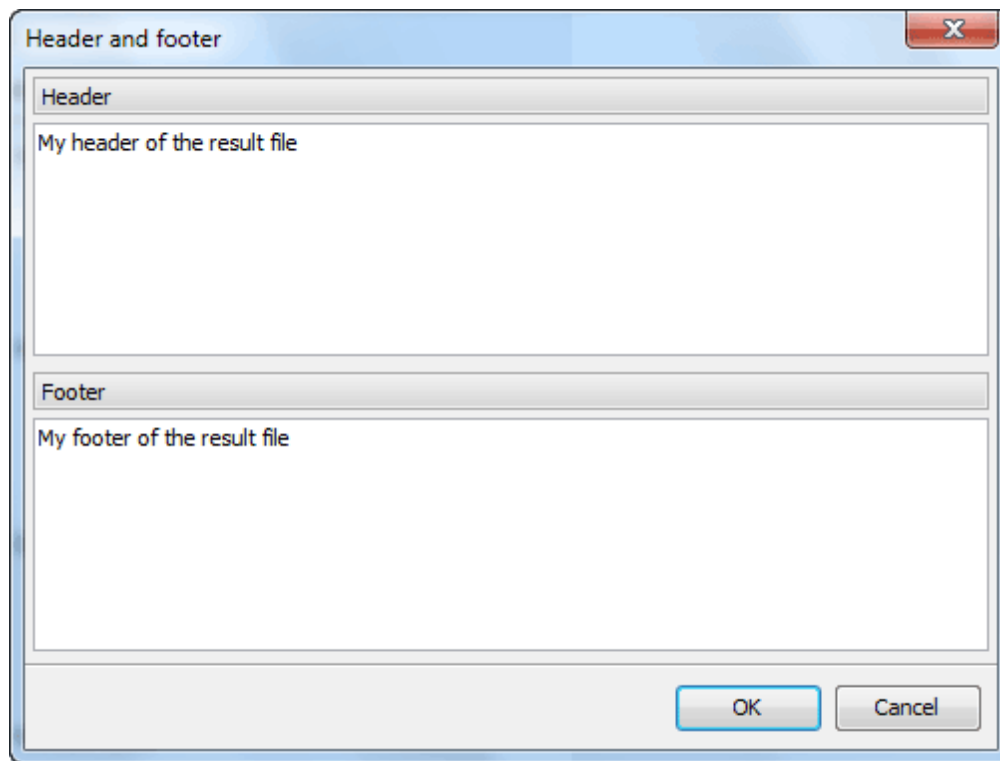
Encoding

ANSI

### 8.3.2 Setting header and footer

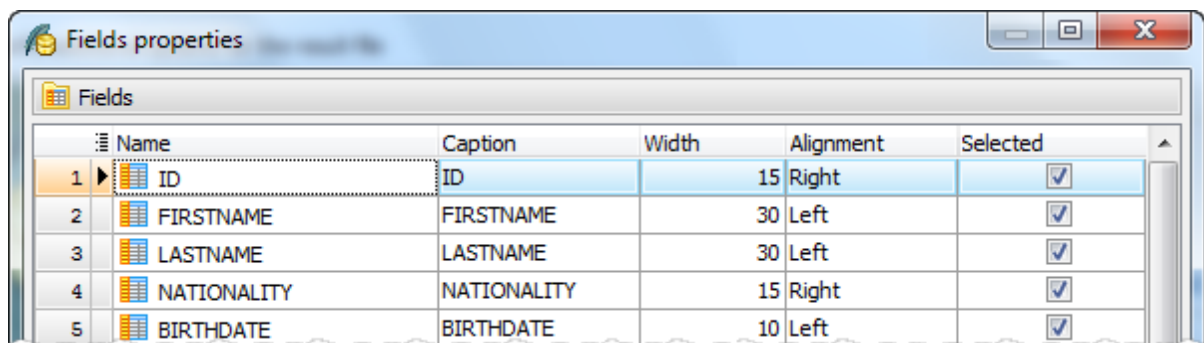
To specify the result file's header and footer, double click the corresponding button and complete fields of the [Header and Footer](#) window.





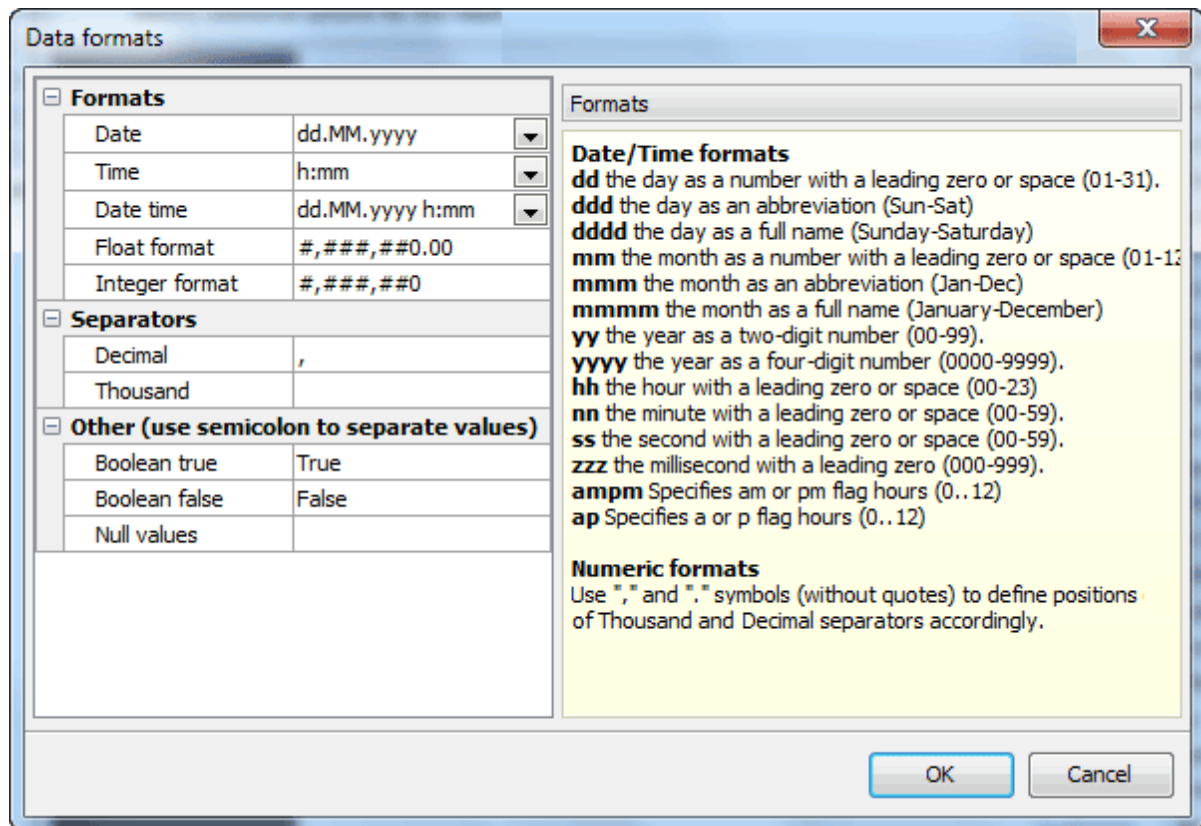
### 8.3.3 Selecting fields for export

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).



### 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.



### 8.3.5 Setting format-specific options

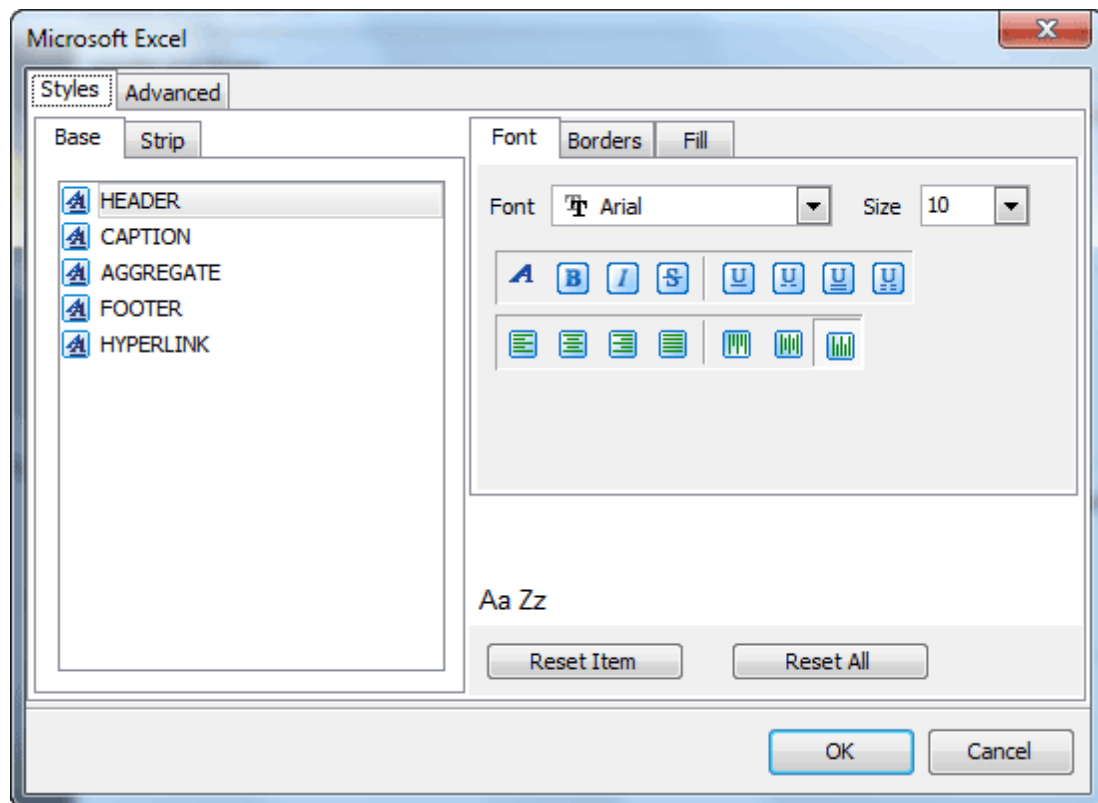
Each format supposes corresponding additional export options. Use the wizard option to adjust export properties depending on the target file format you have selected earlier. The following formats are at your disposal: [Microsoft Excel](#)<sup>[187]</sup>, Microsoft Excel 2007, [CSV](#)<sup>[189]</sup>, [Text](#)<sup>[189]</sup>, [HTML](#)<sup>[188]</sup>, [XML](#)<sup>[189]</sup>, 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.



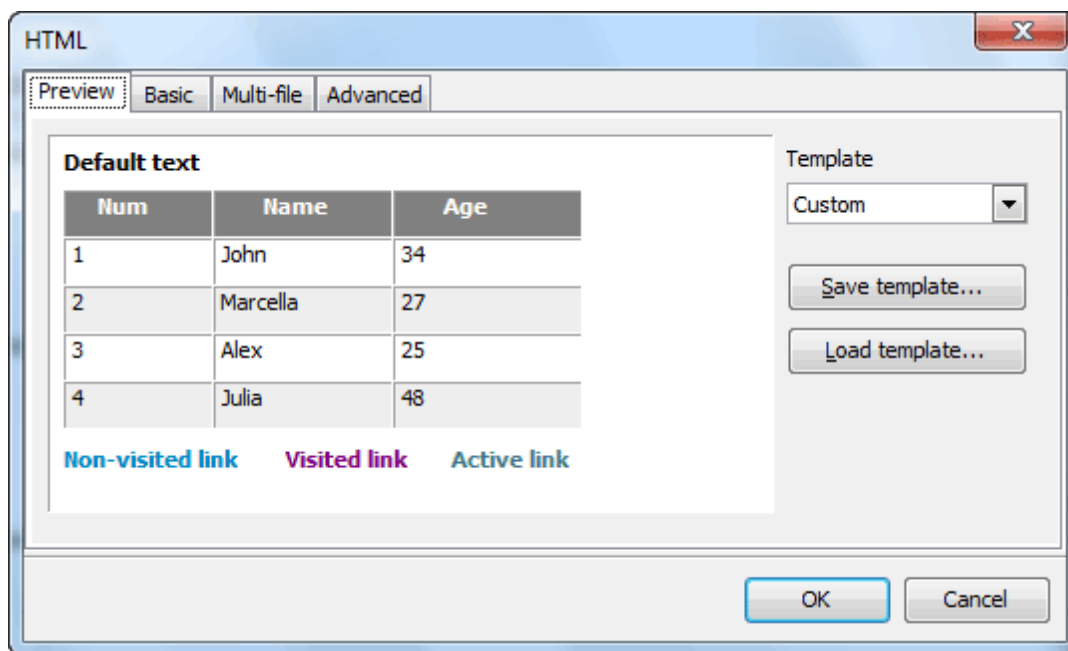
## HTML

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.

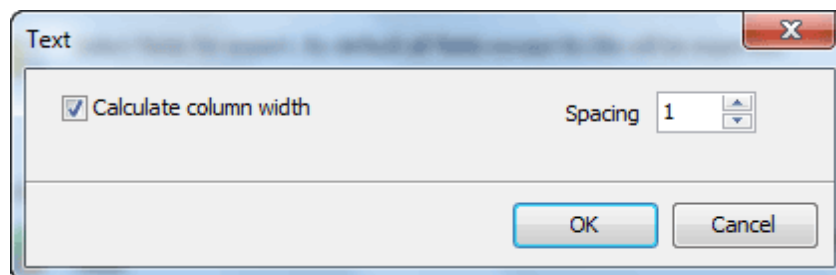
The [Multi-file](#) tab provides you with a possibility to split target HTML file into several separated files. This tab allows you to specify the record count for a single file, set an option to generate an index HTML file, and add an ability of navigation between each other to each of exported files.

The [Advanced](#) tab contains such HTML options as default font, background, cell padding and spacing, etc.



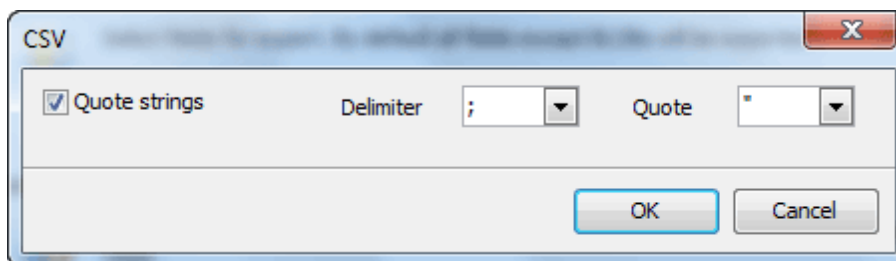
#### Text files

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.



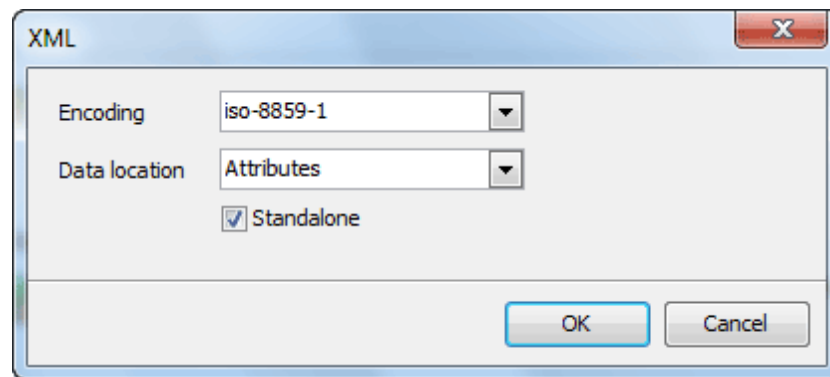
#### CSV files

You can specify column separator and optional values quote character for the target file on this step.



#### XML documents

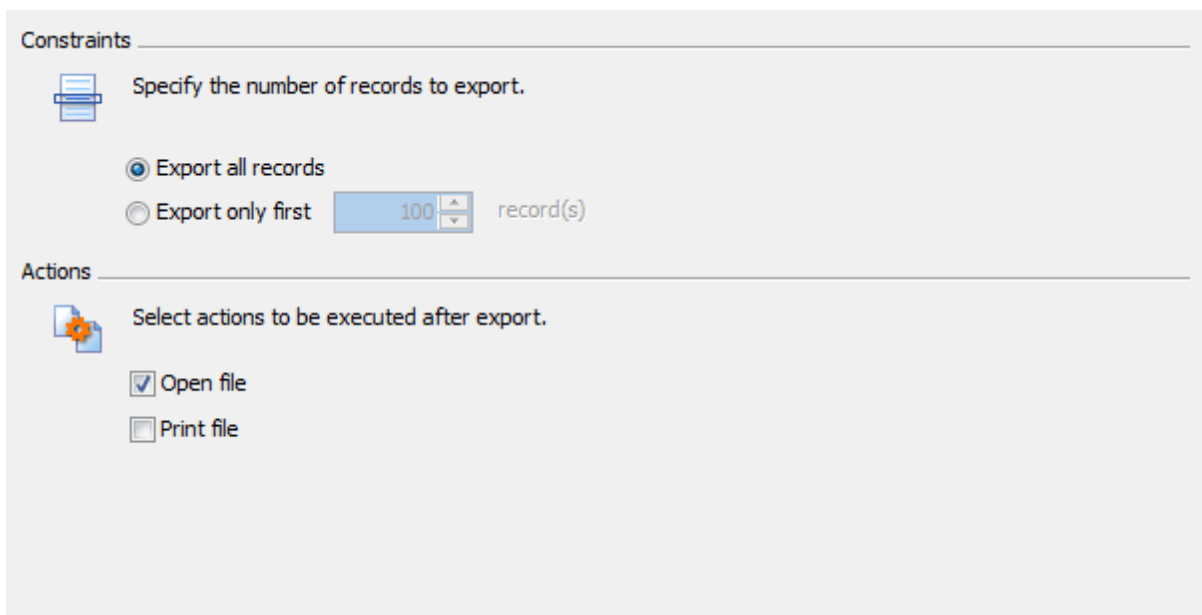
Specify XML document encoding in the [Encoding](#) edit box and set the Standalone option on if you wish the target document to be standalone.



### 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.



## 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](#).

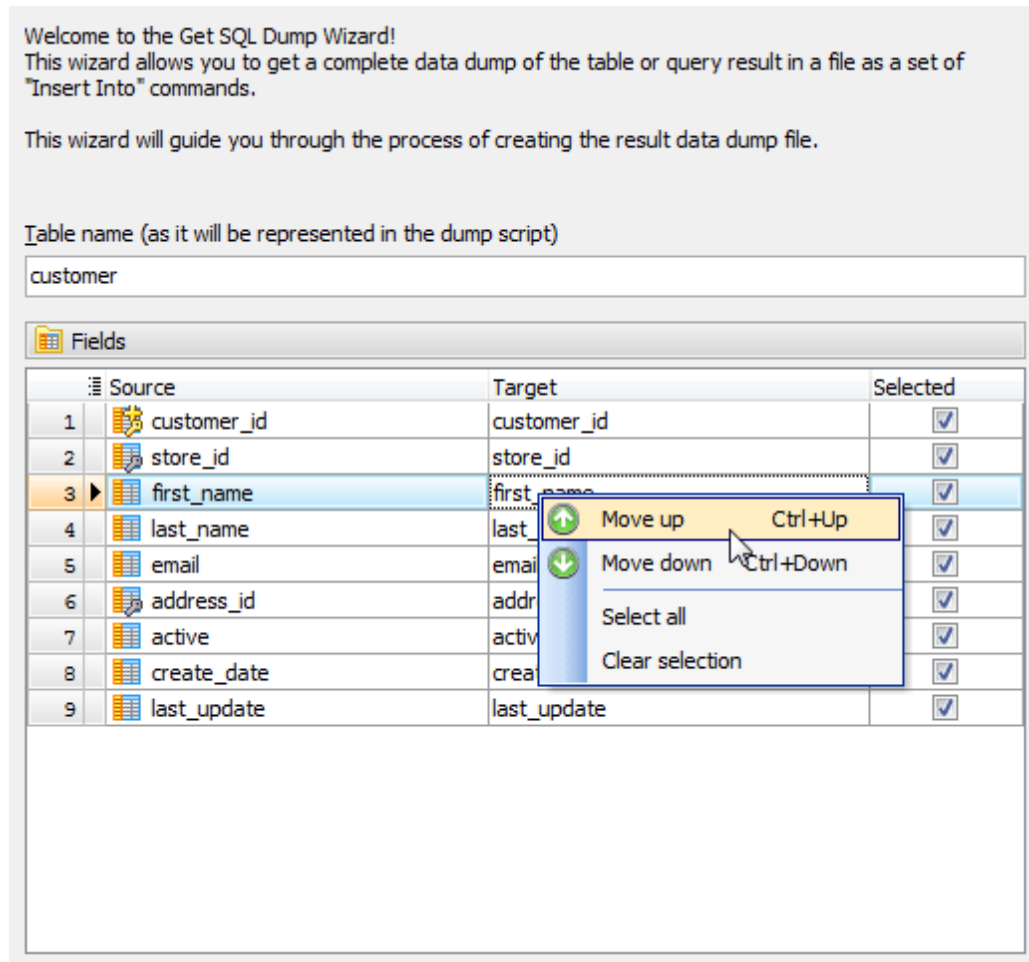
- [Selecting fields to include in the result INSERT statement](#) <sup>[191]</sup>
- [Specifying dump options](#) <sup>[192]</sup>

**See also:** [Export Data Wizard](#) <sup>[184]</sup>, [SQL Script Editor](#) <sup>[204]</sup>

### 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](#)<sup>[31]</sup>.



### 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](#)<sup>[204]</sup> 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

☐ Commit after each statement

☐ Use separate single-row INSERT statements  
Commit after

Statement syntax

  dump

Output

☒ Send to script editor

☐ Save to file

File name  Encoding

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 MySQL 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](#)<sup>[195]</sup> of the input data and the source file name;
- [Map source file columns and target table fields](#)<sup>[197]</sup>;
- [Specify other import options](#)<sup>[200]</sup>.

**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.

<b>File name</b>	<b>Password</b>	<b>Encoding</b>
D:\Data\Excel\employee.xls		ANSI
<b>Connection string</b>	<b>Identifier quote characters</b>	
	None (table_name)	
<b>Data source</b>	<b>Data location</b>	<b>Delimiter</b>
Employee_list	Attributes	
		<b>Quote</b>

**See also:** [Export Data Wizard](#)

### 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:

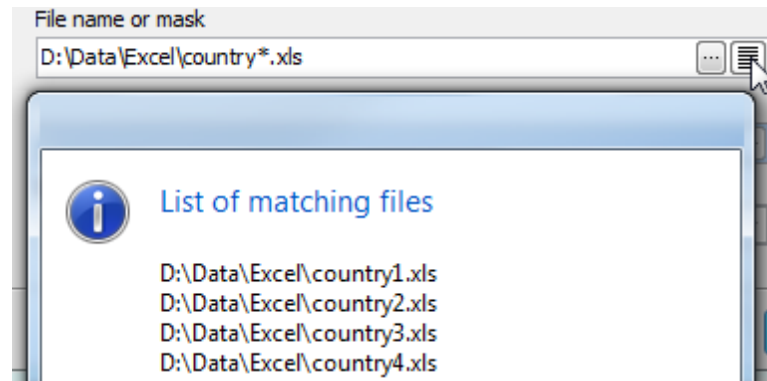
*D:\Data\Excel\country1.xls*

*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*.



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"?>
```

```
<DATAPACKETVersion="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](#)<sup>[198]</sup> 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](#)<sup>[199]</sup> used for the input file.

To exclude the first file row, use the [File contains column header](#) checkbox.

Columns				
	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

Auto fill

Clear

Define columns...

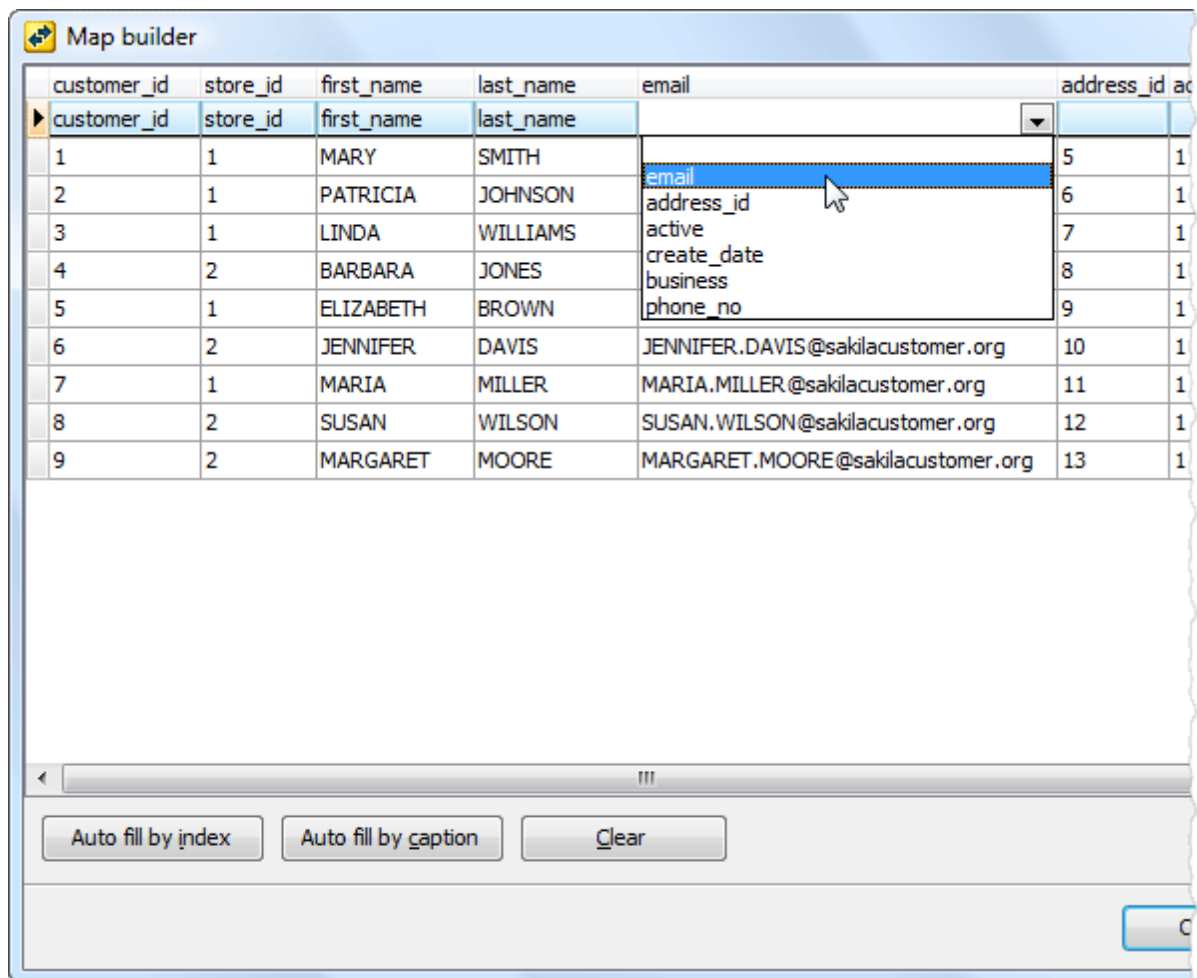
Data formats...

More...

☐ 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.



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	

	0	10	20	
	custo	store	first_name	
1	1	1	MARY	
2	1	1	PATRICIA	
3	1	1	LINDA	
4	2	1	BARBARA	
5	1	1	ELIZABETH	
6	2	1	JENNIFER	
7	1	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	dddmmm 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.

<div> <div>Formats</div> <table> <tr><td>Date</td><td></td></tr> <tr><td>Time</td><td></td></tr> <tr><td>Date time</td><td></td></tr> </table> </div>		Date		Time		Date time		<div>Date time formats</div> <p> <b>dd</b> the day as a number with a leading zero or space (01-31).  <b>ddd</b> the day as an abbreviation (Sun-Sat)  <b>dddd</b> the day as a full name (Sunday-Saturday)  <b>mm</b> the month as a number with a leading zero or space (01-12).  <b>mmm</b> the month as an abbreviation (Jan-Dec)  <b>mmmm</b> the month as a full name (January-December)  <b>yy</b> the year as a two-digit number (00-99).  <b>yyyy</b> the year as a four-digit number (0000-9999).  <b>hh</b> the hour with a leading zero or space (00-23)  <b>nn</b> the minute with a leading zero or space (00-59).  <b>ss</b> the second with a leading zero or space (00-59).  <b>zzz</b> the millisecond with a leading zero (000-999).  <b>ampm</b> Specifies am or pm flag hours (0..12)  <b>ap</b> Specifies a or p flag hours (0..12)         </p>
Date								
Time								
Date time								
<div> <div>Separators</div> <table> <tr><td>Decimal</td><td>,</td></tr> <tr><td>Thousand</td><td>#160</td></tr> </table> </div>		Decimal	,	Thousand	#160			
Decimal	,							
Thousand	#160							
<div> <div>Other (use semicolon to separate values)</div> <table> <tr><td>Boolean true</td><td>True</td></tr> <tr><td>Boolean false</td><td>False</td></tr> <tr><td>Null values</td><td>;NULL</td></tr> </table> </div>		Boolean true	True	Boolean false	False	Null values	;NULL	
Boolean true	True							
Boolean false	False							
Null values	;NULL							

### 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 necessary 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.

### Import mode

If the [Update existing records](#) option is turned ON, the records will be either updated or inserted: an UPDATE will be performed when a target row exists in the table and an INSERT is performed when the target row does not exist.

### LOAD DATA INFILE command

Import Data Wizard supports this command to insert data to the table. This feature can speed up the import process up to 10 times so it is recommended to use it always if possible. Uncheck this option to use INSERT statements instead.



## 9 Database Tools

**SQL Maestro for MySQL** provides a number of powerful tools for working with databases.

The following tools are available:

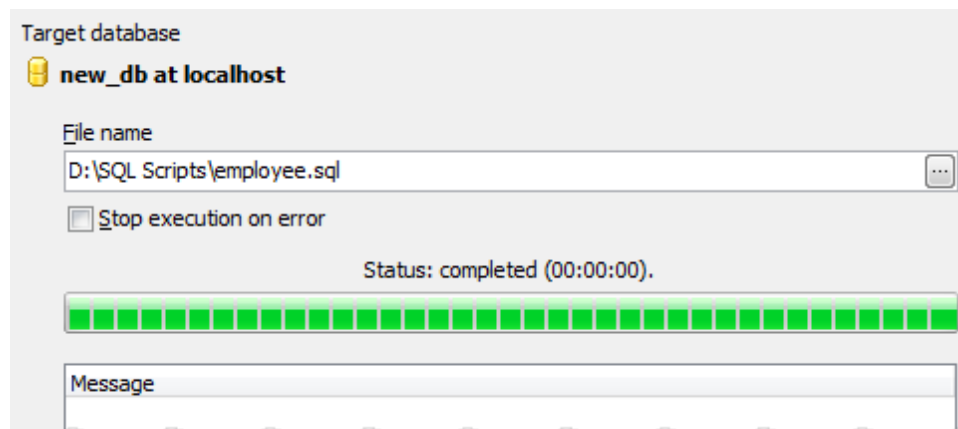
- **[SQL Editor](#)**<sup>[153]</sup>  
Creates and executes SQL queries.
- **[Visual Query Builder](#)**<sup>[158]</sup>  
Builds queries visually.
- **[Script Runner](#)**<sup>[203]</sup>  
Executes SQL scripts to the database.
- **[SQL Script Editor](#)**<sup>[204]</sup>  
Allows to edit and execute SQL scripts.
- **[Extract Database Wizard](#)**<sup>[208]</sup>  
Extracts the database objects and data to the SQL script, which can be executed later to reserve the database structure and data.
- **[Generate Database Report Wizard](#)**<sup>[213]</sup>  
Generates the database HTML or PDF report for structure of selected object in a whole or partially.
- **[BLOB Viewer](#)**<sup>[215]</sup>  
Displays a content of BLOB fields in different representations.
- **[Diagram Viewer](#)**<sup>[221]</sup>  
Represents data from a table or a query as a diagram in various ways.
- **[Data Analysis](#)**<sup>[225]</sup>  
Allows to slice and dice information efficiently according your business rules.
- **[Report Designer](#)**<sup>[230]</sup>  
Prepares data for reading, viewing, and printing in a polished look.
- **[Schema Designer](#)**<sup>[237]</sup>  
Allows to represent database tables and relationships as ER diagrams.
- **[Process Browser](#)**<sup>[242]</sup>  
A very useful feature for DBAs to monitor the users' activity.
- **[SQL Generator](#)**<sup>[243]</sup>  
Provides you with a set of simple SQL statements.
- Simple tools for and **[Updatable views](#)**<sup>[246]</sup> 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**<sup>[204]</sup>.

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.

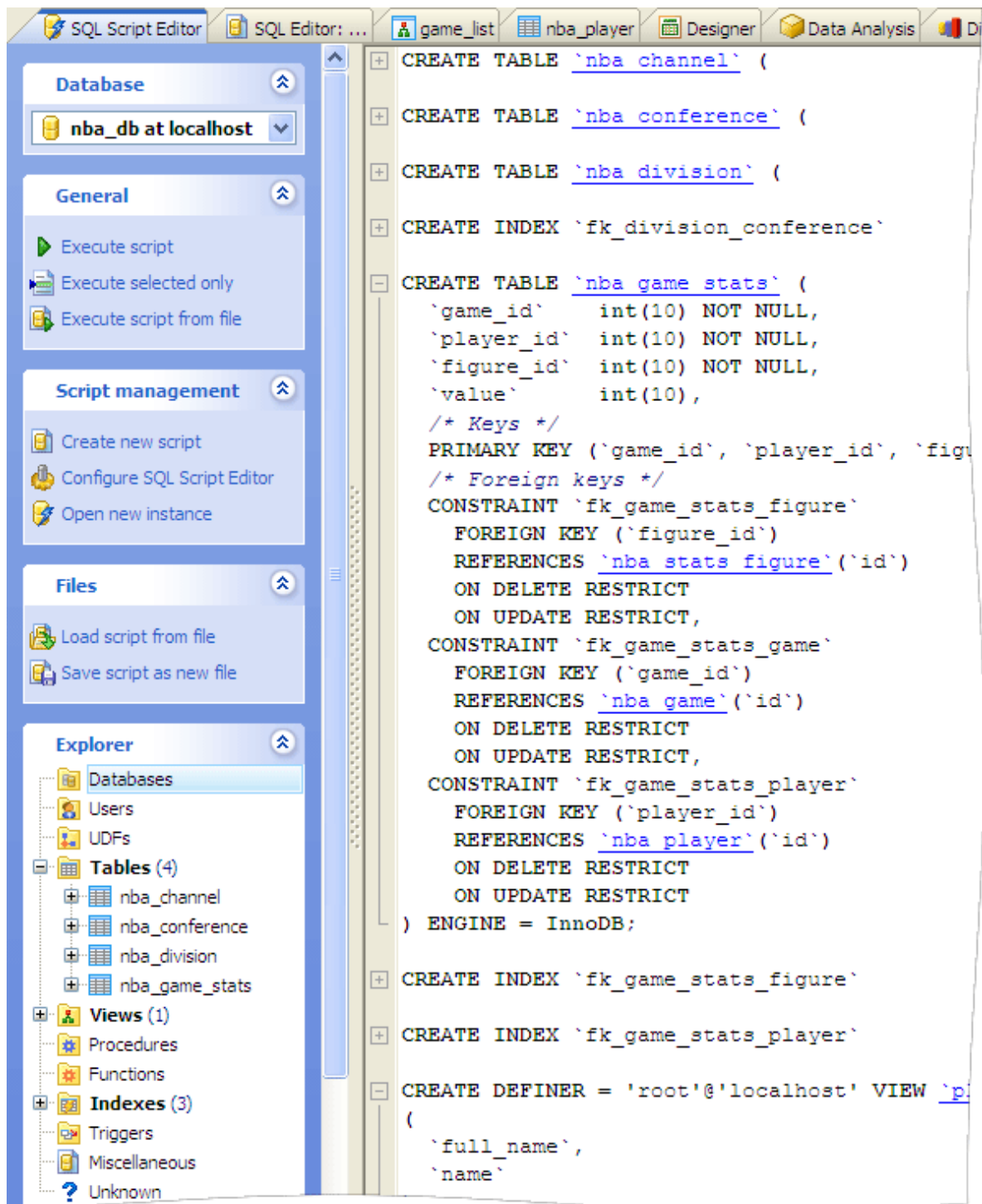


## 9.2 SQL Script Editor

[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](#)<sup>[153]</sup>. If you have a script that is ready to use, execute it with [Script Runner](#)<sup>[203]</sup>. 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](#)<sup>[203]</sup>. 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](#)<sup>[263]</sup> tab.



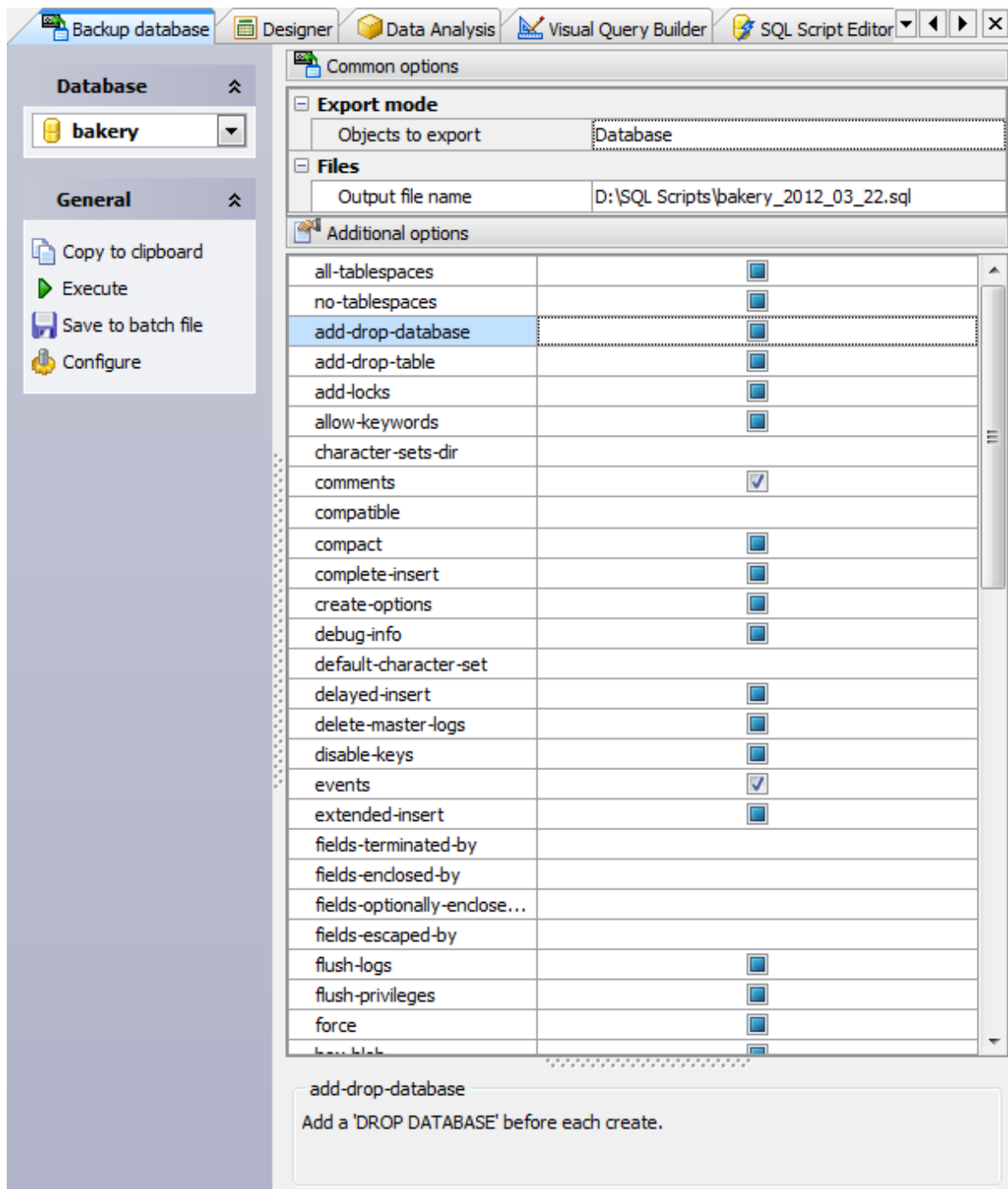
## 9.3 Backup Database

The Database Backup tool allows you to dump the whole database as well as selected tables. To invoke the window select the Tools | Backup Database main menu item.

The tool actually automates your work with the *mysqldump* client. The topic contains a very general overview of how SQL Maestro for MySQL doing a backup. Please refer to [MySQL documentation](#) for detailed information on *mysqldump* options.

To get the prepared command line to the *mysqldump*:

- select the objects to export: the whole database or selected tables;
- specify the name of the output dump file;
- select tables to be dumped (in case of tables backup);
- set additional options to create more suitable backup.



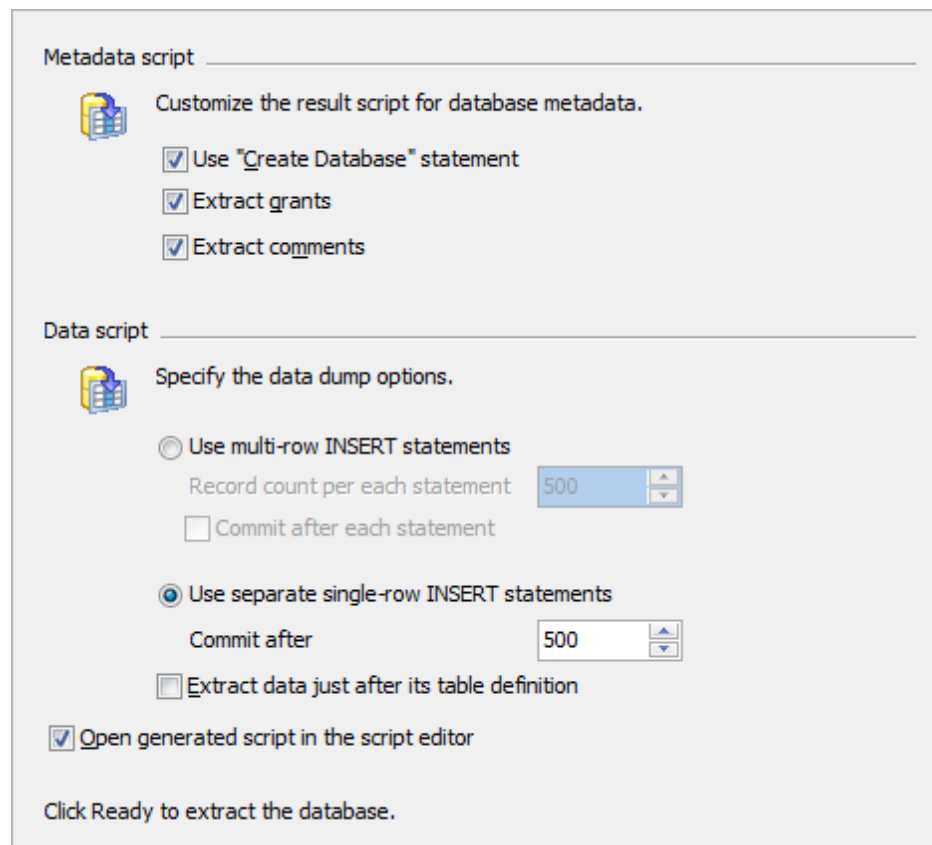
## 9.4 Extract Database

Using [Extract Database Wizard](#) you can extract database objects and data to a SQL script, e.g. for backup purposes. To run this wizard select the [Tools | Extract Database](#) main menu item.

Use the [More...](#) button to save the extract configuration for future use or to load the previously saved configuration for faster extract.

- [Selecting database to extract and the target script file name](#)<sup>[208]</sup>
- [Selecting database objects to extract their structure](#)<sup>[209]</sup>
- [Selecting database objects to extract their data](#)<sup>[210]</sup>
- [Customizing script options](#)<sup>[211]</sup>

**See also:** [Get SQL Dump Wizard](#)<sup>[191]</sup>



The screenshot shows the 'Extract Database Wizard' configuration window. It is divided into two main sections: 'Metadata script' and 'Data script'. The 'Metadata script' section has a description 'Customize the result script for database metadata.' and three checked checkboxes: 'Use "Create Database" statement', 'Extract grants', and 'Extract comments'. The 'Data script' section has a description 'Specify the data dump options.' and two radio button options. The first option is 'Use multi-row INSERT statements' with a 'Record count per each statement' spinner set to 500 and an unchecked 'Commit after each statement' checkbox. The second option is 'Use separate single-row INSERT statements' with a 'Commit after' spinner set to 500 and an unchecked 'Extract data just after its table definition' checkbox. At the bottom of the 'Data script' section, there is a checked checkbox for 'Open generated script in the script editor'. A final instruction at the bottom of the window says 'Click Ready to extract the database.'

### 9.4.1 Selecting the database and the target file name

Select the [source database](#) to extract and set the target script [file name](#).

Select the components to be extracted: object definitions, table data or both.

Welcome to the Extract Database Wizard!  
This wizard allows you to extract the database structure and table data into the SQL script.

This wizard will guide you through the process of selecting schema objects and data tables and setting other options for generating the result script.

Source database  
NORTHWIND at MERCURY

Script file name  
NORTHWIND.sql

You can select to extract either database structure, or table data only, or both.  
Which components would you like to extract?

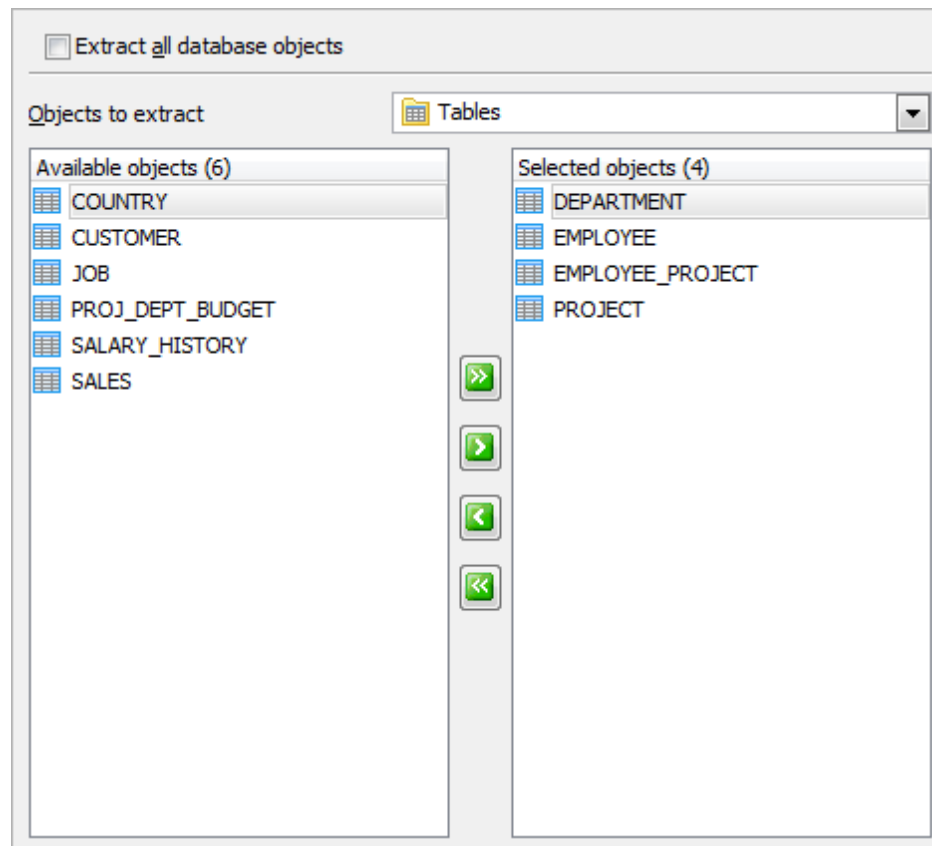
☒ Extract both of structure and data  
☐ Extract structure only  
☐ Extract data only

### 9.4.2 Selecting objects to extract their structure

Select the database object to be extracted or check the [Extract all database objects](#) option to extract all objects from the database.

**Note:** this step is not available if you select the extract data only mode when [selecting components to be extracted](#) <sup>[208]</sup>.

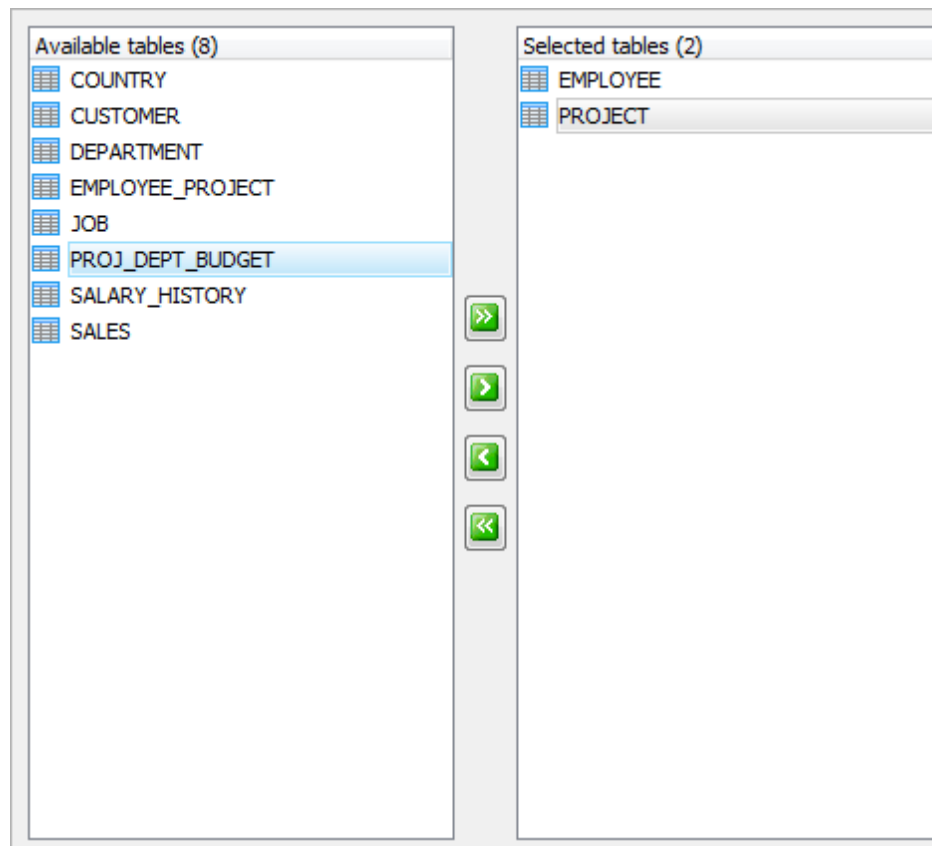




### 9.4.3 Selecting objects to extract their data

Select the tables to extract their data by moving them from the [Available tables](#) list to the [Selected tables](#) list.

**Note:** this step is not available if you select the extract structure only mode when [selecting components to be extracted](#) <sup>[208]</sup>.



#### 9.4.4 Customizing script options

Adjust the result script for database metadata according to your needs. To include/exclude the following statements into the script, check the corresponding boxes: *CREATEDATABASE*, *DROPDATABASE IF EXISTS*, *DROP IF EXISTS* statements for database objects, and foreign key checks.


Select the data dump mode to be used ([Multi-row INSERT statements](#) or [separate single-row INSERT statements](#)) and specify commits' frequency.

You can also set extract data after its table definition.

Fill the [Open generated script in the script editor](#) box to load the result script to [SQL Script Editor](#)<sup>204</sup>.

Click the [Ready](#) button to start the extraction process.

Metadata script \_\_\_\_\_


 Customize the result script for database metadata.

☒ Use "Create Database" statement

☒ Extract grants

☒ Extract comments

Data script \_\_\_\_\_

 Specify the data dump options.

☐ Use multi-row INSERT statements

Record count per each statement

☐ Commit after each statement

☒ Use separate single-row INSERT statements

Commit after

☐ Extract data just after its table definition

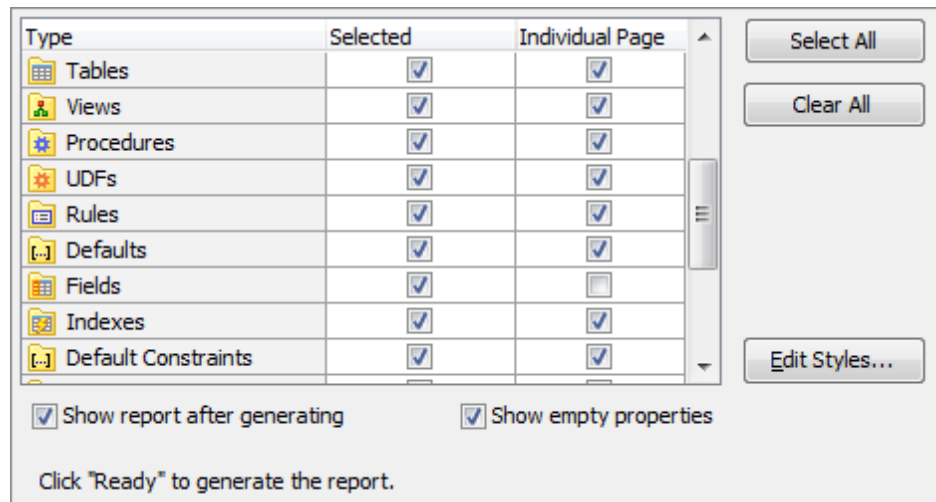
☒ Open generated script in the script editor

Click Ready to extract the database.

## 9.5 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](#)<sup>[213]</sup>
- [Specifying reporting objects and editing styles](#)<sup>[213]</sup>



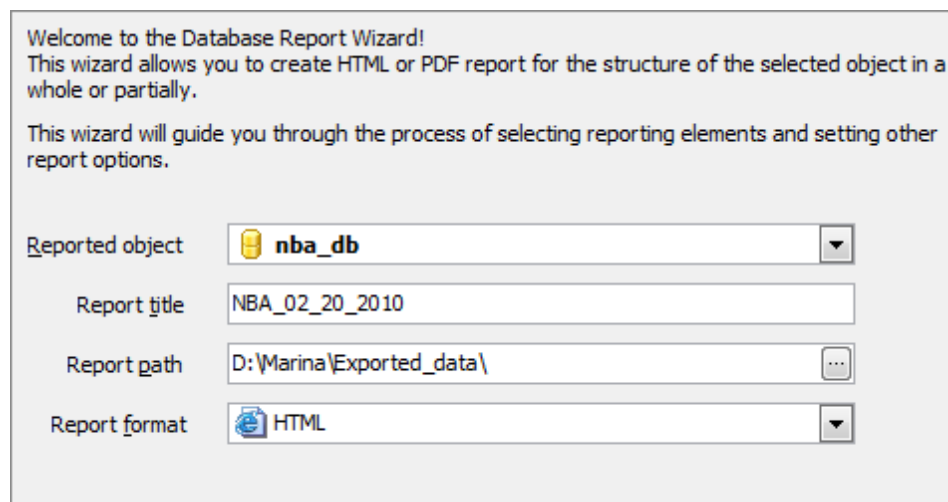
Type	Selected	Individual Page
Tables	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Views	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Procedures	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
UDFs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rules	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Defaults	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fields	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Indexes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Default Constraints	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

☒ Show report after generating
 ☒ Show empty properties

Click "Ready" to generate the report.

### 9.5.1 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

### 9.5.2 Reporting objects and editing styles options

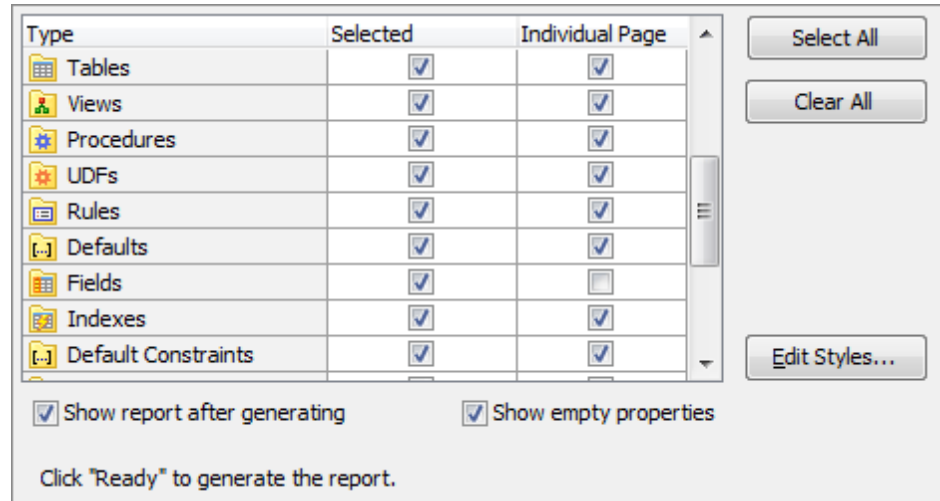
This step allows you to select the essential objects to report and to specify the output format and style using [Report Style Editor](#)<sup>[214]</sup>.

- ☒ 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.



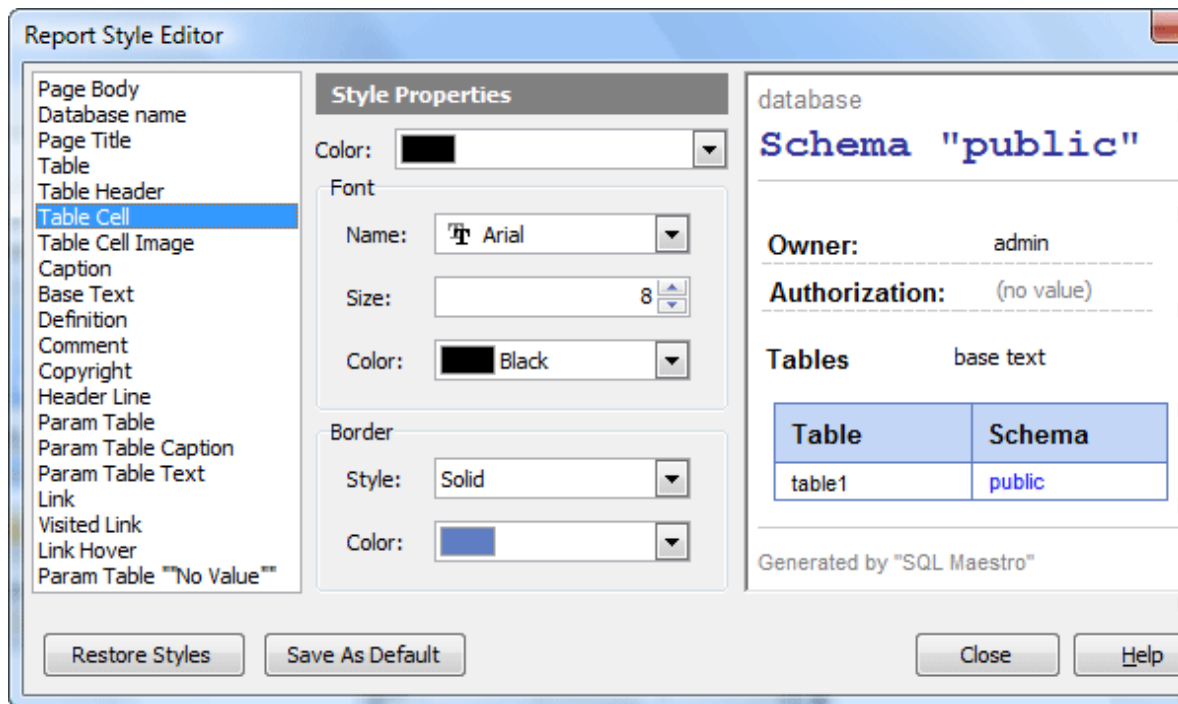
Type	Selected	Individual Page
Tables	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Views	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Procedures	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
UDFs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rules	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Defaults	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fields	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Indexes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Default Constraints	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

☒ Show report after generating
 ☒ Show empty properties

Click "Ready" to generate the report.

### 9.5.3 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.



**Report Style Editor**

**Style Properties**

Color:  

Font

Name: A Arial

Size: 8

Color:   Black

Border

Style: Solid

Color:  

database

**Schema "public"**

Owner: admin

Authorization: (no value)

Tables base text

Table	Schema
table1	public

Generated by "SQL Maestro"

Restore Styles Save As Default Close Help

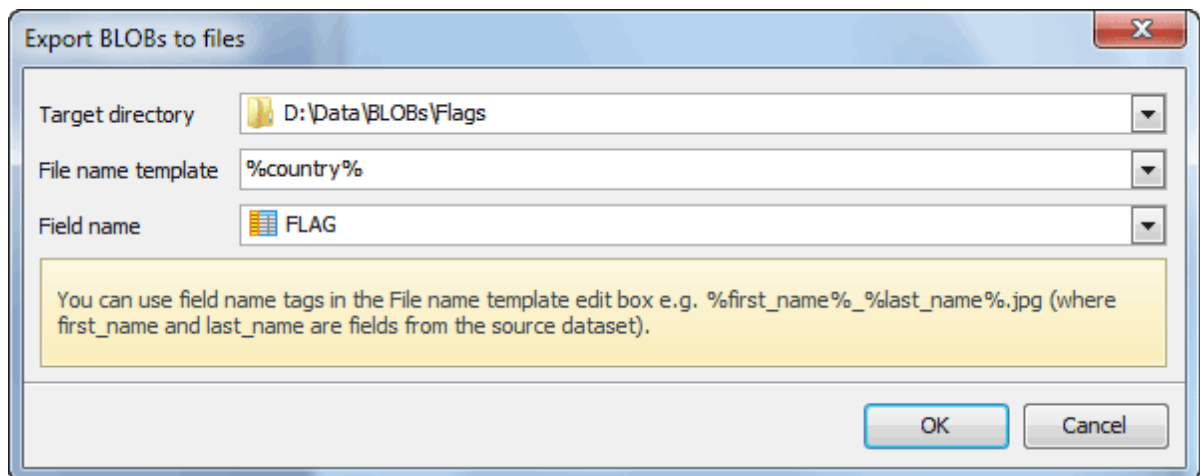
## 9.6 BLOB Viewer

BLOB Viewer allows you to view the content of the BLOB fields in various representations.

- [Viewing BLOB field as hexadecimal dump](#)<sup>[215]</sup>
- [Viewing BLOB field as plain text](#)<sup>[216]</sup>
- [Viewing BLOB field as graphical image](#)<sup>[217]</sup>
- [Viewing BLOB field as HTML](#)<sup>[218]</sup>
- [Viewing BLOB field as PDF](#)<sup>[219]</sup>

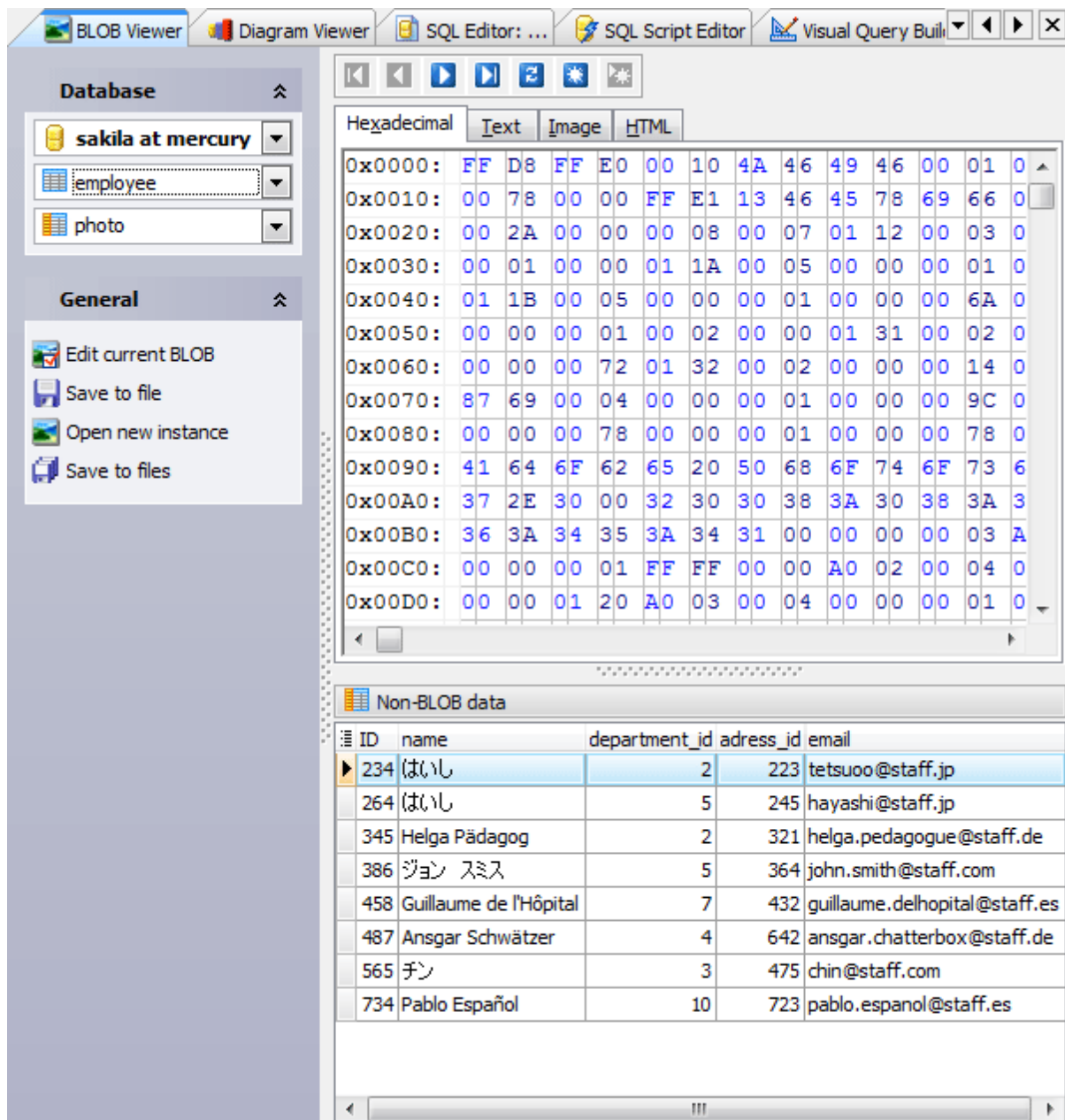
**See also:** [BLOB Editor](#)<sup>[179]</sup>

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.



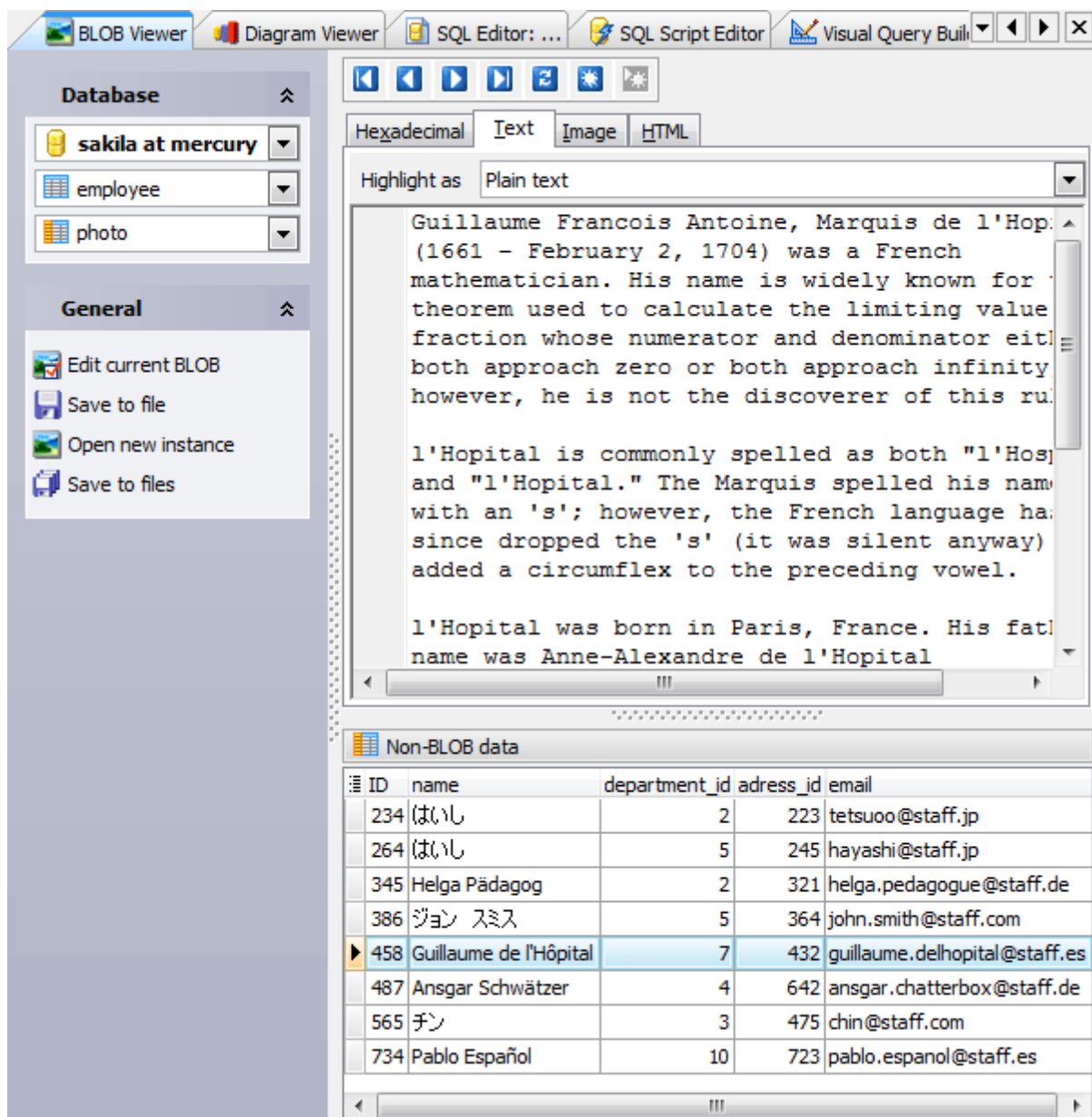
### 9.6.1 Viewing as hexadecimal dump

The [Hexadecimal](#) panel allows you to view data in hexadecimal mode.



### 9.6.2 Viewing as plain text

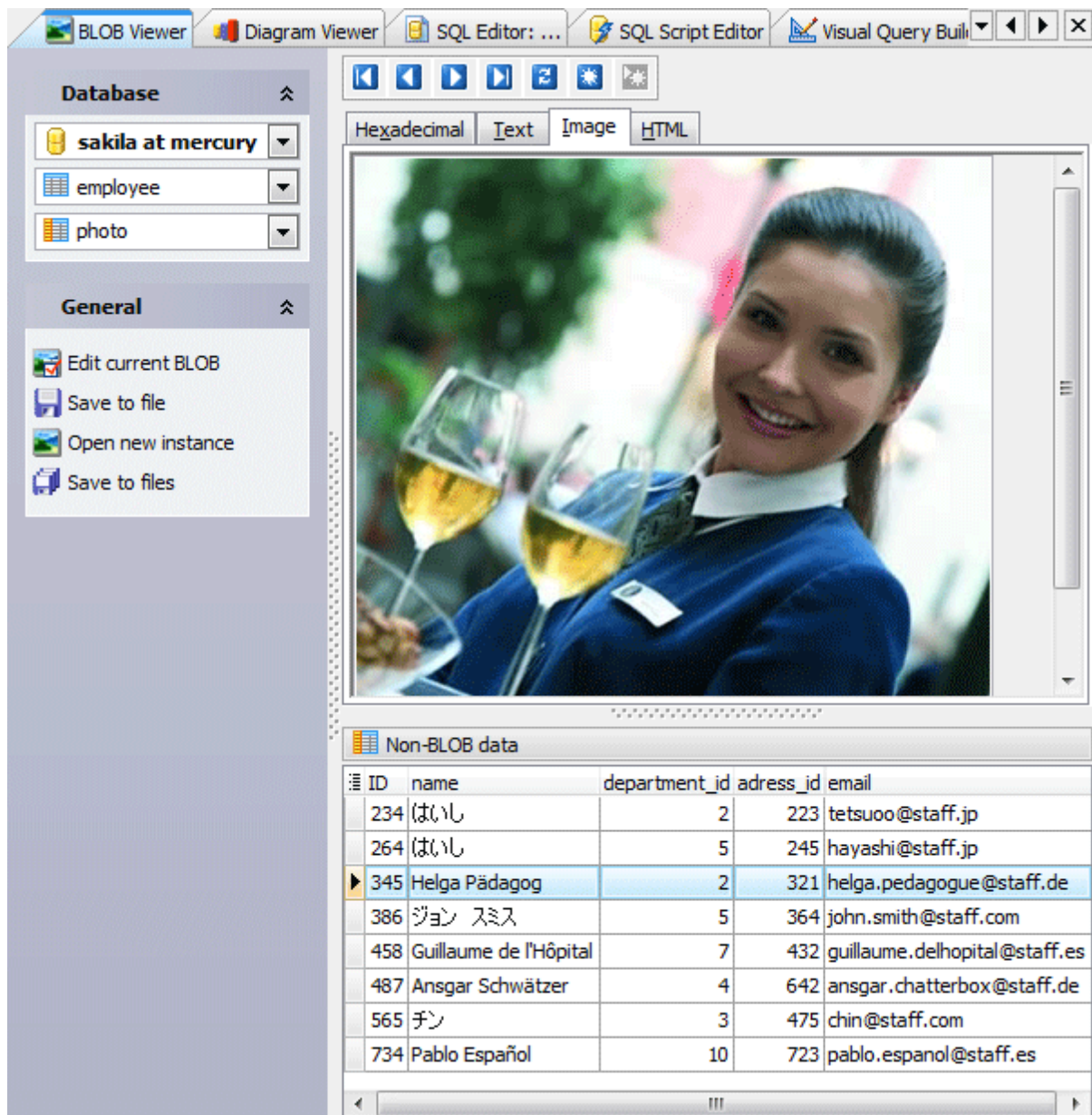
The **Text** panel allows you to view data as simple text. For your convenience several types of text highlighting are available (*Plain text*, *HTML*, *JScript*, *CSS*, *PHP*, *XML*, *SQL*, and *SQLite DDL*). The popup menu of the panel provides you to **Find** or **Replace** a necessary text fragment.



### 9.6.3 Viewing as image

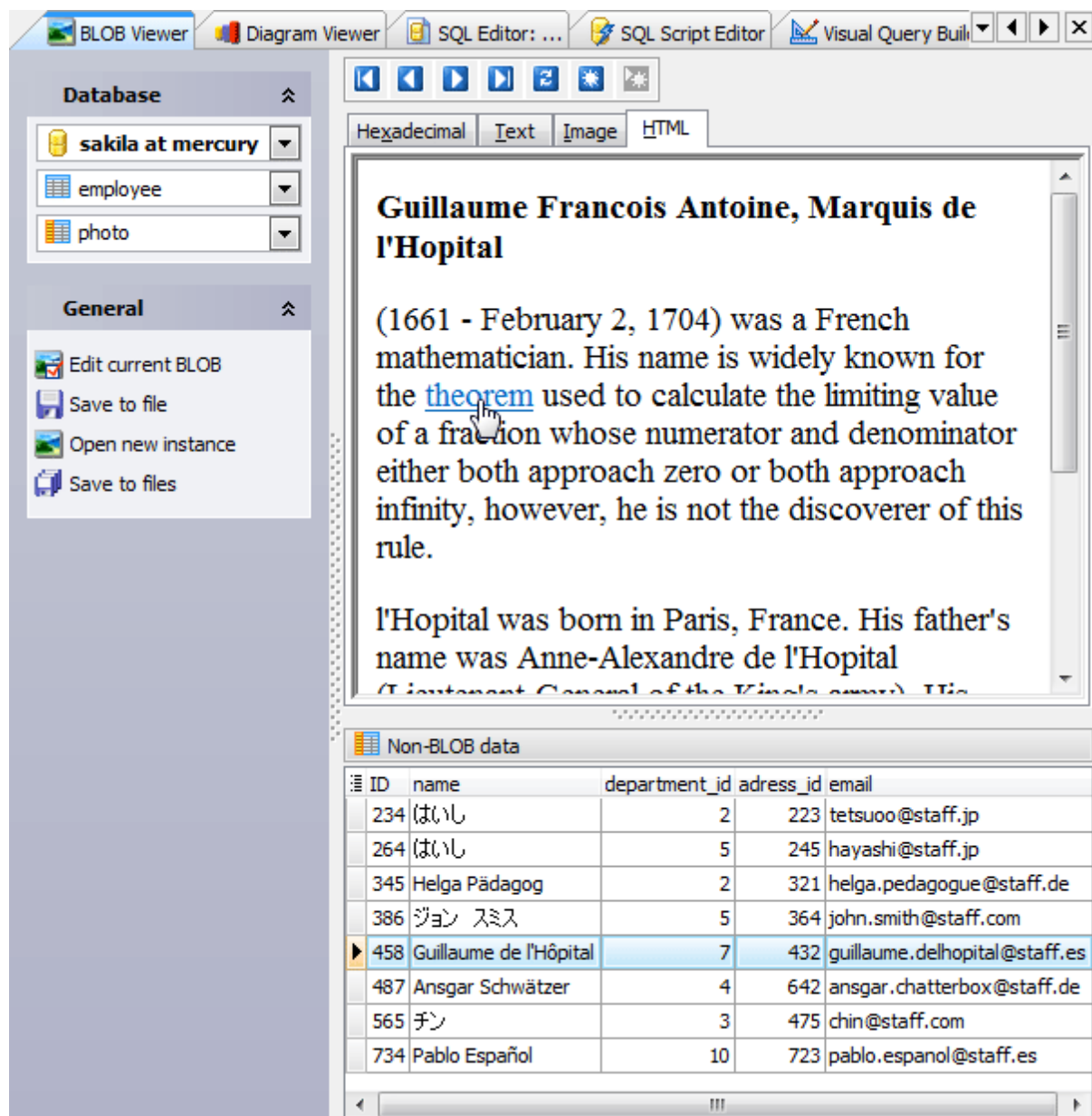
The [Image](#) panel displays field data as image.





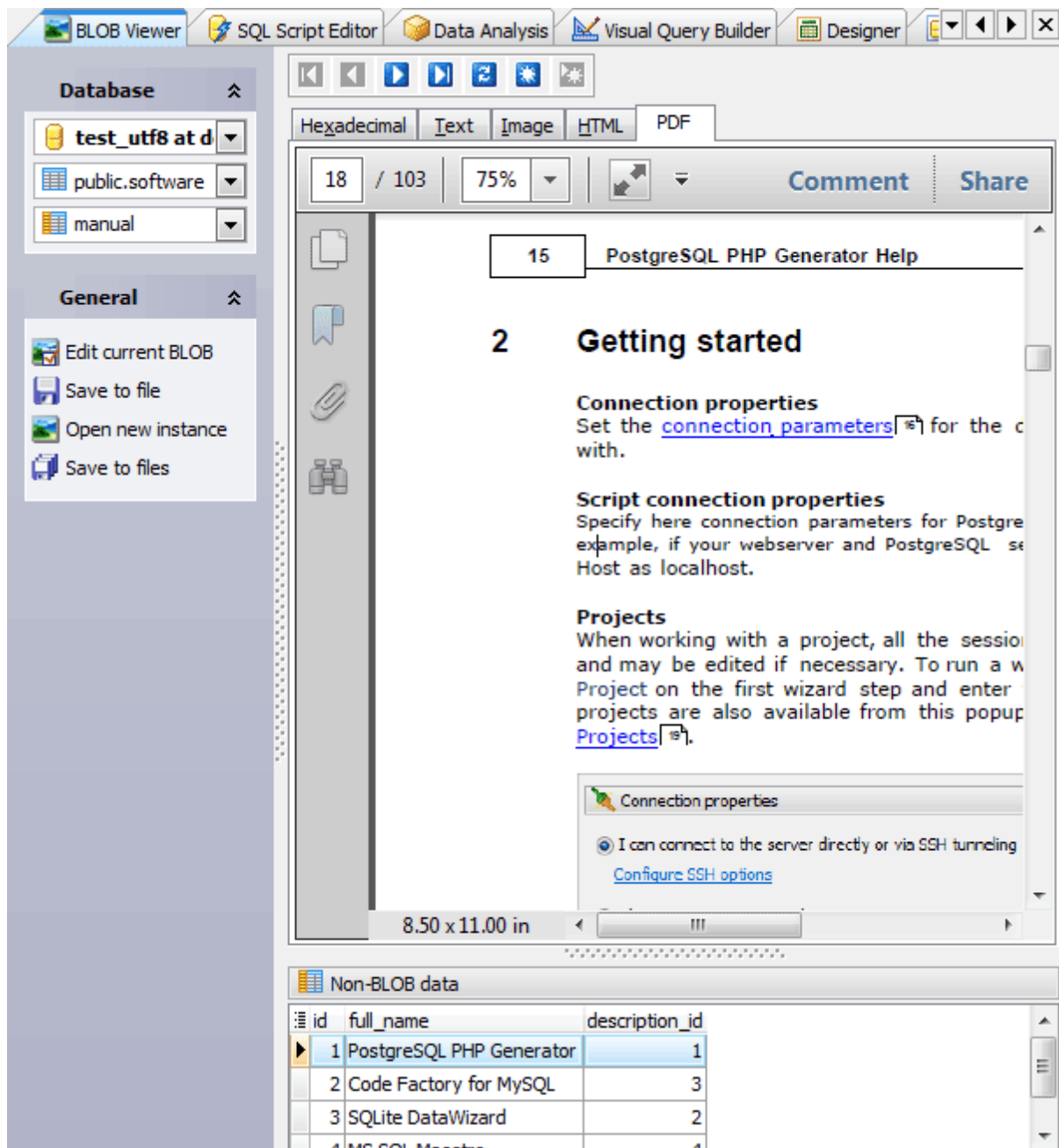
### 9.6.4 Viewing as HTML

The [HTML](#) panel displays field data as HTML.



### 9.6.5 Viewing as PDF

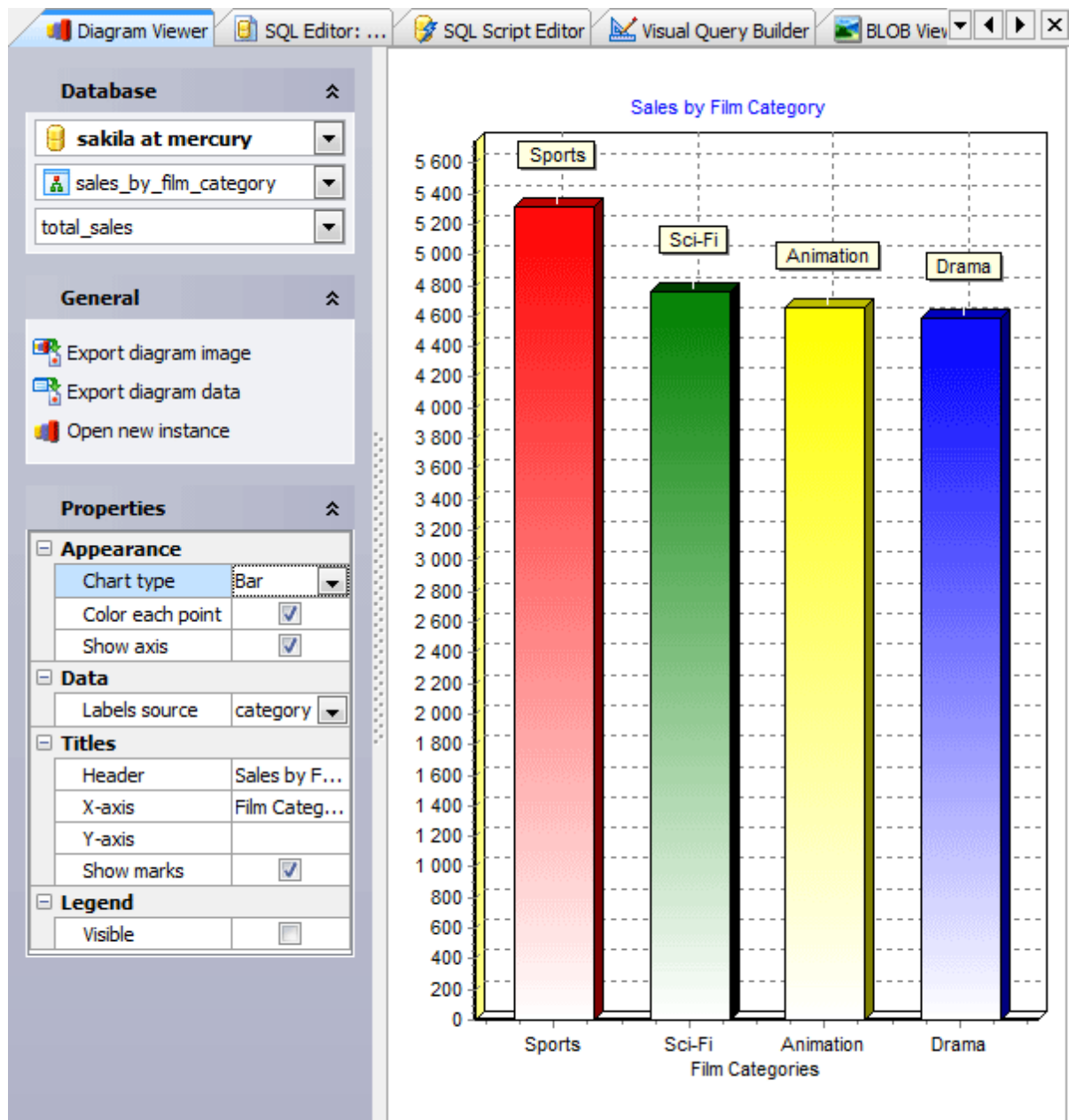
The PDF panel allows you to browse PDF data stored in the database.



## 9.7 Diagram Viewer

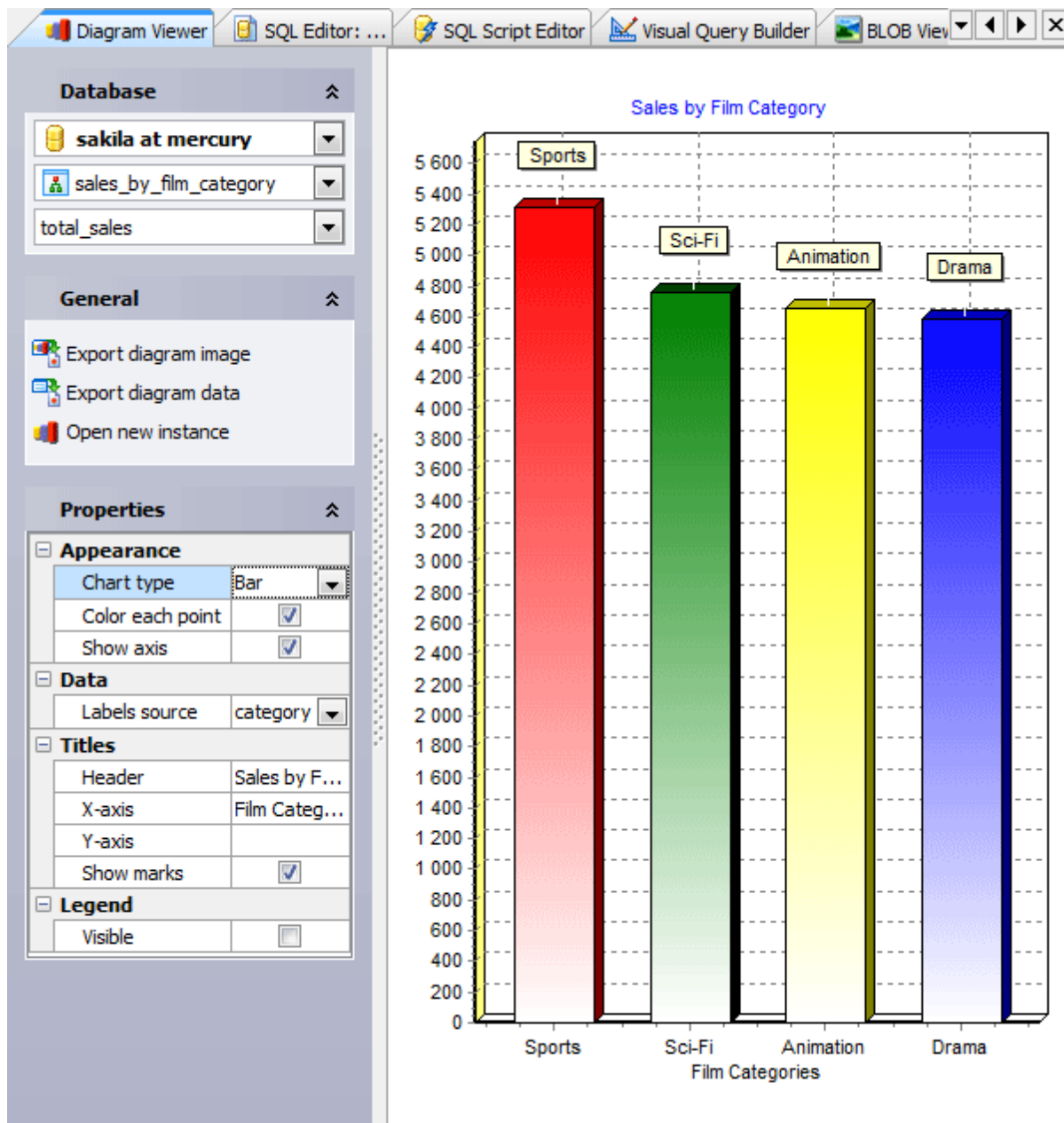
**Diagram Viewer** is a tool for representing data from a table or a query as a diagram in various ways. This means you can build a diagram represented as bars, lines, areas, points or pies, colored or not, with axis visible or not; specify axis labels source, diagram header and more. The **Diagram Viewer** also has the [Export diagram image](#)<sup>[223]</sup> and the [Export diagram data](#) features implemented, with a lot of formats supported.

- [Customizing diagram options](#)<sup>[222]</sup>
- [Exporting diagram as a graphical image](#)<sup>[223]</sup>



### 9.7.1 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.



[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 pointmarks .

### 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

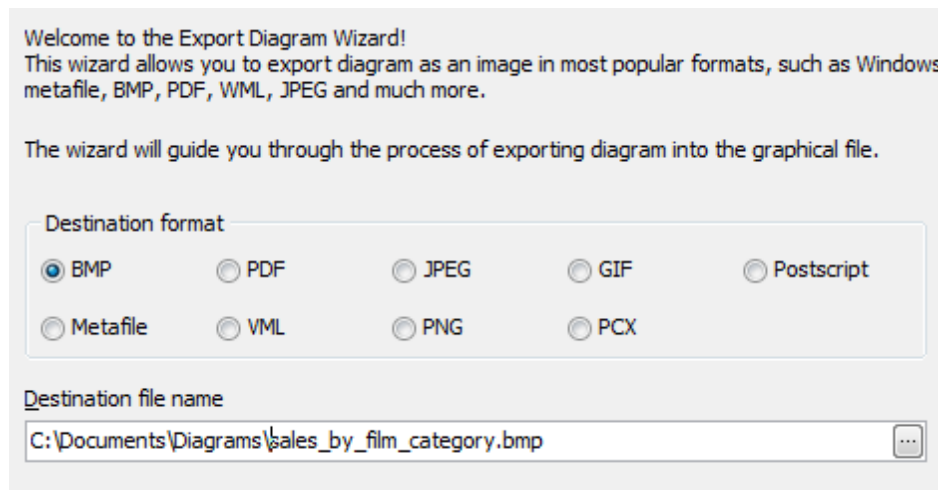
### Legend

The only **Visible** property of this subgroup specifies whether the legend rectangle should be represented on the right side of the diagram or not.

## 9.7.2 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.



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.

Image size

Width  Height

☒ Keep aspect ratio

☐ Open exported diagram in associated program

Click "Ready" to export the diagram.

## 9.8 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](#) <sup>226</sup> in the [Query](#) window or load it from the .cub file.
- [Manage report data](#) <sup>227</sup> in the [Data](#) window.

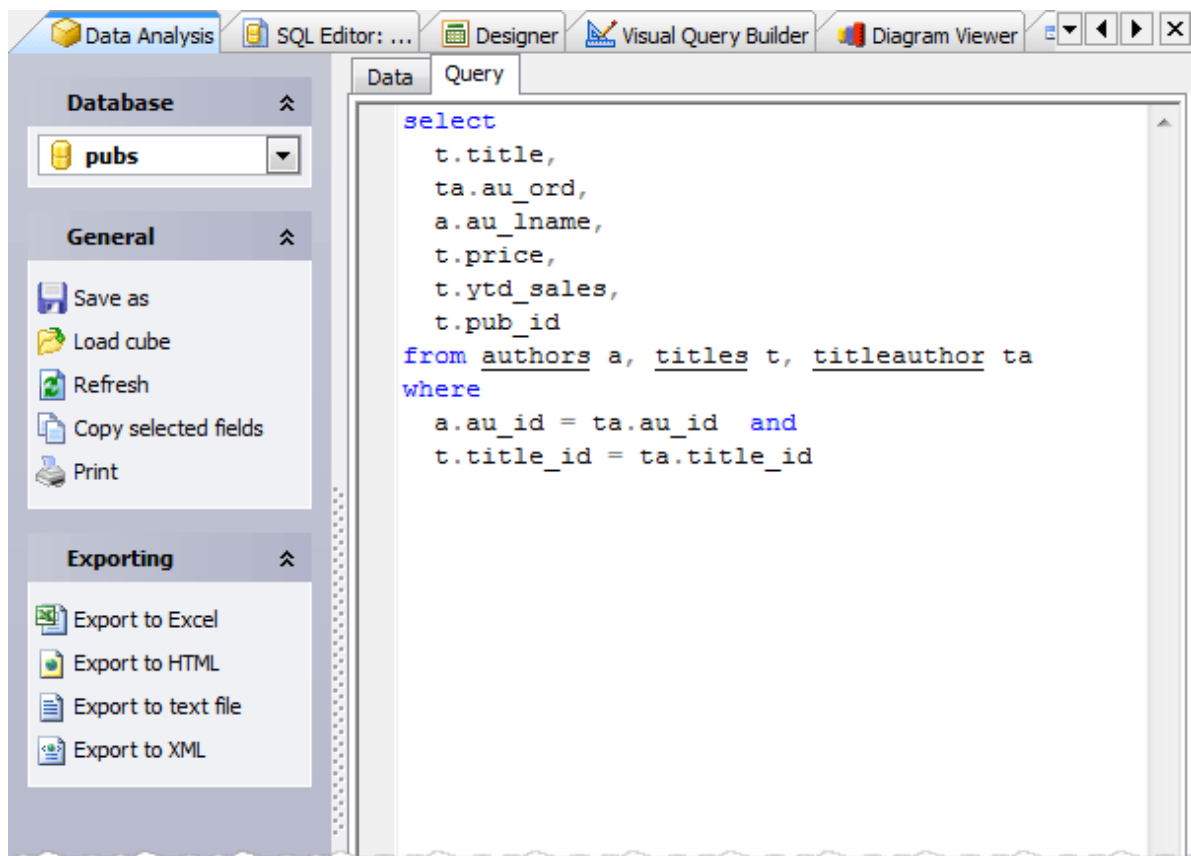
The Data Analysis tool allows you to save the created OLAP cube to .cub file, print it, or export it to Excel, HTML, XML, and text file.



Data		Query			
au ord		vtd sales			
price		pub id			
au lname	title	0736	0877	1389	Grand Total
<input type="checkbox"/> Bennet	The Busv Executive's Database Guide			19,99	19,99
<input type="checkbox"/> Blotchett-Halls	Fiftv Years in Buckingham Palace Kitchens		11,95		11,95
<input type="checkbox"/> Carson	But Is It User Friendly?			22,95	22,95
<input type="checkbox"/> DeFrance	The Gourmet Microwave		2,99		2,99
<input type="checkbox"/> Dull	Secrets of Silicon Valleu			20,00	20,00
<input type="checkbox"/> Green	The Busv 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
<input type="checkbox"/> Grindlesbv	Sushi. Anvone?		14,99		14,99
<input type="checkbox"/> Hunter	Secrets of Silicon Valleu			20,00	20,00
<input type="checkbox"/> Karsen	Computer Phobic AND Non-Phobic Individuals: Beh		21,59		21,59
<input type="checkbox"/> Locksley	Emotional Security: A New Algorithu	7,99			7,99
	Net Etiquette				
Lockslev Total		7,99			7,99
<input type="checkbox"/> 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
<input type="checkbox"/> O'Leary	Cooking with Computers: Surreptitious Balance Sh			11,95	11,95
	Sushi. Anvone?		14,99		14,99
O'Leary Total			14,99	11,95	26,94
<input type="checkbox"/> Pantelev	Onions. Leeks. and Garlic: Cooking Secrets of the		20,95		20,95
<input type="checkbox"/> 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
<input type="checkbox"/> Straight	Straight Talk About Computers			19,99	19,99
<input type="checkbox"/> White	Prolonged Data Deprivation: Four Case Studies	19,99			19,99
<input type="checkbox"/> Yokomoto	Sushi. Anvone?		14,99		14,99
<input type="checkbox"/> del Castillo	Silicon Valleu Gastronomic Treats		19,99		19,99
Grand Total		59,87	147,02	146,82	353,71

### 9.8.1 Input SELECT query

To get an [OLAP cube](#)<sup>[227]</sup>, 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 Analysis.



## 9.8.2 Managing report data

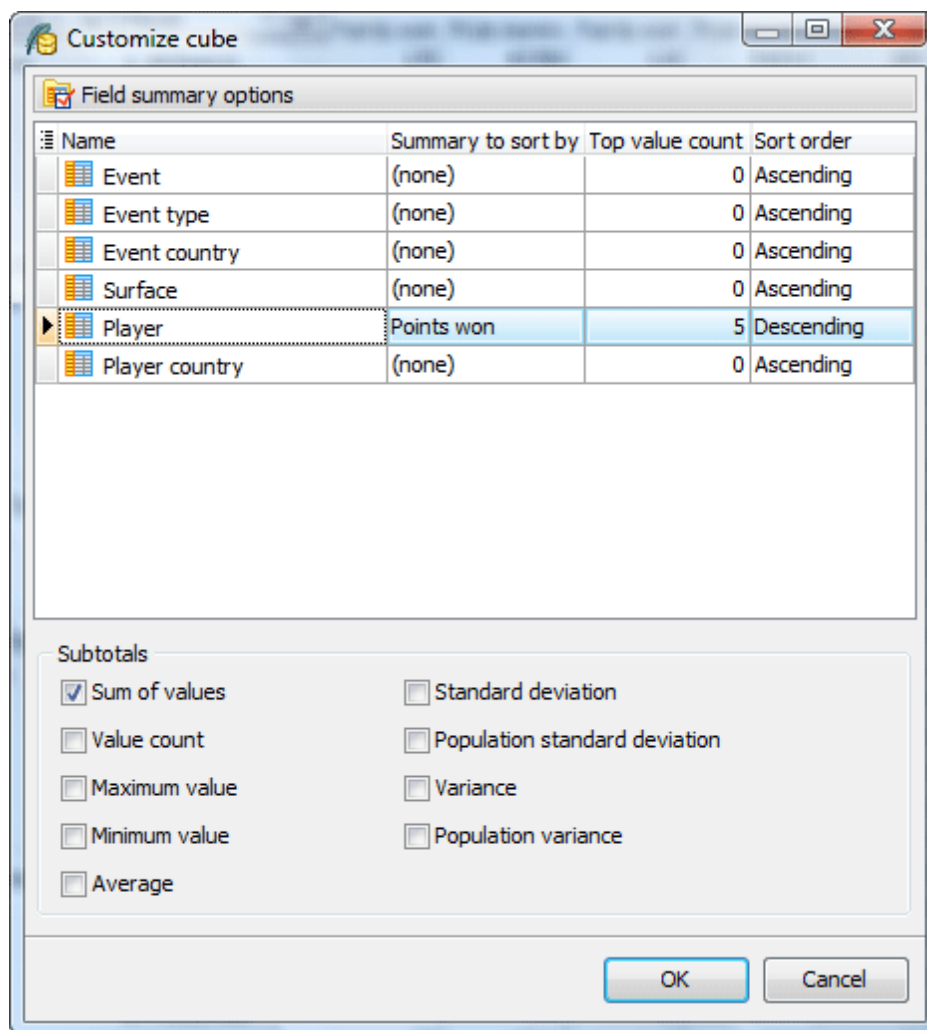
The [Data](#) tab allows you to manipulate the created OLAP cube appearance. At the beginning all the [query](#)<sup>226</sup> columns are arranged at the top of the tab. Put them according to your business rules: drag numeric columns to be filtered and summarized corresponding to the chosen columns 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.

The screenshot shows a database query tool interface. At the top, there are tabs for 'Data' and 'Query'. Below the tabs, there is a query grid with columns: 'title', 'au', 'ord', 'vtd', 'sales', and 'pub id'. The 'pub id' column is highlighted. Below the query grid, there is a 'Drop Column Fields Here' area. Below this area, there is a table with columns 'au lname' and 'Grand Total'. The table contains 20 rows of data, including a 'Grand Total' row at the bottom. The 'au lname' column lists author names, and the 'Grand Total' column shows the sum of sales for each author.

au lname	Grand Total
Bennet	19,99
Blotchet-Halls	11,95
Carson	22,95
DeFrance	2,99
Dull	20,00
Green	22,98
Grindlesbv	14,99
Hunter	20,00
Karsen	21,59
Lockslev	7,99
MacFeather	33,54
O'Learv	26,94
Pantelev	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.



## 9.9 Report Designer

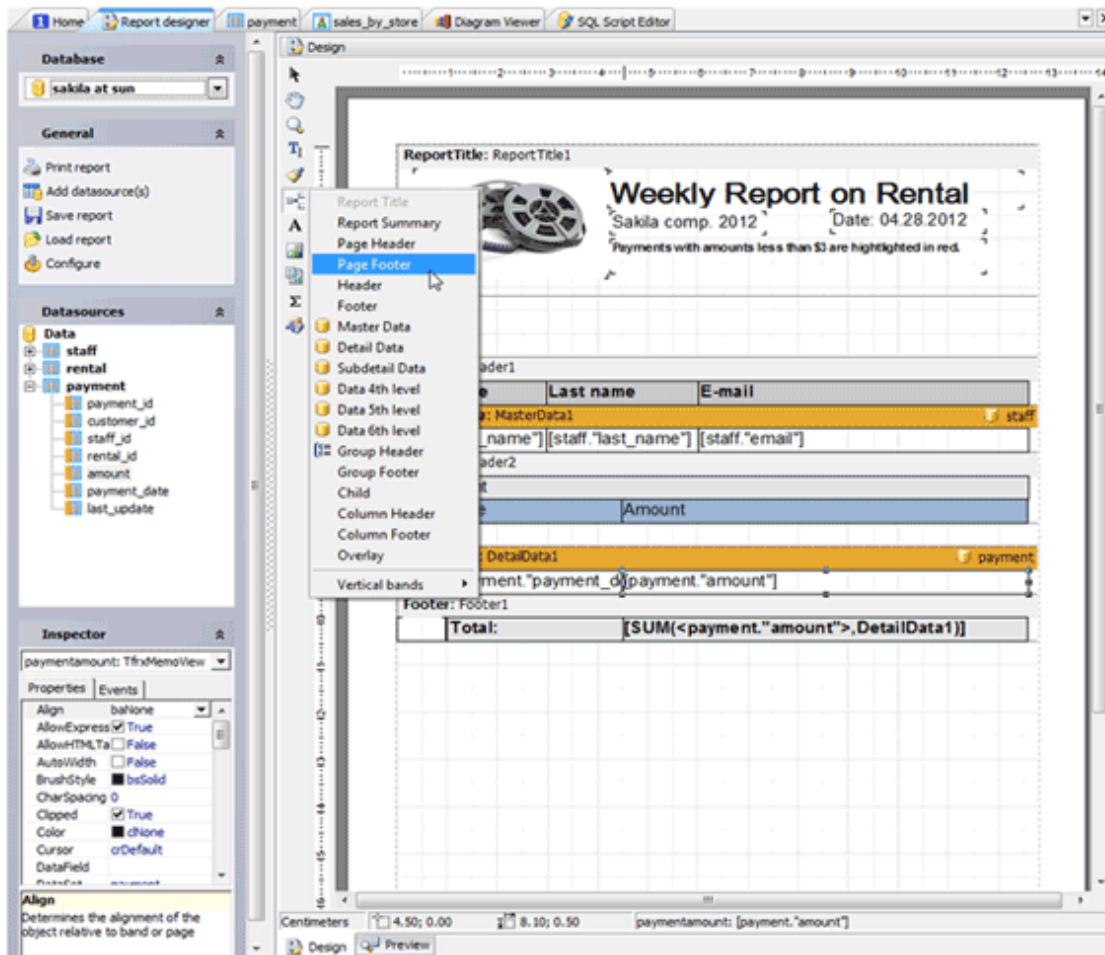
**Report Designer** allows you to create database reports, define reports appearance in your own style, equip it with master-detail data views, aggregate functions, and images and control the result with the ability of simultaneous previewing. To run Report Designer, choose [Tools | Report Designer](#) main menu item.

To create a report, you need to:

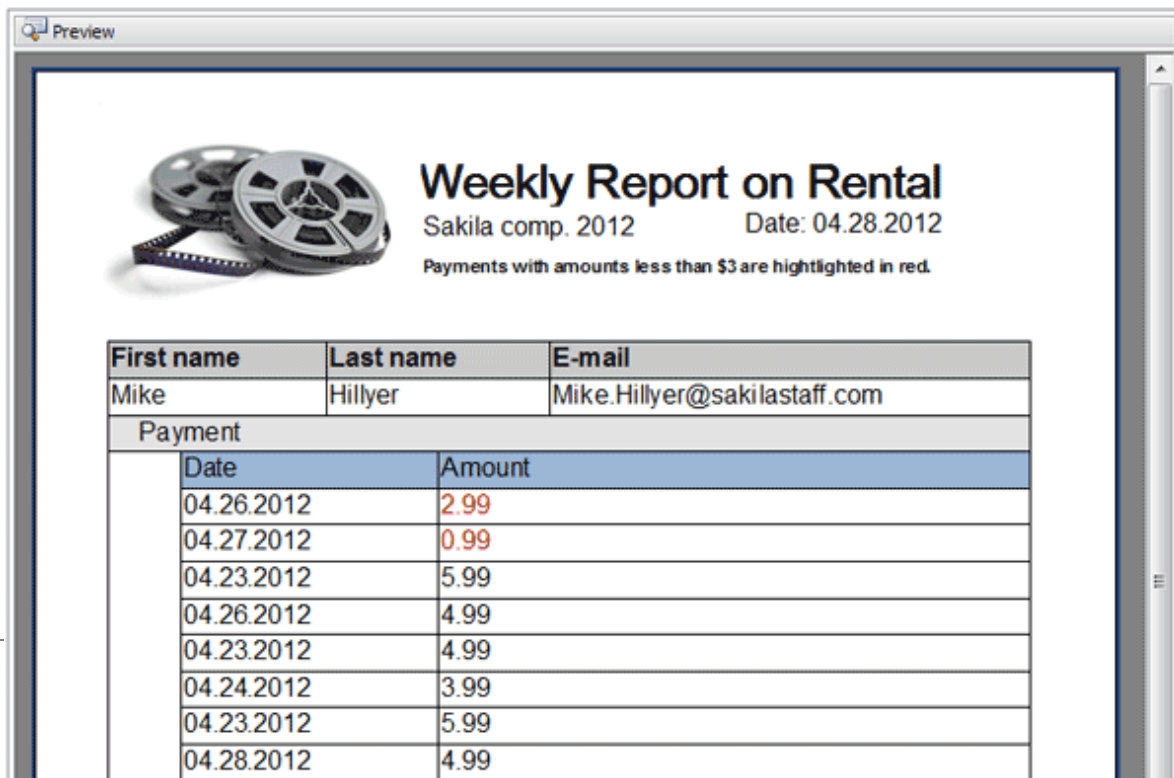
- [specify data sources](#)<sup>[232]</sup> for the data to be used in the report;
- [add all necessary objects](#)<sup>[232]</sup> to the report template;
- set the objects' format within the [Inspector window](#)<sup>[234]</sup>.

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



### 9.9.1 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 its 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.

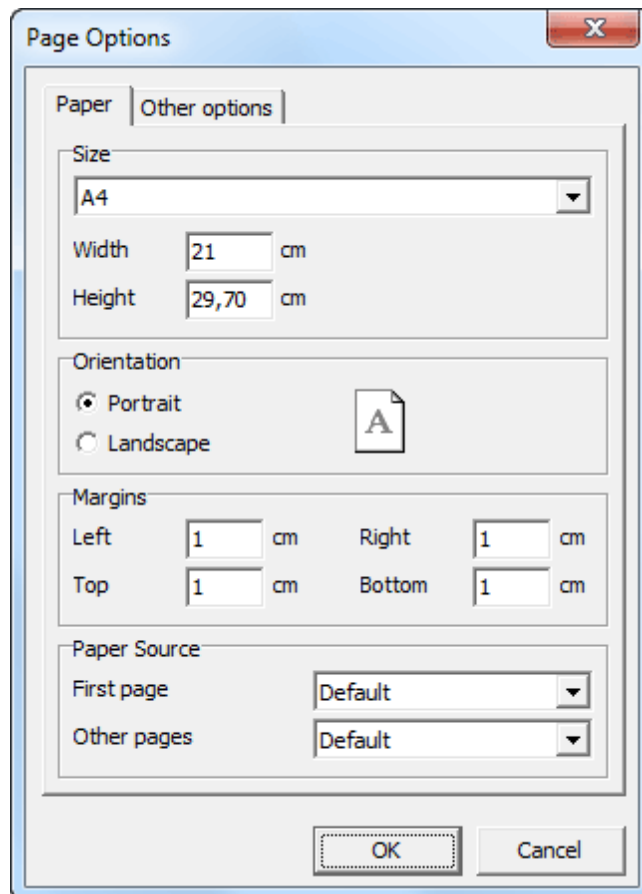
[Subreport object](#) allows inserting an additional report design page inside the basic one.

[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).

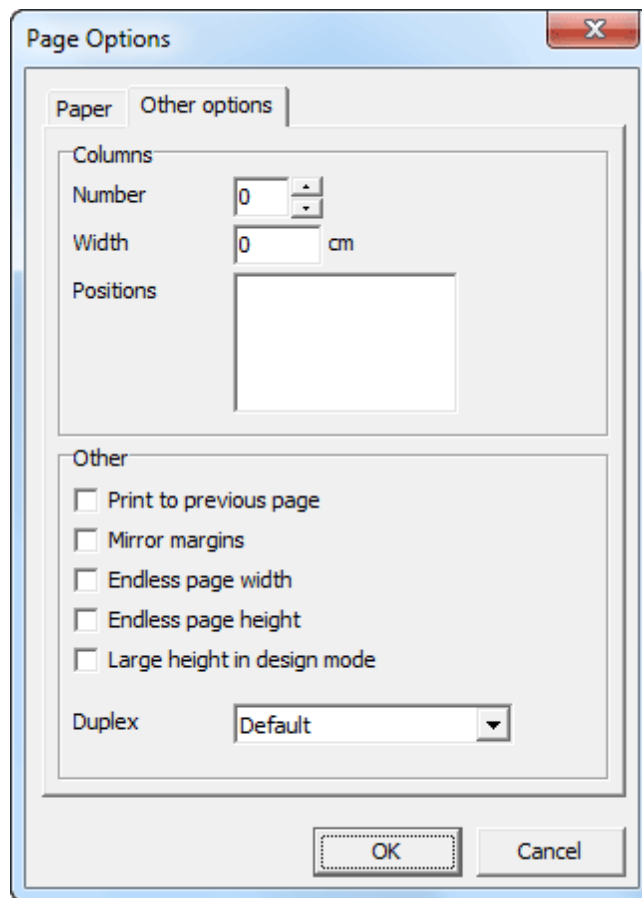
### Page options

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.



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.

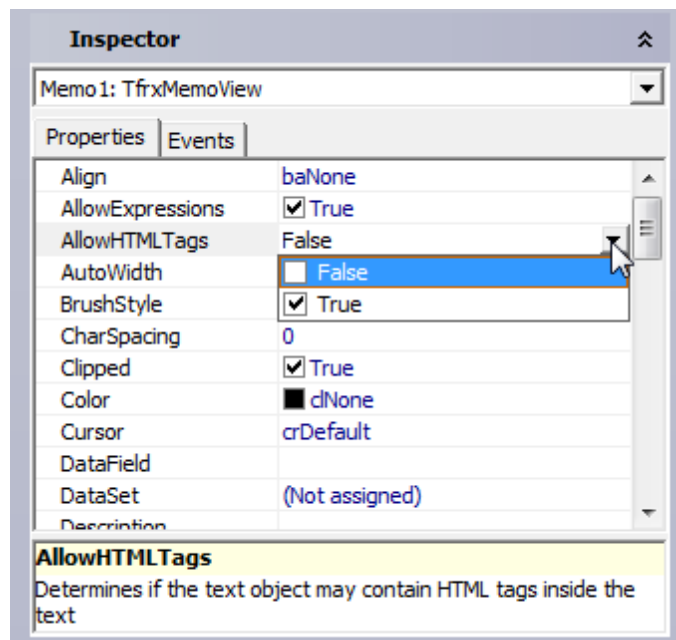
The [Mirror margins](#) option switches right and left margins of page for even pages during previewing or printing a report.

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.

## 9.9.2 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.



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).

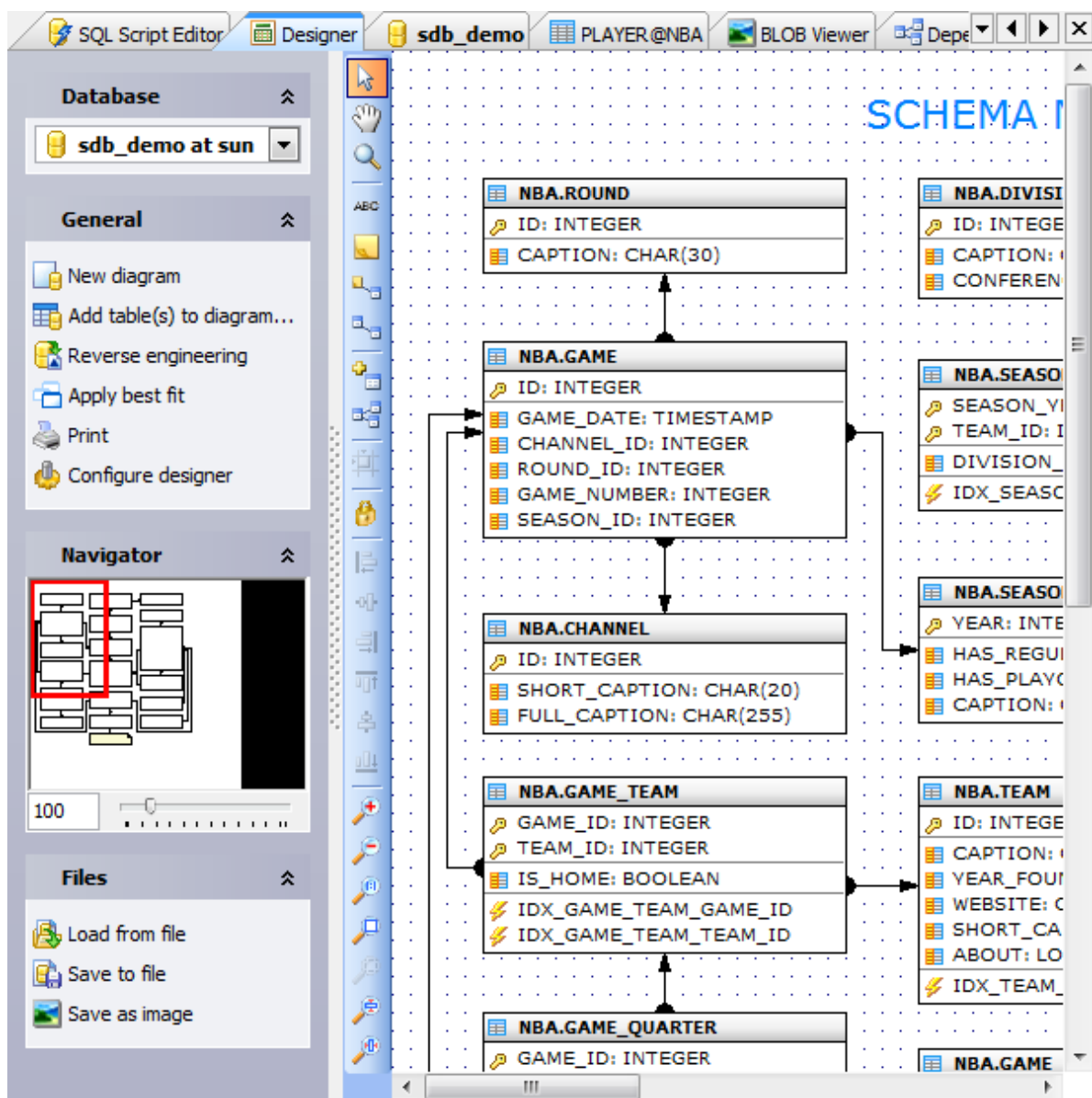
**Rotation** - specify the angle of the text rotation in the field.

**WordWrap** - if it is disabled, the long lines will be simply cut off.

## 9.10 Schema Designer

**Schema Designer** allows you to create physical Entity Relationship Diagram that will represent objects in your MySQL 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?](#)<sup>[238]</sup>
- [How can I add a relationship between tables?](#)<sup>[238]</sup>
- [How can I delete a diagram object?](#)<sup>[238]</sup>
- [How can I work with diagram objects?](#)<sup>[239]</sup>

**See also:** [Designer Navigation bar](#)<sup>[239]</sup>, [Schema Designer Toolbox](#)<sup>[239]</sup>.

### Adding a table

You can add an existing MySQL table to the diagram using popup menu in the working area, or with the corresponding link on the [Navigation bar](#)<sup>[239]</sup>.

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](#)<sup>[81]</sup> window.
- Specify there properties of the relationship been created.

Moreover you can add a reference graphically:

- Choose the [Create relation](#) tool on the [Toolbox](#)<sup>[239]</sup>. 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](#)<sup>[81]</sup> 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](#)<sup>[76]</sup>, [Index Editor](#)<sup>[79]</sup>, [Create Trigger Wizard](#)<sup>[88]</sup>.

### 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.

### **9.10.1 Designer Navigation Bar**

The [Navigation Bar](#) of [Schema Designer](#) provides you the following opportunities:

Use the [Database](#) drop-down list to move around your MySQL 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](#) <sup>208</sup>.

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).

### **9.10.2 Schema Designer Toolbox**

The toolbox is located on the left side of the [Schema Designer's](#) working area.



### Move

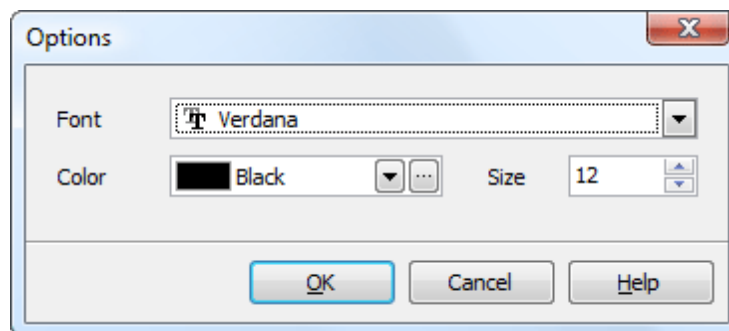
The tool is intended for selection of diagram objects. Use the tool then click anywhere inside of the object. Double click opens the corresponding [Object Editor](#).

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.



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.

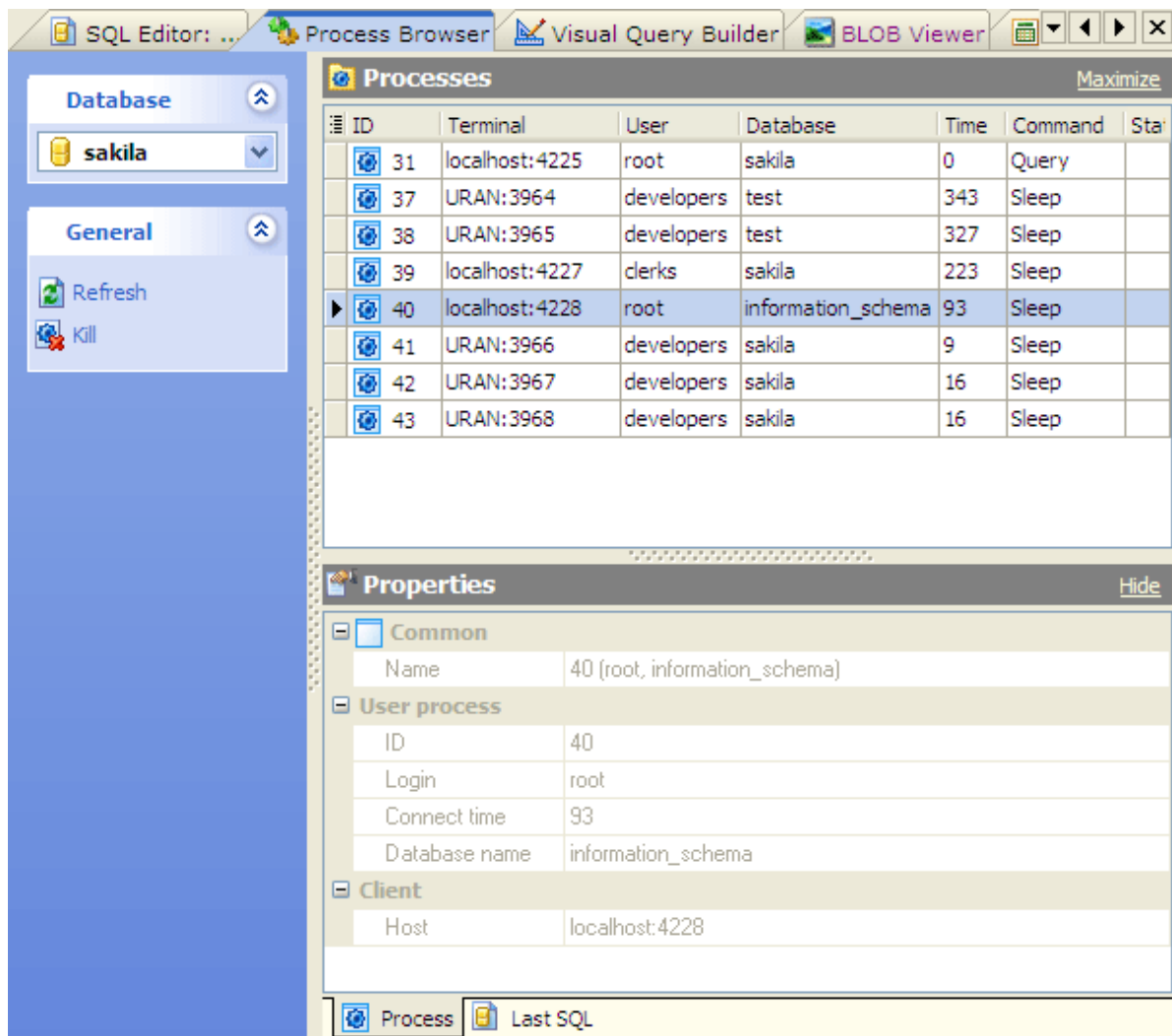


## 9.11 Process Browser

**Process Browser** is very useful tool for DBAs who want to monitor the users' activity (in fact, there are potentially thousands of sessions in a database at any one time). You can view details for each session (such as login, connect time, database name, client host, last SQL statement executed and more) as well as group and filter processes by client host, connected user, database, client application, etc.

To access the [Process Browser](#) window, select the corresponding item from the [Tools](#) menu.

You can also observe the current process list at the [Explorer](#) tree.



The screenshot shows the **Process Browser** window with the following components:

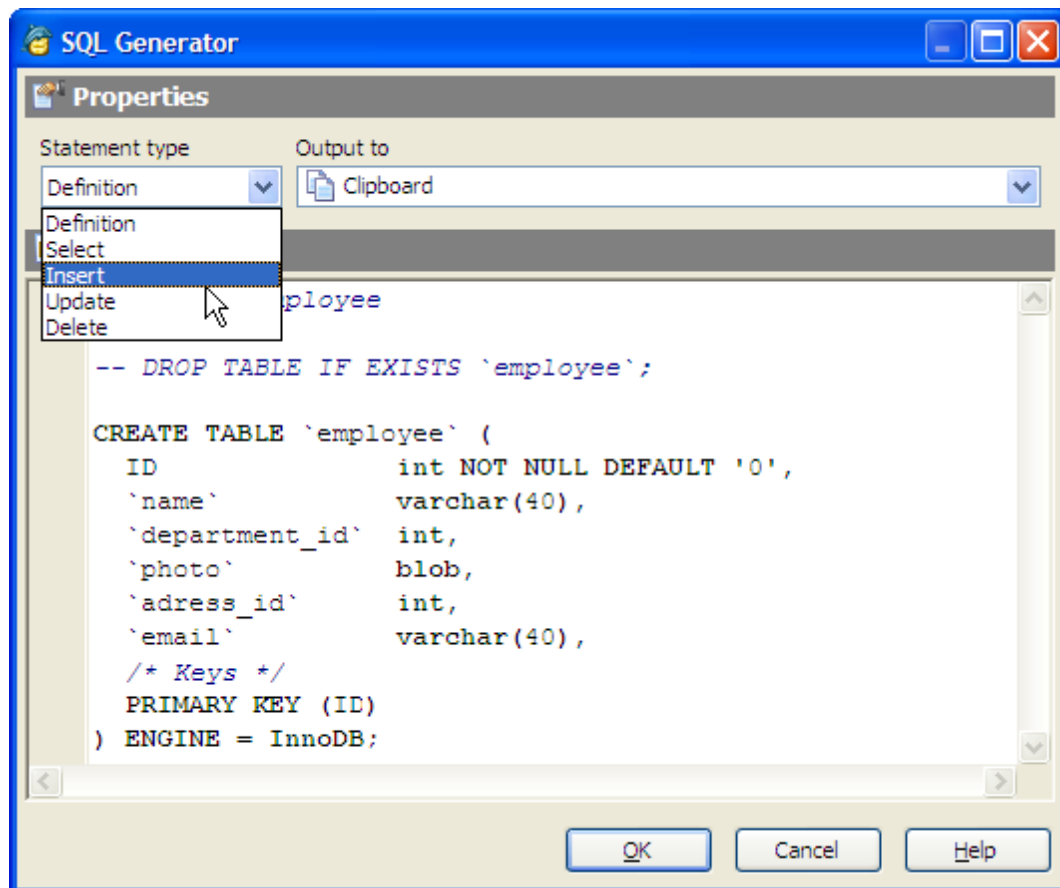
- Database:** sakila
- General:** Refresh, Kill
- Processes Table:**

ID	Terminal	User	Database	Time	Command	Status
31	localhost:4225	root	sakila	0	Query	
37	URAN:3964	developers	test	343	Sleep	
38	URAN:3965	developers	test	327	Sleep	
39	localhost:4227	clerks	sakila	223	Sleep	
40	localhost:4228	root	information_schema	93	Sleep	
41	URAN:3966	developers	sakila	9	Sleep	
42	URAN:3967	developers	sakila	16	Sleep	
43	URAN:3968	developers	sakila	16	Sleep	
- Properties:**
  - Common:** Name: 40 (root, information\_schema)
  - User process:** ID: 40, Login: root, Connect time: 93, Database name: information\_schema
  - Client:** Host: localhost:4228
- Process Browser:** Process, Last SQL

## 9.12 SQL Generator

Among other features SQL Maestro for MySQL 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.



## 9.13 DML procedures generation

SQL Maestro for MySQL 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 MySQL 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	<input checked="" type="checkbox"/>
Update procedure	<input checked="" type="checkbox"/>
Insert procedure	<input checked="" type="checkbox"/>
Delete procedure	<input checked="" type="checkbox"/>

**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 

## 9.14 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). 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	<input checked="" type="checkbox"/>
Update	<input checked="" type="checkbox"/>
Delete	<input checked="" type="checkbox"/>

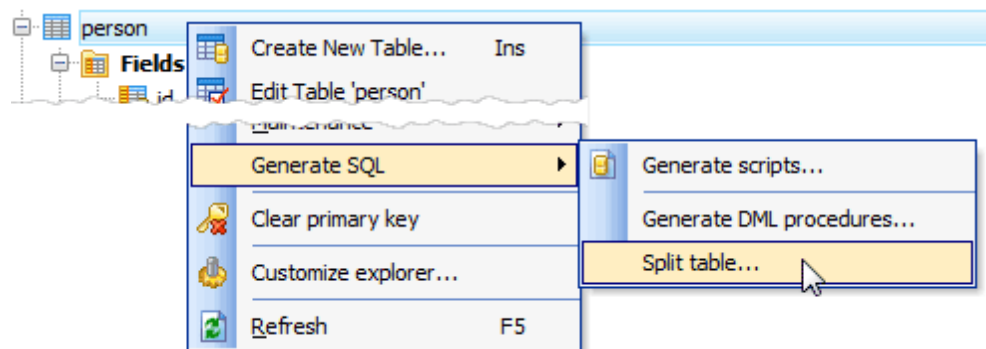
Naming	
View name	V_%TableName%
Insert trigger name	TR_BI_%TableName%
Update trigger name	TR_BU_%TableName%
Delete trigger name	TR_BD_%TableName%

Action to perform after generation

☒ Execute immediately

## 9.15 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. SQL Maestro for MySQL 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 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	<input type="checkbox"/>	city	<input checked="" type="checkbox"/>

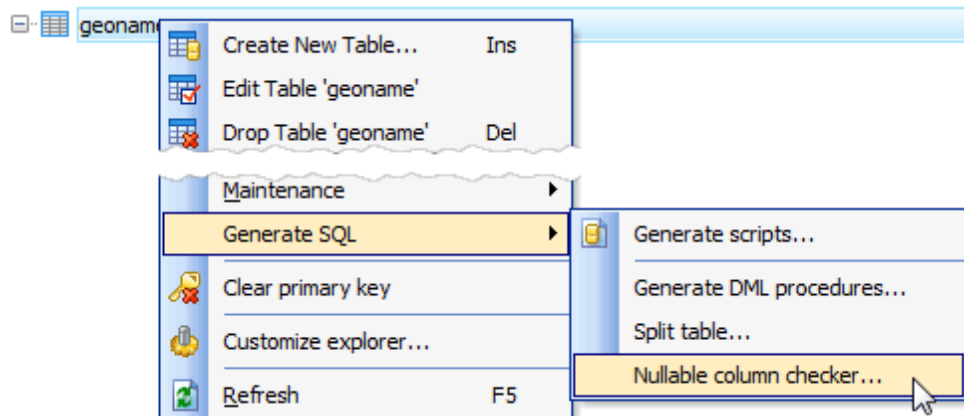
Then click Ready and get the following tables:

	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

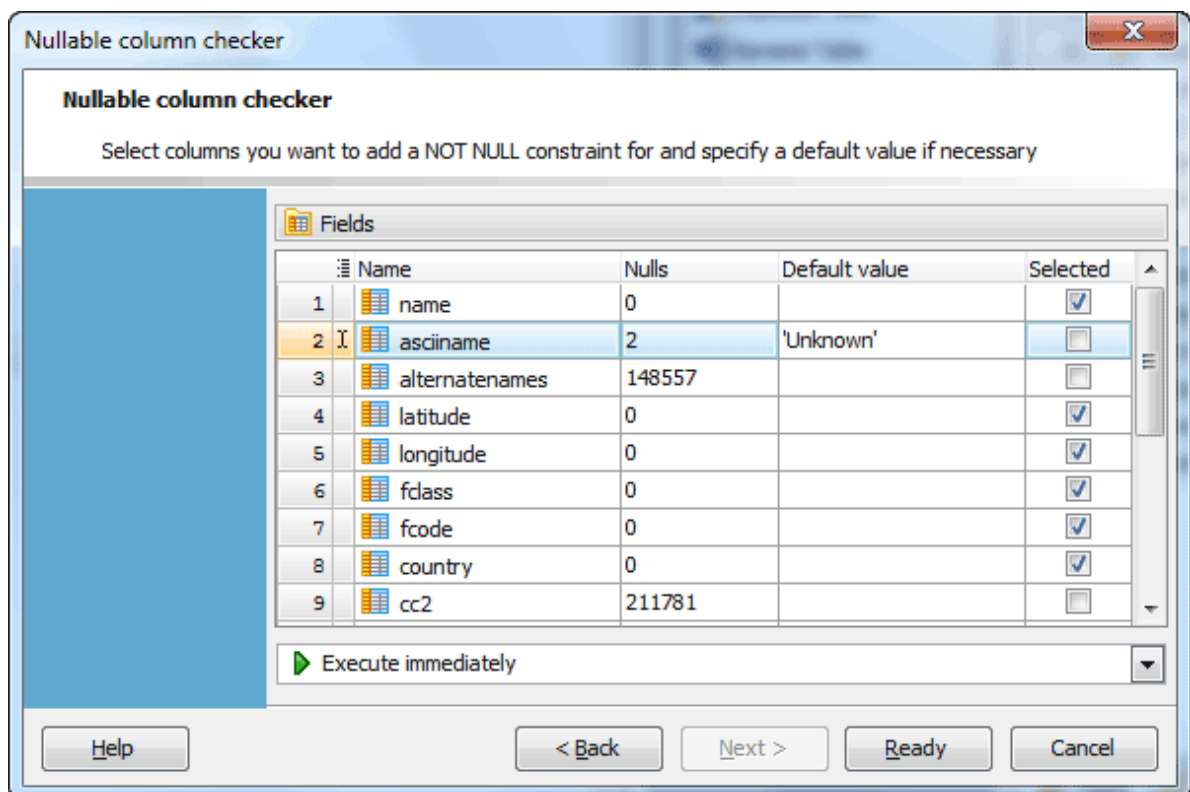
## 9.16 Nullable Column Checker

**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](#)<sup>[204]</sup> or executed immediately.

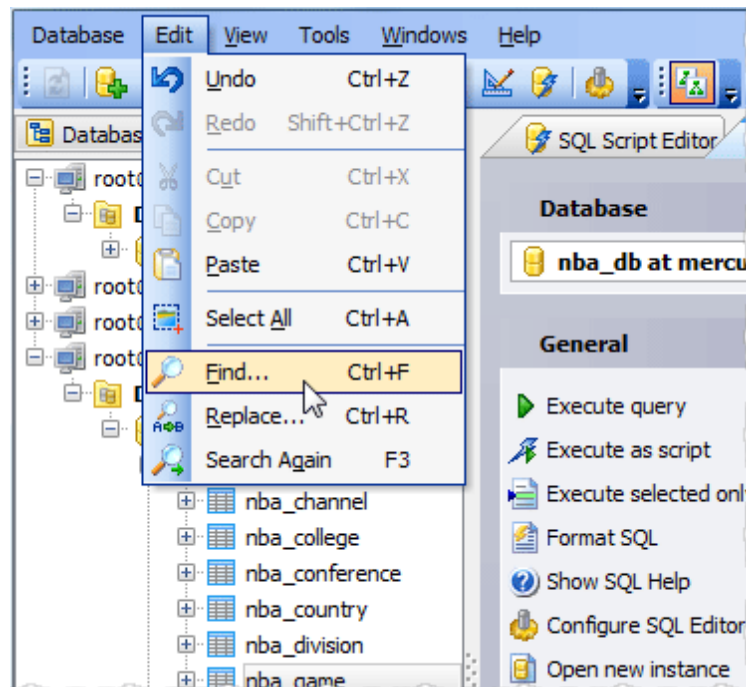




## 9.17 Dialogs

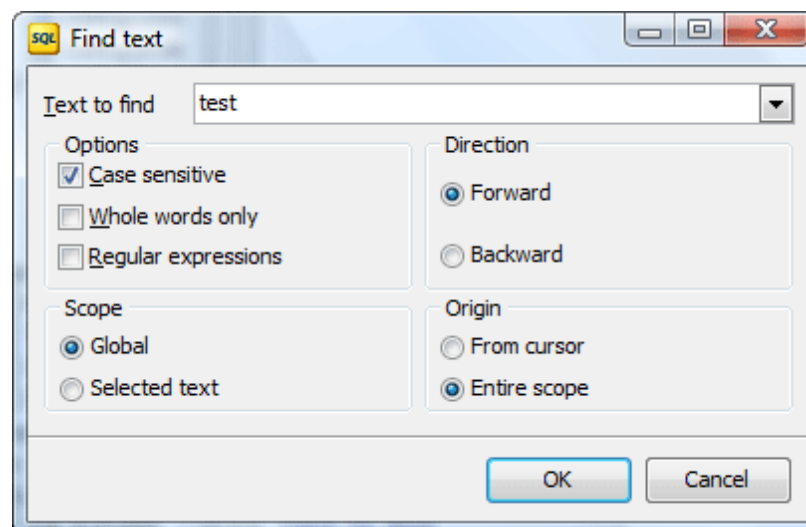
SQL Maestro for MySQL provides two dialogs for searching and replacing text in the editor areas of the database tools. Both of them are available through the popup menu of the editor area.

- [Find Text dialog](#) <sup>[251]</sup>
- [Replace Text dialog](#) <sup>[252]</sup>



### 9.17.1 Find Text dialog

The [Find Text](#) dialog is provided for quick search for certain text.



### 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

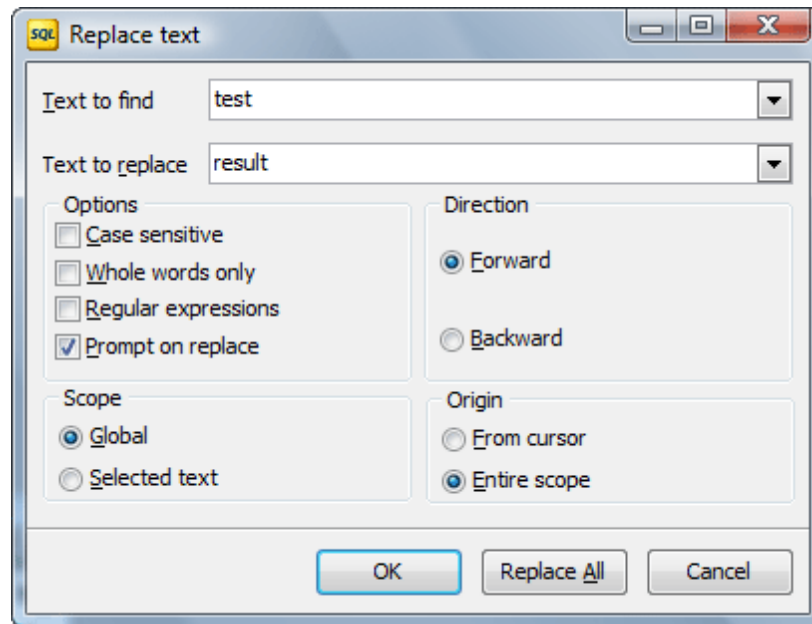
The search starts at the cursor's current position, and then proceeds either forward to the end of the scope, or backward to the beginning of the scope depending on the [Direction](#) setting. [From Cursor](#) is the default setting.

### 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.

## 9.17.2 Replace Text dialog

The [Replace Text](#) dialog is provided for searching and replacing text in the editor window.



#### 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

SQL Maestro for MySQL 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](#)<sup>[256]</sup>  
General SQL Maestro for MySQL options: environment style, confirmations, window restrictions, explorer tree, [SQL Editor](#), [Visual Query Builder](#), etc.
- [Editors & Viewers](#)<sup>[278]</sup>  
Customizing of all the SQL editors - [SQL Editor](#), [SQL Script Editor](#), etc.
- [Appearance](#)<sup>[286]</sup>  
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](#)<sup>[295]</sup> for details).

It is a good idea to check through these settings before you start working with SQL Maestro for MySQL. 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 SQL Maestro for MySQL behavior. The section consists of several tabs; follow the links to find out more about each of them.

- [Preferences](#) <sup>[256]</sup>
- [Confirmations](#) <sup>[257]</sup>
- [Directories](#) <sup>[259]</sup>
- [Tools](#) <sup>[259]</sup>
  - [Explorer](#) <sup>[261]</sup>
  - [Object Manager](#) <sup>[262]</sup>
  - [SQL Editor](#) <sup>[262]</sup>
  - [SQL Script Editor](#) <sup>[263]</sup>
  - [Query Builder](#) <sup>[264]</sup>
  - [BLOB Viewer](#) <sup>[266]</sup>
  - [Export data](#) <sup>[267]</sup>
  - [Database Designer](#) <sup>[268]</sup>
- [Object Editors](#) <sup>[269]</sup>
  - [Table](#) <sup>[271]</sup>
- [Data Grid](#) <sup>[271]</sup>
  - [Colors](#) <sup>[274]</sup>
  - [Formats](#) <sup>[274]</sup>
  - [Filter](#) <sup>[276]</sup>

### 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 SQL Maestro for MySQL 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 SQL Maestro for MySQL.

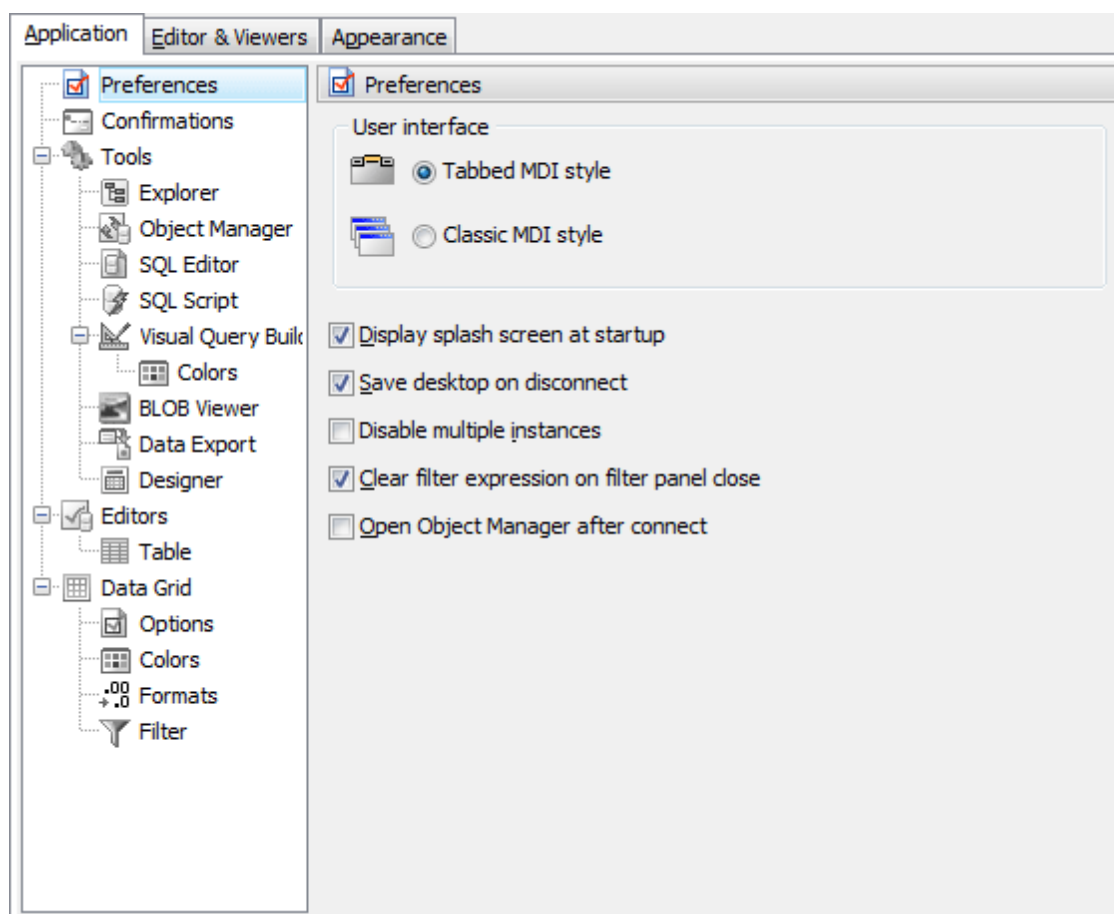
☒ [Open Object Manager after connect](#)

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

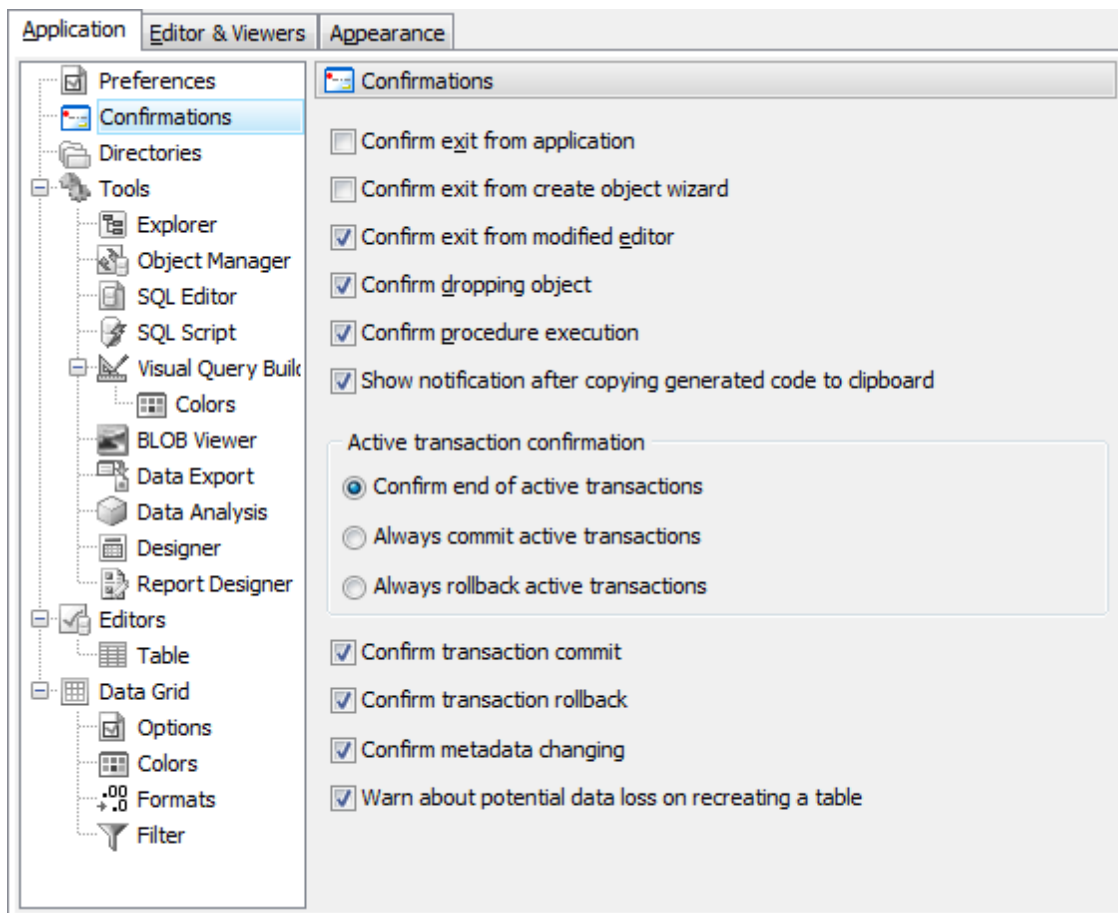
after the filter panel is closed.



### 10.1.2 Confirmations

Use this tab to manage application confirmations.





☒ **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 SQL Maestro for MySQL will commit or rollback transactions without asking.

☒ **Confirm metadata changing**

If this option is checked, the program requires confirmation for changing metadata.

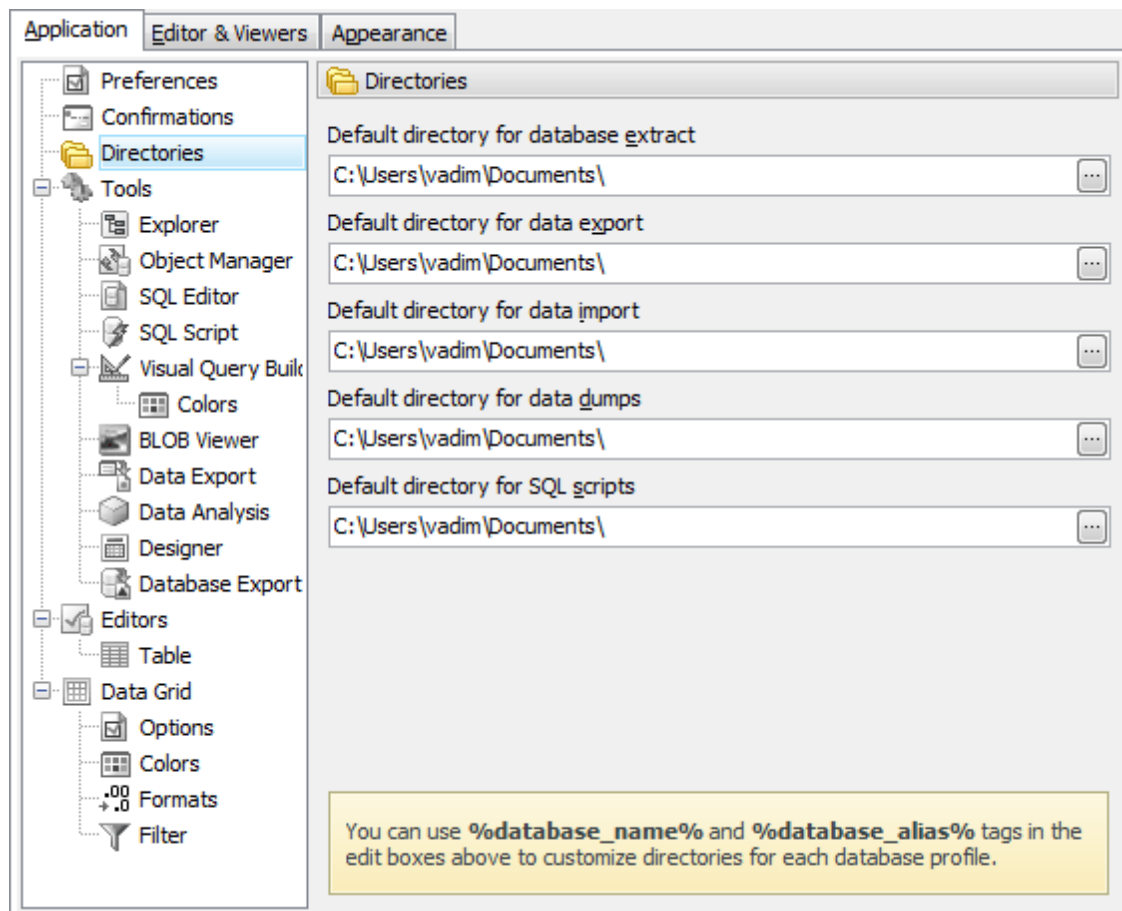
### 10.1.3 Directories

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:**

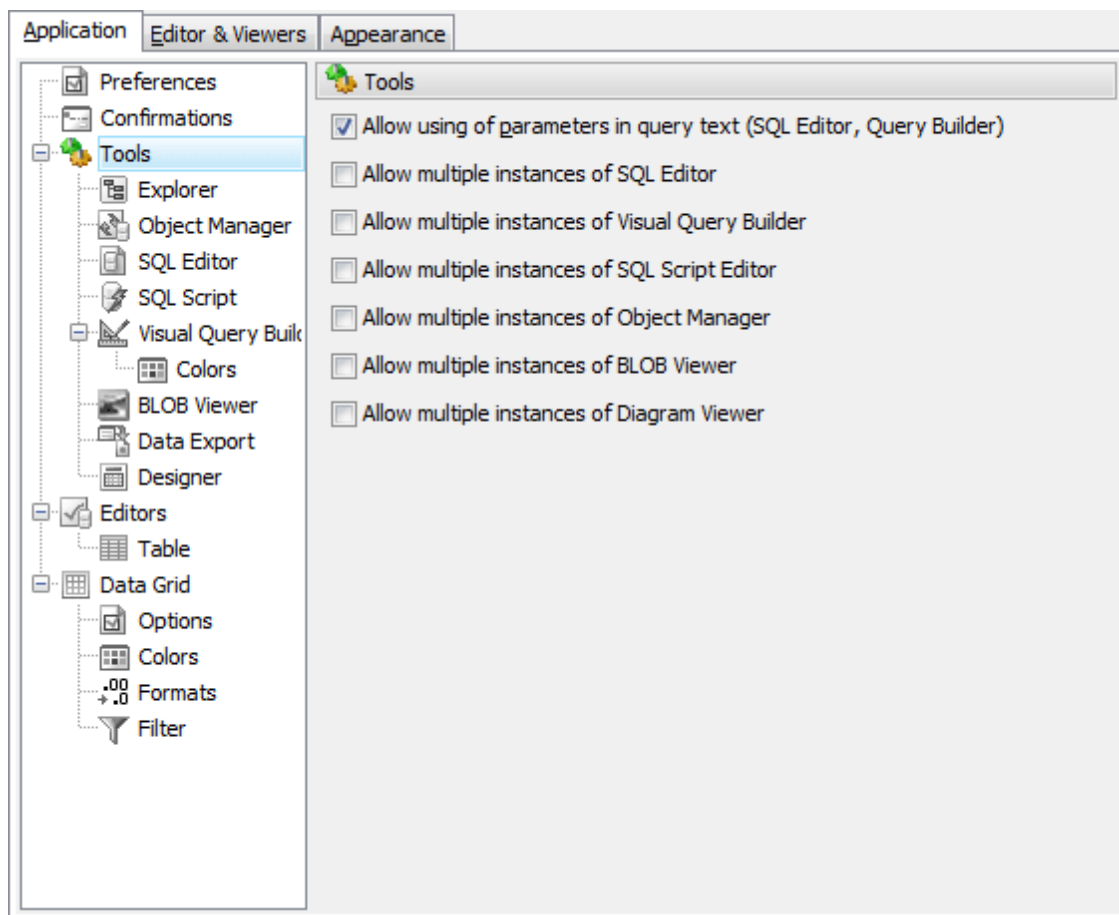
To store all SQL scripts in folders sorted by databases in the "C:\SQL Scripts\" directory, specify the default directory for SQL scripts as follows:

*C:\SQL Scripts\%database\_name%\*



### 10.1.4 Tools

Below you will find a detailed decryption of the following tools options.



☒ **Allow using of parameters in query text**

Check this option to be able to use query parameters in [SQL Editor](#)<sup>[153]</sup> and [Visual Query Builder](#)<sup>[158]</sup>.

☒ **Allow multiple instances of SQL Editor**

Check this option to be able to use multiple instances of [SQL Editor](#)<sup>[153]</sup> simultaneously.

☒ **Allow multiple instances of Visual Query Builder**

Check this option to be able to use multiple instances of [Visual Query Builder](#)<sup>[158]</sup> simultaneously.

☒ **Allow multiple instances of SQL Script Editor**

Check this option to be able to use multiple instances of [SQL Script Editor](#)<sup>[204]</sup> 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](#)<sup>[215]</sup> simultaneously.

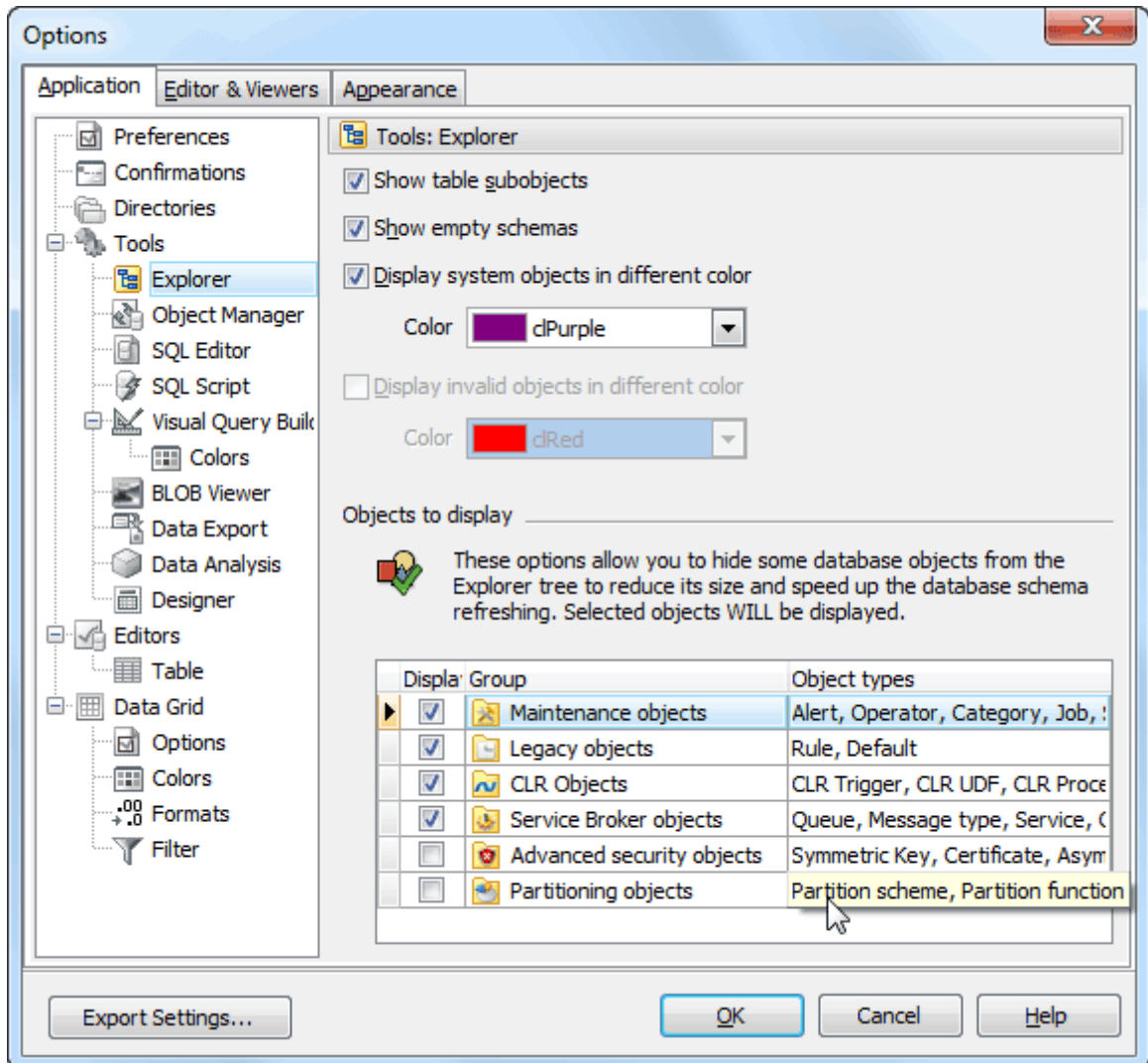
☒ **Allow multiple instances of Diagram Viewer**

Check this option to be able to use multiple instances of [Diagram Viewer](#)<sup>[221]</sup>

simultaneously.

#### 10.1.4.1 Explorer

Below you will find a detailed decryption of the following explorer options.



☒ **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.

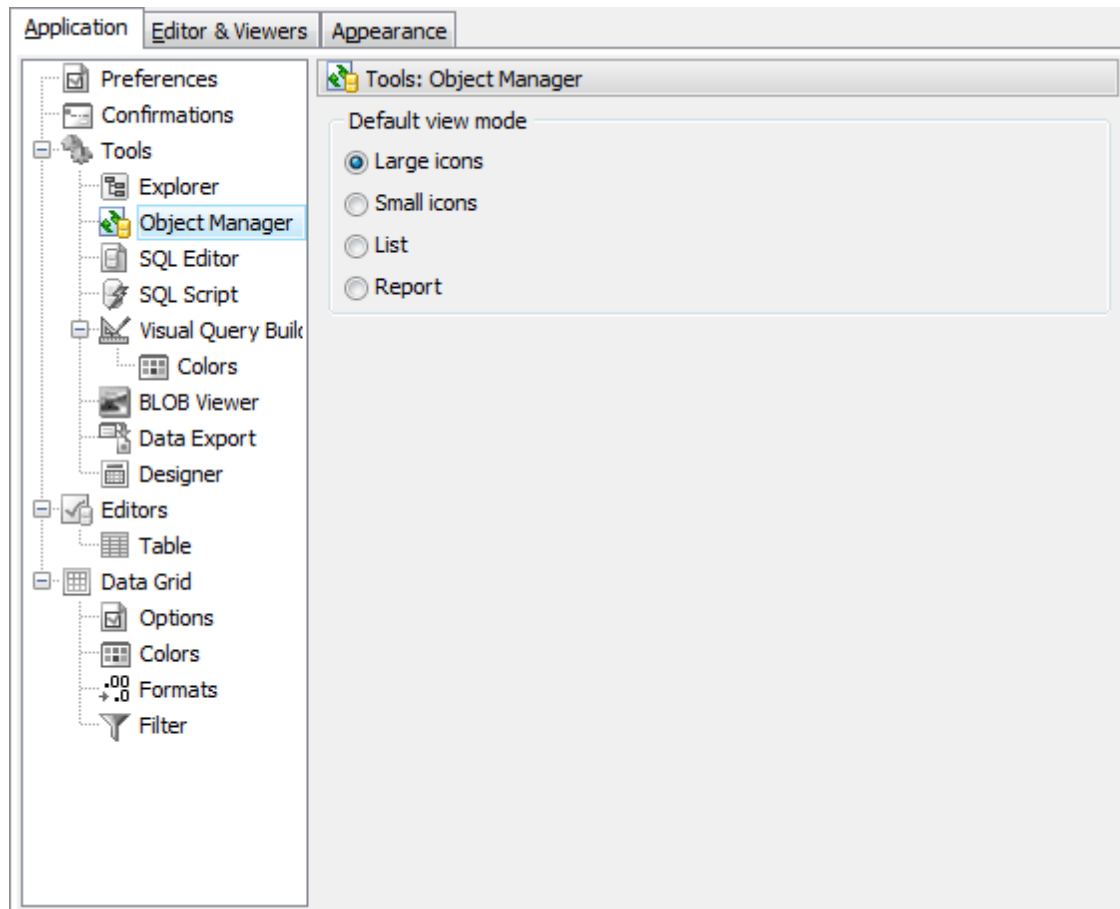
☒ **Display system objects in different color**

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.

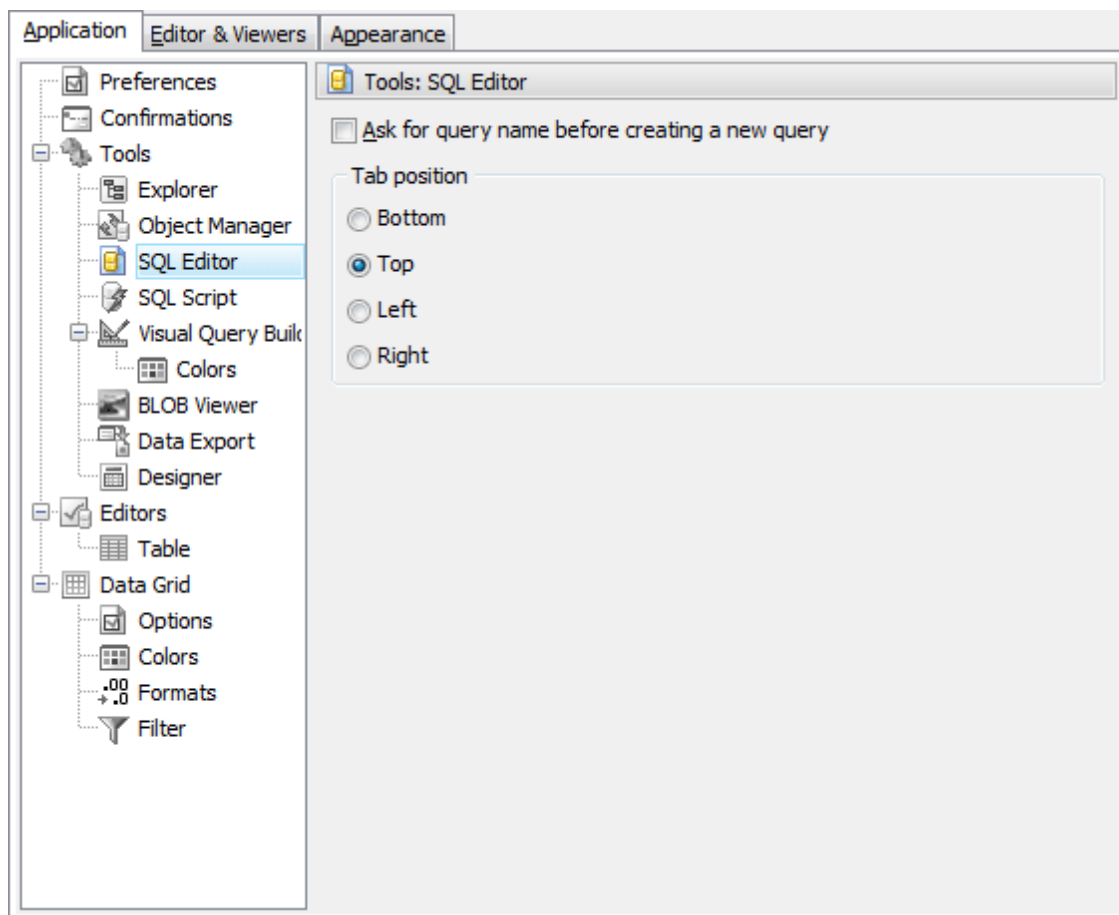


##### Default view mode

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**

If this option is checked, [SQL Editor](#)<sup>153</sup> asks for a query name each time you create a new query.

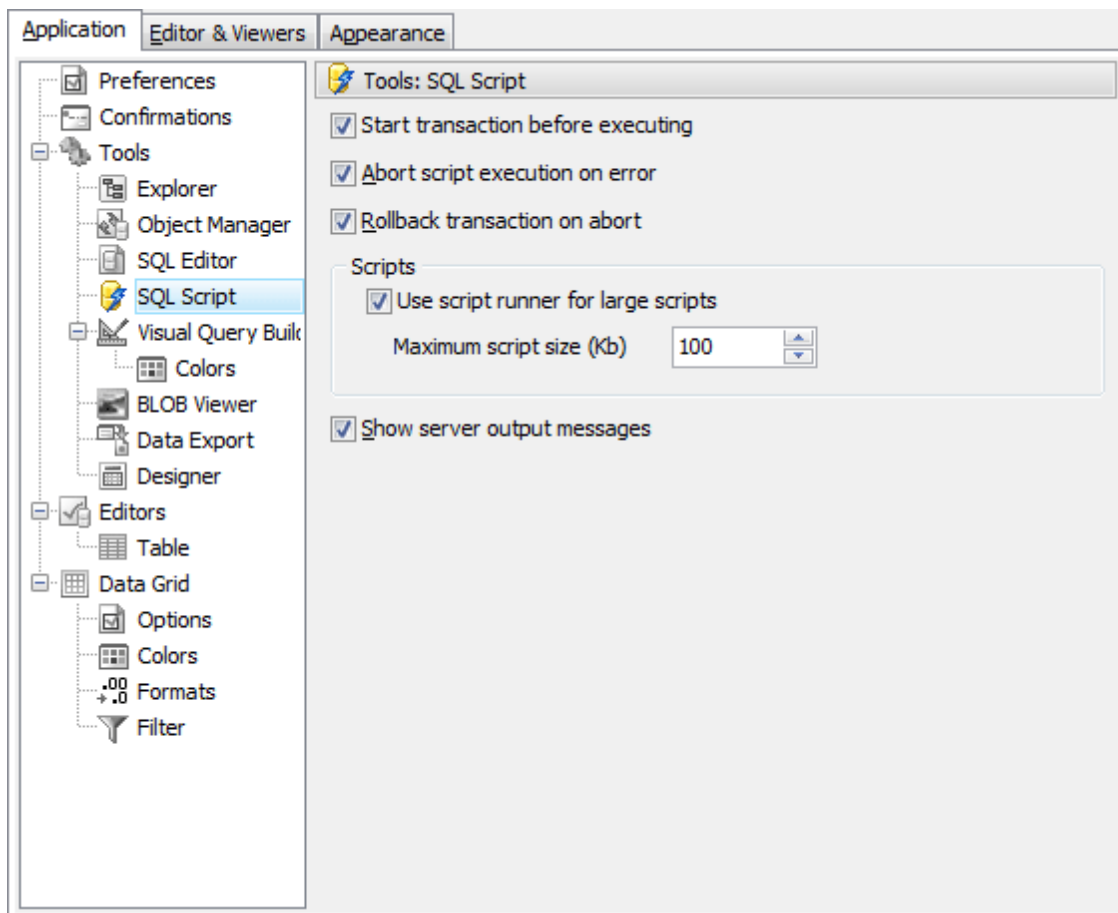
☒ **Auto commit**

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.



☒ **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**

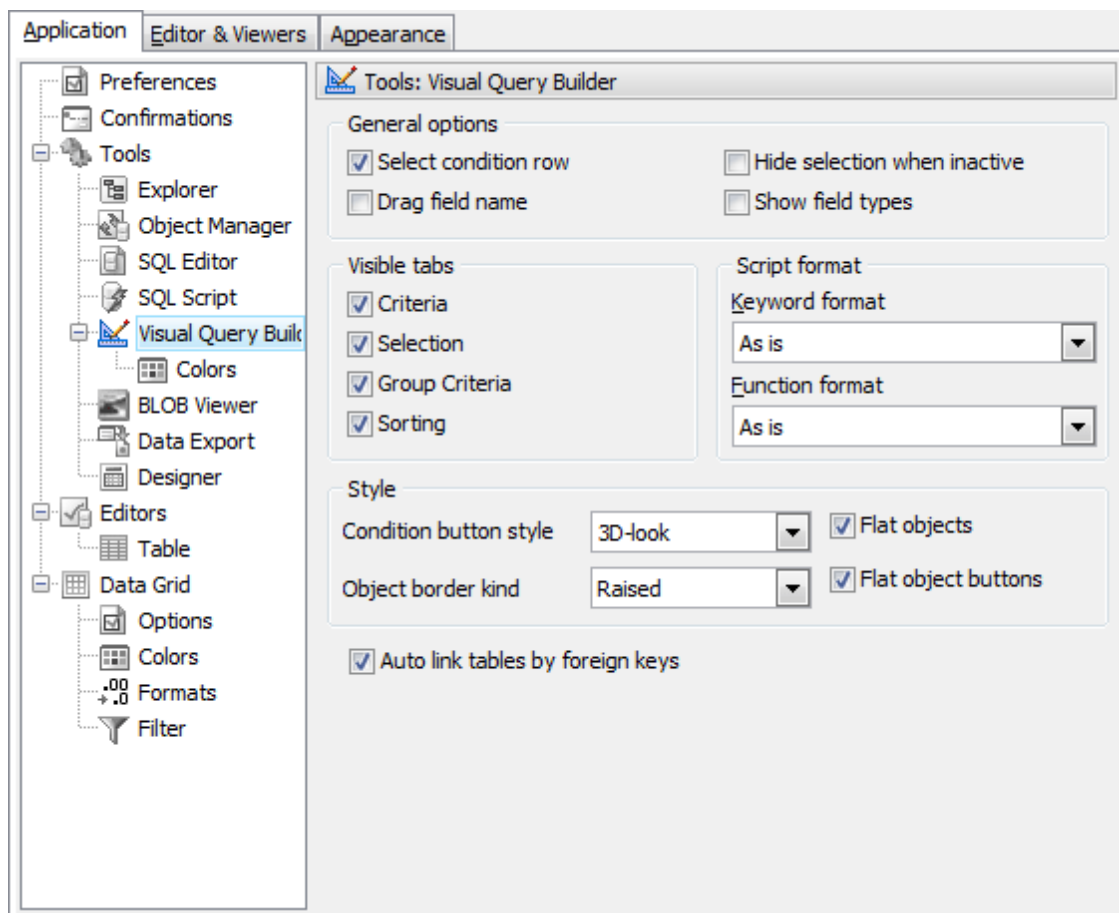
Check the box to execute large script in the fastest way. You can change the maximum size of a script to execute without script runner.

☒ **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.



☒ **Select condition row**

Displays the selected condition in different row on the **Criteria** and **Grouping Criteria** tabs of [Visual Query Builder](#)<sup>[158]</sup>.

☒ **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

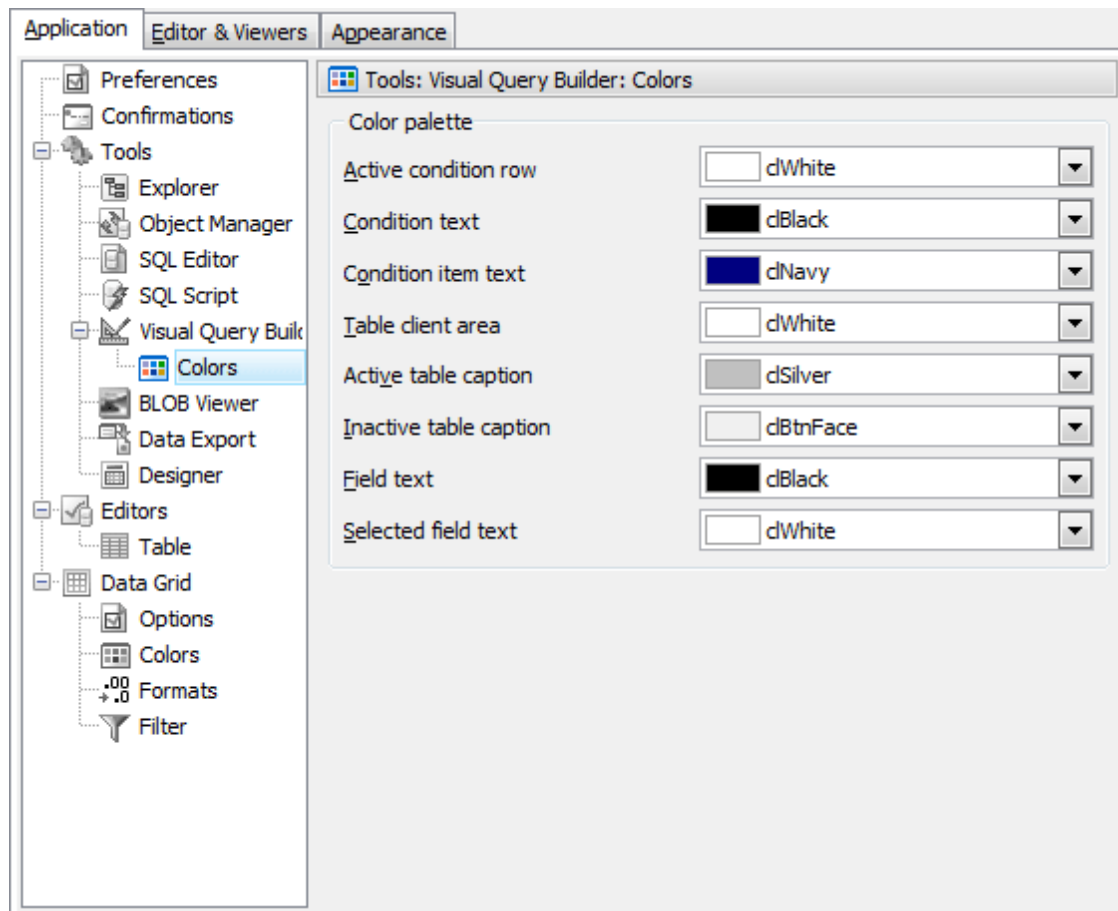
If tables that have foreign key reference are placed in [Query Builder](#), in diagram they will be auto linked.END

## 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.

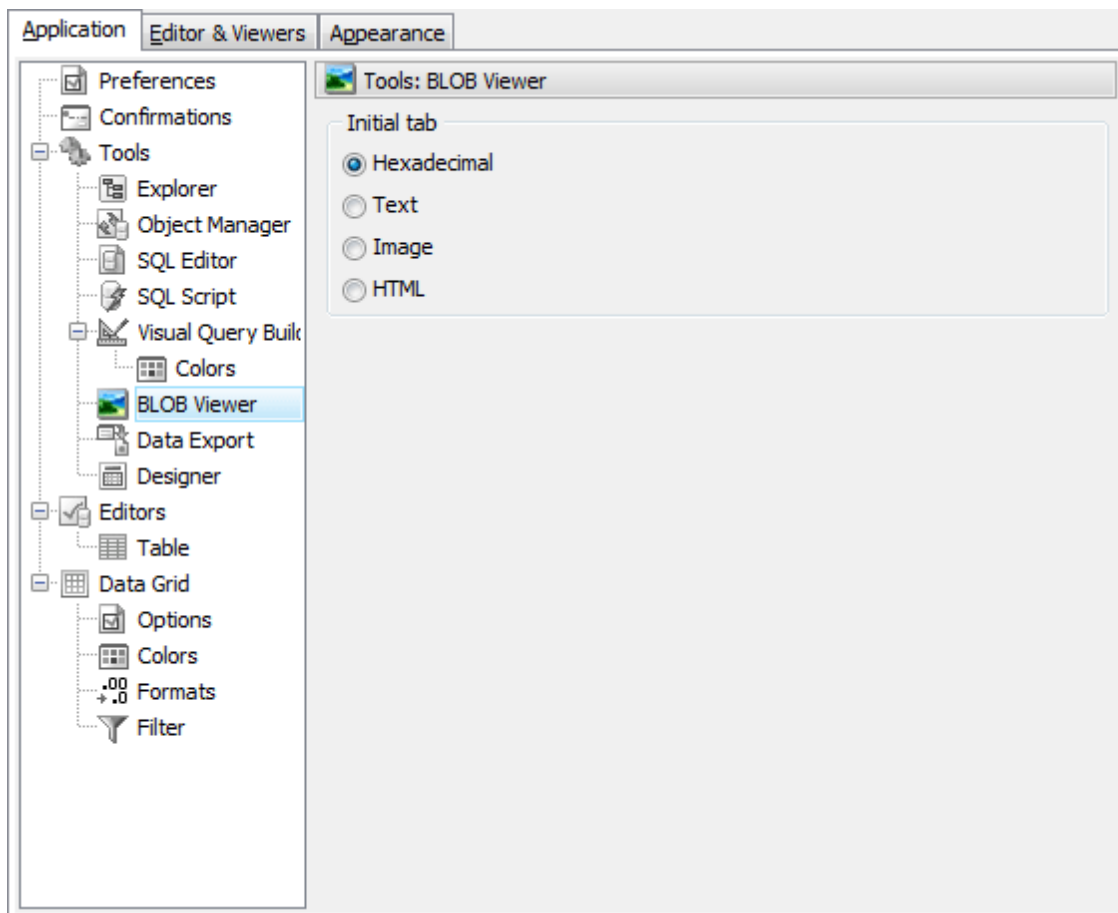
### 10.1.4.5.1 Colors

The tab is provided to editing of the Query Builder color schema. Customize colors for all editor element according to your preferences.



### 10.1.4.6 BLOB Viewer

Below you will find a detailed decryption of the following [BLOB Viewer](#)<sup>[215]</sup> options.



#### Initial tab

Specifies which tab of **BLOB Viewer** should be active when it is initially opened.

#### 10.1.4.7 Data Export

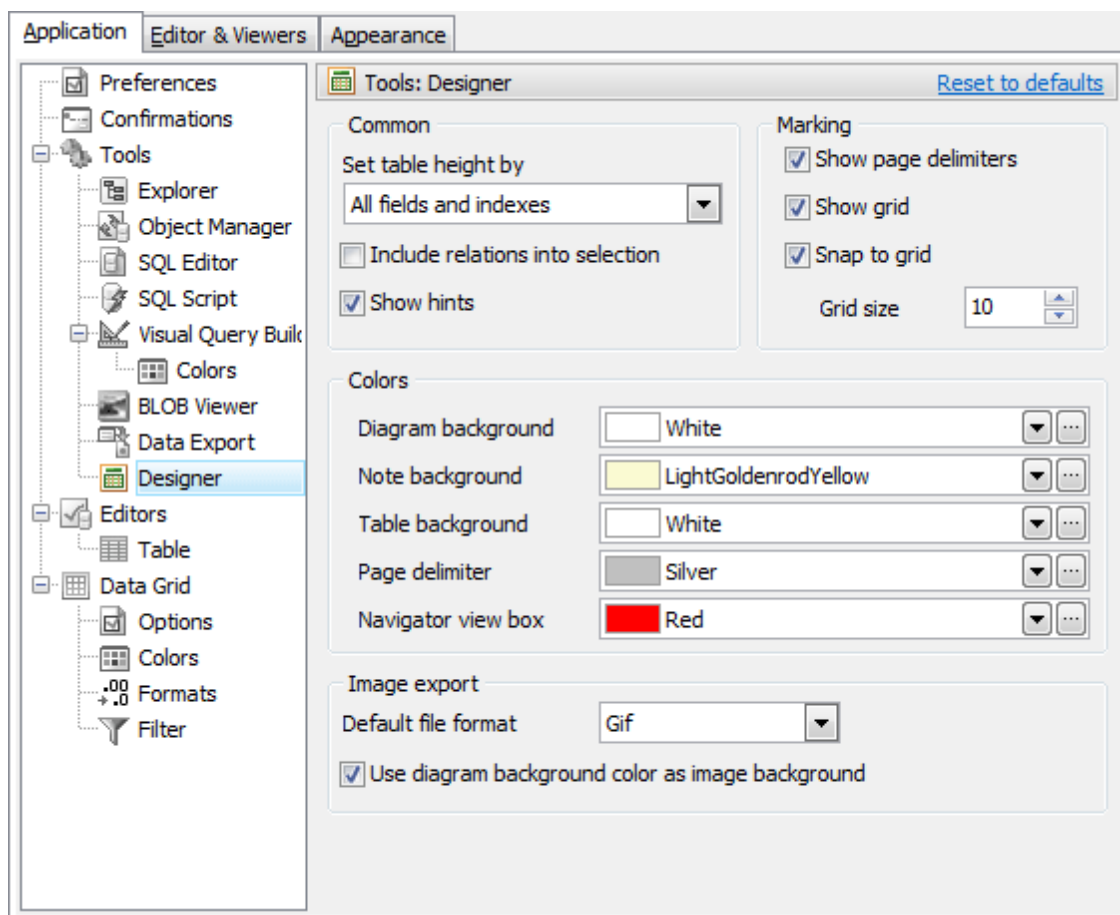
This window allows you to customize formats applied to exported data. Edit the format masks to adjust the result format in the way you need.

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:

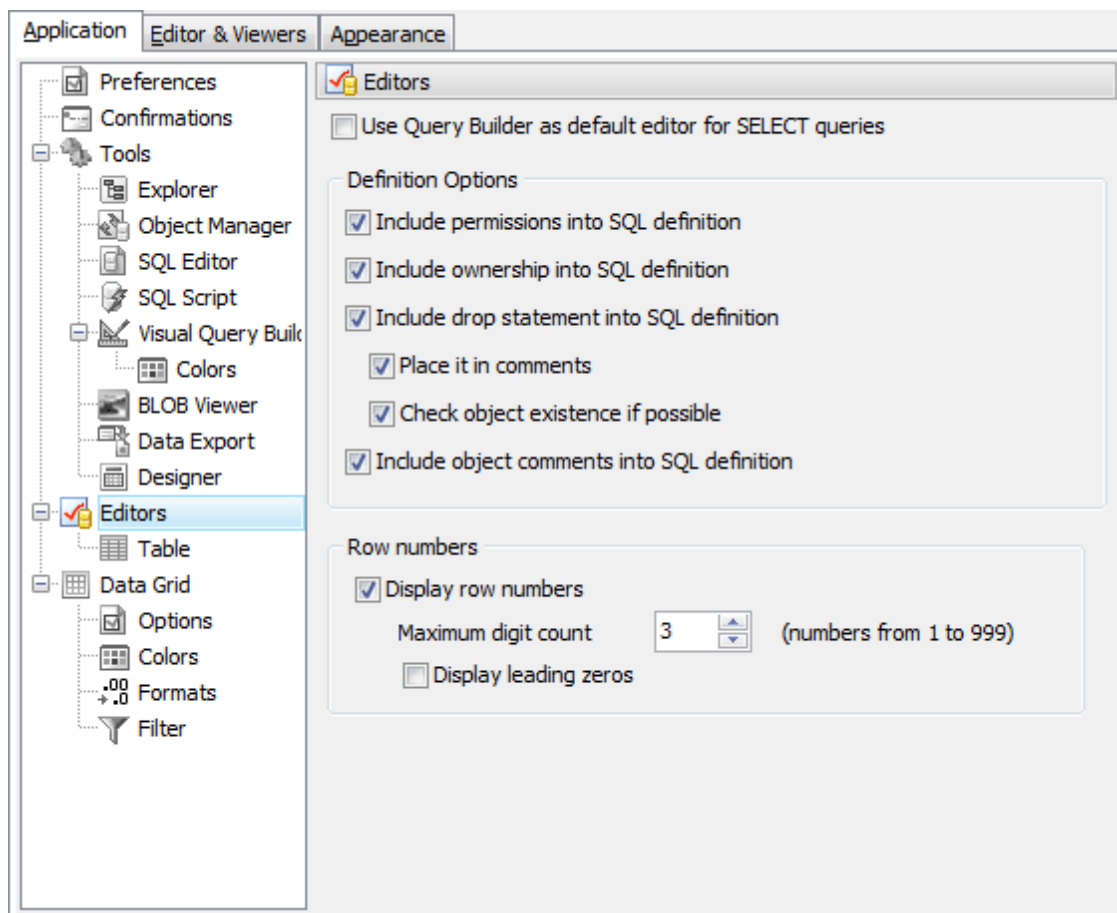
dd	day of the month, represented by 1 or 2 symbols. For example, the first day of month is 1
DD	day of the month, represented only by 2 symbols. For example, the first day of month is 01
mm	minutes





### 10.1.5 Object Editors

Below you will find a detailed description of the following object editors options.



☒ **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](#)<sup>158</sup> instead of [SQL Editor](#)<sup>153</sup>.

☒ **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 fields, 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' your numbering column will be of the form: '001, 002, 003, ...'.

### 10.1.5.1 Table

#### Initial tab

Specifies which tab of [Table Editor](#)<sup>167</sup> should be active when it is initially opened.

#### ☒ Retrieve record count before loading data in the data grid

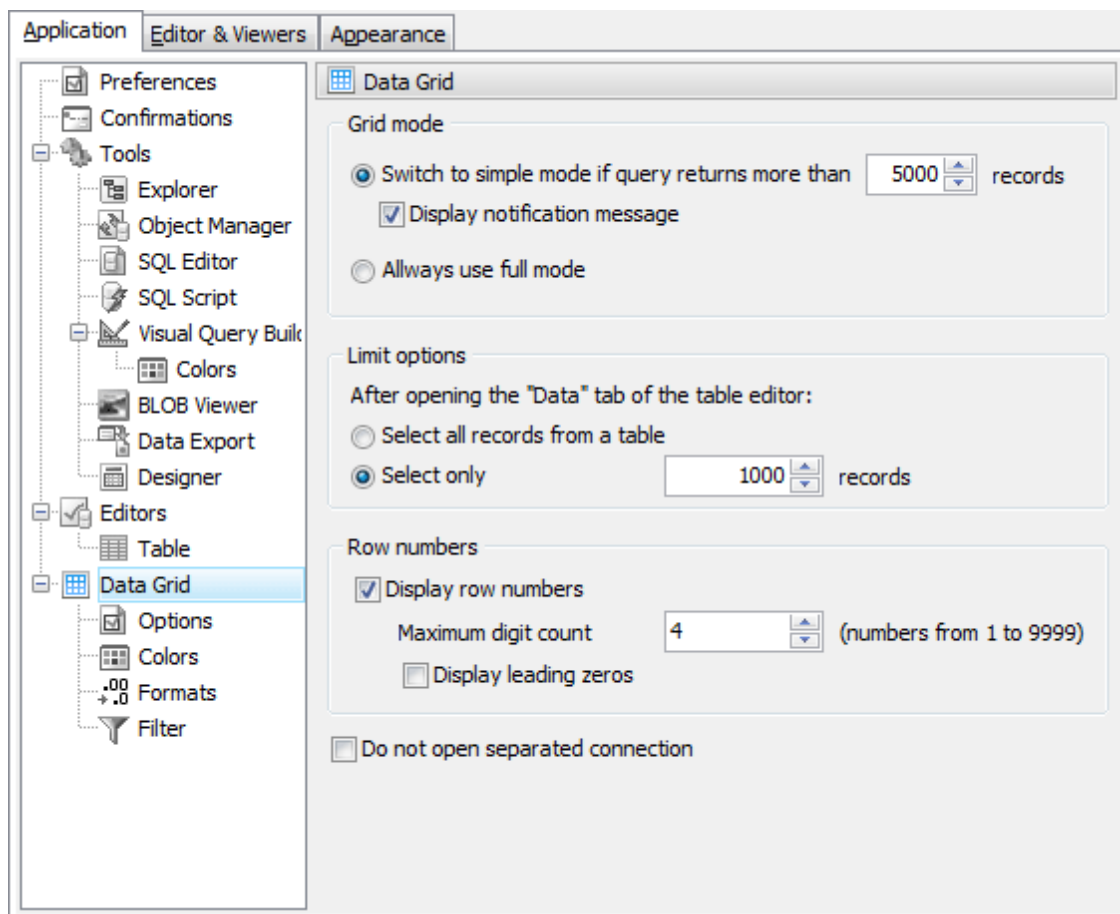
With this option enabled all the `SELECT COUNT(*)...` query is executed before loading data in the data grid.

#### Default field type

Specifies the field type appearing in [Field Editor](#)<sup>168</sup> by default.

### 10.1.6 Data Grid

Below you will find a detailed description of the following data grid options.



SQL Maestro for MySQL provides you with [two grid modes](#)<sup>169</sup> of viewing data:

- Full 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).

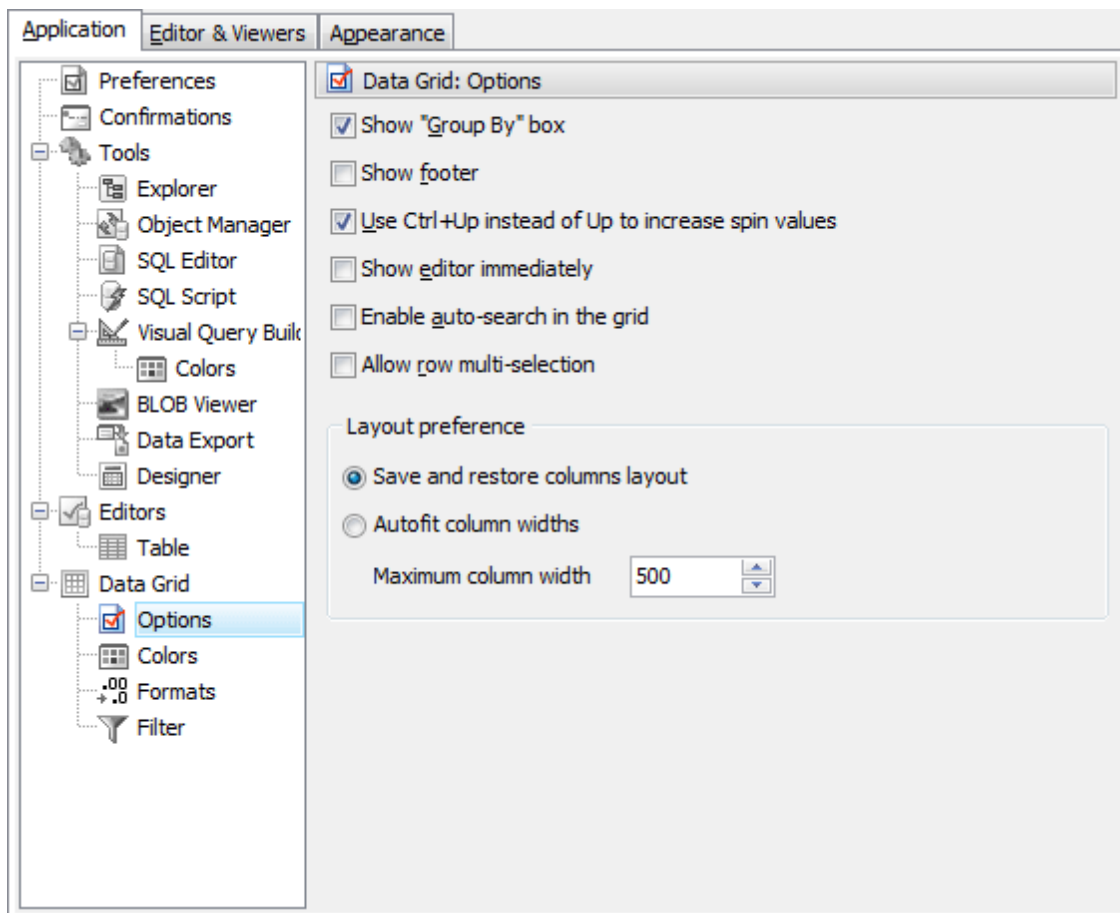
For uniformity you can use the [Display leading zeros](#) option. With this option enabled and maximum digit count '3' your numbering column will be of the form: '001, 002, 003, ...'.

#### ☒ [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.



☒ **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.

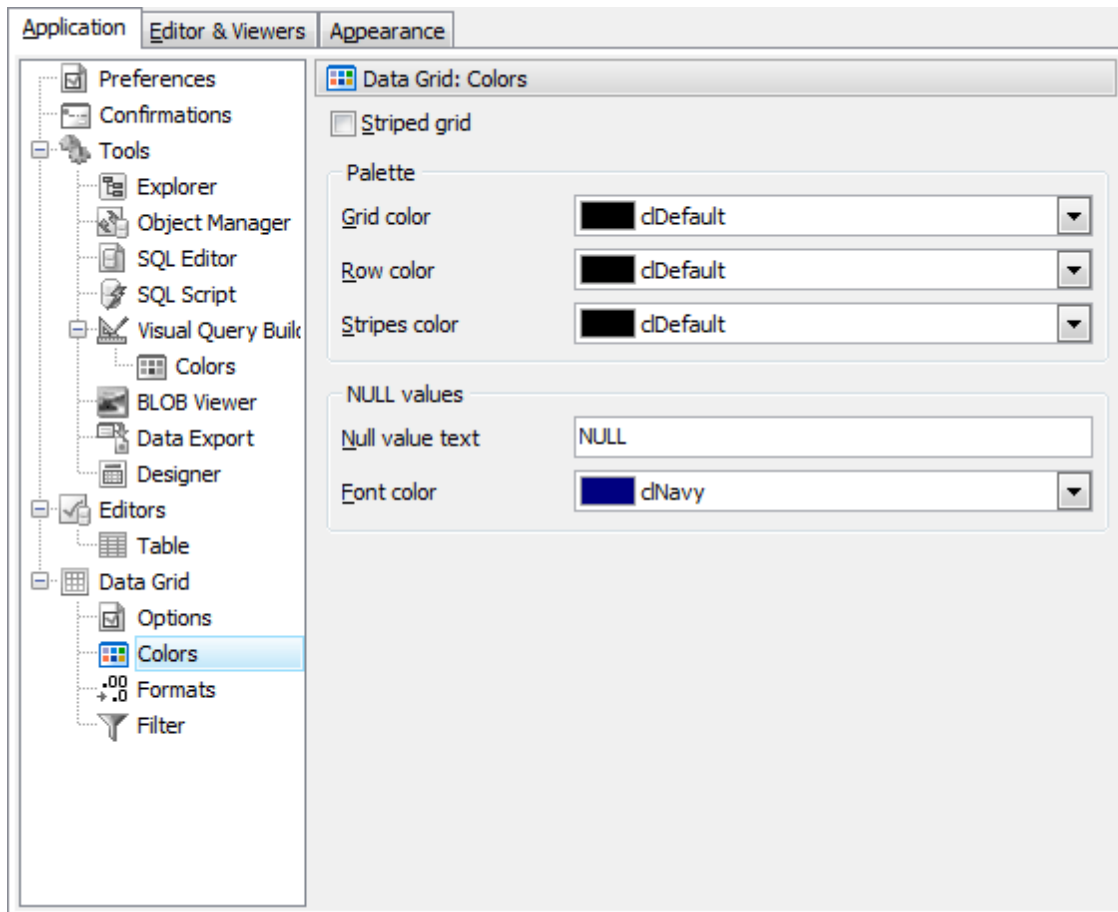
**Layout preference**

Select whether SQL Maestro for MySQL 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

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

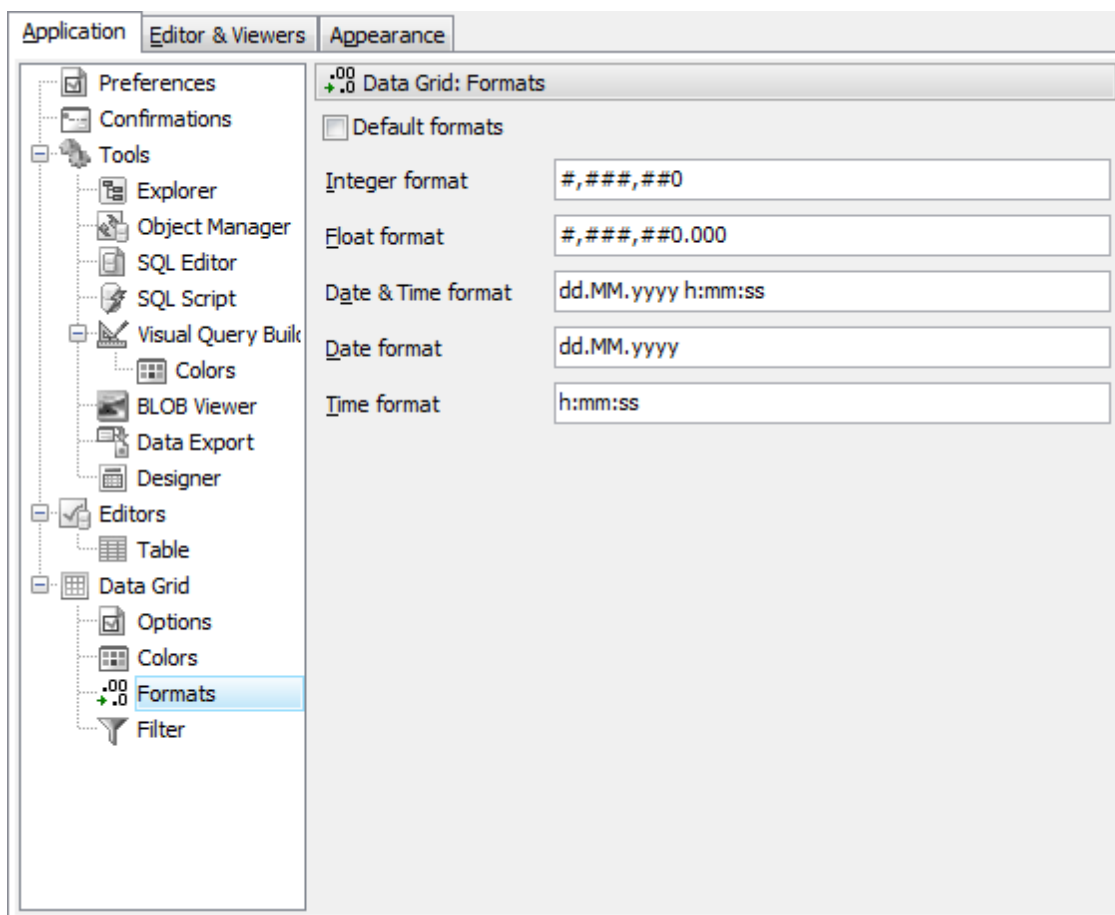
Defines the color of the odd rows if the [Striped Grid](#) option is on.

#### 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.



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:

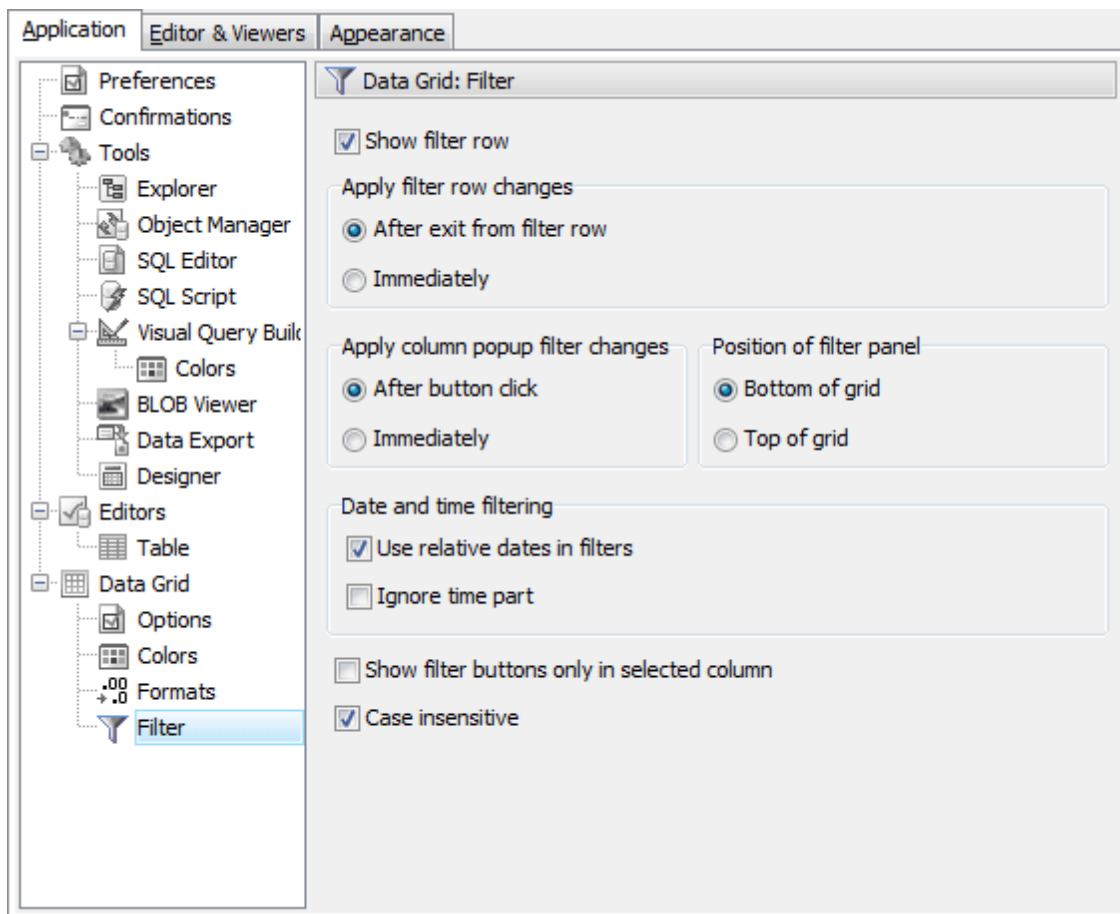
dd	day of the month, represented by 1 or 2 symbols. For example, the first day of month is 1
DD	day of the month, represented only by 2 symbols. For example, the first day of month is 01
mm	minutes
MM	month
yy	year, represented by 2 symbols. For example, 2006 year will be 06

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.

☒ 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 SQL Maestro for MySQL.

- [General](#) <sup>[278]</sup>
- [Display](#) <sup>[279]</sup>
- [SQL highlight](#) <sup>[280]</sup>
- [PHP highlight](#) <sup>[282]</sup>
- [XML highlight](#) <sup>[281]</sup>
- [Code Insight](#) <sup>[283]</sup>
- [Code Folding](#) <sup>[284]</sup>

**See also:** [SQL Editor](#) <sup>[153]</sup>, [SQL Script Editor](#) <sup>[204]</sup>, [Visual Query Builder](#) <sup>[158]</sup>, [Table Editor](#) <sup>[70]</sup>.

### 10.2.1 General

If the [Auto indent](#) option is checked, each new indentation 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](#)

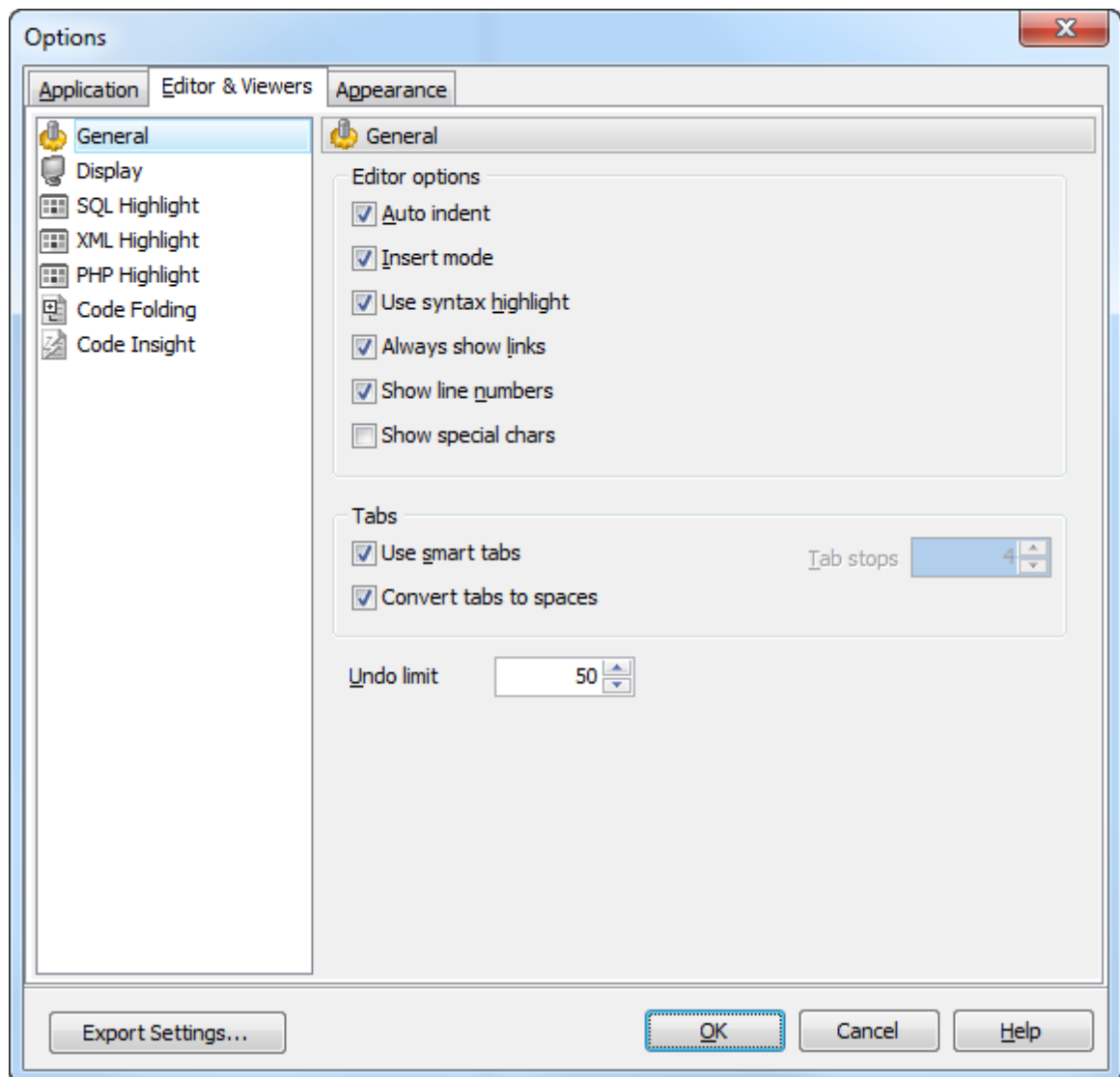
If this option is checked, each time you press the Tab key, the appropriate number of spaces will be added to the edited text.

[Tab Stops](#)

Defines the tab length, used when editing text.

### Undo Limit

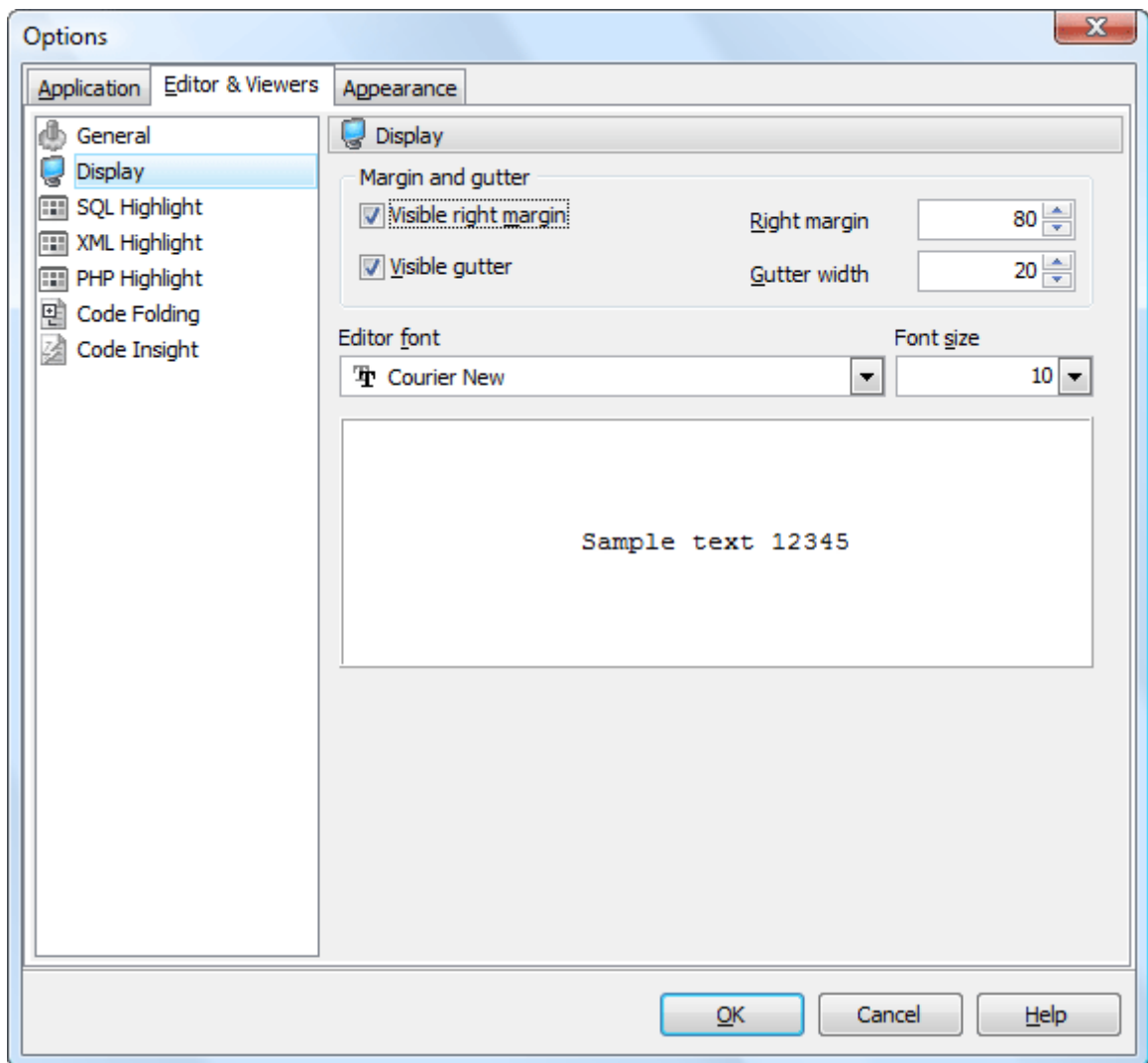
Defines the maximum number of changes possible to be undone.



## 10.2.2 Display

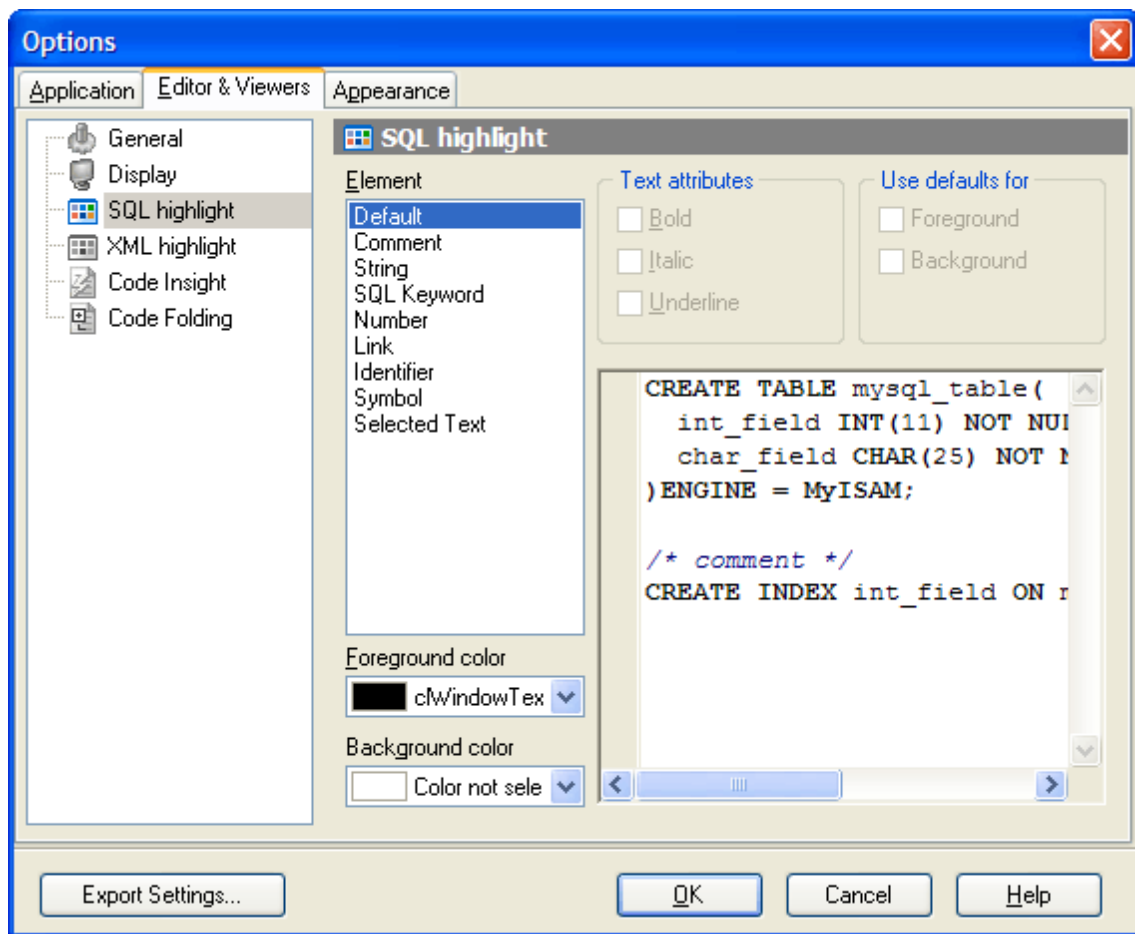
You can disable/enable the right text margin and the gutter of the editor area, set the position of the right text margin as [Right margin](#), and [the Gutter width](#).

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.



### 10.2.3 SQL highlight

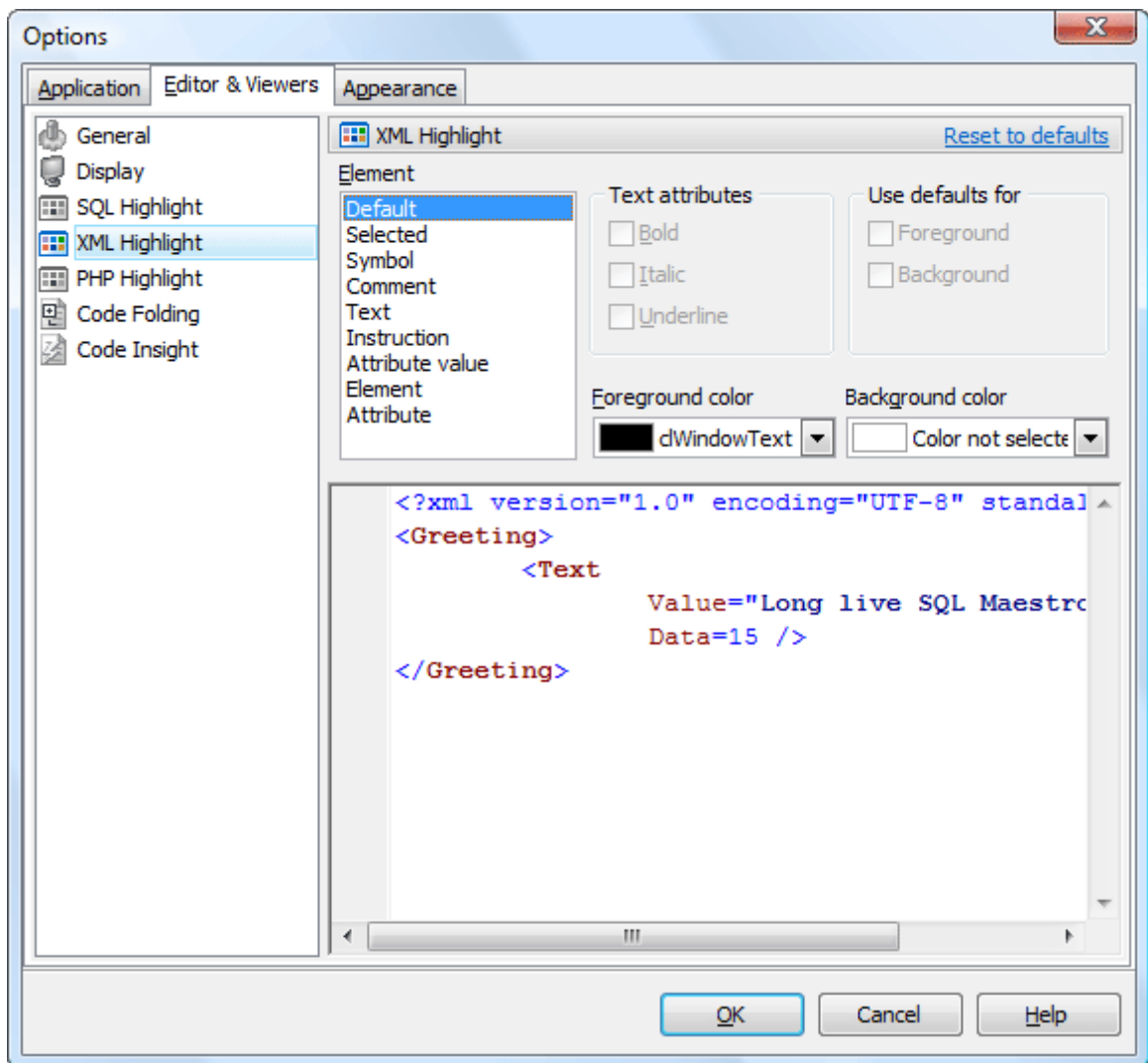
Use the [SQL highlight](#) item to customize syntax highlight in all SQL editors and viewers, e.g. in [SQL Editor](#), [Query Builder](#), [Table Editor](#) and others. Select the text element from the list, e.g. *comment* or *SQL keyword* and adjust its foreground color, background color and text attributes according to your preferences.



#### 10.2.4 XML highlight

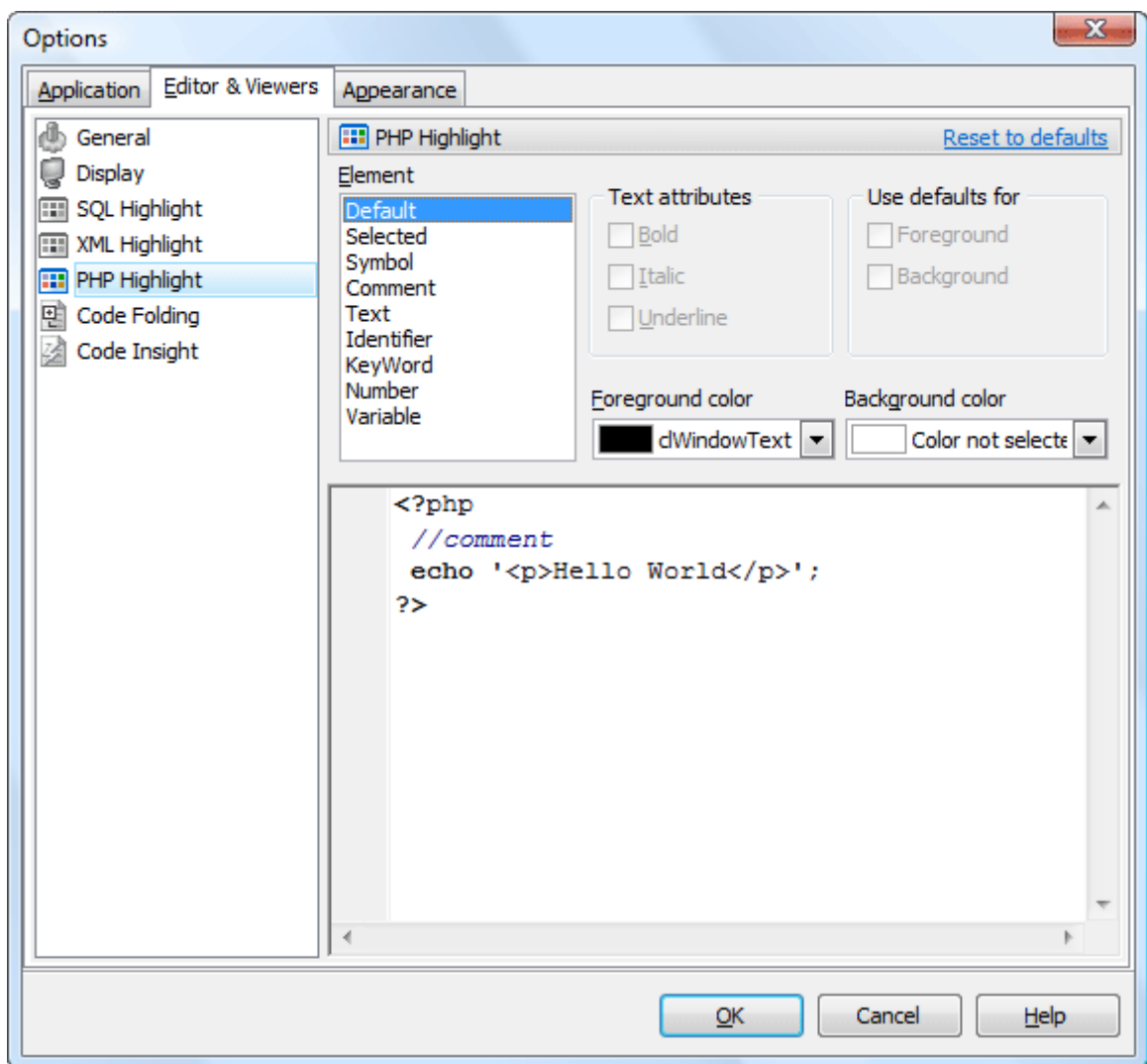
Use the [XML highlight](#) item to customize XML syntax highlight for the text representation of BLOBs in [BLOB Viewer/Editor](#). Select the text element from the list, e.g. attribute or attribute value and adjust its foreground color, background color and text attributes according to your wishes.





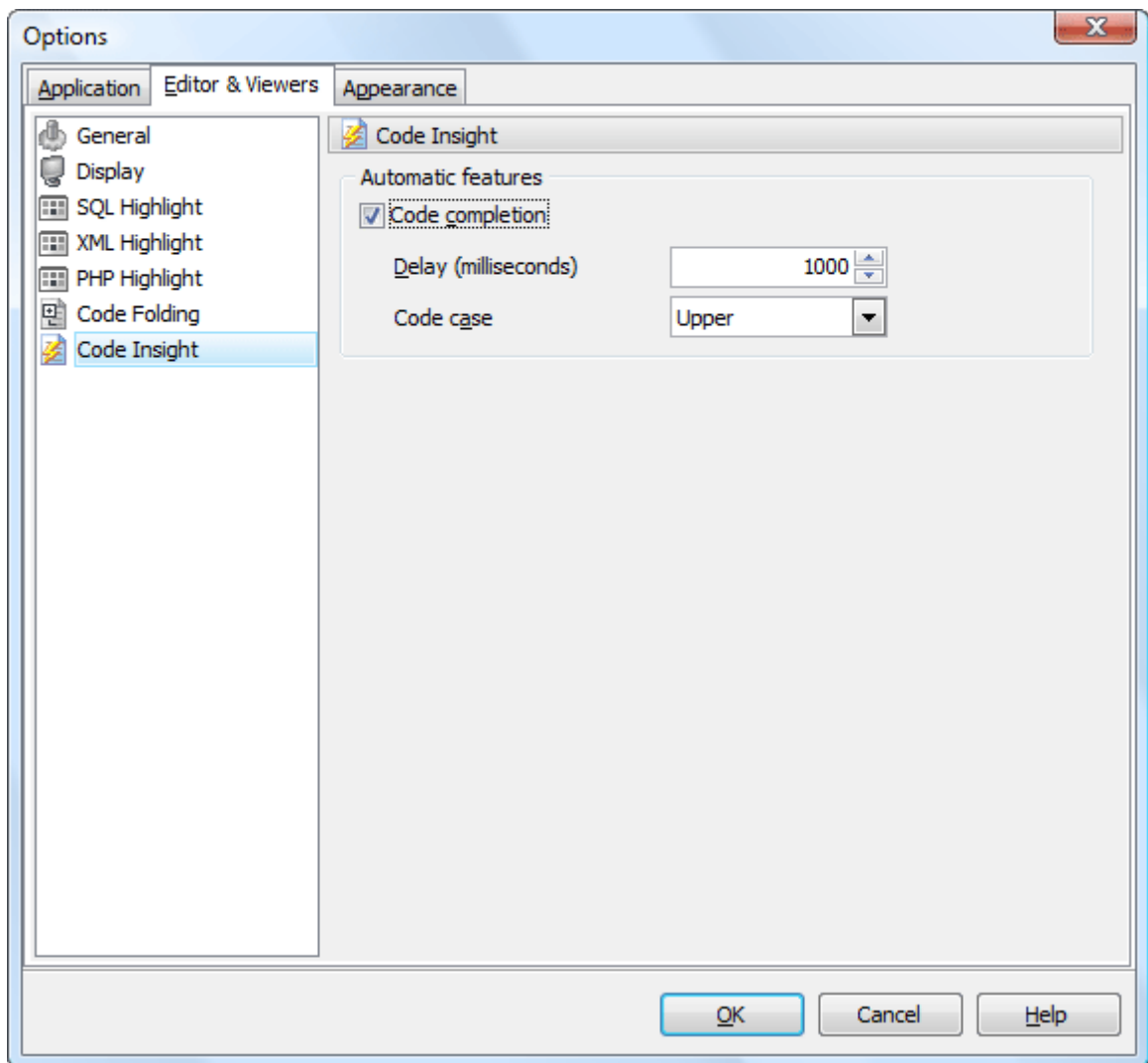
### 10.2.5 PHP highlight

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.



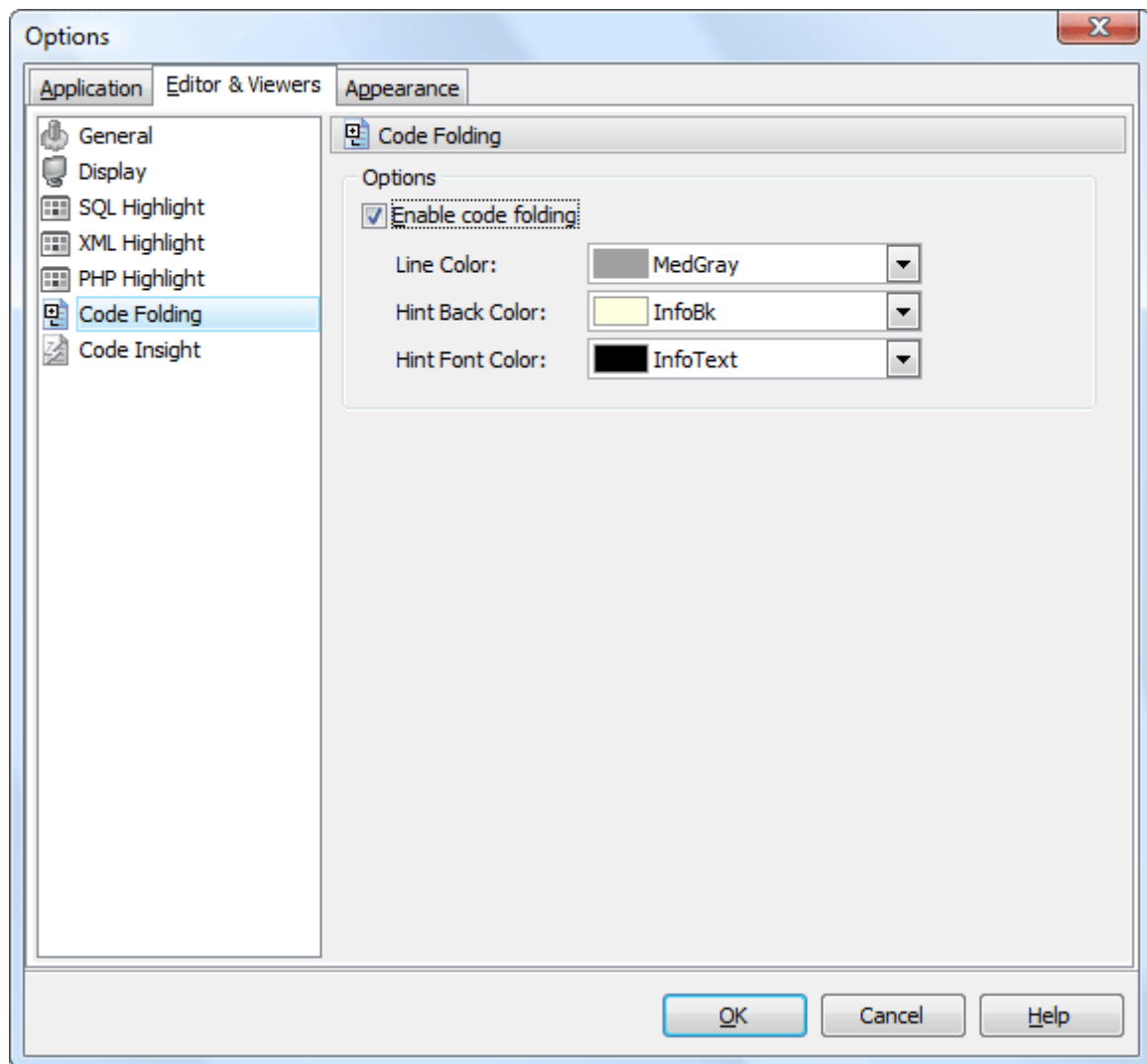
### 10.2.6 Code Insight

You can disable/enable the code completion with the corresponding option and also set the time it appears as *Delay*, and case of words inserted automatically.



### 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.



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.

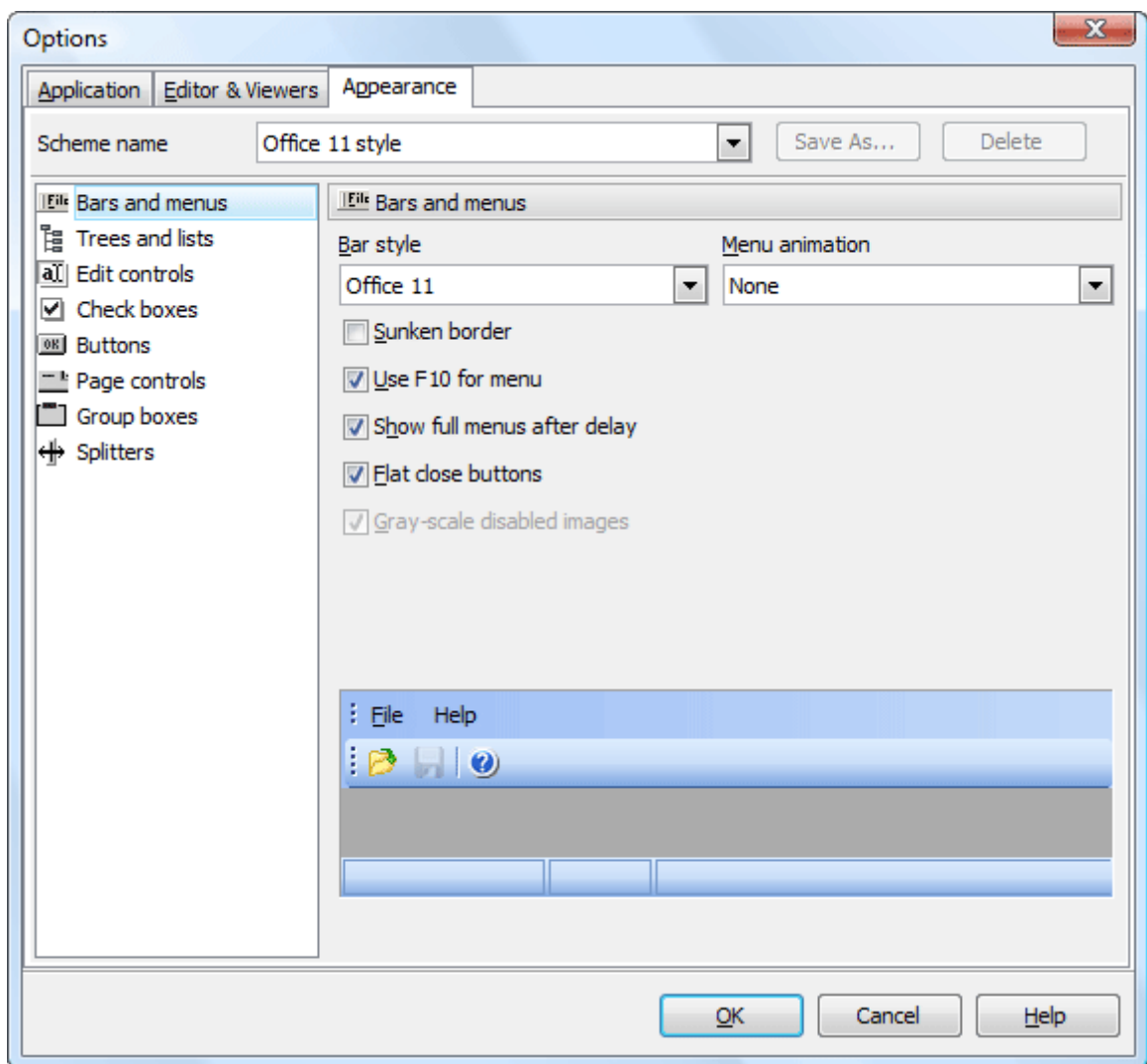
Use the [Scheme name](#) box to select the interface scheme you prefer: *Office XP style*, *Windows XP native style*, etc. You can create your own interface schemes by customizing any visual options ([Bars and menus](#), [Trees and lists](#), [Edit controls](#), [Check boxes](#), [Buttons](#), etc.) and clicking the [Save As](#) button. All the customized options are displayed on the sample panel.

- [Bars and menus](#) <sup>[286]</sup>
- [Trees and lists](#) <sup>[287]</sup>
- [Edit controls](#) <sup>[288]</sup>
- [Check boxes](#) <sup>[289]</sup>
- [Buttons](#) <sup>[290]</sup>
- [Page controls](#) <sup>[291]</sup>
- [Group boxes](#) <sup>[292]</sup>
- [Splitters](#) <sup>[293]</sup>

### 10.3.1 Bars and menus

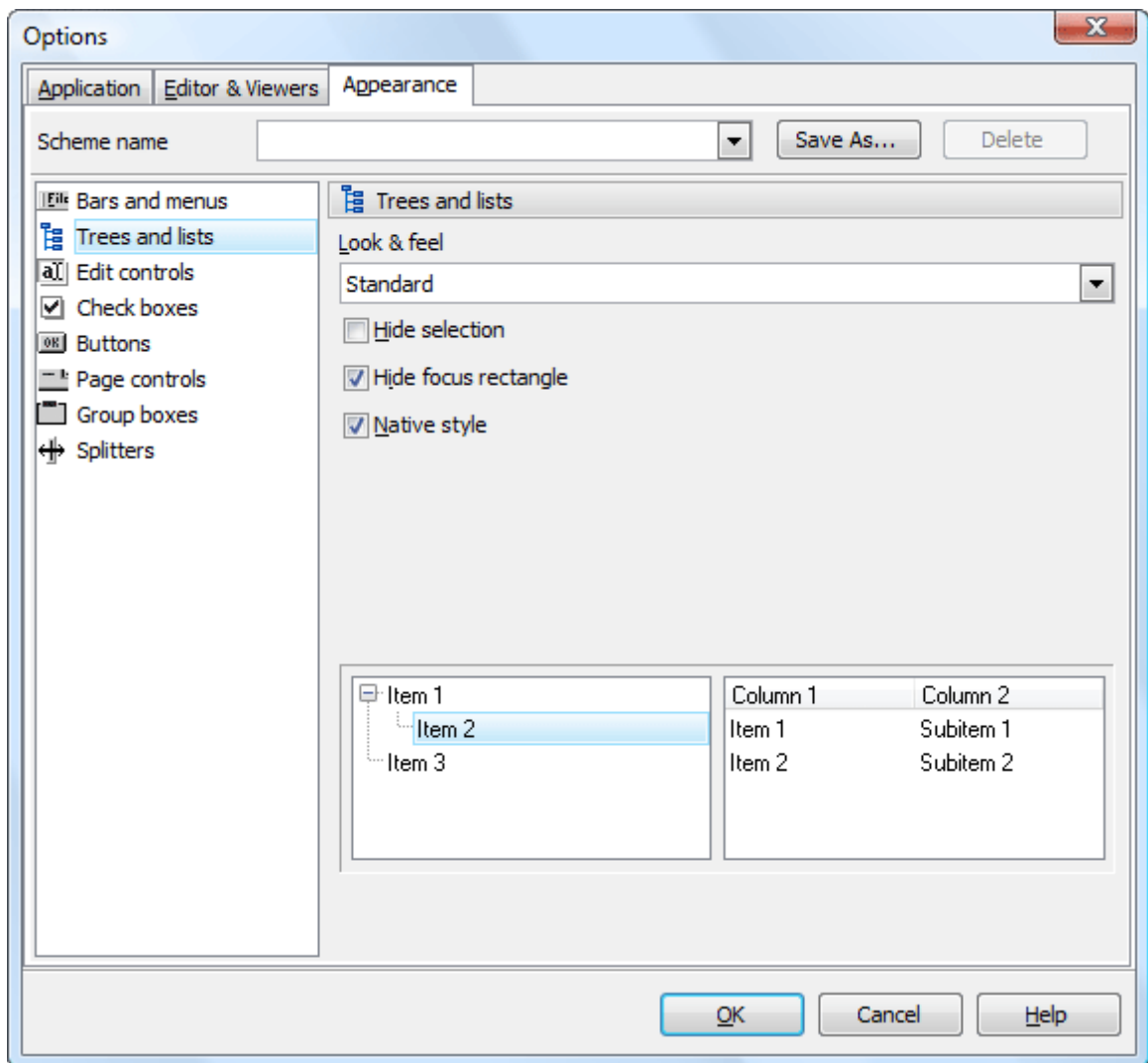
Use the [Bars and menus](#) item to customize SQL Maestro for MySQL toolbars style and menus animation.

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.



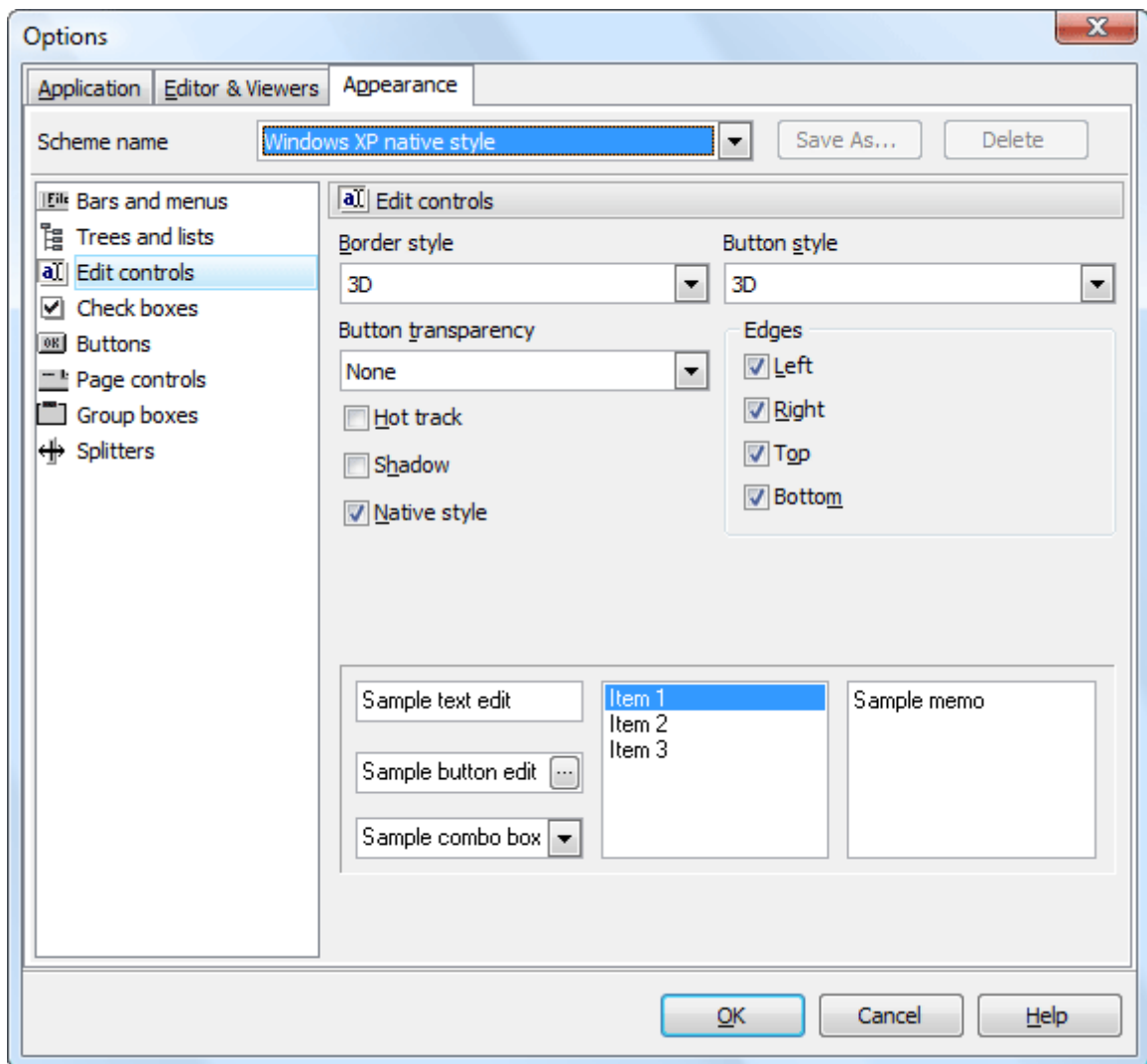
### 10.3.2 Trees and lists

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.



### 10.3.3 Edit controls

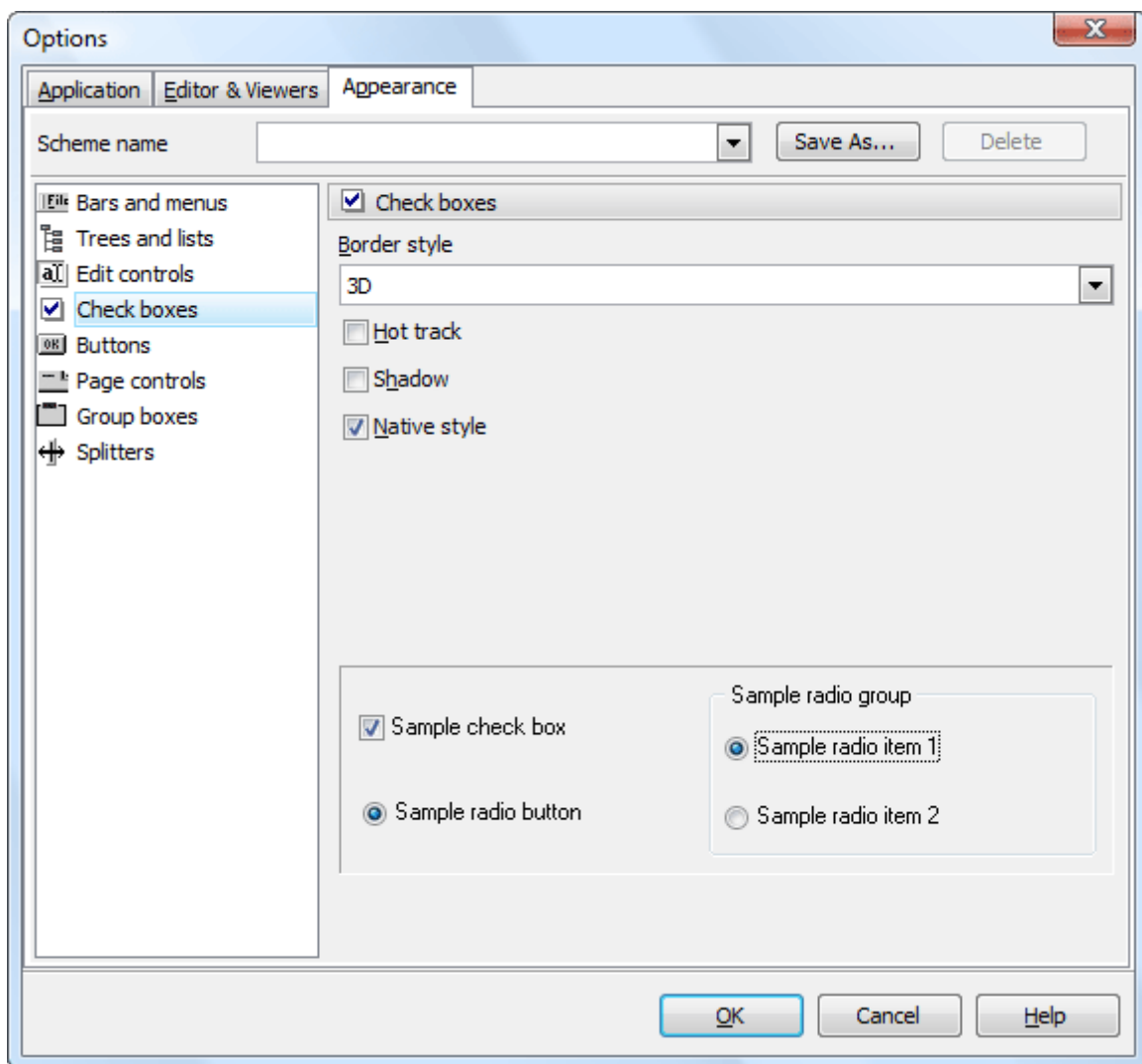
Use the [Edit controls](#) item to customize the appearance of different SQL Maestro for MySQL edit controls. The tab allows you to select the edit controls border style, button style and transparency, enable/disable hot tracks, shadows, native style and customize edges. It is also possible to define samples for the text edit, button edit and combo box controls.



### 10.3.4 Check boxes

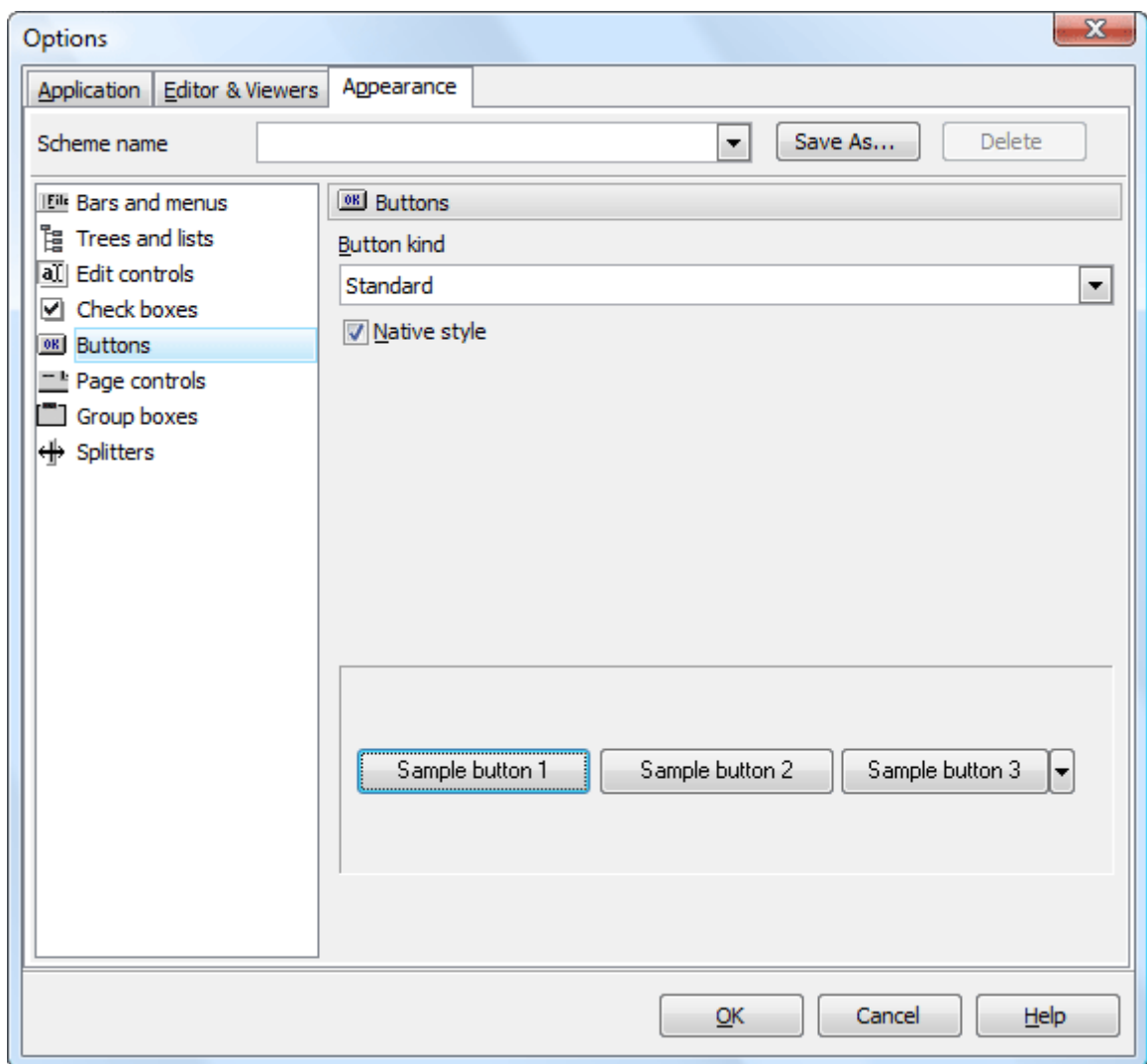
The [Check boxes](#) item allows you to customize the appearance of check boxes and radio buttons. The tab allows you to customize the appearance of check boxes: set border style, enable/disable hot tracks, shadows, native style. It is also possible to define samples for check boxes and radio buttons.





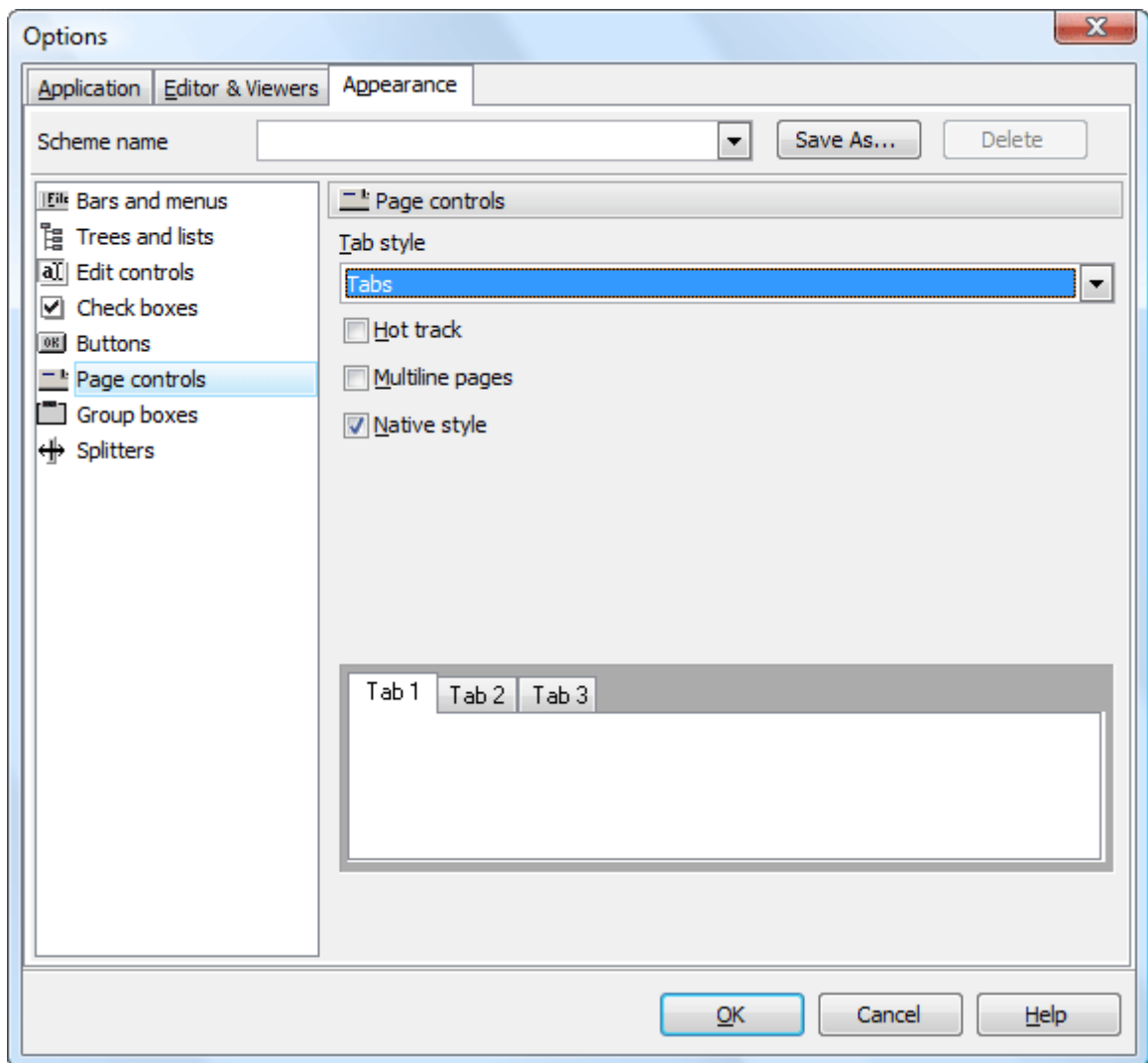
### 10.3.5 Buttons

Use the [Buttons](#) item to customize SQL Maestro for MySQL buttons. The tab allows you to adjust the appearance of buttons and define sample buttons as well.



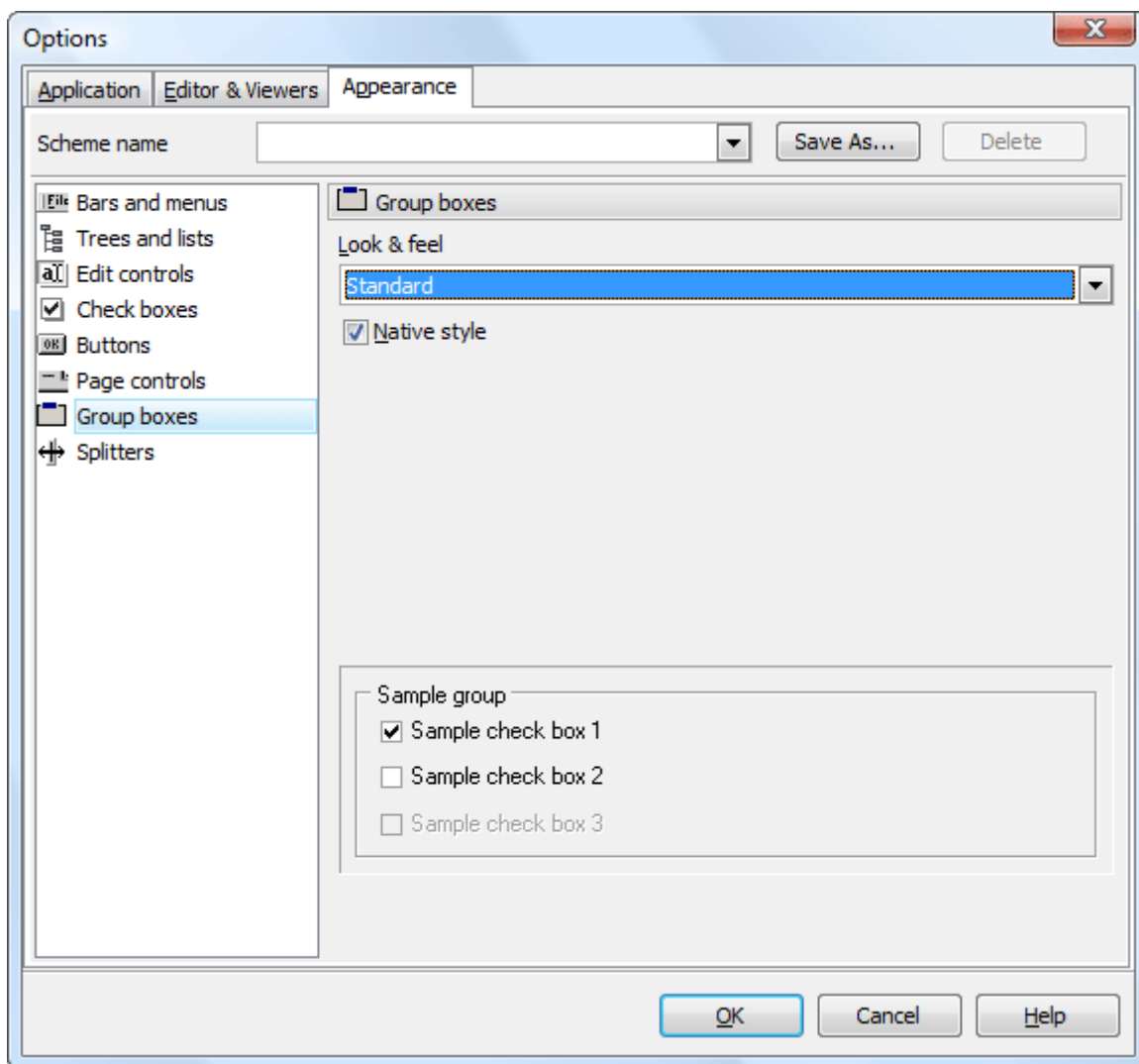
### 10.3.6 Page controls

The [Page controls](#) item allows you to customize the style of all SQL Maestro for MySQL page controls. The tab allows you to select tab styles, enable/disable hot track, multi-line pages and native style.



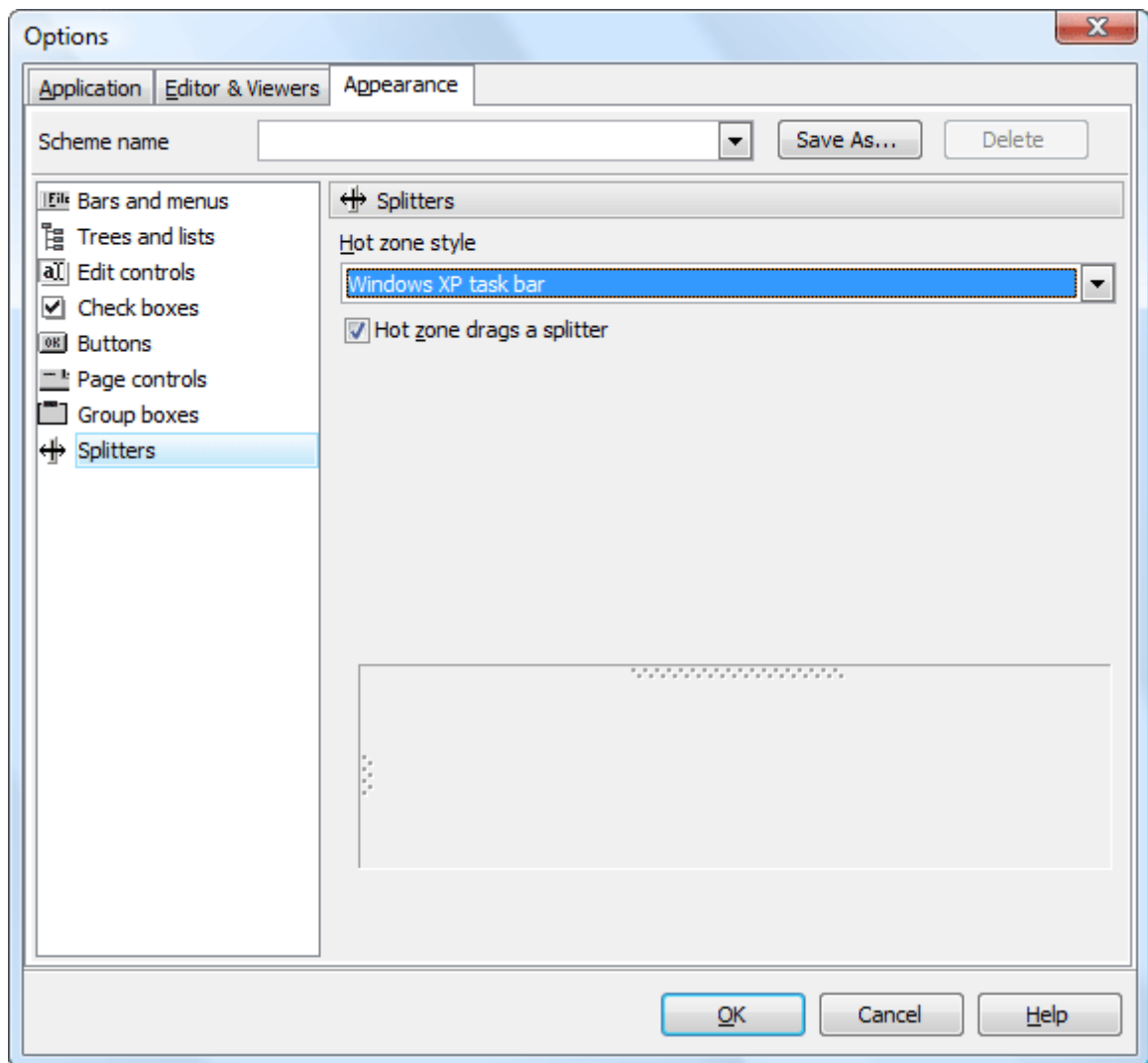
### 10.3.7 Group boxes

Use the [Group boxes](#) item to customize all SQL Maestro for MySQL group boxes according to your preferences. Use tab to apply styles for group boxes, enable/disable native style and define samples.



### 10.3.8 Splitters

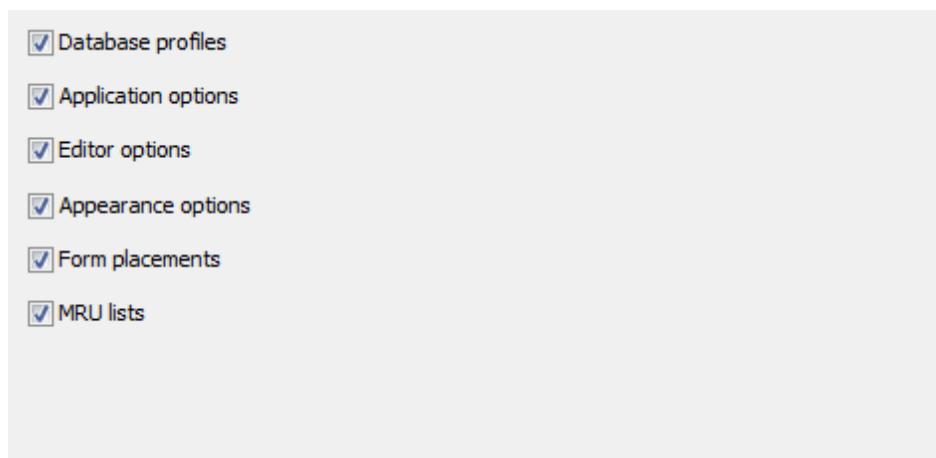
Use the [Splitters](#) item to customize all SQL Maestro for MySQL splitters according to your preferences. Use the tab to select hot zone style (*Windows XP task bar*, *Media Player 8*, *Media Player 9*, *Simple* or *none*) and specify the [Hot zone drags a splitter](#) option.



## 10.4 Export Settings

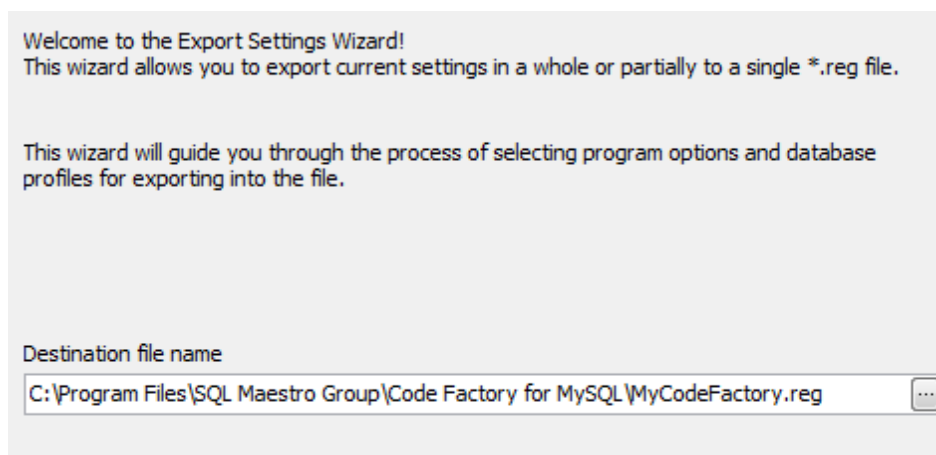
Export Settings Wizard allows you to export all or partial SQL Maestro for MySQL settings to single \*.reg file which can be applied to the application of SQL Maestro for MySQL installed on another machine or used to backup previous settings. To run the wizard, select the Tools | Options main menu item and click Export Settings in the [Options](#)<sup>[255]</sup> dialog.

- [Specifying destination file to save settings to](#)<sup>[295]</sup>
- [Specifying settings categories to save](#)<sup>[295]</sup>
- [Select database profiles to save](#)<sup>[296]</sup>
- [Saving settings](#)<sup>[296]</sup>



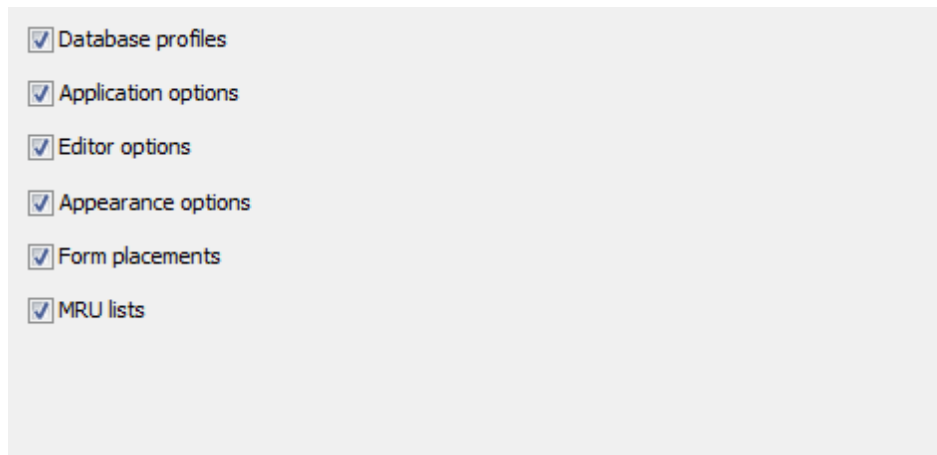
### 10.4.1 Specifying destination file

Specify a \*.reg file to extract SQL Maestro for MySQL setting to.



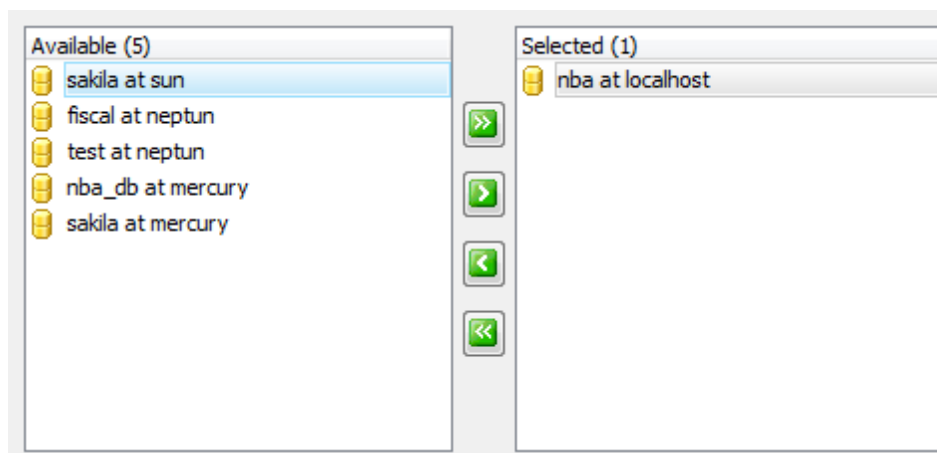
### 10.4.2 Selecting setting categories

The options of this step specify the information saved to the result file, e.g. Database profiles, [Application options](#)<sup>[256]</sup>, etc.



### 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.

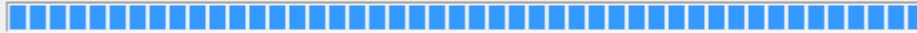


### 10.4.4 Saving settings

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.



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