

Toad Edge® 2.10.0

User Guide



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Quest Software Inc.
Attn: LEGAL Dept
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About Toad Edge®

Toad Edge® is a next-generation tool for today's complex database environments

Toad Edge® is a flexible Java based toolset for the development and management of open source relational databases. It is built to reduce the learning curve for developers and DBAs working in next-generation database environments.

Features

Toad Edge® allows you to:

- Connect to your databases on premise or in cloud
- View, explore and edit database structure, database objects and properties
- Manage database objects, easily add, edit or drop objects in **Object Explorer**
- Manage data stored in your database, add, edit or remove records
- Write complex SQL code comfortably in **Worksheet**
- Monitor running SQL queries in progress
- Compare and synchronize databases using powerful **Schema Compare**
- Obtain detailed information about your databases
- Edit JSON script in an advanced **Editor**
- Take database **Snapshots** and much more

About Quest

We are more than just a name

We are on a quest to make your information technology work harder for you. That is why we build community-driven software solutions that help you spend less time on IT administration and more time on business innovation. We help you modernize your data center, get you to the cloud quicker and provide the expertise, security and accessibility you need to grow your data-driven business. Combined with Quest's invitation to the global community to be a part of its innovation, and our firm commitment to ensuring customer satisfaction, we continue to deliver solutions that have a real impact on our customers today and leave a legacy we are proud of. We are challenging the status quo by transforming into a new software company. And as your partner, we work tirelessly to make sure your information technology is designed for you and by you. This is our mission, and we are in this together. Welcome to a new Quest. You are invited to Join the Innovation.

Our brand, our vision. Together.

Our logo reflects our story: innovation, community and support. An important part of this story begins with the letter Q. It is a perfect circle, representing our commitment to technological precision and strength. The space in the Q

itself symbolizes our need to add the missing piece — you — to the community, to the new Quest. For sales or other inquiries, visit www.quest.com/contact.

New features of Toad Edge

In Toad Edge® 2.10, the following new features were implemented:

General features

Support for Stored Procedure Cursors

- Users now have the ability to view cursor information directly from the user interface (UI).

Support for MariaDB Function Parameter Modes

- Users now have the ability to select MariaDB Function Parameter Modes like IN/OUT/INOUT directly from the user interface (UI).

Support for Roles Schema Compare

- Users now can compare login/group roles for PostgreSQL and EDB databases within the Schema Compare Feature.

Support for Microsoft Edge Browser

Toad Edge for Windows now supports Microsoft Edge Browser for Sign In/Up purposes.

Database features

Support for MySQL

- Toad Edge now supports connecting with MySQL 8.2.

Support for MariaDB

- Toad Edge now supports connecting with MariaDB 11.2.

Support for PostgreSQL

- Toad Edge now supports connecting with PostgreSQL 16.

Support for EDB

- Toad Edge now supports connecting with EDB 16.

Enhancements

The following is a list of enhancements implemented in Toad Edge 2.10

- An option to view stored procedure cursors in Toad Edge® like Toad For Oracle
- UI Support for MariaDB function parameter qualifiers (IN, OUT, INOUT)
- Supports Microsoft Edge as an alternative default browser
- Supports PostgreSQL 16 + EDB 16 features
- Supports MySQL 8.2
- Supports Maria 11.2
- Schema Compare: Include comparison of login/group roles for Postgres and EDB platform.
- Updated installer signing certificate
- An option to copy the headers of the table along with the selected rows

Getting started with Toad Edge

Contents of installation package

The Toad Edge release package contains the following:

- Installation file of Toad Edge (MSI or PKG)
- Product Documentation, including:
 - Release Notes
 - Installation Guide
 - User Guide

i | **NOTE:** Toad Edge® is distributed with the latest Advance Server JDBC Connector 42.3.3.1, MySQL Connector/J 5.1.46, MySQL Connector/J 8.0.32, PostgreSQL JDBC 42.5.1, and Redshift JDBC42-1.2.12.

Installation Instructions

- See **System requirements** before installation to avoid any possible issues during installation or later when using Toad Edge
- Launch Toad Edge installation file and follow the instructions in the installation wizard

Additional resources

Additional information is available from the following:

Toad World [Community Site](#)

Toad Edge Toad World Community.

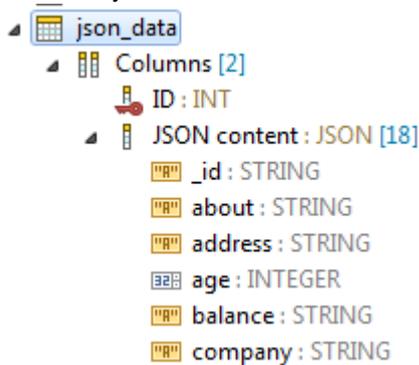
Commercial features

While Toad Edge® is free to use for everyone in its basic Freeware version, the most advanced features are available to users with Trial or Commercial licenses. This topic aims to guide you through all of the extra functionality that could be useful in your production.

NOTE: A comprehensive comparison matrix of Freeware and Commercial versions can be found [here](#).

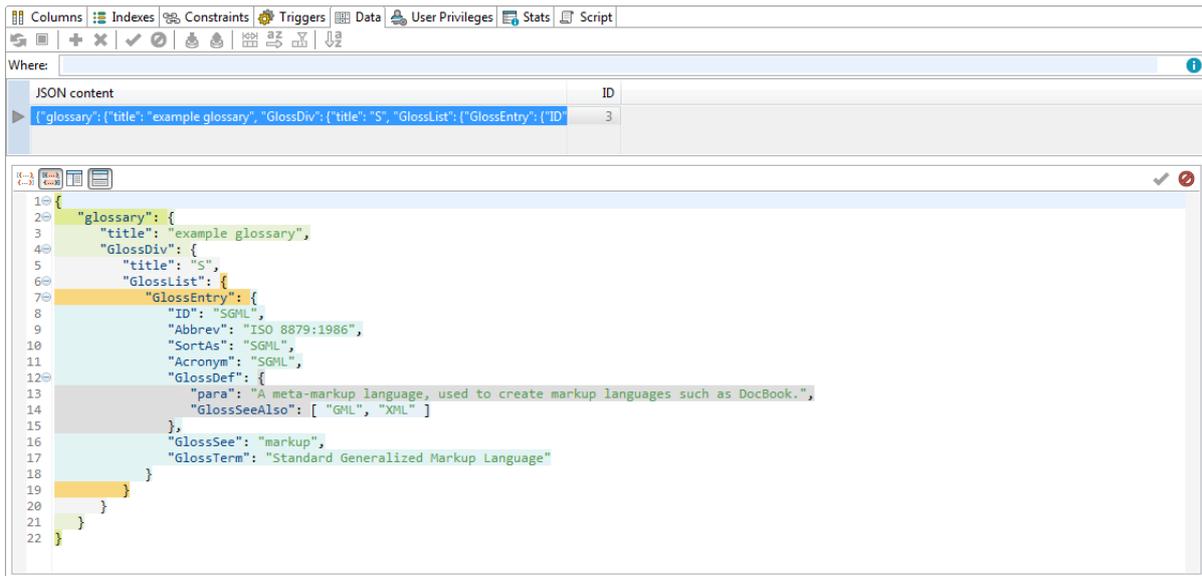
JSON structure visualization

- JSON columns, usable in MySQL 5.7 and newer, can be easily viewed in **Object Explorer** even when they are nested



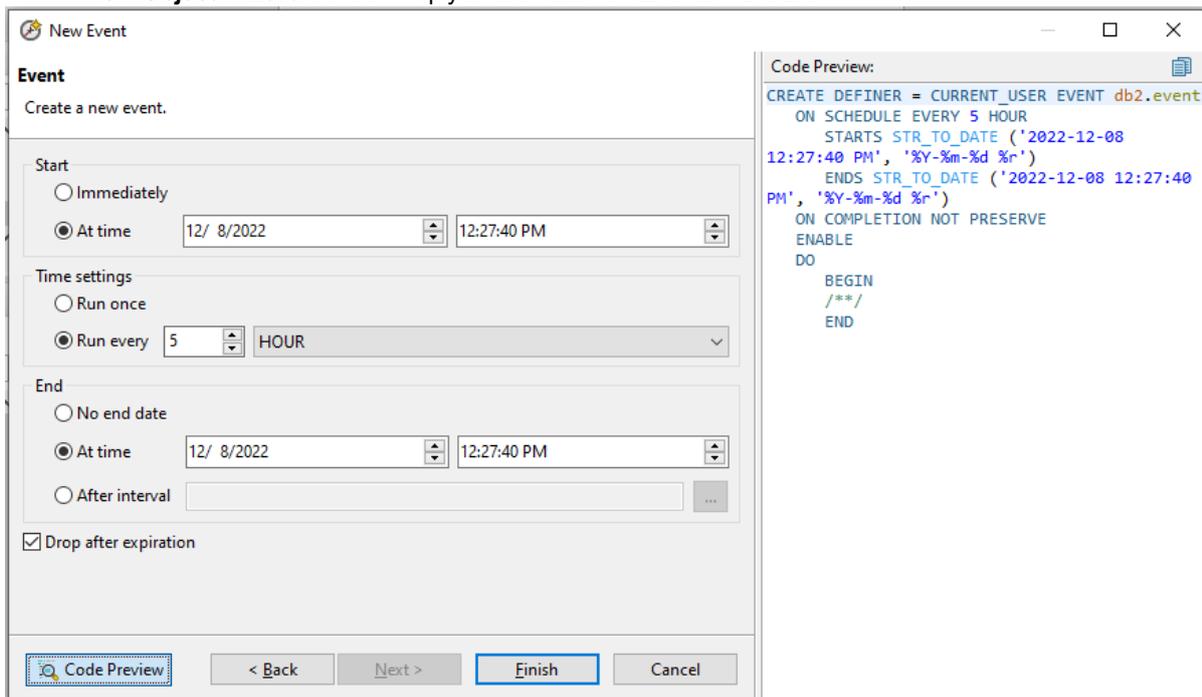
JSON data editor

- Instead of struggling to change a particular value in complex JSON data, you will be able to use an in-built editor with advanced bracket highlighting options



MySQL event editor

- While you can see Events in Freeware version of Toad Edge, you will be also able to edit these objects directly in **Object Detail**
- **New Object Wizard** will also help you to create new Events with ease



Advanced user privilege management

- One of the most valuable features for database administrators is the ability to grant and revoke various user privileges at server, user or even object level

world_airports ×

world_airports (Table) created: 06/13/2017 11:23:56

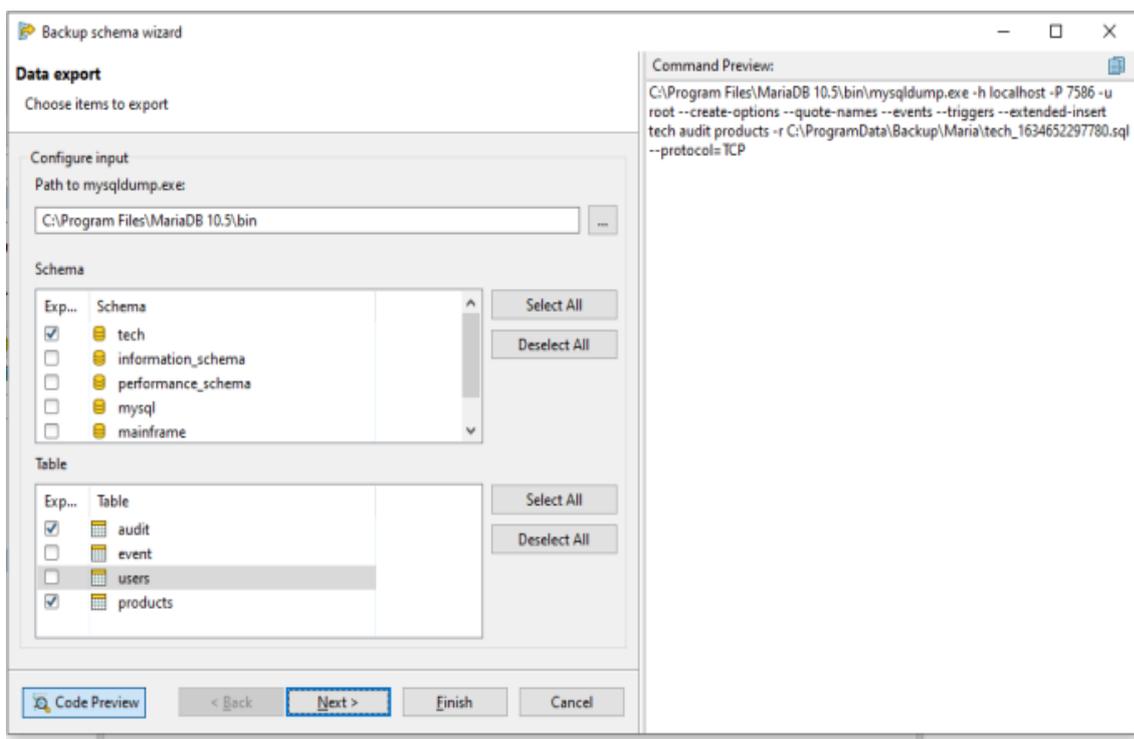
Columns Indexes Constraints Triggers Data User Privileges Stats Sc

type filter text

User Name	GRANT OPTION	SELECT	INSERT
JohnAdmin@localhost	Inherited	Granted & Inherited	Granted & Inherited
JohnDoe@localhost		Granted	Granted
JohnReader@localhost		Inherited	
root@127.0.0.1	Inherited	Inherited	Inherited

Backup and Restore

- You can create backups of your database/schema using SQL provider-specific binaries like mysqldump, pg_dump etc. via Toad Edge user friendly wizards. These binaries will create backup files. You can also restore your database/schema using these generated backup files.



Lock Manager for PostgreSQL and EDB

- This view displays all PostgreSQL/EDB database locks. You can observe all blocking and blocked locks of all connected users and also stop the blocking lock with the appropriate privileges.

Locks [postgres@localhost:5435] ×

postgres@localhost:5435: type filter text

PID	User Name	Locked Item	Blocked Query	Blocked Mode	Blocking PID	Blocking Query
71512	postgres	stu	insert into public.stu values(3)	RowExclusiveLock	27324	LOCK TABLE public.stu IN ACCESS E

SQL Worksheet/Editor

Advanced Content Assist

- Content Assist is present in the Freeware version. However, upgrading allows you to configure its function

Content Assist / Autocompletion

Enable content assist

Activate automatically

Delay in milliseconds:

Content Assist trigger characters:

Sorting and Filtering

Sort proposals by dependencies and relevance

Sort proposals alphabetically

Alias Handling

Generate and insert aliases (select m.title from movies m)

Keep full objects names (select movies.title from movies)

Editable result grid

- Easily select any data that fits your requirements and modify its value right in the result grid

ID	Identification	Type	Name
2,835	FASC	medium_airport	Secunda Airport
2,836	FASD	medium_airport	Saldanha /Vredenburg Airport
2,837	FASI	small_airport	Springs Airfield
2,838	FASK	small_airport	Swartkop Air Force Base
2,839	FASS	medium_airport	Sishen Airport

Result is Editable | 2762

Export

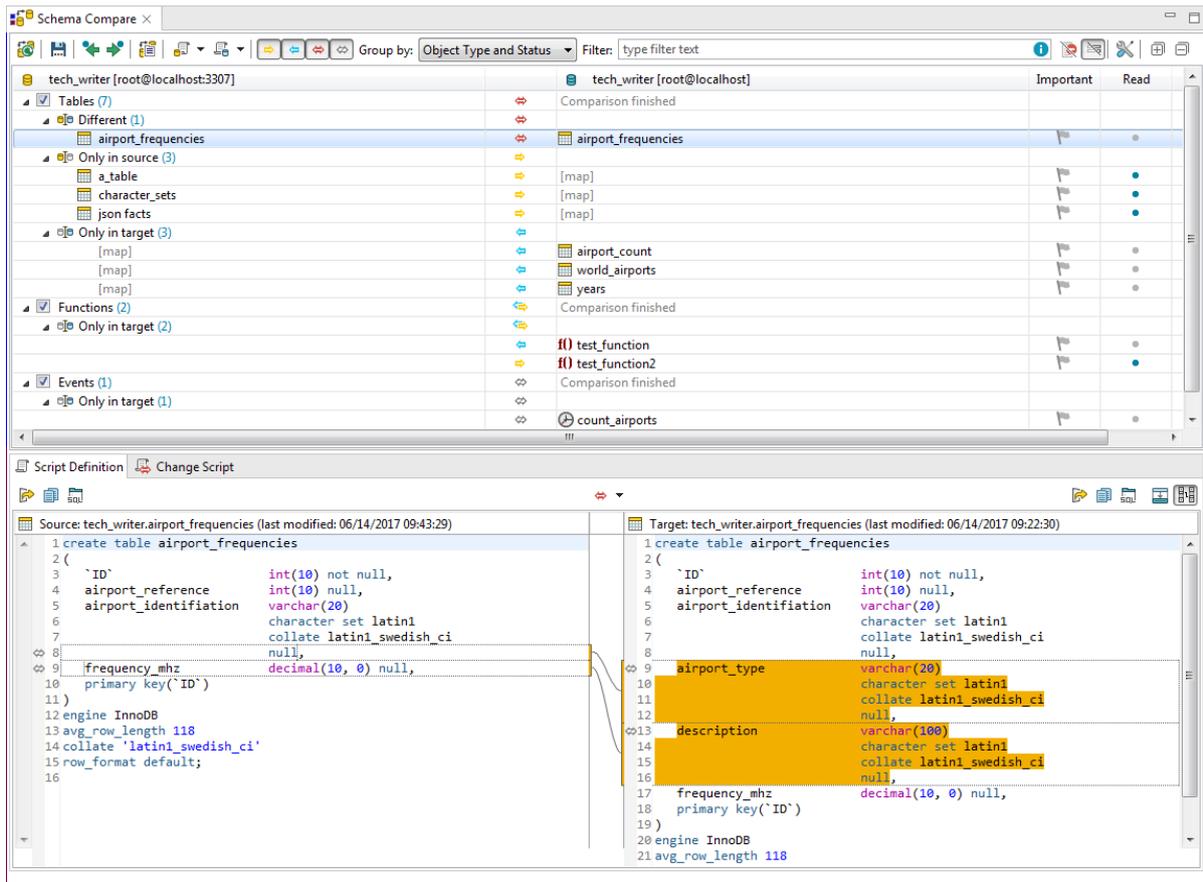
Export to CSV

- Export your entire table, selected rows or even query results to the universally used CSV format file

ID	Identification	Type	Name	Latitude	Longitude	Elevation	Continent	ISO country	Iso Region
56	AYGA	medium_airport	Goroka Airport	6	145	5 327	OC	PG	PG-EHG
63	AYMH	medium_airport	Mount Hagen Kagamuga Airport					PG	PG-WHM
63	AYMH	medium_airport	Mount Hagen Kagamuga Airport					PG	PG-WHM
148	SDAM	small_airport	Amarais Airport					BR	BR-SP
152	SDBP	small_airport	Fazenda Pontal Airport					BR	BR-GO
156	SDCO	small_airport	Sorocaba Airport					BR	BR-SP
255	SBAV	closed	Usina Porto Primavera Airport					BR	BR-SP
612	CAA8	small_airport	Invermere Airport					CA	CA-BC
612	CAA8	small_airport	Invermere Airport					CA	CA-BC
614	CAD4	small_airport	Trail Airport					CA	CA-BC
615	CAD5	small_airport	Merritt Airport					CA	CA-BC
621	CAH4	small_airport	Valemount Airport					CA	CA-BC
623	CAJ3	small_airport	Creston Valley Regional Airport - Art Sut					CA	CA-BC
624	CAJ4	small_airport	Anahim Lake Airport					CA	CA-BC
625	CAJ7	small_airport	Cayley A J Flying Ranch Airport					CA	CA-BC
629	CAL3	small_airport	Douglas Lake Airport					CA	CA-BC

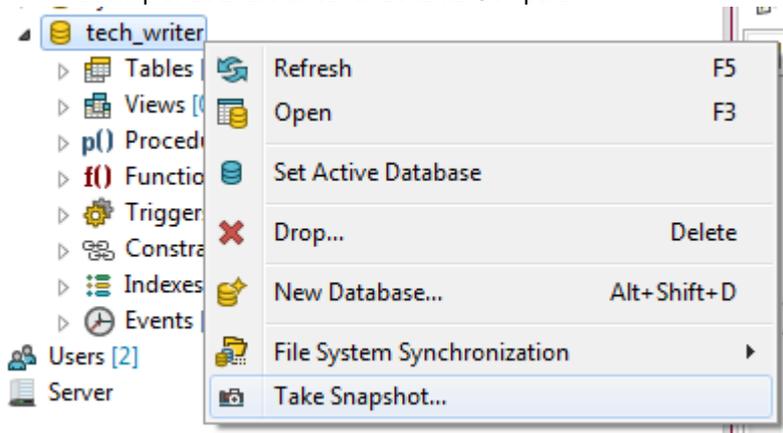
Schema Compare

- This powerful tool makes database difference resolution significantly easier. You can:
 - Compare two different Schemas/Databases, even across two different database connections of the same platform and version
 - View all SQL code differences between two objects
 - Compare two objects with the same name based on their timestamps
 - Generate an HTML report detailing each and every difference found
 - Generate and deploy change scripts to automatically resolve the differences



Snapshots

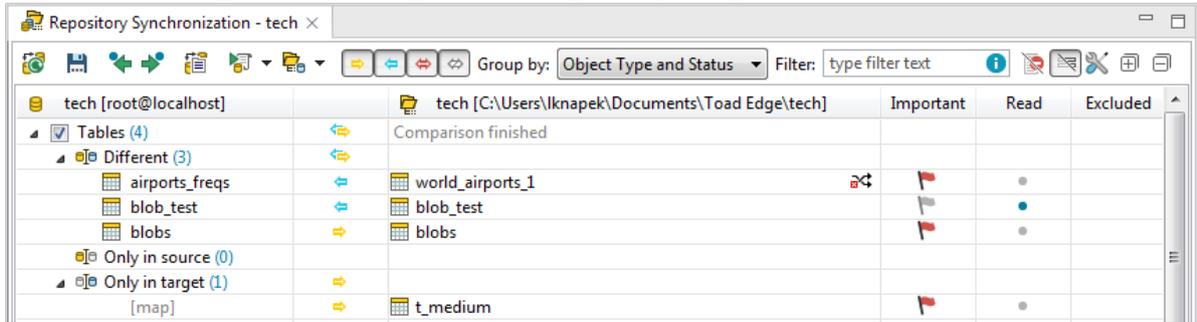
- By taking a snapshot of your database, you will be able to store its structure as a JSON file and use it as a backup or as a reference for Schema Compare



Versioning/Collaboration

Repository

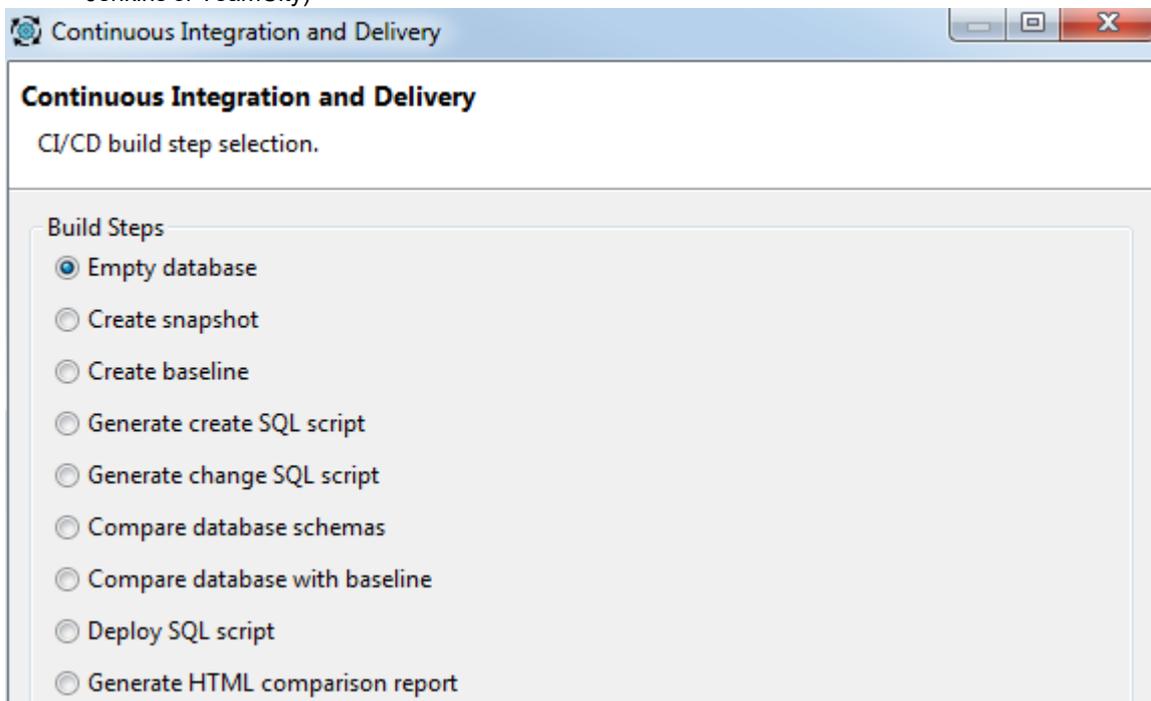
- This feature brings databases and version control systems together
- Map your database to a file system and Toad Edge will transfer your database metadata to a folder structure populated with JSON files representing individual objects, referred to as a repository
- Then, use any version control system to manage the repository



Automation

Continuous Integration/Continuous Delivery

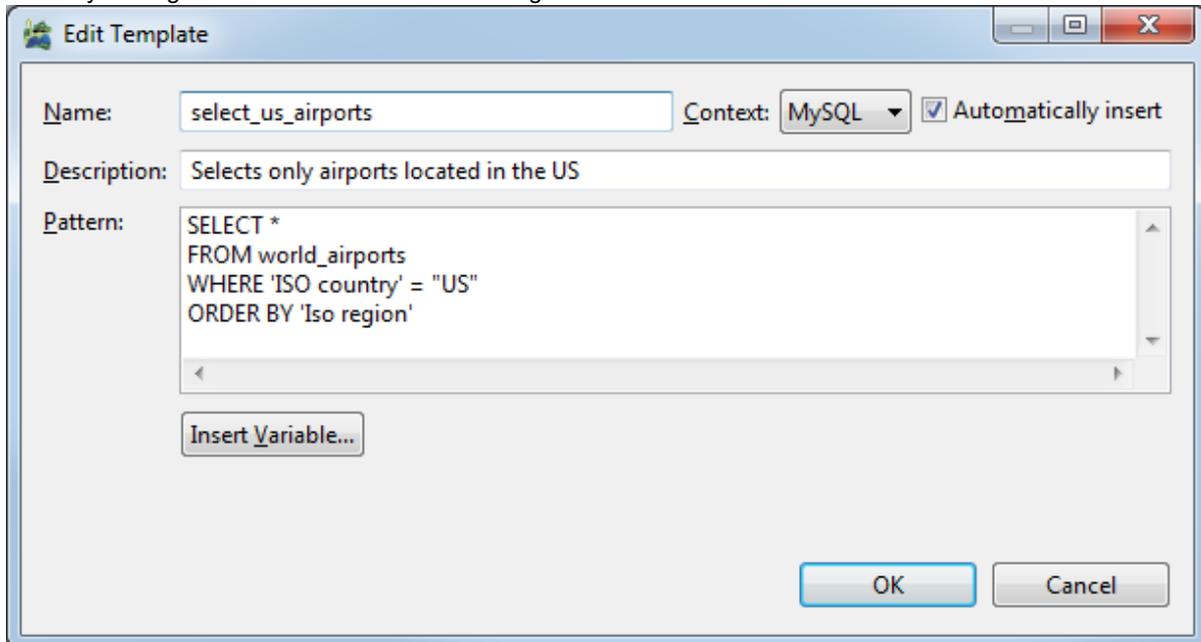
- Enhance your workflow by utilizing Toad Edge CI/CD features to perform periodic tasks with no manual input
- Toad Edge is able to generate scripts and JAR files, which can be used by your automation server (such as Jenkins or TeamCity)



Other application features

Code snippets and templates

- Create many code templates and then reuse them by invoking a specific custom keyword. This ability saves you a significant amount of effort in the long run



Session Browser

- This view displays all current database sessions and is updated continuously. Observe all connected users and the states of their sessions while also being able to stop any of them, assuming you possess the appropriate privileges

Sessions [JohnDoe@localhost] x

JohnDoe@localhost

ID	User	Host	DB	Command	Time	State	Thread ID	Type
▶ 23	JohnDoe	localhost		Query	0	Sending data	43	BACKGROUND
■ 22	root	localhost		Sleep	36		42	BACKGROUND
■ 24	root	localhost		Sleep	5		44	BACKGROUND

Feature comparison matrix

Feature	Commercial	Freeware
SQL Worksheet/Editor		

Feature	Commercial	Freeware
Advanced Content Assist	✓	✗
Syntax check	✓	✓
Code formatting	✓	✓
Run multiple statement	✓	✓
Run from/to position	✓	✓
Data editor		
Table lookup via foreign keys	✓	✓
Basic data filters	✓	✓
Data type specific data editors	✓	✓
Editable result grid	✓	✗
Export and import		
Export to CSV	✓	✓
Export to SQL	✓	✗
Export to HTML	✓	✗
Export to XML	✓	✗
Export to Excel	✓	✗
Import from SQL	✓	✗
Import from CSV	✓	✓
Schema Compare		
Schema/Database comparison	✓	✗
Advanced SQL difference recognition	✓	✗
Detailed SQL comparison settings	✓	✗

Feature	Commercial	Freeware
Timestamp comparison	✓	✗
Detailed Schema Compare reports	✓	✗
Generation of change scripts	✓	✗
Snapshots		
Snapshot creation	✓	✗
Snapshot comparison	✓	✗
Versioning/Collaboration		
Repository (MySQL/MariaDB/PostgreSQL)	✓	✗
Continuous Integration/Continuous Delivery support	✓	✗
Native plugin solution for Jenkins	✓	✗
Other application features		
Object search	✓	✓
Code snippets/templates	✓	✗
Session browser	✓	✗
Support for JSON data types	✓	✓
JSON structure visualization	✓	✗
JSON in-place data editor	✓	✗
MySQL Events editor	✓	✗
Advanced user privilege management	✓	✗
SQL Warnings	✓	✓
Backup and Restore	✓	✗
Lock Manager for PostgreSQL and EDB	✓	✗
Run SQL File	✓	✗

Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at <https://support.quest.com>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request
- View Knowledge Base articles
- Sign up for product notifications
- Download software and technical documentation
- View how-to-videos
- Engage in community discussions
- Chat with support engineers online
- View services to assist you with your product

About product improvement program

To prioritize enhancements in future releases, Toad Edge® collects data about the use of its different features, and periodically, this data is communicated back to us. Initially, this usage data includes an IP address. Upon its receipt at a temporary server in the U.S.A., the IP address is removed, and then the anonymous data is aggregated before it is sent to our servers in California. Our product team analyses the aggregated data to understand our user community's preferences and common practices. This analysis influences our future releases. Click [here](#) for more information on the data we collect and on our privacy policy.

- No personal information is collected
- You can stop participating at any time

To initiate participation in Product Improvement Program

Select **View | Preferences | Feedback | Product Improvement Program** and select **Yes, I want to participate**

To cancel participation in Product Improvement Program

Select **View | Preferences | Feedback | Product Improvement Program** and select **No, thank you**

Additional Resources

Toad World [Community Site](#)

Toad Edge Toad World Community.

User Interface

The following subsections describe the various user interfaces used by Toad Edge®.

Connections View

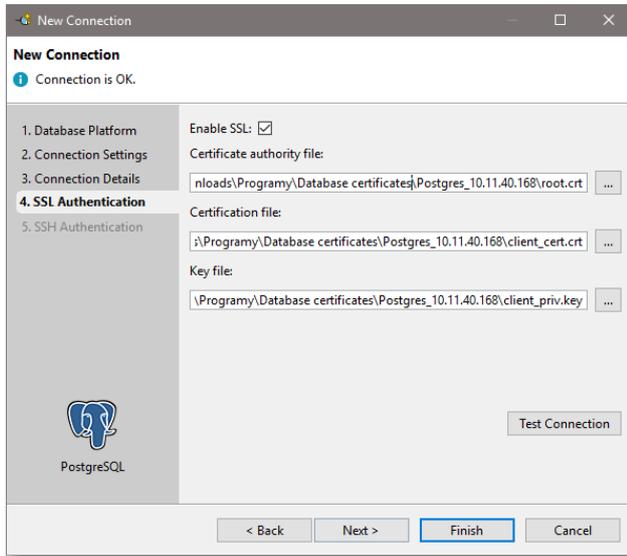
All of your existing connections can be found in this view. You can edit or delete them as well as add new ones.

To create a new connection

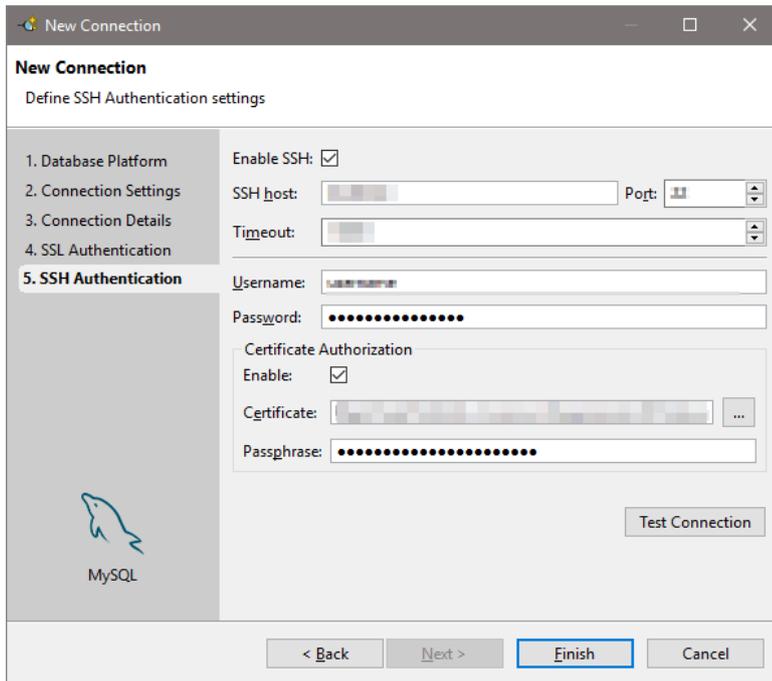
1. Click **New Connection** or click **Connect** in application toolbar and select **New Connection**
2. Select your **Database Platform**
3. Fill in the **Connection Settings**. You can **Test Connection** before you actually create it to see whether Toad Edge is able to connect to your database successfully
4. Optionally, check **Custom connection string** and edit it
5. Adjust your new **Connection Details**, such as name, color, and AutoCommit.

6. Optionally, enter your secure connection details:

- In **SSL Authentication** click Enable SSL and enter paths or click browse to set your Certificate authority file, Certification file and Key file

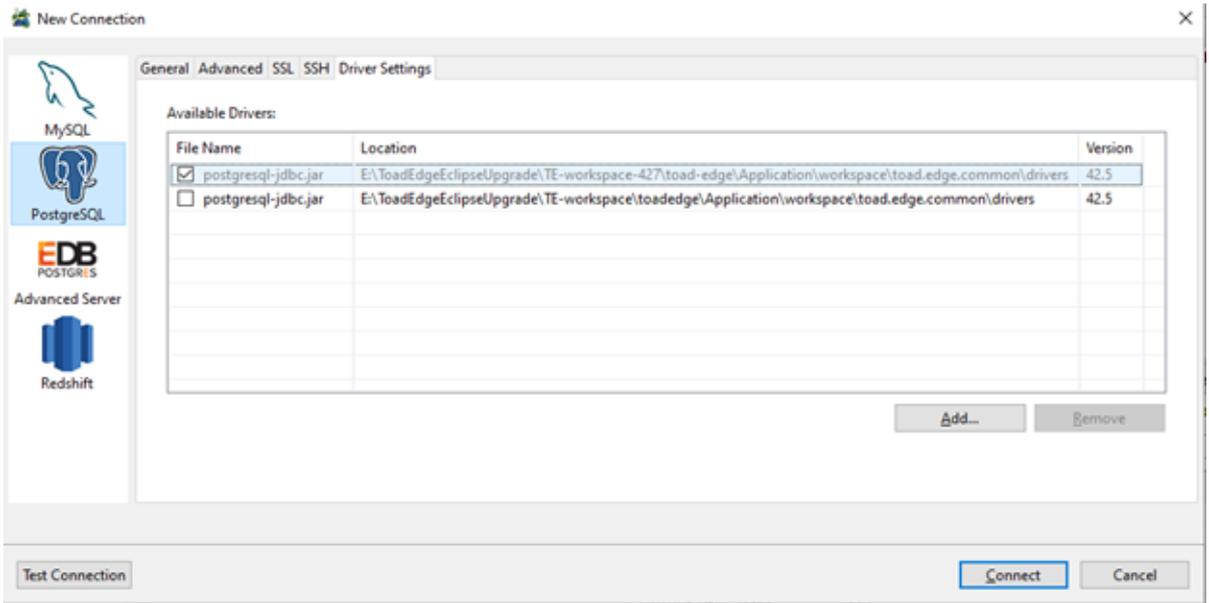


- In **SSH Authentication** click Enable SSH and set your SSH connection details. Optionally, enable **Certificate Authorization** and enter the path to your certificate and your passphrase

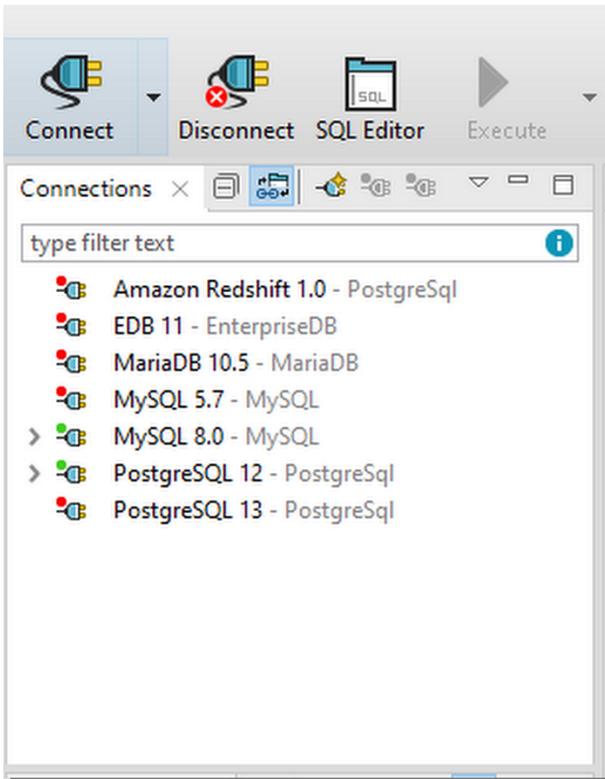


7. Optionally, add a new driver details:

- In **Driver Settings**, click add to browse the driver location to add the new driver.



8. Click **Finish** to save the connection



Button	Option	Description
	Link with Editor	If enabled, bringing a window (Worksheet , Object Detail and Describe Object...) into focus will highlight the window in Connections View and selecting the window in Connections view will bring it into focus

Button	Option	Description
	New Connection	Displays a dialog where you can create a new connection as described above
	Connect Selected	Connects the selected connection
	Disconnect Selected	Disconnects the selected connection

To create like connection

- Right-click any connection in **Connections** and select **Copy Connection** to use its settings to create a similar database connection

Connection properties

- Existing connections, connection drivers and performance settings can be configured in this dialog.
- A search bar now can be used to find a specific connection.

To configure a connection

- Right-click any connection in **Connections** and select **Properties**

Tab	Description
Connection Settings	This tab contains connection settings identical to those that are set when a connection is created
Connection Details	You can set the following options here: <ul style="list-style-type: none"> • Connection name - Add a custom name for your connection • Connection color - Select a color for your connection • Description - Add a custom description • AutoCommit - Check to enable AutoCommit feature for the connection • Restore previous work after login - Automatically restores the previous Toad Edge session
SSL Authentication	Enable SSL and enter paths or click browse to set your Certificate authority file, Certification file and Key file
SSH Authentication	Enable SSH and set your SSH connection details. Optionally, enable Certificate Authorization and enter the path to your certificate and your passphrase
Driver Settings	You can choose which available JDBC driver should be used by the connection. Add a new driver, Remove a selected driver. Click Suggest to let Toad Edge decide which driver is the most appropriate for you
Performance	This tab contains settings which determine the performance of the connection by loading objects in Object Explorer in a specific way. Click Auto Configure to let Toad Edge decide for you

Error View

This view provides you with information about issues encountered during the execution of SQL statements.

- Click the error description to highlight the statement that caused the problem while working with [Worksheet](#)



Object Detail and Describe Object

Object Detail and **Describe Object** are the primary ways to view and modify objects in your database (especially data in [Data tab](#)). They are nearly identical except for one key difference:

- **Object Detail** is opened to view any database object of any connection
- **Describe Object** is opened for each connection to view all database objects of the connection

To view an object in Object Detail window

- In **Object Explorer**, double-click the object you would like to view
- Note how each object is displayed in its own **Object Detail** window

To view objects in Describe Object window

1. In **Object Explorer** toolbar, enable the  **Open Objects in Common Detail Window** option
2. Left-click any object in **Object Explorer** that you would like to view
 - Note how all objects of a connection are displayed in one **Describe Object** window

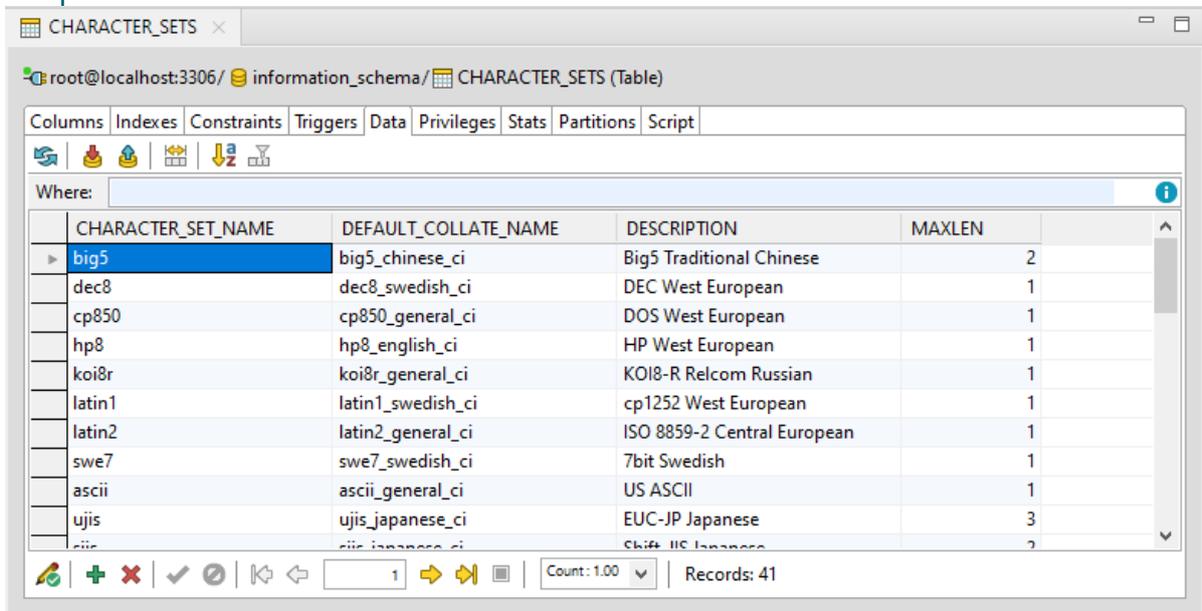
The tabs displayed in **Object Detail** and **Describe Object** depend on the specific type of an object you are trying to view. For example, if you open a table, you will see additional tabs such as Columns, Indexes and Constraints.

Data tab

One of the most useful features of both **Object Detail** and **Describe Object** is this tab where you can view, filter and edit data in your tables and views without the need of writing complicated SQL queries.

TIP: While working with records in a child table, you can quickly move to the linked record in the parent table by pressing **CTRL (#)** and clicking on the record value in its foreign key column. The values change into hyperlinks when you hold **CTRL (#)**.

comment_id	movie_comment	customer_id	movie_id
9	What a movie!	23	1



Button	Option	Description
	Refresh Query	Refreshes the data currently visible in the grid
	Cancel Query	Cancels loading of the data in grid. Useful in cases where your tables/views have millions of rows and you have disabled the Use fetch limit option
	Insert Row	Creates a new record in the table, simply fill in the values for all columns
	Delete Rows	Deletes the selected row(s)
	Apply Changes	Saves the value that is currently being edited
	Discard Changes	Restores the original data in the value that is currently being edited
	Commit Transaction	Commits the changes you have made to the table. See AutoCommit for more information
	Rollback Transaction	Rolls back the changes you have made to the table. See AutoCommit for more information

Button	Option	Description
	Resize Columns to Data	Resizes columns so they fit the values they contain
	Sort Columns Alphabetically	If enabled, the columns are ordered alphabetically
	Select Visible Columns	Opens a dialog where you can select which columns you would like to display or hide
	Sort Data	Opens a dialog where you can sort the records by one or more column values in ascending or descending order
	Filter	Filters the currently shown data. Use the same notation as you would in the WHERE clause in a query. In case of multiple conditions, put "and" between them TIP: The light bulb icon  suggests that there is an available history of your Where conditions. Press CTRL (*) + ARROW DOWN while typing in the field to view it.

Object Explorer

Object Explorer allows you to comfortably navigate your databases and view their objects. The contents of the explorer change depending on the currently selected connection in [Connections View](#). There are various options available in the context menu depending on the type of object you select.

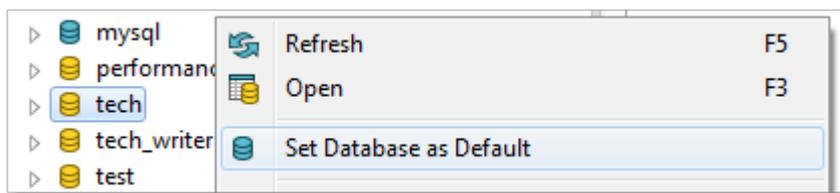
i | Note: To quickly find a specific object in any database of a connection, use the [Object Search](#) function (**CTRL (*) + SHIFT + D**)

Default database (MySQL/MariaDB)

You can set any of your MySQL or MariaDB databases as **default**. This means that scripts in [Worksheet](#) will be run on the selected database by default if you do not specify another database.

To set a default database

- In Object Explorer, right-click any database and select **Set Database as Default**



Object Explorer toolbar

Button	Option	Description
	Link with Editor	If enabled, bringing a window (Worksheet , Object Detail and Describe Object...) into focus will highlight the window in Connections View and selecting the window in Connections view will bring it into focus
	Define Visible Categories	Opens a dialog where you can set which categories / object types should be shown or hidden
	Open Objects in Common Detail Window	If enabled, allows you to use the Describe Object window. See Object Detail and Describe Object for more information
	Refresh	Refreshes the status of the selected object / object type / database
	Rename Selected Object	Opens a dialog where you can change the name of the selected object
	Drop Selected Objects	Deletes the selected object(s) from the database
	New *object*	Creates a new specific object depending on the object type you are currently viewing

Filter: Filter 

Filters the objects in Object Explorer according to the input. It is possible to use wildcards (? and *) and regular expressions as well as filter by multiple comma separated values

Object Search

This tool allows you to search for any database object of the currently selected connection in [Connections View](#).

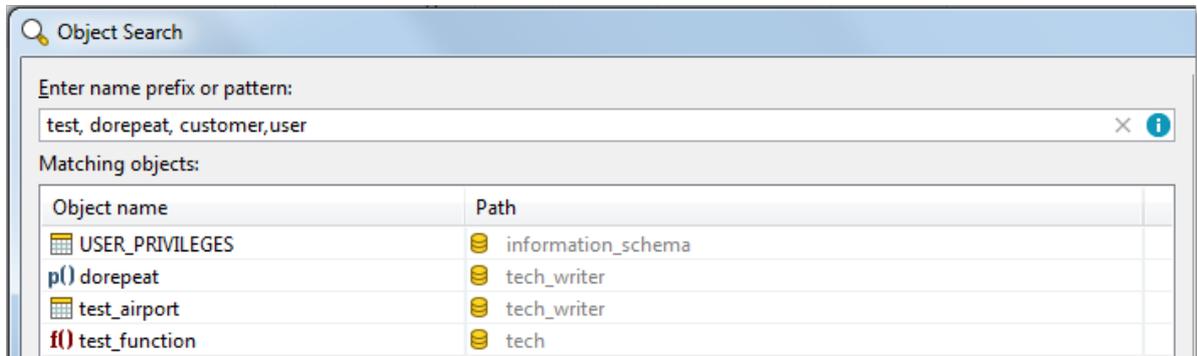
To search for object(s)

1. Open Object Search window by clicking the **Object Search** button in the application toolbar or by pressing **CTRL (#) + SHIFT + D**
2. From the **Databases** section, select databases that should be searched
3. In the **Object types** section, check the object types that should be included in the search
4. Start writing the object name. The search results will be displayed as you write

You can use any of the following in your search query:

- **Simple text** - Toad Edge will look for the literal text string, the search is case insensitive
 - For example, "air" will match "airport_frequencies", but not "test_airport"
- **Wildcard characters** - where a question mark (?) represents any one character and an asterisk (*) any number of any characters
 - For example, "?cc*s" will match "ACCESS_TIME" as well as "accounts", but not "accident_data"

- **Multiple values** - use multiple search patterns, separated by commas (,)
 - For example, "test, customer" will match both "test_function" and "customer_id"
- **Regular expressions** - enclosed in square brackets ([regex])
 - For example, "[^cd]u+" will match "DURATION" or "customer_id", but not "concurrent_connections"



Outline View

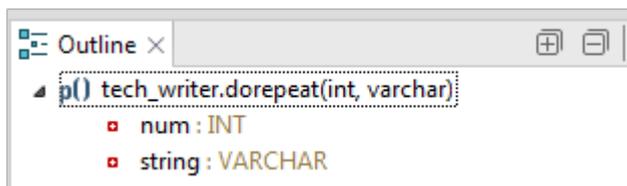
The contents of the View change depending on what are you doing in Toad Edge. Its functionality can be divided into several modes:

- [Code outline](#)
- [Database object outline](#)
- [JSON outline](#)
- [Schema Compare settings](#)

TIP: In all modes except for **Schema Compare**, you can click on any item in the **Outline** to navigate to the object quickly in the other UI element. For example, clicking on a specific constraint in database object outline mode switches **Object Detail/Describe Object** to **Constraints** tab and highlights the selected constraint.

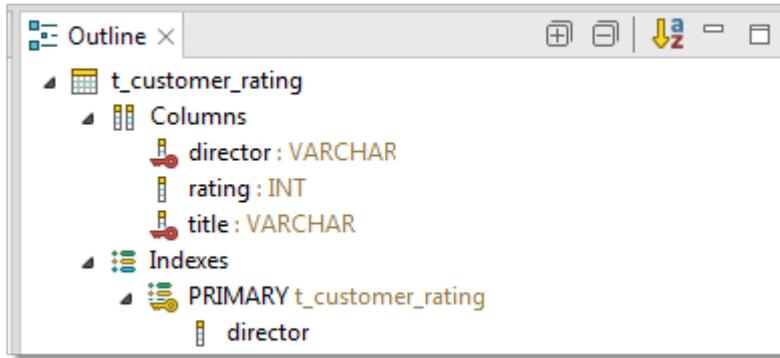
Code outline

When editing procedures, functions, etc., **Outline** displays the code structure, including variables.



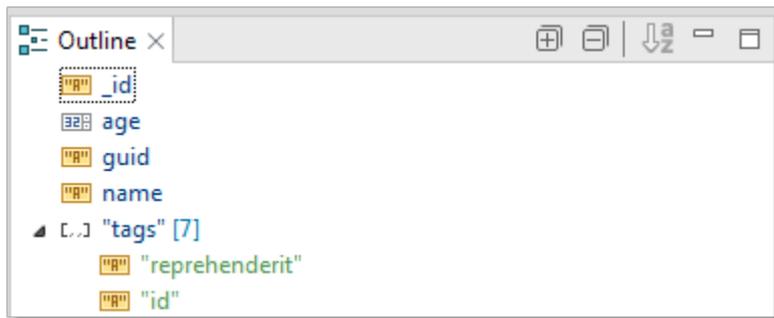
Database object outline

In this mode, **Outline** displays important details of database objects displayed in [Object Detail and Describe Object](#).



JSON outline

This mode is triggered by opening a JSON column value in [JSON support and JSON Editor](#). In this case, the complete structure of the current JSON value, including nested values, is shown.



Schema Compare settings

When in **Schema Compare**, **Outline** displays comparison settings which determine what is considered a difference and what should be ignored.

Column Matching

You can match columns based on:

- Position
- Identical names
- Similar names

Difference Fragmentation

This slider further determines the precision of difference finding. The further it goes left, the smaller and more precise the differences are, such as specific values or words. The further it goes right, the looser and more flexible the differences are, such as entire statements or blocks of code.

Slider position

Difference precision



```
ELSEIF (bonus <= 1000 AND bonus >= 1000)
```



```
ELSEIF (bonus <= 1000 AND bonus >= 1000)
```

Quick Doc View

Quick Doc displays brief, relevant information about the currently selected objects.

Quick Doc has two modes:

- **Object Explorer mode**
- **Comparison mode**

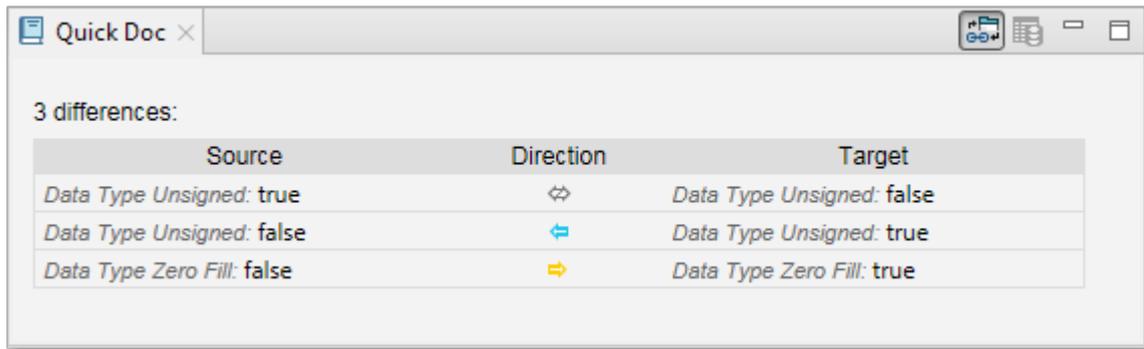
Object Explorer mode

This mode is used most of the time. As you select various objects in [Object Explorer](#), **Quick Doc** displays basic information about them.



Comparison mode

This mode is triggered when you work with [Overview Grid](#) as part of [About Schema Compare](#) or [Repository](#). It displays specific differences between two objects in a row that is currently selected in the grid. The view becomes very useful in cases where there are many differences.

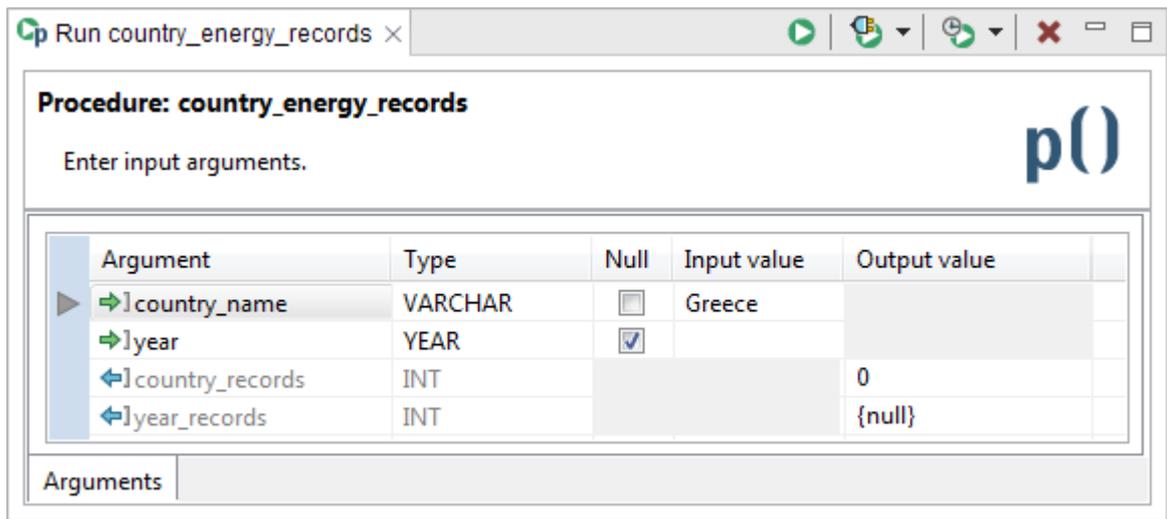


Quick Doc view toolbar

Button	Option	Description
	Link with Selection	If enabled, Quick Doc automatically displays information every time you select an object in Object Explorer or a record in the Overview Grid
	Open Declaration	(Object Explorer mode only) Opens the currently described object in Object Detail and Describe Object

Run Routines

The results of all performed routines (procedures and functions) are shown in this view. You can rerun routines using the same arguments or view past results.

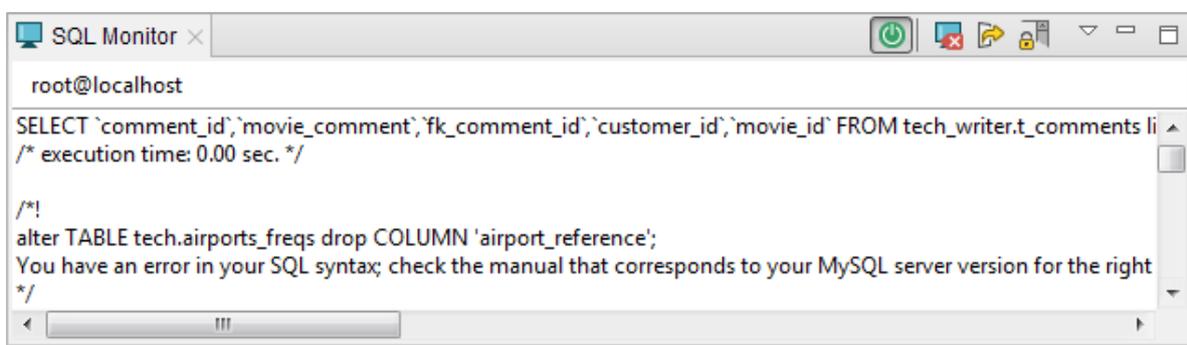


Button	Option	Description
	Run	Runs the routine using the argument values entered in the grid

Button	Option	Description
	Select Connection	If you performed a routine with the same name from multiple connections, you can specify the connection from which the routine should be performed using this drop down menu
	Show Results	Displays the results of routines you ran in the past
	Remove Execution Result	Removes the current routine result from the view

SQL Monitor View

SQL Monitor displays all internal/user run SQL queries as well as their execution time. Any queries that fail during the operation are commented out in the monitor and the error description is attached.

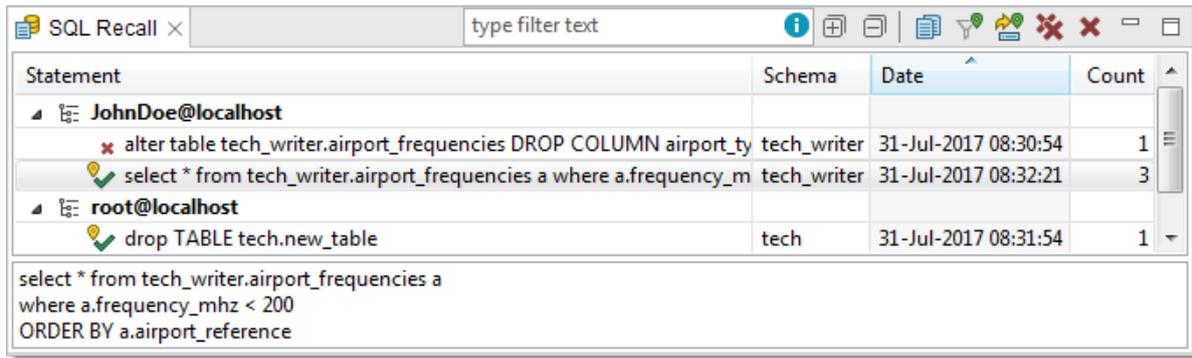


Button	Option	Description
	Enable/Disable Output	Enables/disables SQL query monitoring
	Clear Console	Deletes the contents of the view
	Export Script	Exports the contents of the view to a SQL file
	Scroll Lock	If enabled, your current position in the monitor is not changed even as new information is being displayed. Otherwise, the position changes to display the newest information
	View Menu	This menu allows you to enable/disable monitoring of internal/user queries

SQL Recall View

SQL Recall displays the last 100 performed SQL statements. The statements are grouped by connection and can be filtered and pinned. You can view the entire statement simply by selecting in the view. Double-clicking a

statement will cause it to be pasted into the currently active [Worksheet](#).



Button	Option	Description
	Filter	Filters the statements according to the input. It is possible to use wildcards (? and *) and regular expressions as well as filter by multiple comma separated values
	Expand All	Expands all connections to display their statements
	Collapse All	Collapses all connections, hiding all statements
	Copy	Copies the currently selected statement to clipboard. You can copy multiple statements at once
	Hide Unpinned Entries	Hides statements that are not pinned
	Pin Entry	Pins the selected statement(s) so they can be filtered using the option above
	Delete All	Deletes all statements from the view
	Delete	Deletes the selected statement(s) from the view

SQL Warnings View

SQL warnings will make sure to display all server messages including warnings. These warnings are pulled from the JDBC class called **SQLWarning**. This will help the user in viewing the necessary server warnings as well as RAISE NOTICE/DEBUG/INFO messages of PostgreSQL functions. The warnings are grouped by their parent SQL command. You can copy the view's contents by right clicking and pressing **Copy**.

Statement	Time	SQL State
CREATE TABLE IF NOT EXISTS public.asd () relation "asd" already exists, skipping	Jul 6, 2021, 5:55:28 PM	42P07
{RETURN_VALUE = call testf() }		
Function execution notice 2.	Jul 6, 2021, 5:55:23 PM	00000
Function execution notice 1.	Jul 6, 2021, 5:55:23 PM	00000

Button	Option	Description
	Clear Console	Deletes the contents of the view
	Expand all	Expands all statements to display their warnings.
	Collapse all	Collapses all statements to hide their warnings.
	Copy	Copies the selected statements and warnings to clipboard. You can copy multiple items at once.

Session Browser

The **Session Browser** displays database sessions and their state. The information is continuously updated and all changing values are highlighted. The sessions can be filtered and inactive sessions can be hidden. If the current user has sufficient privileges, it is also possible to close sessions.

To start monitoring sessions

- Select a database connection from the  **Select Connection** dropdown menu
- The refresh period can be configured in the  **View Menu** dropdown menu

To end a session

- Select session that you want to end and then click the  **End Selected Session** button

ID	User	Host	DB	Command	Time	State	Thread ID	Ty
▶ 408	root	localhost		Query	0	Executing	452	FC
00 396	root	localhost		Sleep	2172		440	FOREGROUND thread/sql/one
00 397	root	localhost		Sleep	985		441	FOREGROUND thread/sql/one
00 398	root	localhost		Sleep	1272		442	FOREGROUND thread/sql/one

Toolbar button	Name	Description
	Refresh	Manual update of the status of all sessions
	Select Connection	Select a connection here in order to monitor its sessions
	Hide Inactive Sessions	Hides sessions that are currently not being active (e.g. sessions that are asleep)
	Resize Columns to Data	Resizes columns so they fit the values they contain
	End Selected Session	Ends the selected session
	View Menu	Allows you to change the monitoring refresh period
	Copy	Copy the selected session

Session browser in Redshift

Amazon Redshift sessions are slightly different from PostgreSQL due to its database limitations and internal architecture for distributed processing. The Redshift session browser will display information about users, databases, commands, and query start times, which are derived from the currently active user sessions and incomplete queries on the Amazon Redshift cluster.

Sessions [toadedge@ost-edge:5439 (toadedge)] × Quick Doc Text Search Progress

toadedge@ost-edge:5439 (toadedge) type filter text

PID	User	DB	Command	Query Start
1073807507	toadedge	...	toadedge	Nov 7, 2023, 5:40:10 AM
1073816198	rdsdb	...	dev	Nov 3, 2023, 4:50:03 AM
1073832574	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM
1073857052	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM
1073857058	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM
1073864895	rdsdb	...	dev	Nov 7, 2023, 5:38:12 AM
1073889538	toadedge	...	toadedge	Nov 7, 2023, 5:40:06 AM
1073897789	toadedge	...	toadedge	Nov 7, 2023, 5:40:14 AM
1073906052	rdsdb	...	dev	Nov 3, 2023, 4:48:42 AM
1073946864	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM
1073947049	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM
1073955513	toadedge	...	toadedge	SELECT q.process AS PID, q.user_na...
1073971409	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM
1073988052	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM
1073988183	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM
1073996124	rdsdb	...	dev	Nov 3, 2023, 4:48:25 AM

Snapshots View

This view displays all taken [Snapshots](#), grouped by connection and database. From here you can filter, export/import and also delete snapshots.

Snapshots × type filter text

Snapshots	Date of Creation	User
root@10.11.40.93:3356		
videorental		
videorental_current_structure	29.06.2017 08:49:09	root
root@localhost		
tech		
tech_backup_2017_06_27	29.06.2017 08:46:11	root

Button	Option	Description
	Import Snapshot	When a database is selected, you can import a snapshot from file (.json). This snapshot will be then listed under the database in the view
	Export Snapshot	Exports the selected snapshot as a JSON file

Button	Option	Description
	Compare Snapshot with Active Database	Compares the selected snapshot with the database that is currently marked as Default in Object Explorer . Note that the currently selected connection in Connections View must have a default database for this option to be available
	Compare with Each Other	When you select two snapshots, you can compare them with each other using this option
	Generate Script	Generates a create script based on the selected snapshot. The script can be generated to clipboard, a worksheet or to a file
	Delete Snapshot	Removes the selected snapshot from the view and deletes the snapshot file

Text Search

Not to be confused with [Object Search](#), **Text Search** allows you to find specific strings in database scripts of certain object types such as (platform dependent):

- Aggregates
- Procedures
- Functions
- Events
- Packages
- Triggers
- User types
- Views and materialized views

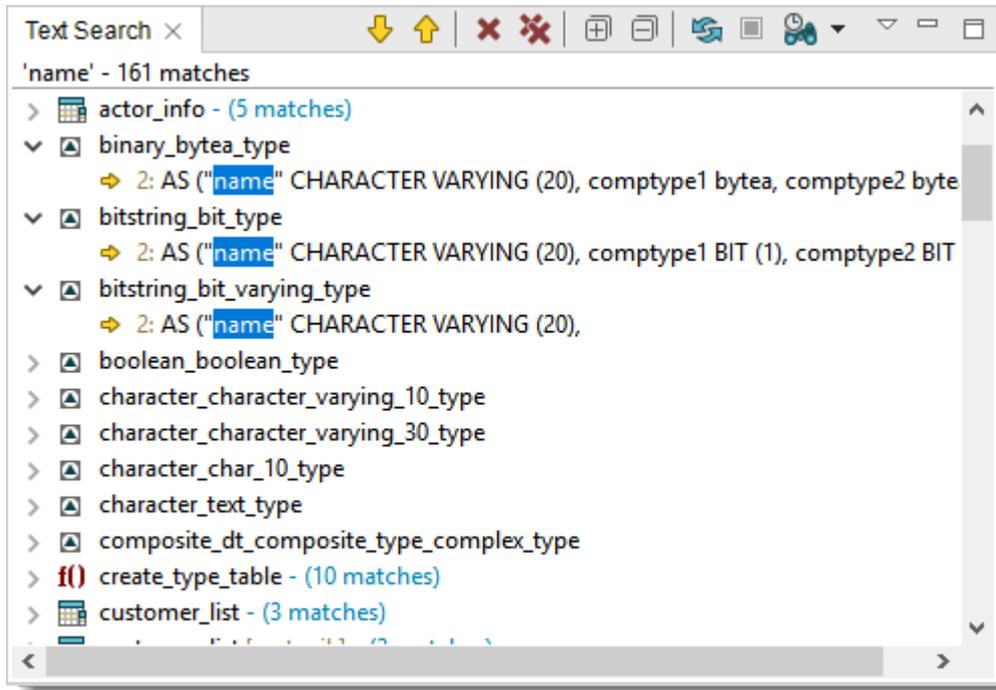
To search for specific text in object scripts

1. Select **Database Menu | Text Search** or by pressing *CTRL + H*
2. Enter the text you want to look for into the **Containing text** field
3. The other field, **Object name patterns**, allows you to search only in objects that match the given pattern
 - For example, `"*energy*"` will cause the application to only search for text in objects whose names contain "energy"
4. Select the **Databases** that you want to search in as well as the **Object types**
5. Once finished, click **Search**. The results will be shown in **Text Search**

i **NOTE:** You can use standard wildcard characters in both fields mentioned above. Use question mark (?) to match one character, asterisk (*) to match multiple characters and back slash (/) to escape literal characters. You can also use multiple search patterns in the **Object name patterns** field as long as you separate them with commas.

Text Search

The results of Text Search are displayed in this window. By double-clicking any match, you can open the respective object in **Object Detail** and highlight the match.



Button	Option	Description
	Show Next Match	Jumps to the next match, automatically displaying it in Object Detail
	Show Previous Match	Jumps to the previous match, automatically displaying it in Object Detail
	Remove Selected Matches	Removes the selected matches from the view
	Remove All Matches	Removes all matches from the view
	Expand All	Expands all objects and their matches
	Collapse All	Collapses all matches to their respective objects
	Refresh the Current Search Again	Performs the current search again
	Cancel Current Search	Cancels the currently undergoing search
	Show Previous Searches	Contains a history of past searches that you can perform again

Worksheet

Worksheet is one of the most basic tools in Toad Edge. It is used to interact with a database using SQL scripts and queries. Coupled with additional features such as [Content Assist](#) and [Outline View](#), you can create and modify queries in a fast and efficient manner.

i | **NOTE:** If you do not specify a database, the scripts and queries will be performed on the [Default database \(MySQL/MariaDB\)](#)

To open a Worksheet

- Click the **Worksheet** button on main toolbar to open a blank Worksheet

Worksheet toolbar

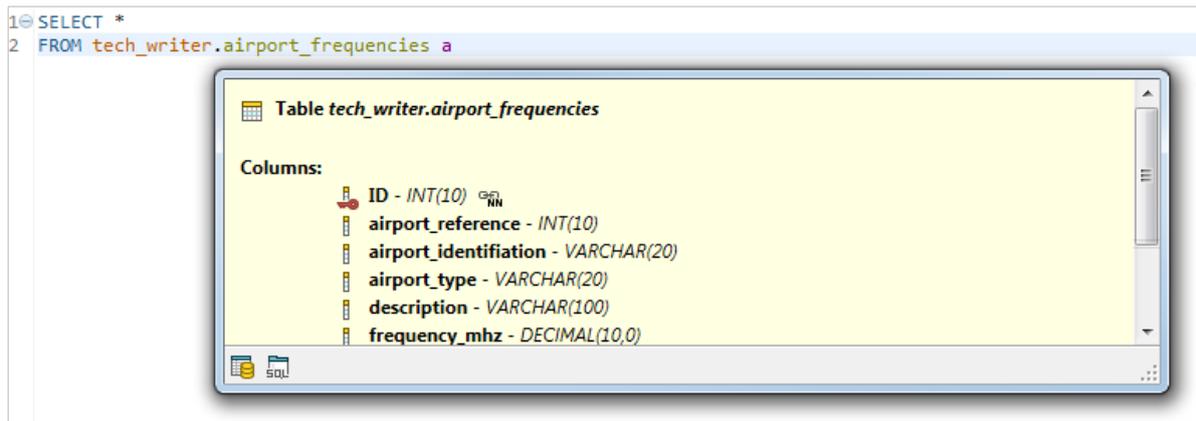
Button	Option	Description
	Run All Statements	Runs all statements in the query
	Run From Current Position	Runs all statements from the current cursor position in the query
	Run to Current Position	Runs all statements up to the current cursor position in the query
	Run SQL Statement	Runs the statement where the cursor is currently placed. Can be used to run multiple selected statements at once
	Run Explain All	Runs explain plan cost of all queries
	Run Explain From	Runs explain plan cost of all queries from the current one up to the end
	Run Explain To	Runs explain plan cost of all queries from the beginning up to the current one
	Run Current	Runs explain plan cost of the current SQL query
	Cancel Query	Stops the query that is currently being run
	Commit Transaction	Commits the changes included in the current transaction. See AutoCommit for more information
	Rollback Transaction	Cancels the changes included in the current transaction. See AutoCommit for more information
	Select Connection	Allows you to select a connection using which the query should be run
	Show Result Set	Displays Result Set either in Vertical Layout or Horizontal Layout
	Rename SQL tab	Opens a dialog where you can enter the new name of the worksheet. This option is disabled for worksheets opened from files.

Worksheet context menu options

Option	Description
Revert	Restores the last saved state of the Worksheet
Open	Opens the selected object in Object Detail . Note that this option only works when you place the cursor in or select a highlighted object name, i.e. an object that already exists in the database
Make Code Statement	Generates Java code which recreates the selected query as a StringBuilder object. The code is copied to clipboard
Strip Code Statement	When selecting Java code which contains a SQL query, this option will strip away the Java code and keep the SQL code. The code is copied to clipboard
Formatting	Provides options to switch the selected text to uppercase/lowercase or to enclose it in text/object quotes
Quick Outline	Displays the basic structure of a Worksheet if it contains multiple queries
Toggle Comment	Comments out the selected lines

Hint Window

When you hover over a database object name, **Hint Window** is displayed to provide you with quick information about the object. Hover over the bottom bar of the window to see additional options.



Button	Option	Description
	Open Declaration	Opens the object in Object Detail
	Show Script	Displays the object SQL code in a new Worksheet

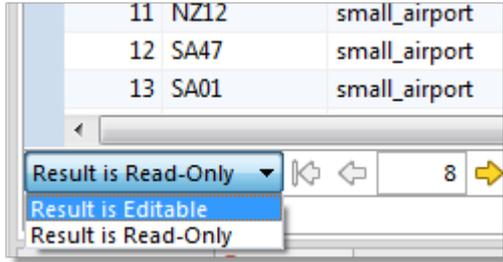
Result

When you run a SELECT statement in Worksheet, the result is displayed in the Result. The rows and cell values here can be conveniently exported to multiple formats and you can even edit the cell values in-place.

i **NOTE:** Currently, the Result is only displayed if you run a SELECT statement alone and not as a part of a query.

To switch Result to editable mode

- Select the **Result is Editable** option in the drop down menu in the bottom-left corner of the Result

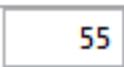


i **NOTE:** The SELECT statement must satisfy several conditions in order for the Result to be editable. Specifically, the statement must not contain:

- Aggregation functions (count, max, sum...)
- Set operators (join, union...)
- Nested SELECT statements

Additionally, the Result is not editable when selecting from a view or when the selection does not include at least one identification key column (e.g. primary key).

To navigate and manipulate results

Button	Option	Description
	Go to Beginning	Goes to the first page of the Result Set
	Go to Previous Page	Goes to the previous page of the Result Set
	Selected Row	Displays the number of the currently selected row
	Go to Next Page	Goes to the next page of the Result Set
	Go to End	Goes to the last page of the Result Set
	Drop Selected Rows	Deletes the selected rows
	Apply Changes	After editing a value, applies the changes
	Restore Original Values	After editing a value, cancels the changes

Result context menu options

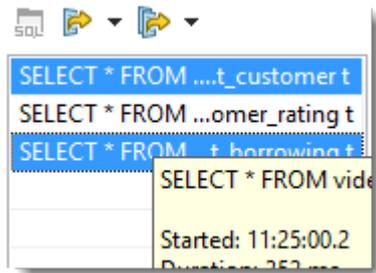
Option	Description
Define in Editor	Edits the selected cell value in a type-specific editor
Set Null	Sets the selected cell value to null
Export BLOB to file	(BLOB columns only) Exports the binary object of the selected cell as a file
Import BLOB from file	(BLOB columns only) Imports a file as a binary object and places it into the selected cell
Export Selection	Exports the currently selected rows as SQL code or to a CSV/HTML/XML file
Export Query Result	Exports the entire result as SQL code or comma separated values
Advanced copy	Gives the option to copy all rows or selected rows with the headers.

Multiple Result Set

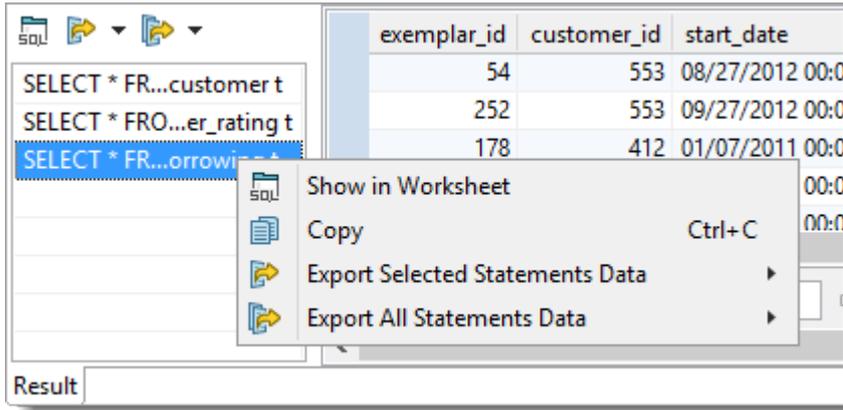
Toad Edge supports working with more than one result sets. Type your **SELECT** queries into **Worksheet** and click **Run All Statements**. Result sets from all queries will be displayed in a new **Result** view, where you can easily switch between results, display them side-by-side, edit and export them

To work with multiple results

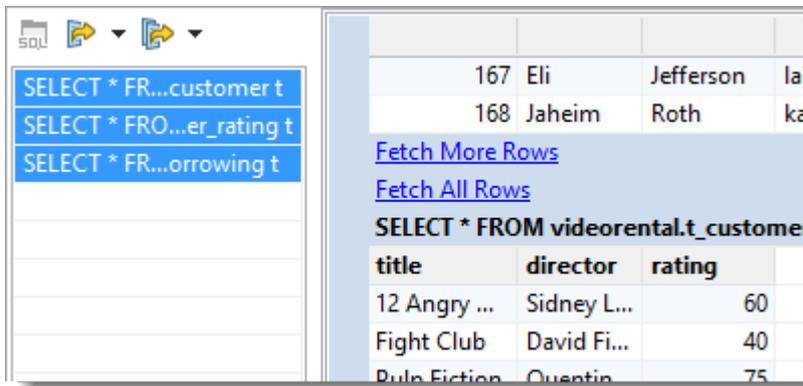
- Left-click a result to select it
- Hold Shift/Ctrl + left-click multiple results to select them



- Click **SQL** button to highlight a specific statement in **Worksheet**
- Right-click a statement in **Result** and click copy to copy the statement and later paste it into **Worksheet**

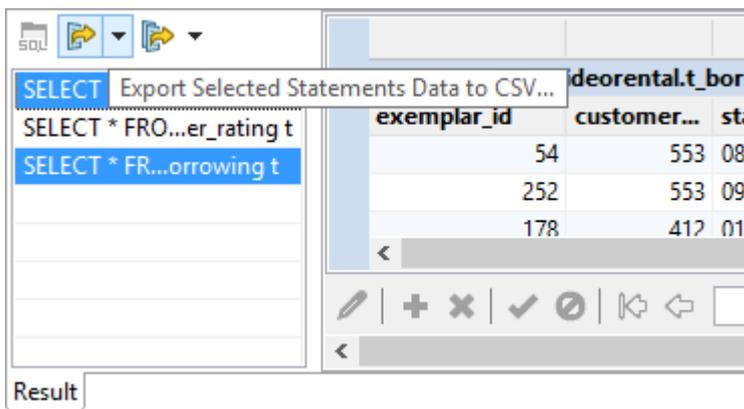


- Only a certain number of results will be fetched upon operation. Scroll down to reveal more results when one result is selected. Set the number of fetched rows in **View | Preferences | Data | Use fetch limit**
- When more result sets are selected, click **Fetch More Rows** or **Fetch All Rows** to load more data



To export results

- Click **Export Selected Statements Data to CSV/SQL** to export some of the result sets
- Click **Export All Statements Data to CSV/SQL** to export all of the result sets



- Configure destination and format options in the next step:

Feature	Description
Export As	Select the desired option: <ul style="list-style-type: none"> • SQL - INSERT statements - exports the data as INSERT SQL statements into the selected destination • SQL - MERGE statements - exports the data as MERGE SQL statements into the selected destination • CSV - exports the data as comma separated values into the selected destination
Line Terminator	Select from: <ul style="list-style-type: none"> • Environment default • Mac/Unix • Windows • Mac OS Classic
Destination for exported data	Exported data are displayed in: <ul style="list-style-type: none"> • Worksheet - Toad Edge exports the data into a new instance of Worksheet • Clipboard - Exports data into system clipboard • Single file - Click browse button to select the name for the exported file and its location. All result sets will be saved in one file. • Separate files - Click browse button to select the name for the exported file and its location. Files will named automatically.
Compress file in ZIP format	Available for exporting as files.
Open directory after finishing the export	Opens the destination directory after a successful export.
Format exported queries	Check to export data in an easier-to-read format with indentations and extra lines.

Multiple Result Viewers

Toad Edge supports having more than one result view to see query results. Type your **SELECT** queries into Worksheet and click **Run SQL Statement** or **Run All Statements**. If you run your queries multiple times, it will display the results in multiple tabs.

COLLATION_NAME	CHARACTER_SET_NAME
armscii8_general_ci	armscii8
armscii8_bin	armscii8
ascii_general_ci	ascii
ascii_bin	ascii
big5_chinese_ci	big5
big5_bin	big5
binary	binary
cn1250_general_ci	cn1250

Count: 0.00 | Records: 272

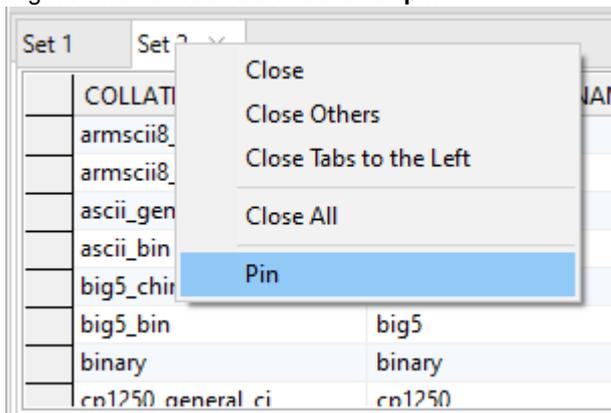
To work with multiple tabs

- By default the number of tabs is 1. You can go to View | Preferences | SQL Editor| Maximum results in a worksheet and increase it.
- You can at max have 5 unpinned tabs.

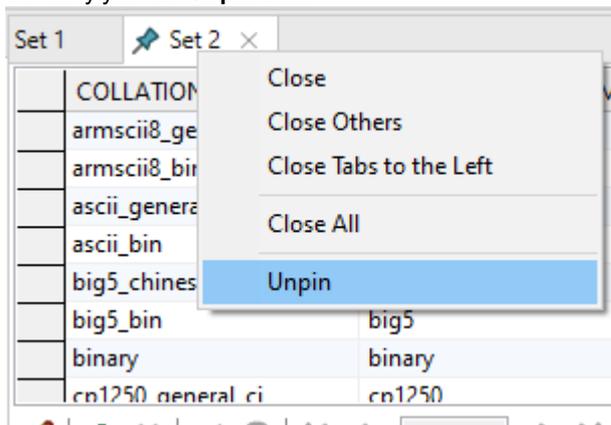
To pin a tab

When the maximum number of tabs have already been created, Toad Edge picks the oldest created tab and re-uses it effectively replacing its result. You can pin a tab if you want Toad Edge to retain that tab and the result shown.

- Right click on a result tab and click on **pin**.



- Similarly you can **unpin** a tab.



Locks View

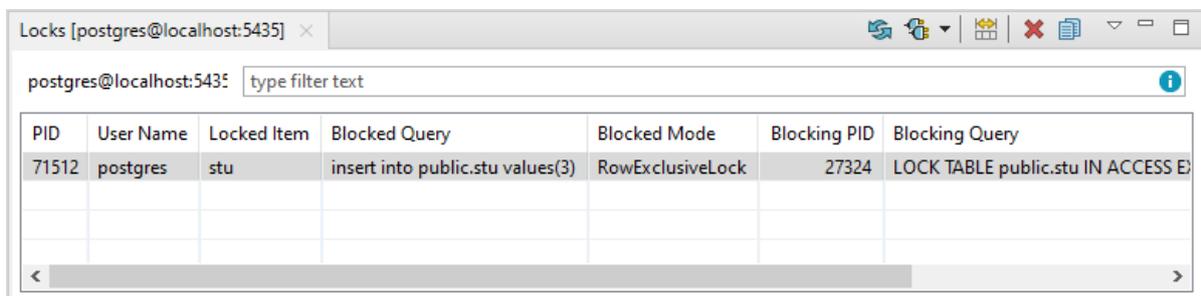
The **Locks View** displays blocked queries and the blocking query. It will tell you the PID of the blocked and blocking query along with other details like blocked mode, locked item etc. The information is updated according to your preferred frequency. It also gives you the ability to stop the blocking lock.

To start monitoring sessions

1. Select a **PostgreSQL/EDB** connection from the  select connection dropdown menu.
2. The refresh period can be configured in the  **View Menu** dropdown menu.

To stop a lock

1. Select a lock and then click the  **End Blocking Lock** to stop the locks.



PID	User Name	Locked Item	Blocked Query	Blocked Mode	Blocking PID	Blocking Query
71512	postgres	stu	insert into public.stu values(3)	RowExclusiveLock	27324	LOCK TABLE public.stu IN ACCESS E

Button	Option	Description
	Refresh	Manual update of the status of all locks
	Select Connection	Select a PostgreSQL/EDB connection here in order to monitor its sessions
	Resize Columns to Data	Resizes columns so they fit the values they contain
	End Blocking Lock	Ends the Blocking lock
	Copy	Copy the selected lock
	View Menu	Allows you to change the monitoring refresh period

Keyboard Shortcuts

This topic lists shortcuts that you can use when working Toad Edge.

General shortcuts

Option	Shortcut
Open SQL Worksheet	CTRL (⌘) + N
Close	CTRL (⌘) + W
Close All	CTRL (⌘) + SHIFT + W
Save	CTRL (⌘) + S
Print	CTRL (⌘) + P
Undo	CTRL (⌘) + Z
Redo	CTRL (⌘) + Y
Cut	CTRL (⌘) + X
Copy	CTRL (⌘) + C
Paste	CTRL (⌘) + V
Delete	DELETE
Select All	CTRL (⌘) + A
Object Search	CTRL (⌘) + SHIFT + D
Text Search	CTRL (⌘) + H
Enable / Disable AutoCommit	CTRL (⌘) + ALT (OPT) + A
Manage Connections	CTRL (⌘) + ALT (OPT) + C
New Connection	CTRL (⌘) + ALT (OPT) + N
Disconnect	CTRL (⌘) + ALT (OPT) + I
Reconnect	CTRL (⌘) + ALT (OPT) + R
Preferences	ALT (OPT) + P
Maximize Window	CTRL (⌘) + M
Reset Application Layout	ALT (OPT) + SHIFT + L
Help	F1
Open Tab Dropdown Menu	CTRL (⌘) + E
Next Tab	CTRL (⌘) + F6
Previous Tab	CTRL (⌘) + SHIFT + F6

New object shortcuts

Option	Shortcut
Database	ALT (OPT) + SHIFT + D
Event	ALT (OPT) + SHIFT + E

Option	Shortcut
Function	ALT (OPT) + SHIFT + F
Procedure	ALT (OPT) + SHIFT + P
Role	ALT (OPT) + SHIFT + O
Schema	ALT (OPT) + SHIFT + H
Sequence	ALT (OPT) + SHIFT + Q
Table	ALT (OPT) + SHIFT + T
Trigger	ALT (OPT) + SHIFT + R
Trigger Function	ALT (OPT) + SHIFT + G
Type	ALT (OPT) + SHIFT + Y
User	ALT (OPT) + SHIFT + U
View	ALT (OPT) + SHIFT + V

Worksheet shortcuts

Use these shortcuts while working with [Worksheet](#). Some of these shortcuts also work in **Source** of procedures and functions opened in **Object Detail**.

Option	Shortcut
Find and Replace	CTRL (⌘) + F
Find Next	CTRL (⌘) + K
Find Previous	CTRL (⌘) + SHIFT + K
Format Code	CTRL (⌘) + SHIFT + F
Open (cursor located in an existing object name)	F3
Rename/refactor (cursor located in an existing object name or alias)	F2
Add Object Quotation Marks	CTRL (⌘) + SHIFT + Q
Add Text Quotation Marks	CTRL (⌘) + ALT (OPT) + SHIFT + Q
To Upper Case	CTRL (⌘) + SHIFT + X
To Lower Case	CTRL (⌘) + SHIFT + Y
Run All Statements	CTRL (⌘) + SHIFT + ENTER
Run Selected	CTRL (⌘) + ENTER
Run To Current Position	CTRL (⌘) + SHIFT + UP ARROW
Run From Current Position	CTRL (⌘) + SHIFT + DOWN ARROW
Toggle Comment	CTRL (⌘) + /
Content Assist	CTRL + SPACE
Surround with Parentheses	CTRL (⌘) + ALT (OPT) + 1

Option	Shortcut
Surround with Brackets	CTRL (⌘) + ALT (OPT) + 2
Surround with Braces	CTRL (⌘) + ALT (OPT) + 3
Delete Line	CTRL (⌘) + D
Go to Line	CTRL (⌘) + L
Scroll Line Up	CTRL (⌘) + UP ARROW
Scroll Line Down	CTRL (⌘) + DOWN ARROW
Additional context menu	CTRL (⌘) + F10
Move Line Up	ALT (OPT) + UP ARROW
Move Line Down	ALT (OPT) + DOWN ARROW
Object Information (cursor located in an existing object name)	F6

Object Detail | Data, Editable Result set

Option	Shortcut
Insert Row	SHIFT + INSERT
Delete Selected Row	SHIFT + DELETE
Apply Changes	SHIFT + ENTER
Discard Changes	ESC
Edit Value	ENTER
Open Value in Editor	CTRL (⌘) + E
Insert Null	DELETE
Restore Original Values	ESC
Lock/Unlock values for editing (Result set)	CTRL (⌘) + SHIFT + E

Object Detail | Source (procedures and functions)

Option	Shortcut
Refresh	F5
Run SQL Statement	SHIFT + ENTER
Run	CTRL (⌘) + R

Connections

Option	Shortcut
Copy Connection	CTRL (⌘) + C
Reconnect	F5

Option	Shortcut
Properties	F2

Search

Option	Shortcut
Next Match	CTRL (⌘) + .
Previous Match	CTRL (⌘) + ,
Remove Selected Matches	DELETE

Features

The subsections below describe the various product features of Toad Edge® and different ways of user and object privilege management .

AutoCommit

When you turn on AutoCommit for your connection, all SQL statements will form transactions on their own and will be committed immediately unless an error is returned.

To enable/disable AutoCommit in Worksheet/Object Detail

- Double-click the **AutoCommit** button in the bottom application bar



To enable/disable AutoCommit in Connections

- Right-click a connection in **Connections** and select **Properties | Connection Details Enable AutoCommit**
- The last option is to go to **Database menu** and select **Enable/Disable AutoCommit**

When you disable AutoCommit, you will have to commit or rollback your transactions manually. Whenever you run a DML statement in **Worksheet** or make any modification using **Object Detail**, the changes will be applied only in your session. They will not be applied in the database unless you commit them.

There are two buttons that can be used to manually control the process:

- **Commit Transaction**  - the changes you have made will be committed and applied in the database
- **Rollback Transaction**  - the changes you have made will be discarded and the database will not be modified

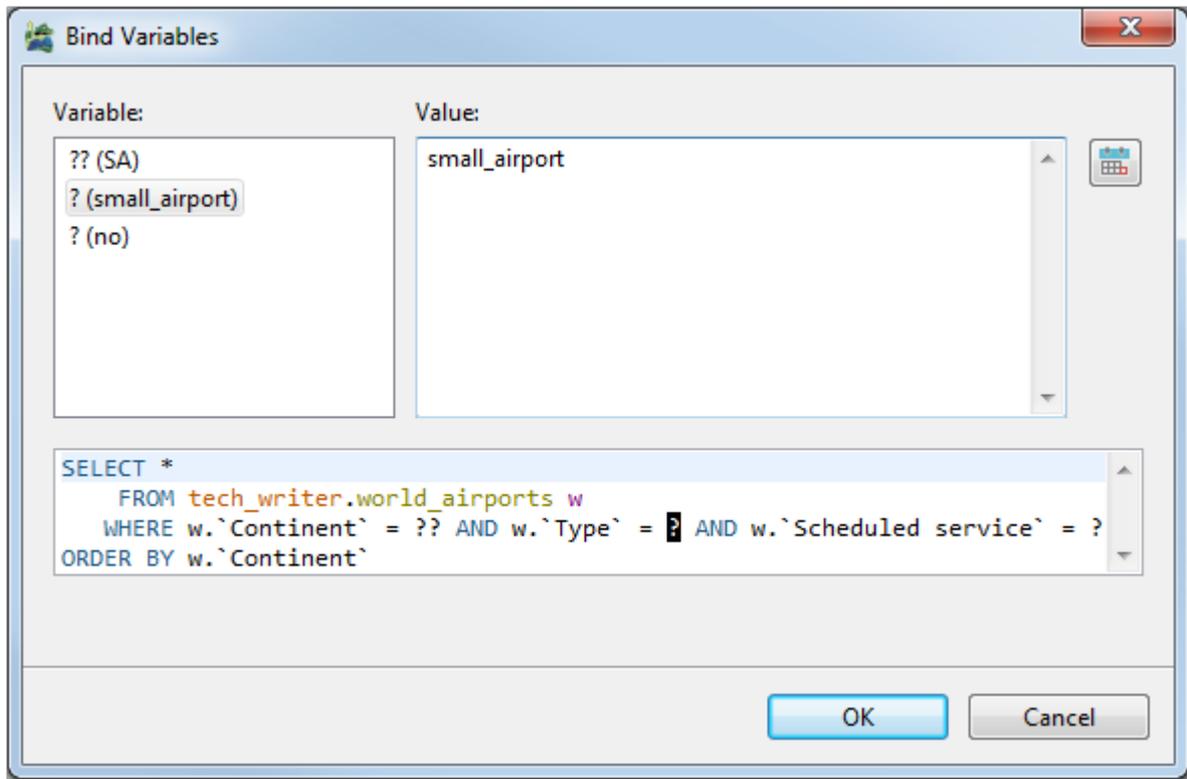
i | **NOTE:** These buttons are disabled when AutoCommit is enabled.

Bind Variables

Toad Edge provides a way to reuse queries by using variables instead of specific values. These variables can be given value each time you performed a query.

To bind and use variables

1. Open a new **Worksheet** and start writing your query. Use a single or double question mark ("?" or "??") to bind variables
2. Run the query
3. **Bind Variables** dialog appears. You can give each variable a value and then finish executing the query



Content Assist

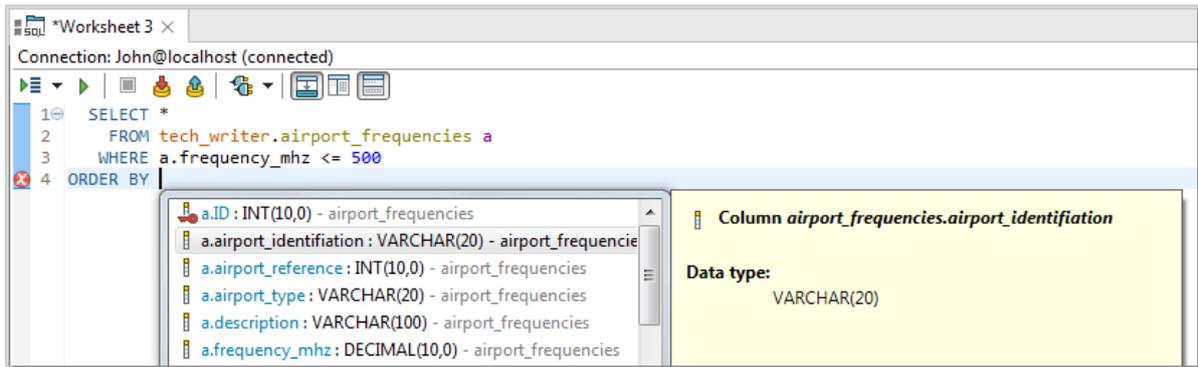
To make writing scripts and editing JSON data easier, Toad Edge offers a convenient tool - Content Assist (also known as autocompletion). This utility automatically suggests keywords or templates you might want to use when you are working with [Worksheet](#) or [JSON support and JSON Editor](#) on page 58

Content Assist can be displayed in two ways:

- Type any Content Assist trigger character and wait a set delay (configurable in Preferences | [Content Assist/Autocompletion](#) on page 94
- Manually by pressing **CTRL (⌘) + SPACE**

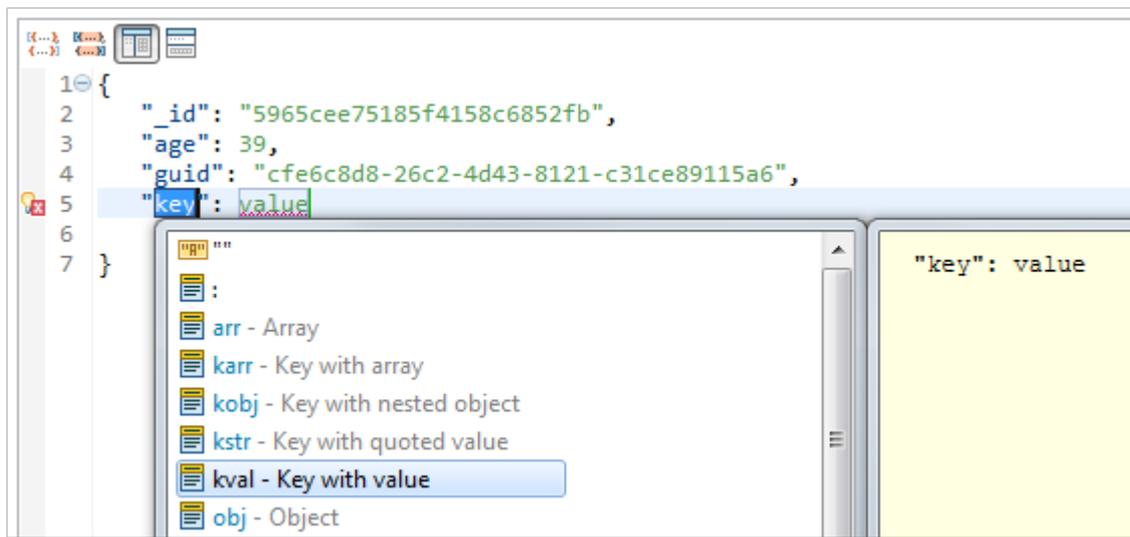
Content Assist - SQL

In this environment, Content Assist suggests various relevant SQL keywords depending on the context of your query. It also suggests default or custom [Templates](#).



Content Assist - JSON

Once you open JSON Editor, you can invoke Content Assist to utilize JSON templates. Instead of worrying about closing brackets and quoting keys properly, you can simply insert the key-value structure and just fill in the values.



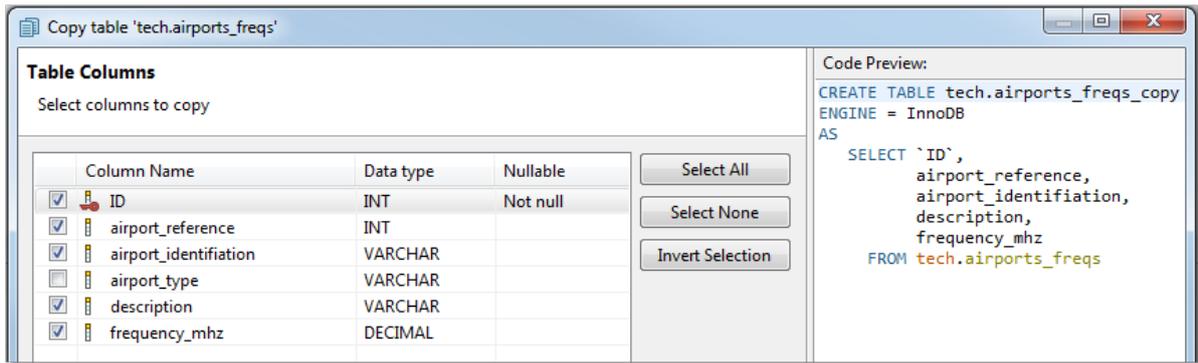
Copy Table

The Copy Table tool is convenient for when you need to copy an entire table with all its contents to the same or a different database.

NOTE: You can only copy tables between databases of the same connection.

To copy a table:

- In **Object Explorer**, right-click the table you want to copy and select **Copy Table...**
- In the first dialog of **Copy Table wizard**, select the destination **Database** and enter the copied **Table name**
- In the last dialog, you can select which table columns should be copied



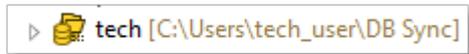
Repository

Version control systems (VCS) are not a part of database/schema systems by default. However, Toad Edge® offers a way to apply version control to a database/schema by mapping it to a file system as a folder structure where each object is represented by a JSON file. The resulting structure is referred to as a "repository". It can be tracked with any VCS and it can be also synchronized with any other database/schema of the same platform and version using **Schema Compare. Repository** is available for MySQL, MariaDB, and PostgreSQL.

To map a database/schema to a file system

1. Right-click a database/schema in **Object Explorer** and select **Repository | Map Database**
2. Enter the path to the destination folder where the database/schema folder structure should be created

Your database/schema is now mapped to the file system. The path to the folder structure is displayed next to the database/schema icon in **Object Explorer**.



Object Explorer also displays the synchronization status of all objects in the database/schema.



The following table lists all possible states indicated by the object decorators and the action suggested once you synchronize database/schema and repository:

Decorator	Cause	Suggested action	Description
	A new object was added to database/schema that is not present in	 Change target	You added a new object to your database/schema. Toad Edge assumes you want to add the object to your repository as well

repository

	An object was deleted from repository, but it still exists in database/schema	 Change source	You deleted an object in your repository. Toad Edge assumes you want to delete the object from your database/schema as well
	An object was probably modified in database/schema / repository	None	You modified an object in your database/schema / repository. These changes have been detected by Toad Edge but they have not been confirmed yet. To confirm and resolve them, Synchronize the database/schema and the repository
	An object was confirmed to be modified in database/schema / repository	 Change source / target	You modified an object in your database/schema / repository and synchronized them afterwards. Toad Edge assumes that when you modify an object on one side you will want to modify on the other side as well.
	An object was possibly modified in both database/schema and repository	None	You modified an object in both your database/schema and your repository. These changes have been detected by Toad Edge but they have not been confirmed yet. To confirm and resolve them, Synchronize the database/schema and the repository
	An object was confirmed to be modified in both database/schema and repository	 Change both	You modified an object in your database/schema / repository and synchronized them afterwards. Toad Edge assumes that when you modify an object on both sides, you will want to decide which specific changes should be applied in the source and the target
	An object has not been added to repository yet, its state is unknown	 Change target	You mapped your database/schema to a file system (repository), but you have not synchronized them yet. Synchronize the database/schema and the repository in order to copy the objects from your database/schema to the repository

To remove mapping of a database/schema to a file system

1. Right-click a database/schema in **Object Explorer** and select **Repository | Remove Mapping**
2. Confirm the removal. Optionally, you can check the **Also delete file on disk** checkbox to delete the remaining files in the file system

To synchronize a mapped database/schema with a repository

- Right-click a database/schema that is mapped to a file system in **Object Explorer** and select **Repository | Synchronize**

The process of synchronization of a database/schema and a repository is very similar to **Schema Compare**. See [About Schema Compare](#) to learn more about the synchronization process.

NOTE:

- When synchronizing a database/schema and a repository, it is currently not possible to use the **Change both** resolution action to resolve specific differences.
- In PostgreSQL, the version control system (VCS) feature is limited to schemas and does not apply to the entire database.

Data Export

Toad Edge allows you to export various data from [Object Explorer](#), [Object Detail and Describe Object](#) and [Result Set](#).

Exporting data from Object Explorer

There are two kinds of exports available in **Object Explorer**:

- **Export Script**  - exports the SQL create script for any object
- **Export Data**  - exports table records

You can export data in SQL (INSERT/MERGE) or CSV, XML, EXCEL format.

To export script of an object in Object Explorer

1. Right-click an object and select **Export Script**
2. Select **Destination** and configure **Script Options**

To export table data in Object Explorer

1. Right-click a table and select **Export Data**
2. In the first dialog of the wizard, you can **Add** other tables to the export. If your table is linked to other tables by a relationship, you can also **Add Children/Parent** tables
3. In the next dialog, select the export **format** and its **Destination**
4. The next dialog presents you with a grid where you can exclude specific data type columns from the export
5. If you want to exclude specific columns rather than column data types, you can do so in the following dialog
6. The last dialog contains a couple more **SQL Settings**. Once you are done with the configuration, click **Finish**

Exporting data from Object Detail and Result Set

There are two kinds of exports available in **Object Detail | Data tab** and **Result Set**:

- **Export Grid Selection**  - exports the rows that you have selected in grid
- **Export Query Result**  - exports the entire contents of the grid

You can export data in CSV and SQL (INSERT/MERGE statements) format. Grid selection can be additionally exported in HTML, EXCEL and XML format

To export data from Object Detail or Result Set

1. Open a table or a view in **Object Detail | Data tab** or run a query to display the **Result Set**
2. Right-click anywhere in the grid and select **Export Grid Selection** or **Export Query Result**

3. If exporting to XML/HTML, simply choose the destination path and **Save** the export
4. If exporting to CSV/SQL, select the **format** of the export and its **Destination**
5. In the last dialog, configure the final **SQL/CSV Settings** to your liking and click **Finish**

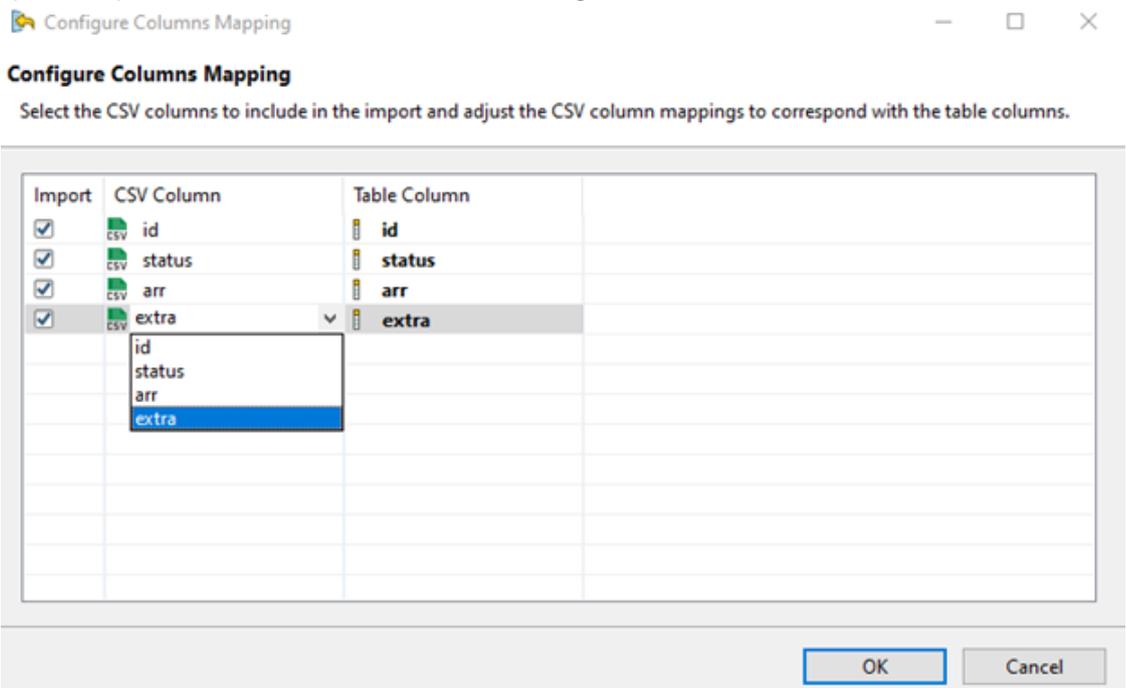
Data Import

Importing data is the fastest way to populate your tables. Toad Edge offers data import from SQL (INSERT or MERGE statements) or CSV files. You can even import data from ZIP archives that contain these files.

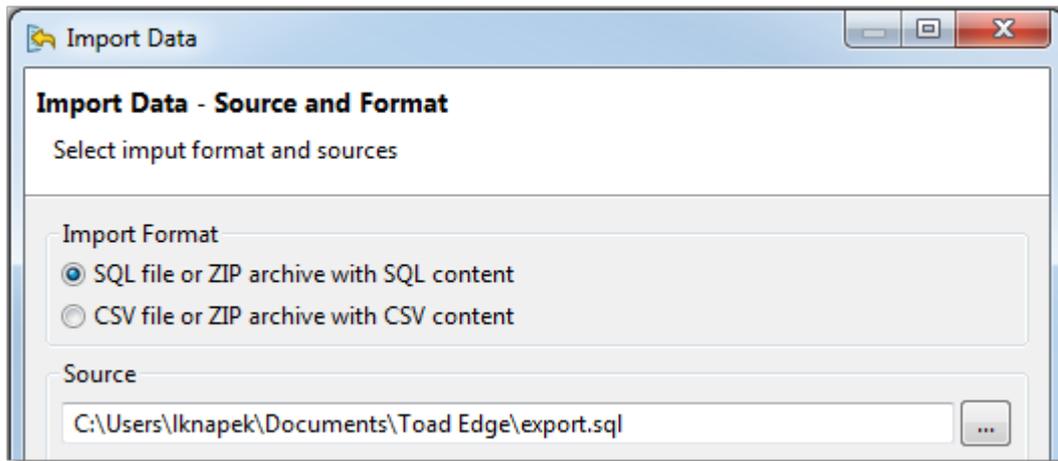
i Note: CSV file import currently allows importing data only into one table at a time.

To import data into a table:

1. In **Object Explorer**, right-click the table you want to import data into and choose **Import Data...** 
2. In the **Import Data wizard**, choose the import file format, the **Source** path and encoding. The encoding field is editable in case encoding is not detected correctly
3. The final dialog depends on whether you import a SQL or a CSV file:
 - SQL file - you can configure additional **SQL Format Settings**, for example, you may want to remove the database name from the code or open it in [Worksheet](#)
 - CSV file - you can configure columns mapping between CSV columns and table columns to meet specific requirements and various **CSV Format Settings** such as delimiters, date and time formats.



4. Once you are done with the final configuration, click **Finish**

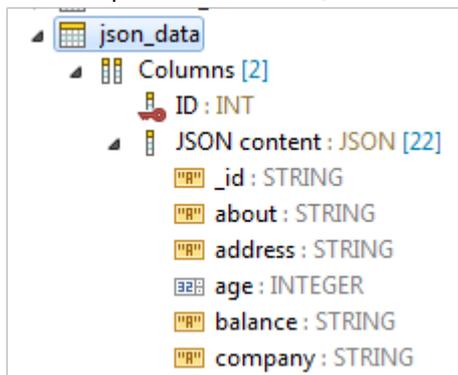


JSON support and JSON Editor

With Toad Edge you can view JSON columns structure clearly in multiple places and you can also edit specific JSON values using an editor with support of Content Assist, Quick Fixes, and other features that support JSON (JavaScript Object Notation) data types.

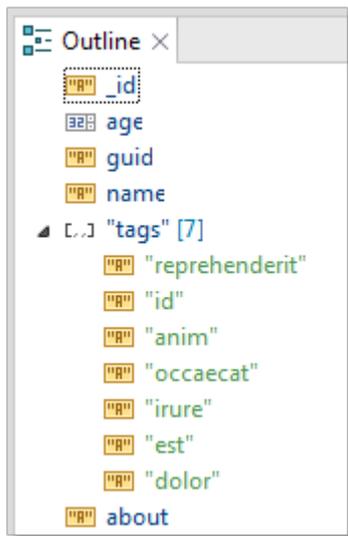
To view JSON column values

1. In **Object Explorer**, locate your database/schema and then the table that contains a JSON data type column
2. Expand the table node, the columns node and then finally the node of the specific JSON column



To view detailed structure of JSON values

1. Double-click any table in **Object Explorer** with a JSON data type column to open it in **Object Detail**
2. In **Object Detail**, switch to the **Data** tab
3. Right-click a value and select **Define in Editor** to open the value in **JSON Editor**
4. The structure of the specific JSON value is then displayed in **Outline View**



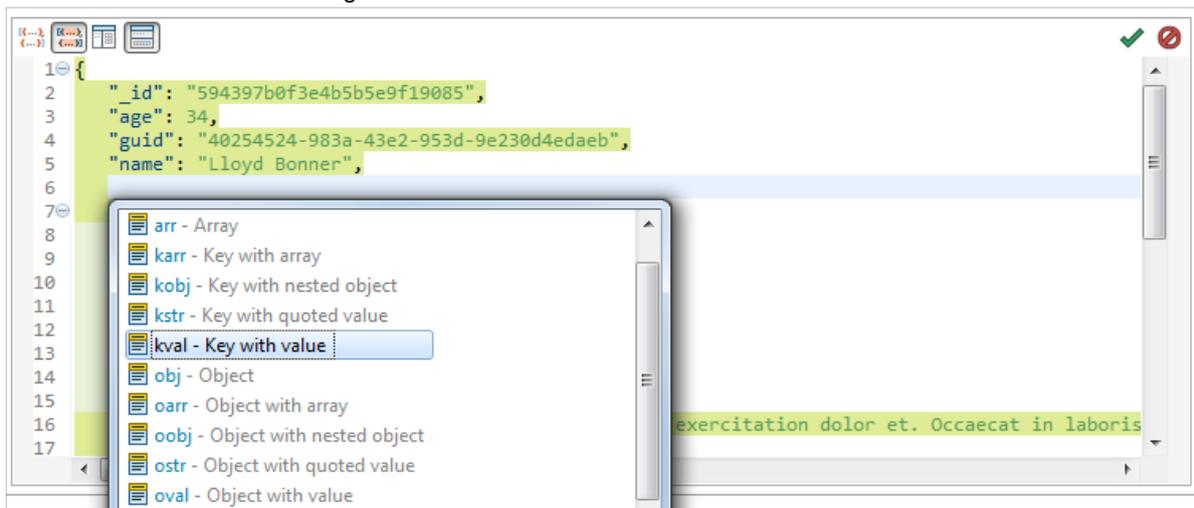
JSON Editor

To edit values in JSON Editor

1. Double-click any table in **Object Explorer** with a JSON data type column to open it in **Object Detail**
2. In **Object Detail**, switch to the **Data** tab
3. Open a JSON value in **JSON Editor** by either:
 - Right-clicking the value and selecting **Define in Editor**
 - Double-clicking the value and clicking the edit icon 

JSON Editor has two especially notable features:

- **Content Assist** (*CTRL* (*#*) + *SPACE*) - suggests JSON templates (see [Templates](#) for more information)
- **Quick Fix** - offers simple solutions to syntax errors, use them by right-clicking an underlined part of the JSON value and selecting a fix



Toolbar button	Name	Description
	Brackets Highlighting	Toggles brackets highlighting. Corresponding starting/ending brackets are highlighted in the same color
	Brackets Content Highlighting	Toggles brackets content highlighting. Bracket values of the same depth are highlighted in the same color
	Vertical Layout	Switches the editor into vertical layout
	Horizontal Layout	Switches the editor into horizontal layout
	Apply	Applies changes made to a value
	Cancel	Discards changes made to a value

Management of BLOBs

There are several tools that can be used to work with BLOBs (Binary large objects). You can open them in application of your choice and you can also import/export BLOB values directly in **Object Detail**.

To view the contents of a BLOB value

1. Open a table with BLOB values in **Object Detail** and switch to the **Data tab**
2. Double-click any BLOB value to open it in its associated application

 **NOTE:** The application in which the BLOB value will be opened depends on current settings. See [BLOB Viewers](#)

To export BLOB values

1. Open a table with BLOB values in **Object Detail** and switch to the **Data tab**
2. Right-click any BLOB value and select **Export BLOB to File**
3. Choose the destination for the file and click **Save**

To import BLOB values

1. Open a table with BLOB values in **Object Detail** and switch to the **Data tab**
2. Right-click any BLOB value and select **Import BLOB from File**
3. Select the file that you would like to import as a BLOB value and click **Open**

NOTE: The imported file must not exceed the maximum size of the destination BLOB column type. The maximum size of a BLOB column value of each type is:

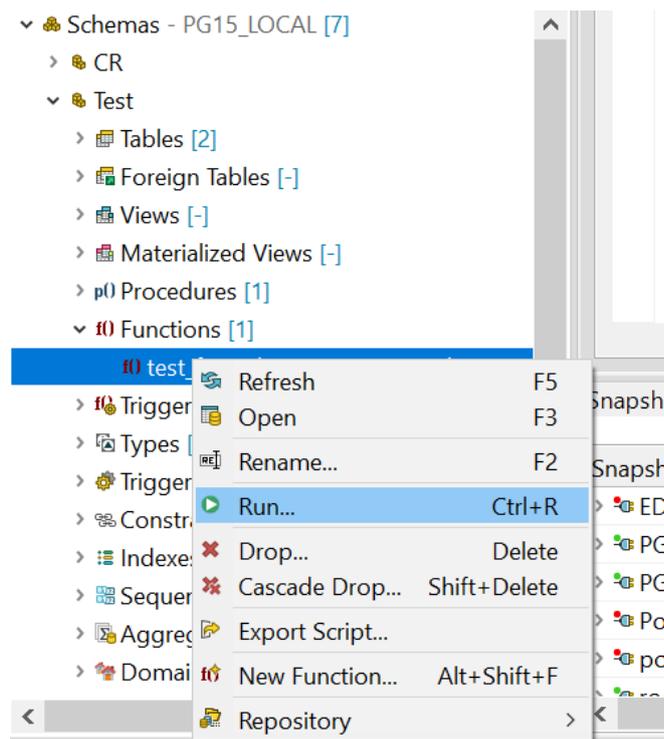
- TINYBLOB - 255 bytes
- BLOB - 64 KB
- MEDIUMBLOB - 16 MB
- LONGBLOB - 4GB

Running Stored Procedures and Functions

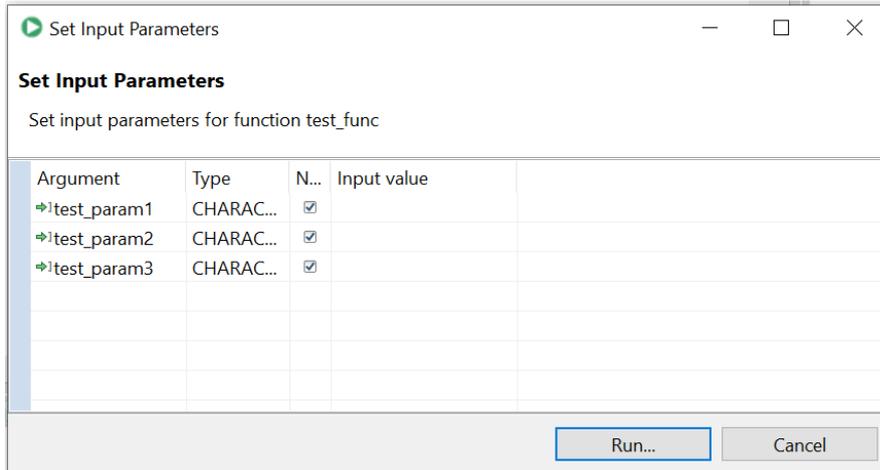
Procedures and functions stored in your database can be run right from the **Object Explorer**. Once the procedure/function is performed, you can display the results in the **Run Routines** window. See [Run Routines](#) for more information.

To run a function

- Right-click a function and select **Run**

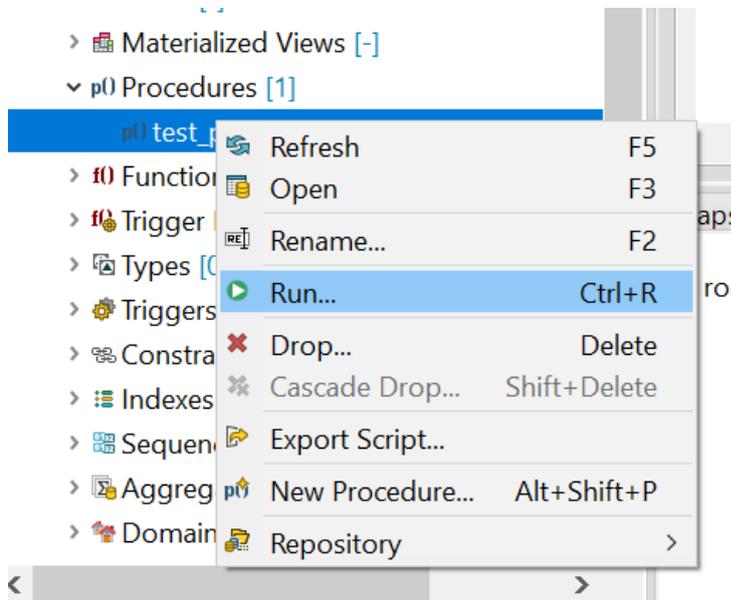


- If your function accepts parameters, you will be able to enter them before operation in the Set Input Parameters window

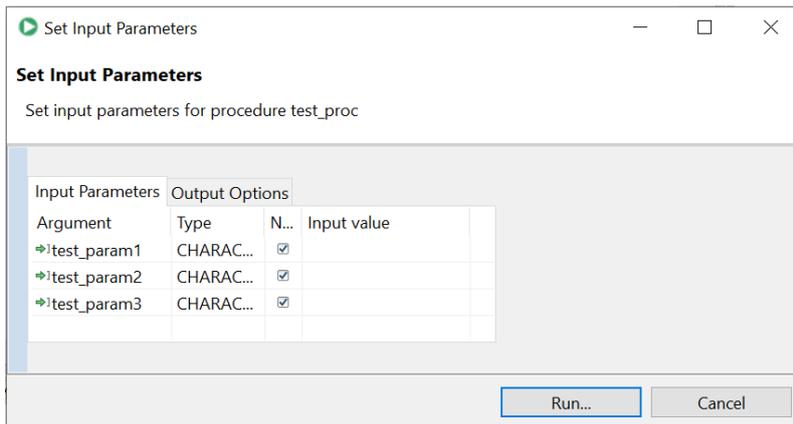


To run a stored procedure

- Right-click a procedure select **Run**

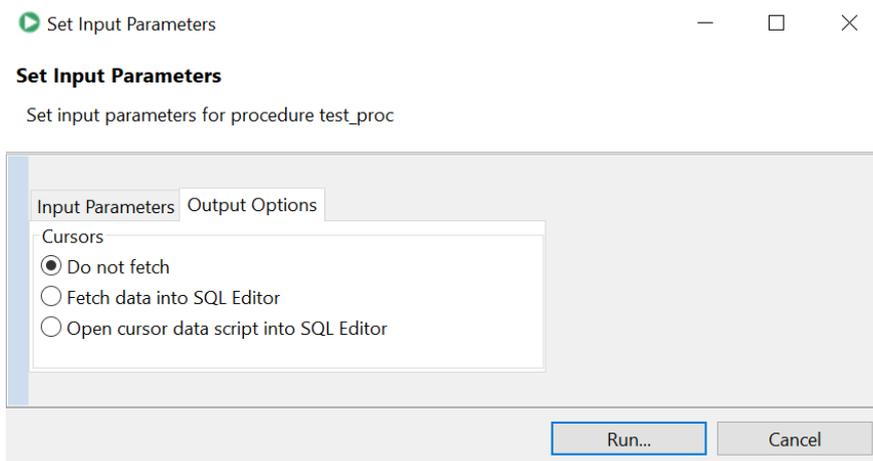


- If your procedure or function accepts parameters, you will be able to enter them before operation in the **Set Input Parameters** window

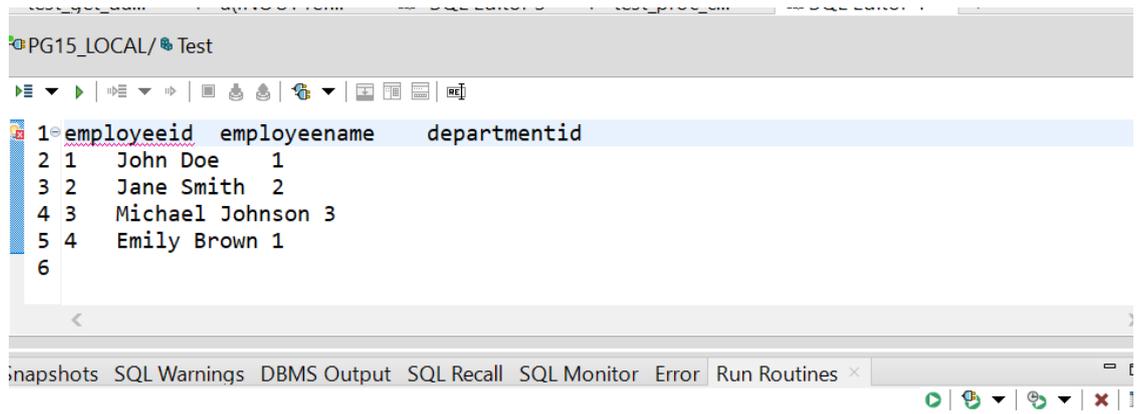


To view cursors in PostgreSQL/EDB

- There are three options to view cursor information using Output Options tab.
 - **Do not fetch** - This option disables fetching any cursor information. It is useful when you don't need to retrieve data from a cursor.

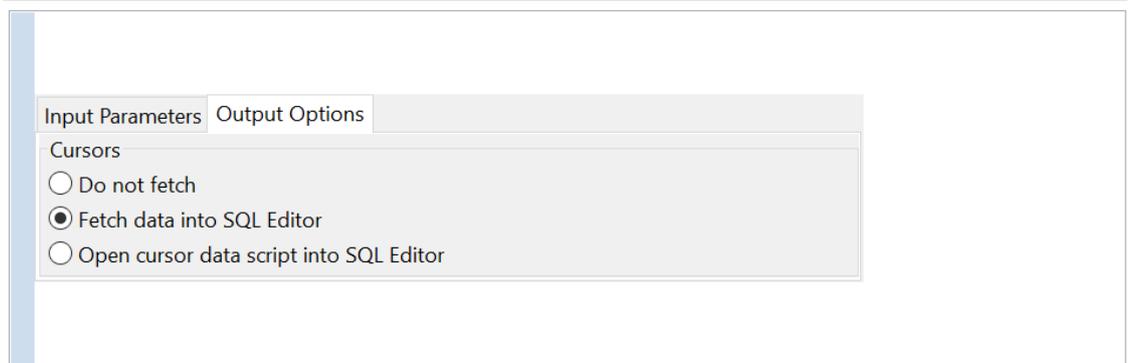


- **Fetch data into SQL Editor** - Selecting this option retrieves the data of a ref cursor into the SQL Editor.



Procedure: test_proc_cur

✓ Execution was successful!



Arguments

- **Open cursor data script into SQL Editor** - Selecting this option opens the script that makes the data from a ref cursor show up in a grid in the SQL Editor.

The screenshot shows the Toad Edge SQL editor interface. The top pane displays a PL/SQL procedure named `test_proc_cur` with the following code:

```

7  /---these names will be referenced with their corresponding fetch statements
8  8---to generate the final output in the data grid
9  9-----
10
11 11---BLOCK BEGINS
12 12---BEGIN;
13
14 14---call "Test".test_proc_cur('TOAD_AUTOGENERATED_CURSOR_NAME_1');
15 15---FETCH ALL IN "TOAD_AUTOGENERATED_CURSOR_NAME_1";
16
17 17---COMMIT;
18 18---BLOCK ENDS

```

The bottom pane shows the execution results for the procedure `test_proc_cur`. A green checkmark indicates "Execution was successful!". Below this, there are tabs for "Input Parameters", "Output Options", and "Arguments". Under "Output Options", there are three radio button options for "Cursors":

- Do not fetch
- Fetch data into SQL Editor
- Open cursor data script into SQL Editor

i **NOTE:** This feature works with INOUT refcursors only. The data will not display if the cursor has been closed before Toad Edge tries to pull data from it.

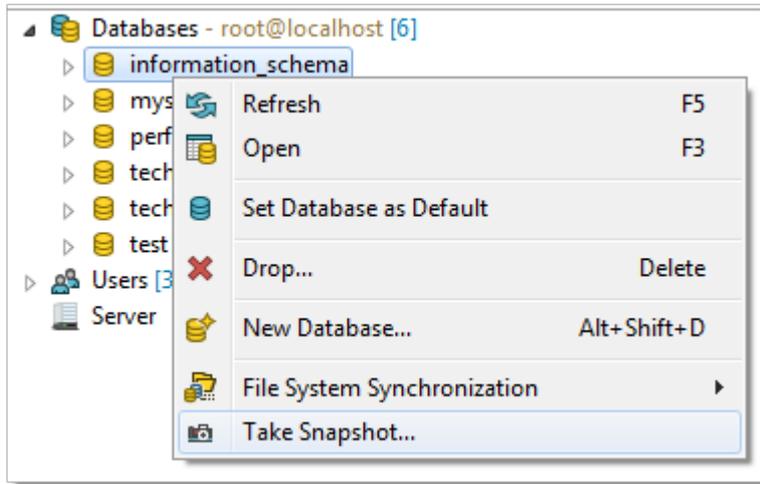
Snapshots

In Toad Edge, snapshots are a way of storing database structure (without data) as a readable JSON file. This file can be subsequently used as a create script source or as a **Schema Compare** source/target in **Continuous Integration and Delivery** (CI/CD).

There is also another type of snapshot - **baseline snapshot**. It is nearly identical to regular snapshot except it can be used in CI/CD in the **Compare database with baseline** build step. This build step will return an error if the database is different from the baseline snapshot. See [Continuous Integration and Delivery Wizard](#) for more information.

To take a snapshot of a database

1. In **Object Explorer**, right-click any database and select **Take Snapshot**
2. Change the snapshot name if you wish. Then click **OK**



Snapshots are stored in the Toad Edge folder structure. You can access the snapshot files in [Snapshots View](#).

Templates

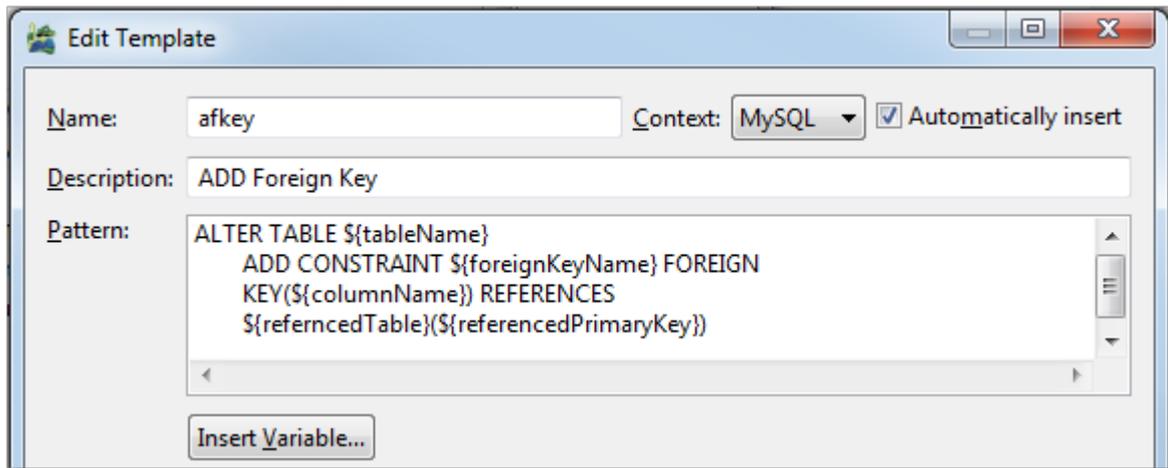
Templates are script snippets that can be reused in various editors. In Toad Edge, templates can be defined in three contexts:

- **SQL** - usable in [Worksheet](#) while working with all databases
- **JSON** - usable in [JSON support and JSON Editor](#)
- *Database specific* - usable in [Worksheet](#) while working with the specific database

To configure templates

1. Go to **Preferences (View menu | Preferences** or press *ALT + P*)
2. Switch to the **Templates** tab. Here you can add/edit/remove templates

i **TIP:** You can use variables in the code of your templates by typing `${variableName}`. If you need to enter a literal dollar symbol, enter two dollar characters in sequence `$$`.
When a template is used, its variables can be quickly set to specific values. You can also jump between the variables by pressing *TAB* and *SHIFT + TAB*.

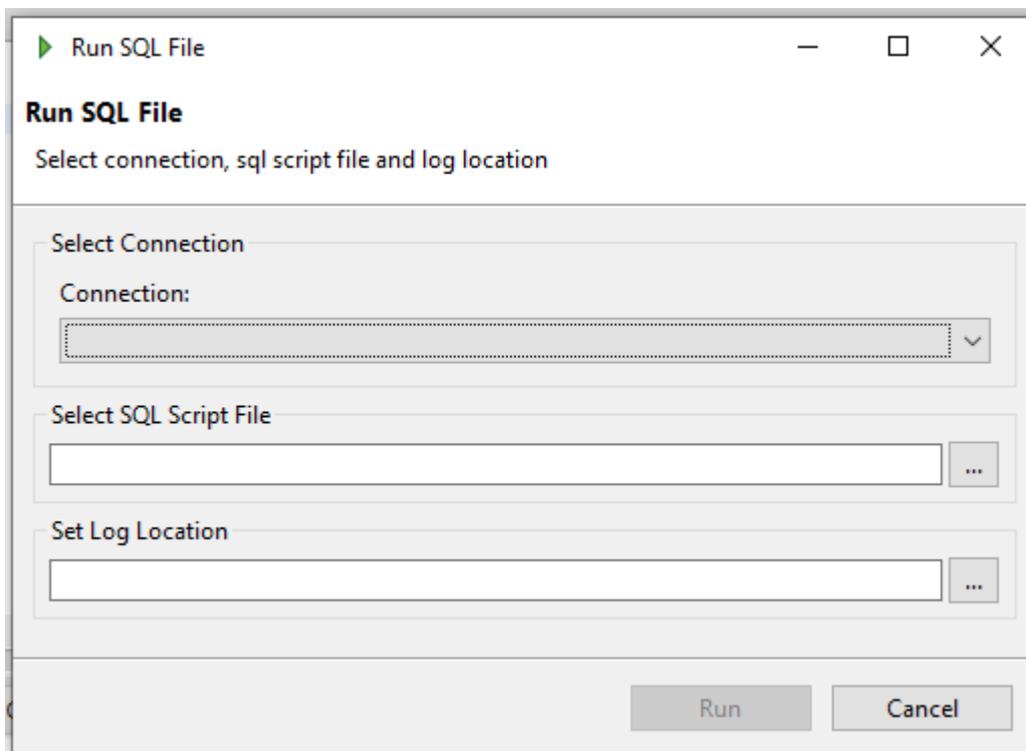


Run SQL file

Toad Edge supports direct SQL script operation without opening script in the worksheet. Select the connection from the drop-up menu on which you want to run the script. Select the SQL script file and set the log location to run the SQL file directly.

Run SQL File can be displayed two ways.

- It gets triggered when trying to open a large script file(>3mb)
- Manually by selecting File -> Run SQL File



User Privilege Managements

The subsections below explain the various user privilege views provided by Toad Edge® and their management w.r.t to an object or an user.

About User Privileges

Toad Edge provides a number of options related to user privileges and how to grant/revoke them. As a general overview, user privileges are granted/revoked on three levels.

- **Server** (global level)
- **Database/Schema**
- **Database objects** (tables, views, routines - procedures and functions)

These levels also represent a hierarchy where privileges on higher level are inherited at lower levels by default. User privileges can be of several types:

- **Inherited** () - the privilege has been granted on higher level and it is not possible to revoke it on the current level
 - Example: User has been granted the CREATE privilege on the server level. It appears as inherited on the database/object levels and cannot be revoked there. It can be granted again on lower levels although this is unnecessary
- **Granted & Inherited** () - this privilege has been granted on higher level and also on the current level
 - Example: User has been granted the SELECT privilege on the server level and then again on the database level. It appears as granted & inherited on the database level
- **Granted** () - the privilege has been granted on the current level and can be revoked
 - Example: User has been granted the UPDATE privilege on the object level. It appears as granted on the object level, and it can be revoked
- **Revoked** (blank value) - the privilege has not been granted on any level
 - Example: User has been revoked the EXECUTE privilege on the database level. It appears as revoked on the object level. It also appears as revoked on the server level as if it were granted on the server level, it could not be revoked on the database level in the first place

The following table describes how privileges set on higher levels affect privileges on the other levels:

Higher level	Current level	Lower level
Granted	Inherited (granted)	Inherited (granted)
Revoked	Inherited (revoked)	Inherited (revoked)
Revoked	Granted	Inherited (granted)
Granted	Granted & Inherited	Inherited (granted)

User and Object Privilege Views

Toad Edge allows you to examine currently configured privileges from two views:

- **User** - displays objects and the privileges the user has to the objects
- **Object** - displays users and the privileges the users have to the object

To examine privileges of a user

1. In **Object Explorer**, expand the **Users** node and double-click the user whose privileges you would like to review
2. Switch to the **Privileges** tab

To examine privileges of an object

1. In **Object Explorer**, locate the object you would like to review (server/database/database object)
2. Double-click the object to open it in **Object Detail**
3. Switch to the **Privileges** tab

User Detail | Privileges tab

Button	Option	Description
	Modify Privileges	Opens a dialog where you can grant/revoke privileges to each individual object
	Add Wildcard Pattern Privileges	Opens a dialog where you can configure Wildcard patterns privileges
	Add Proxy User Privileges	Opens a dialog where you can set up Proxy user privileges
	Revoke Privileges	Revokes the selected privilege for the selected object

Object Detail | Privileges tab

Button	Option	Description
	Modify Privileges	Opens a dialog where you can grant/revoke privileges of any user to the object
	Open Script in Worksheet	Opens the privilege configuration script of the selected user to the object in Worksheet
	Open Script Generation Settings	Allows you to enable/disable inclusion of inherited privileges in the generated privilege script. When disabled, only granted or granted & inherited privileges will be included

Button	Option	Description
	Open User Detail	Opens the User Detail of the selected user
	Filter Unprivileged	Hides users that have not been granted any privileges

Wildcard Patterns and Proxy Privileges

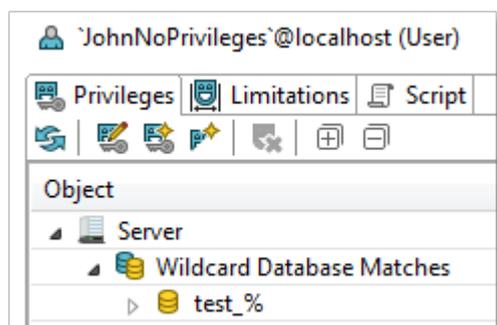
NOTE: Privileges that are set using these methods are NOT visible in the **Privileges tab** in **User Detail** and **Object Detail**.

Wildcard patterns privileges

Wildcard pattern privileges offer a way to grant privileges for multiple databases at once. The condition is that the database names must match a specific wildcard.

To set wildcard pattern privileges for databases

1. Locate the user whose privileges you would like to modify in **Object Explorer** and double-click it
2. Switch to the **Privileges tab**
3. Click the **Add Wildcard Pattern Privileges**  button
4. In the first dialog of the wizard, specify the wildcard pattern. The percent (%) sign represents one or more characters and the underscore (_) sign represents a single character. If you need to use a literal % or _, escape them using a back slash (\)
5. In the next dialog, select the privileges that you would like to grant and **Finish** the wizard



NOTE: Setting database privileges using wildcards has a side effect. You are not able to revoke privileges to a particular database from the set of databases that match the wildcard. Consider the following example. A user has been granted the SELECT privilege to all databases which match the "test_%" wildcard. There are three such databases - test_tables, test_views and test_routines. In this situation, you are not able to revoke the privilege for any one of the three databases, such as test_tables.

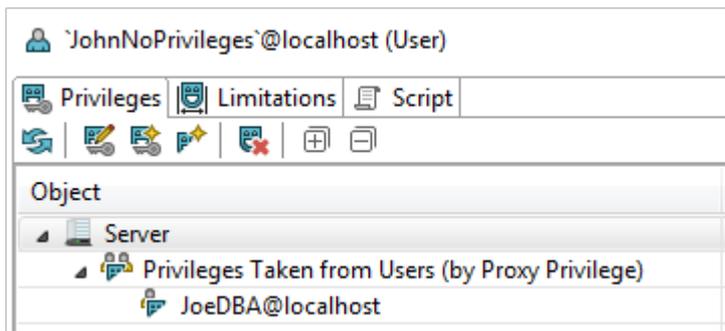
Proxy user privileges

Using proxies, users are able to use privileges of other users. In this operation, there are two sides:

- **Proxy** - the user that uses the privileges of some other user
- **Proxied** - the user whose privileges will be available to the original user

To add proxy user privileges

1. Locate the user whose privileges you would like to modify in **Object Explorer** and double-click it
2. Switch to the **Privileges** tab
3. Click the **Add Proxy User Privileges**  button
4. In the wizard, specify the **Proxied** and the **Proxy** users and click **Finish**



About Schema Compare

With Toad Edge, you can compare database objects of two databases/schemas. Based on the result, you can generate an HTML report or change scripts for both the source and the target to deploy changes immediately.

i | **NOTE:** Although possible, it is not recommended to compare two databases of different database versions (e.g. MySQL 5.6 and MySQL 5.7).

To quickly compare two databases/schemas

- Select any two databases in **Object Explorer**, right-click and select **Compare Schemas**

To configure comparison settings before performing Schema Compare

1. Click the **Compare** button on main toolbar and select **New**
2. Specify the Source and Target schemas and select the desired **Object Types** and **Comparison Rules**
3. Click **Compare**

This comparison process may take a while depending on the number of objects in both databases. Once it is completed, you can see all the differences between the source and the target and perform various actions.

Schema Compare consists of three parts:

- **Overview Grid** - Displays differences between databases. The differences can be resolved and marked as read/unread, important or excluded
- **Comparison Area** - Shows the specific differences in SQL code between the source/target database objects
- **Outline View** - Contains settings that determine which types of differences should be considered or ignored

Overview Grid

The main purpose of the grid is to resolve differences between database objects as a part of **Schema Compare**. You can also use other tools to filter the differences or mark them via context menu as:

- **Read/Unread**  - signifies whether you have already reviewed the difference or not
- **Important**  - simply marks the difference as important, has no influence on the result of the comparison
- **Excluded**  - the difference is ignored and removed from the grid unless you enable the **Show Excluded Items** option

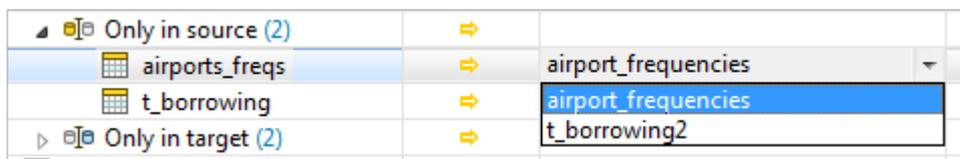
There are two main types of differences:

- **Only in source/target** - objects that are found only in one of the two compared databases
- **Different** - objects that are linked (same name or linked by user) but their SQL code is different

In case you want to compare an unlinked object in source with an unlinked object in target, you will have to map them.

To map an unlinked object to any other unlinked object

1. In the grid, find an object that is not linked yet by looking in the **Only in source/target** nodes
2. Notice the [map] text in the other database column. It is a drop down menu from which you can select the object that should be mapped to your original object



3. After selecting the object, the two objects are now linked. You can unlink them again by clicking the unlink icon 

Once you link objects as you wish, you can go through the differences and decide on how to resolve them.

To resolve differences between two database objects

1. In the Overview Grid, locate any row that marks a difference between two objects
2. Click on the arrow in the cell between the object names to specify how the difference is going to be resolved.

The following table lists all possible resolution actions and their meanings:

Action	Action description	Resolution description
	Change target	The generated change script will change target so it matches source
	Change source	The generated change script will change source so it matches target
	Change both	(Different objects only) All differences between the two objects are marked as ignored. You can go through the specific differences one by one and resolve them in the Comparison Area
	Ignore	The differences between the two objects are ignored and not included in the generated change script

Overview Grid Toolbar

UI Element	Option	Description
	Recompare All	Compares the source and the target again
	Save As	Saves the comparison as a .compare file that can be loaded and displayed at any time
	Previous Unread Change	Switches to the previous difference marked as unread (●)
	Next Unread Change	Switches to the next difference marked as unread (●)
	Export Report	Exports an HTML report detailing the detected differences
	Generate Script for Source	Generates a change script for the source schema/database according to the resolution actions you have set. The script can be generated to clipboard, a worksheet or a file
	Generate Script for Target	Generates a change script for the target schema/database according to the resolution actions you have set. The script can be generated to clipboard, a worksheet or a file

UI Element	Option	Description
	Update Objects in Database	(Repository only) Updates objects in database according to the resolution actions you have set. The drop down menu allows you to only generate a change script instead. The script can be generated to clipboard, a worksheet or a file
	Overwrite Files on File system	(Repository only) Updates objects in file system repository according to the resolution actions you have set. The drop down menu allows you to only generate a change script instead. The script can be generated to clipboard, a worksheet or a file
	Filter by Action	Displays only the differences that you have resolved by the selected action(s)
Group by: <input type="text" value="Object Type and Status"/>	Group by	Groups the differences by the selected criteria
Filter: <input type="text" value="type filter text"/> 	Filter	Filters the differences according to the input. It is possible to use wildcards (? and *) and regular expressions as well as filter by multiple comma separated values
	Show/Hide Excluded Items	Shows/Hides differences marked as Excluded
	Hide Empty Nodes	Hides object type nodes with no detected differences
	Export Settings	Exports the Schema Compare settings and Detailed Settings which can be configured in the Outline View

Comparison Area

This part of Schema Compare displays specific differences between the SQL code of two given database objects. It also allows you to export the SQL code of any of the two objects in various ways and you can also deploy changes based on the actions that you have used to resolve the differences.

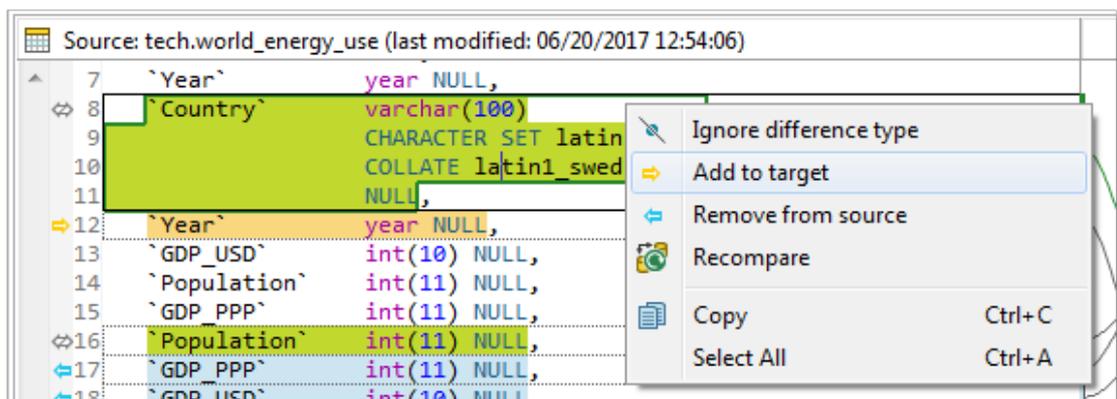
Comparison Area has the following tabs:

- **Script Definition** - displays the SQL code of both objects and the differences between them
- **Change Script** - displays the change script SQL code that will be generated in order to resolve the differences

In the Script Definition tab, differences can be resolved one by one with different actions.

To resolve differences between two objects in Script Definition

1. In [Overview Grid](#), select a row with two different objects
2. You should now see the specific differences displayed in the **Comparison Area | Script Definition** tab
3. Select a specific difference by simply clicking on it. A border should appear to signal that the difference is currently selected
4. Right-click and select the action that you would like to use to resolve the difference



Once you resolve all the differences, you will probably want to deploy the changes. This can be done in two scopes:

- **Deploy changes of all objects** - in this case, you generate and run a change script for all objects that are resolved/not excluded in the [Overview Grid](#)
- **Deploy changes of a single object** - this method uses the Change Script tab

To deploy changes of a single object

1. Resolve all differences as described in the walkthrough above
2. When you are done, switch to the **Change Script** tab

- You should see a generated change script that is based on the resolution actions you have used. To deploy the changes, simply click the **Deploy** button . If you just want to generate the script rather than deploy it immediately, use one of the three buttons to the right of the Deploy button

Comparison Area Toolbar

Button	Option	Description
	Deploy	Runs the generated change script in the source/target to address the differences
	Export/Clipboard/Worksheet	Exports the generated change script for source/target to a file/clipboard/Worksheet
	Set Action	Resolves all differences between the two objects using the selected action

i **NOTE:** Since Toad Edge® 2.10, we also support comparing roles in the **Compare Schema** module of PostgreSQL/EDB. As the roles are created on a server level, any differences, should they exist, will only be visible if you compare two different PostgreSQL/EDB servers.

About Continuous Integration and Delivery in Toad Edge®

Toad Edge aims to simplify **Continuous Integration** and **Continuous Delivery** (CI and CD) processes by providing build steps that can be used in your CI/CD systems (Jenkins, TeamCity and others).

CI/CD process can be comprised of multiple build steps. Consider this illustrative workflow where changes made in development database are deployed to staging database:

- Compare the staging database with a baseline to check for unintended changes made since the last deployment
- Compare the development database with the staging database
- Generate HTML reports
- Generate change SQL script
- Create a snapshot of the staging database as a backup
- Deploy the change script to the staging database
- Create a new baseline snapshot of the staging database

To create a build step in your CI/CD system, several files are required:

- Batch file or shell script (generated by Toad Edge)
- Connection information in XML format (generated by Toad Edge)
- Toad Edge JAR file with additional libraries (available for download [here](#))

i **NOTE:** Some build steps may require additional files. List of build step requirements can be found in [Continuous Integration and Delivery Wizard](#) topic

In general, each build step can be broken down into three stages:

1. Your CI/CD system runs the batch/shell script generated by Toad Edge
2. The script launches Toad Edge JAR with specific arguments to perform the desired operation
3. If there are no errors, the build step is successfully finished

The way to create build steps depends on whether you are using [Jenkins](#) or [a different CI/CD system](#).

Creating build steps - Jenkins

i **IMPORTANT:** To perform build steps correctly, Toad Edge requires a 64-bit installation of Java Development Kit (JDK), however, 32-bit Java is usually used by default. It is therefore necessary to create a JAVA_HOME system variable pointing at 64-bit JDK directory.

Please do the following steps to perform the configuration:

1. Right-click **This PC** and select **Properties | Advanced System Settings | Environment Variables**
2. Click **New** in System Variables
3. In the Variable Name field, enter JAVA_HOME
4. In the Variable Value field, enter your JDK installation path, e.g. C:\Progra~1\Java\jdk-11.0.1

i **NOTE:** Toad Edge CLI works for JDK >= 11. The CLI has been tested with JDK 11.

Creating build steps in Jenkins is easier than in other CI/CD systems since Toad Edge provides its CI/CD functionality in the form of a Jenkins plugin. This topic explains how to install the plugin and use it to create build steps.

The Toad Edge Jenkins plugin can be downloaded [here](#).

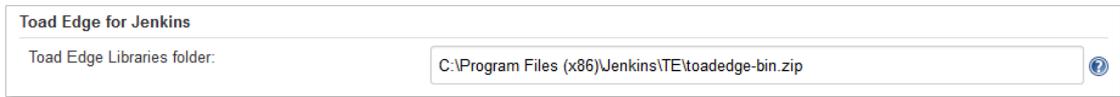
To install and configure Toad Edge plugin in Jenkins

1. In Jenkins, go to home page and select **Manage Jenkins** from the left menu
2. Select **Manage Plugins**
3. Switch to the **Available** tab and type Toad Edge into the **Filter** box
4. Check the checkbox next to the Toad Edge plugin name and then select **Install without restart** or **Download now and install after restart**
5. Once the plugin is installed, download Toad Edge JAR file with additional libraries in zip archive from [here](#)

You will now need to configure the plugin:

1. In Jenkins, go to home page, then select **Manage Jenkins** from left menu
2. Select **Configure System**

3. Scroll down until you see **Toad Edge for Jenkins**. Fill in the path to the Toad Edge zip archive that contains the JAR file and a library folder



Toad Edge for Jenkins

Toad Edge Libraries folder:

4. **Save** or **Apply** the changes

With the plugin installed and configured, you can start creating new build steps.

In this example, we are going to create a new **Generate create SQL script** build step. We assume that a project has already been created in Jenkins.

To create a new build step (Generate create script) in Jenkins

1. In Jenkins, click on your project, and select **Configure** from the left menu.
2. On the configuration page, scroll down to the **Build** section
3. Click **Add build step** and then select **Toad Edge: Generate Create Script**
4. Enter the path in **Input file/folder** field. The input can be:

- Connection XML file

NOTE: Connection XML files can be obtained by exporting a build step in **CI/CD Wizard**.

- Repository folder structure
- Snapshot file

5. In the **Output file**, enter the destination folder and the file name for the generated create script



Build

Toad Edge: Generate Create Script

Input file/folder:

Output file:

Add build step

6. **Save** or **Apply** the changes.
7. Build the Project and you should see the generated create script file in the destination folder

Creating build steps - other systems

In case you are not using Jenkins, you can still take advantage of Toad Edge CI/CD build steps as long as your system is able to run batch files/shell scripts.

This example illustrates how to create a **Create Snapshot** build step and use it in **TeamCity**.

To create a new build step in TeamCity using Toad Edge CI/CD Wizard

1. In Toad Edge, click the **CI/CD** (Continuous Integration and Delivery) button on main toolbar to open the **CI/CD Wizard**
2. Select **Create Snapshot** from the available builds
3. Configure the path to **toadedge.jar** (obtained from [here](#)). The exported batch/shell script will use this path to look for the jar file, so enter the path relative to the path of the script (**Export Path** in the last dialog).
 - We choose to set **Export Path** to *N:\TeamCity\working_directory*
 - The toadedge.jar file will be located in *N:\TeamCity\working_directory\jars*
 - Therefore, the toadedge.jar file path will be *.\jars* (relative) or *N:\TeamCity\working_directory\jars* (absolute)
4. In the next dialog, select the **Connection** and **Database** that you would like to take a snapshot of
 - The connection is exported as an XML file. If we choose to place it in a different folder than the exported script, we have to modify the **Connection File Name** path in the same way as in step 3
5. You can also change the **Output** file name and path (relative to the **Export Path**)
6. In the final dialog, configure the **Export Path** first. This is the destination folder for the exported script and other files
7. Now change the **Command File Name** if you wish. The suffix of the file name determines whether the file will be a batch file (.bat) or a shell script (.sh)
 - Since we are running TeamCity on Windows, it is better to use batch script format. On Linux, shell script would be a better choice

The rest of the configuration is done in TeamCity. This guide assumes that you have already created a **Project** and a **Build Configuration**.

1. In TeamCity web UI, locate your **Project** and a **Build Configuration** to which you would like to add a new build step
2. Open the Build Configuration and select **Build Steps** from the left menu
3. Click the **Add build step** button
4. From the **Runner type** dropdown menu, select **Command Line**

5. The fields that you now need to configure are:

- **Working directory** (you might need to click **Show advanced settings**) - this is the directory where TeamCity will look for and run the batch/shell script (in our case, same as **Export Path** in **CI/CD Wizard**)
- **Run** - select **Executable with parameters**
- **Command executable** - enter the name of the script here (with or without the suffix)

6. Once you are done with the configuration, **Save** the changes

7. Run the Build Configuration to see if everything is configured correctly. If the build step is run successfully, you should see the newly generated snapshot in the script folder

Continuous Integration and Delivery Wizard

The CI/CD Wizard guides you through the process of creating and customizing various build steps. It saves you the hassle of having to manually write a script with appropriate arguments to use with the [Toad Edge® command line interface](#).

The generated script can be viewed at any time in the wizard by clicking the **Command Preview** button.

```

Command Preview:
java --add-opens=java.base/java.util=ALL-UNNAMED --add-opens=java.base/java.lang=ALL-UNNAMED -jar E:\ToadEdgeApril2023\CLI\toadedge.jar
-compare
-in_source postgres@localhost_5435.xml
-in_target postgres@localhost_5435.xml
-settings ./compare_settings.json
-out ./compare_result
    
```

The following table lists all currently available build steps and files/configuration required to export them.

Build Step	Requirements	Description
Empty database	<ul style="list-style-type: none"> • Database connection file (XML) 	Runs a query that drops all objects in the selected database

Build Step	Requirements	Description
Create snapshot	<ul style="list-style-type: none"> Database connection (XML file) 	Stores the structure (not data) of the selected database as a JSON file. The Snapshots can be used as a backup
Create baseline	<ul style="list-style-type: none"> Database connection (XML file) 	Stores the structure (not data) of the selected database as a JSON file. This snapshot can be used as a backup or as a baseline for the Compare database with baseline build step
Generate create SQL script	<p>One of the following:</p> <ul style="list-style-type: none"> Database connection (XML file) Repository (folder structure) Snapshot (JSON file) 	Generates a create SQL script from a repository, saved snapshot or a database. The script can be used to recreate the structure of the source (not data)
Generate change SQL script	<ul style="list-style-type: none"> Schema Compare result (folder with JSON files) 	Generates a change SQL script to deploy changes to the Schema Compare target based on differences

Build Step	Requirements	Description
Compare database schemas	<ul style="list-style-type: none"> • Recent Schema Compare • Saved Schema Compare (.compare file) <p>Or two of the following:</p> <ul style="list-style-type: none"> • Database connection (XML file) • Repository (folder structure) • Snapshot (JSON file) 	<p>found in the previously run Compare database schemas build step</p> <p>Compares two different schemas (from databases, repositories or snapshots). The results are stored in a folder that can be used as an input for other build steps</p>
Compare database with baseline	<p>One of the following:</p> <ul style="list-style-type: none"> • Database connection (XML file) • Repository (folder structure) • Snapshot (JSON file) <p>And also a baseline snapshot (JSON file)</p>	<p>Compares the given database with the given baseline snapshot. In case any differences are found, an error is raised and the build step will fail</p>
Deploy SQL script	<ul style="list-style-type: none"> • Database connection (XML file) • Input SQL file 	<p>Runs any SQL script on a selected database</p>
Generate HTML comparison report	<ul style="list-style-type: none"> • Schema Compare result (folder with JSON files) 	<p>Generates an HTML report based on the results of the previously run Compare database schemas build step</p>

Toad Edge® command line interface

i **IMPORTANT:** To perform build steps correctly, Toad Edge requires a 64-bit installation of Java Development Kit (JDK), however, 32-bit Java is usually used by default. It is therefore necessary to create a JAVA_HOME system variable pointing at 64-bit JDK directory.

Please do the following steps to perform the configuration:

1. Right-click **This PC** and select **Properties | Advanced System Settings | Environment Variables**
2. Click **New** in System Variables
3. In the Variable Name field, enter JAVA_HOME
4. In the Variable Value field, enter your JDK installation path, e.g. C:\Progra~1\Java\jdk-11.0.1

i **NOTE:** Toad Edge CLI works for JDK >= 11. The CLI has been tested with JDK 11.

The core Continuous Integration and Delivery (CI/CD) functionality in Toad Edge is provided by its command line interface (CLI). Although the best way to use it is to use the **CI/CD Wizard**, you can also work with it manually.

To use Toad Edge CLI manually

1. Download a zip archive containing Toad Edge JAR file and other libraries from [here](#)
2. Extract the archive
3. Launch the command line utility (Windows) or the terminal (Linux) and navigate to the folder with the JAR file
4. Execute the JAR file with Java command and additional arguments

Every usable command begins with **java --add-opens=java.base/java.util=ALL-UNNAMED --add-opens=java.base/java.lang=ALL-UNNAMED -jar toadedge.jar** followed by the operation you want to perform and additional arguments.

The available operation arguments correspond to the build steps available in the **CI/CD Wizard**:

- -compare
- -report
- -sql_change
- -sql_create
- -deploy
- -snapshot
- -baseline

The operation argument has to be followed by other arguments specifying input, output, settings, etc. To learn which arguments you need to use to perform a specific operation, add the **-help** argument at the end of your command.

```

E:\ToadEdgeApril2023\CLI\testing>java --add-opens=java.base/java.util=ALL-UNNAMED --add-opens=java.base/
java.lang=ALL-UNNAMED -jar toadedge.jar -compare -help
usage: java --add-opens=java.base/java.util=ALL-UNNAMED
--add-opens=java.base/java.lang=ALL-UNNAMED -jar toadedge.jar
-compare [-database_system <arg>] [-fail_on_diff] -in_source <arg>
-in_target <arg> [-jdbc_driver <arg>] [-lib <arg>] -out <arg>
[-settings <arg>] [-workspace <arg>]
-compare Compare two schemas (from database connections,
file repositories or snapshots)
-database_system <arg> Deprecated. Name of the database this step is
run upon. i.e. MYSQL or MARIADB.
-fail_on_diff If used, an error is returned in case of any
differences between source and target
-in_source <arg> Input source: database connection (connection
xml file), file repository (root folder path) or
snapshot (json file)
-in_target <arg> Input target: database connection (connection
xml file), file repository (root folder path) or
snapshot (json file)
-jdbc_driver <arg> Path to JDBC driver used for database connection
-lib <arg> Lib folder path used by toadedge.jar (if it's
not in the same folder)
-out <arg> Output destination folder
-settings <arg> Schema Compare settings path (json file)
-workspace <arg> Workspace folder for temporary files (in case
Toad Edge cannot write in its current location)

```

Once you supply all the necessary arguments, you can start performing CI/CD actions without having to launch Toad Edge itself.

```

E:\ToadEdgeApril2023\CLI\testing>java --add-opens=java.base/java.util=ALL-UNNAMED --add-opens=java.base/java.lang=ALL-UNNAMED -jar toadedge.jar -snapshot -in public.wal
-out public_snapshot.json
2023-03-22 16:00:10,974 INFO : Command: snapshot
2023-03-22 16:00:10,989 INFO : Loading source input
2023-03-22 16:00:20,304 INFO : Saving snapshot as file: E:\ToadEdgeApril2023\CLI\testing\public_snapshot.json
2023-03-22 16:00:21,512 INFO : Snapshot taken successfully

```

Backup and Restore

This section describes the procedures involved with the backup and restore process. Toad Edge gives you the ability to create backups and restoration of your database/schema with the help of a wizard tools as described in the sections below.

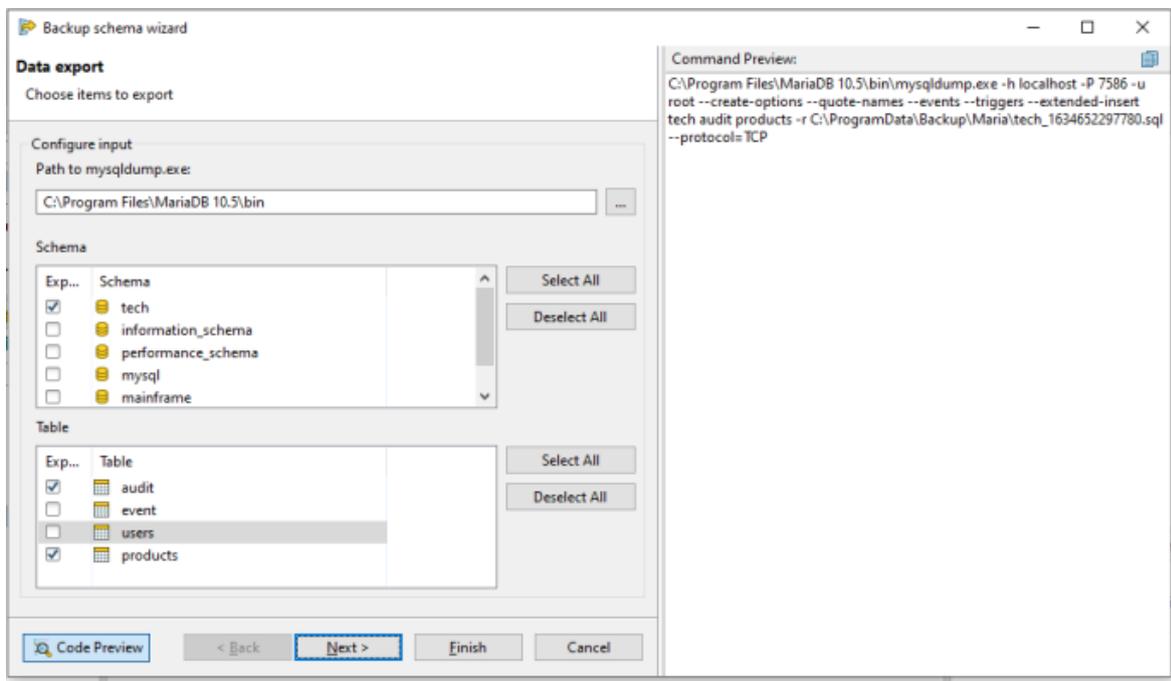
Backup

Toad Edge gives you the ability to create backups of your database/schema. Using the backup wizard Toad Edge leverages the platform's utility like `pg_dump` and `mysqldump` to generate corresponding commands which would be used by the utility to generate backup.

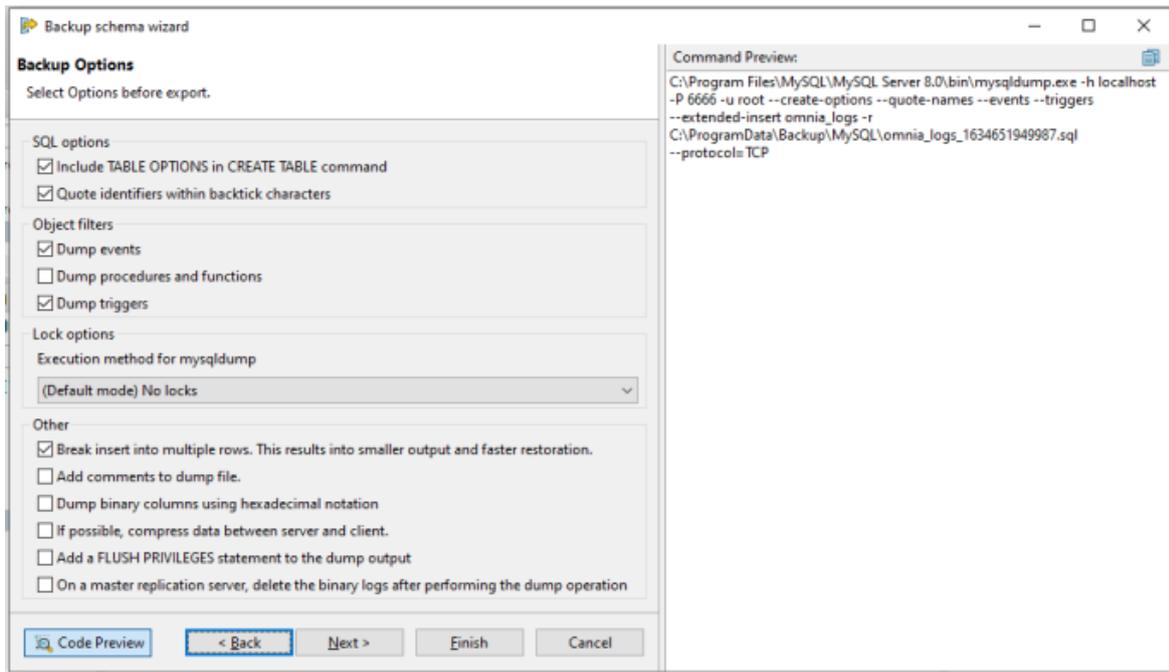
i **NOTE:** It's important that the relevant binaries are present in your system . To create backup for PostgreSQL/EDB schema `pg_dump` is required, while `mysqldump` is required for MySQL and MariaDB.

To create a backup for database/schema

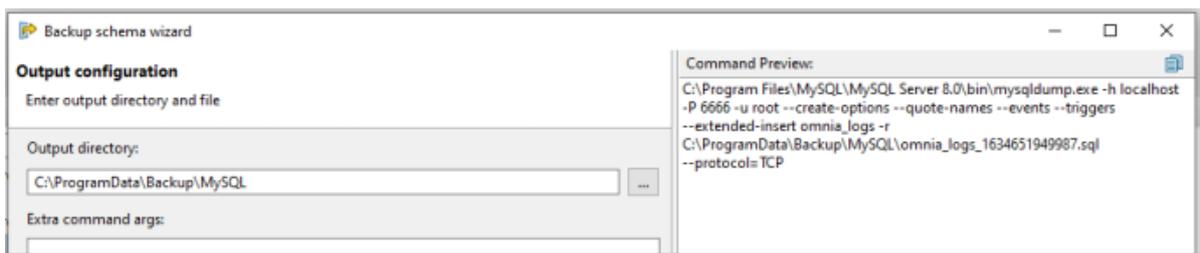
1. In **Object Explorer** right click on a database (schema for PostgreSQL/EDB) and select **Backup**.
2. In the wizard you can select the databases and their corresponding tables that you want to save. You can select/unselect tables of your choice.
3. Provide the path to `mysqldump` for MySQL/MariaDB and in case of PostgreSQL/EDB provide path to `pg_backup`.



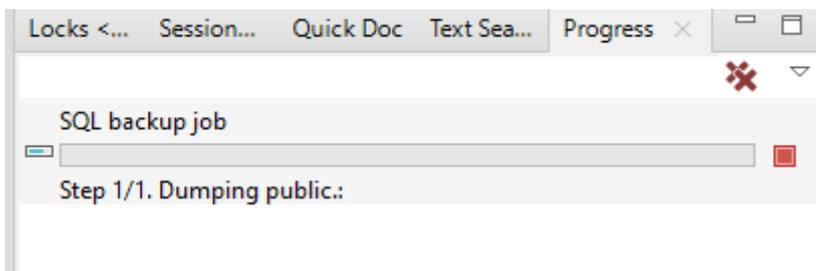
4. On the next page, you can select various options which will be provided to the platform's CLI tool.



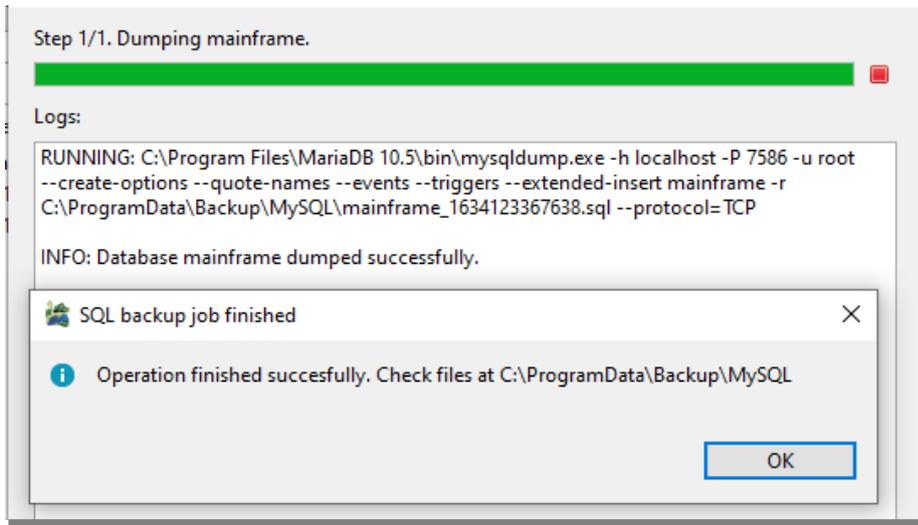
5. On the 3rd step, the wizard will ask for your preferred output directory and extra command arguments which you want the CLI to use.



6. If you are all set, select **Finish** and you will be asked whether you want to run the operation in background.
7. If you run the operation in background, you can still see the progress in the **Progress Monitor** and use Toad Edge for other purposes.



8. If you choose to run the operation in foreground, you can still see the progress and other relevant information via logs.



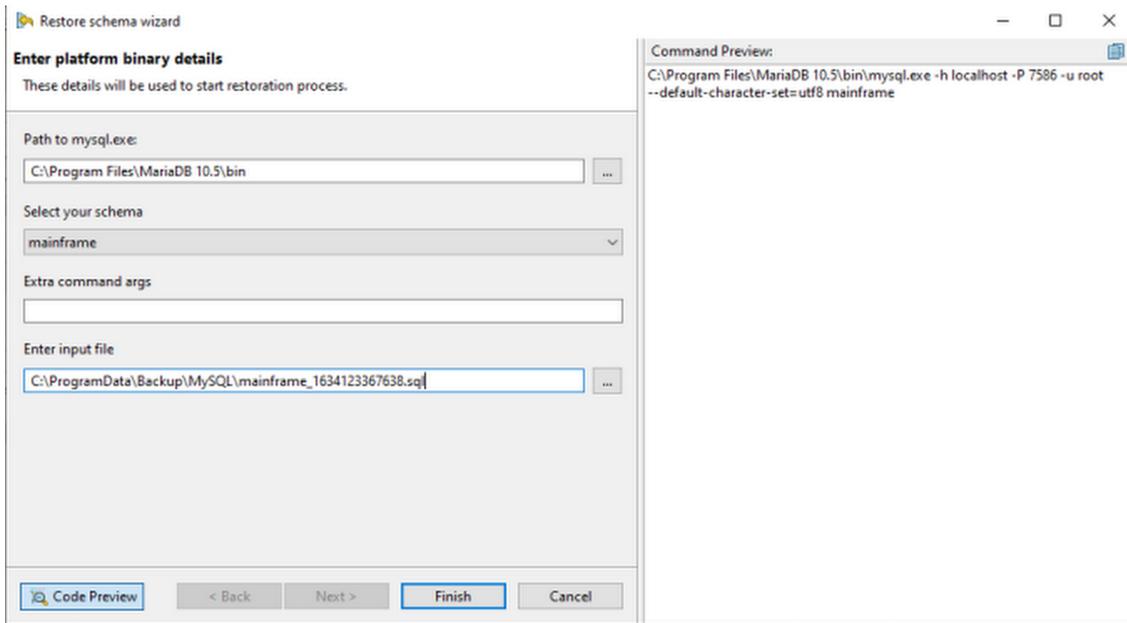
Restore

You can restore your databases/schemas using backup files which were generated by the platform's binaries like mysqldump, pg_dump and others. Toad Edge will use SQL provider-specific binaries like mysql and pg_restore to restore your schemas. The restore schema wizard will provide a user-friendly way to formulate commands for the platform's original binary in order to restore your schema.

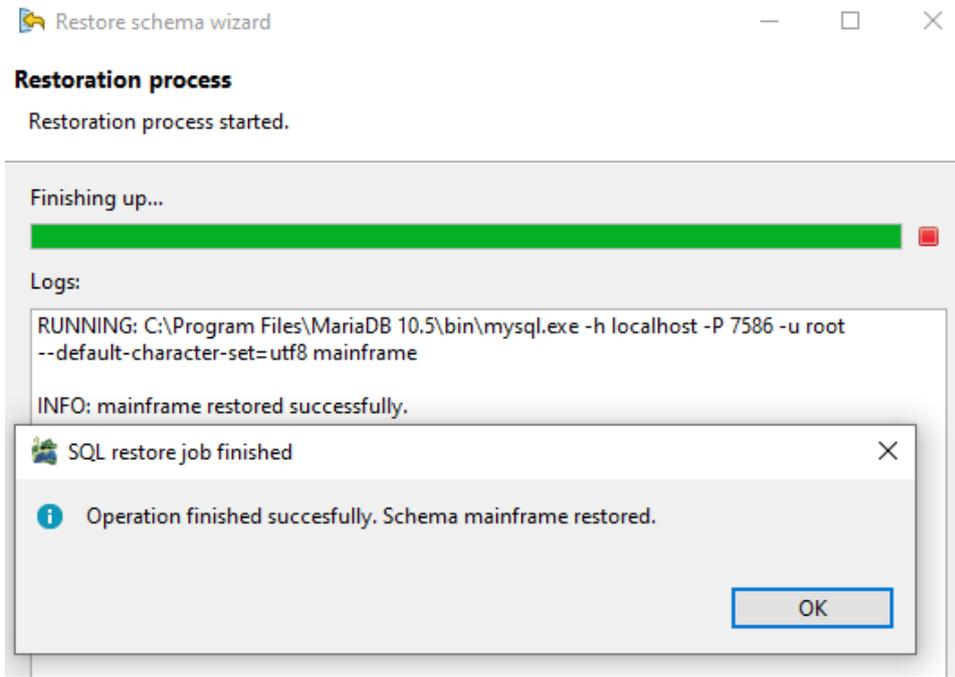
NOTE: Just like backup you need the relevant SQL provider-specific binaries to restore your schema.

To restore a database in MySQL/MariaDB

1. In **Object Explorer** right click on a database and select **Restore**.
2. Provide the path to mysql (mysql.exe in Windows) for MySQL/MariaDB and in case of PostgreSQL/EDB provide a path to pg_backup.
3. Provide the path to your backup file. Normally it is a SQL file for MySQL/MariaDB.
4. Select the schema that you want to restore.

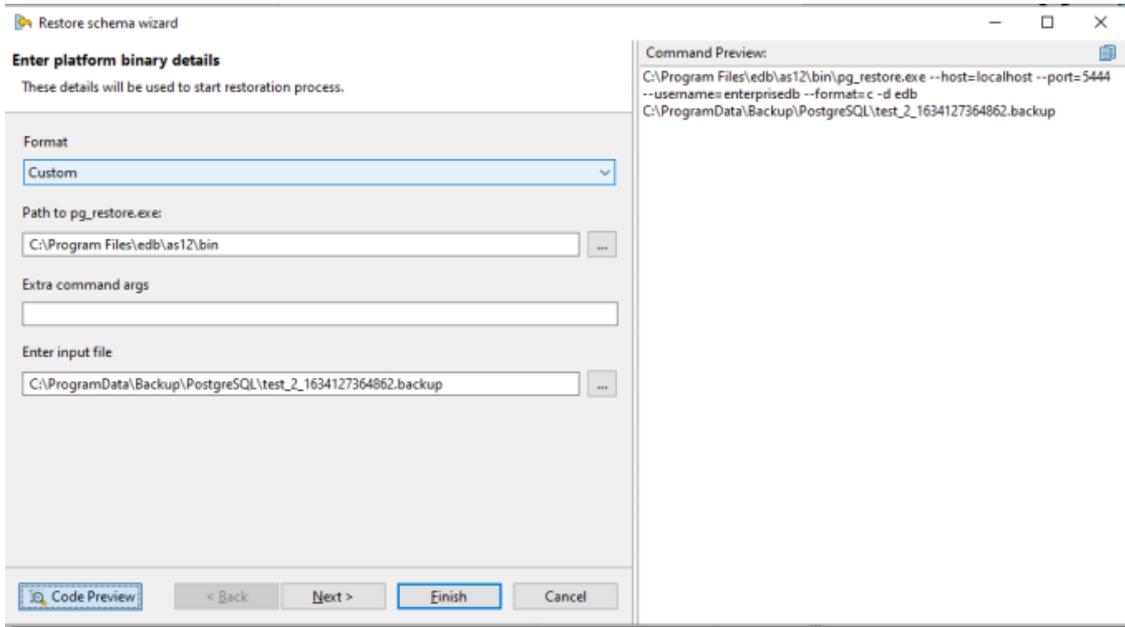


5. If you are all set, select **Finish**. You will be prompted whether you want to run the operation in background.
6. If you run the operation in background, you can see the progress in the **Progress Monitor** and still use Toad Edge for other purposes.
7. However if you choose to run the operation in foreground, you can still see its progress and other relevant information via logs.

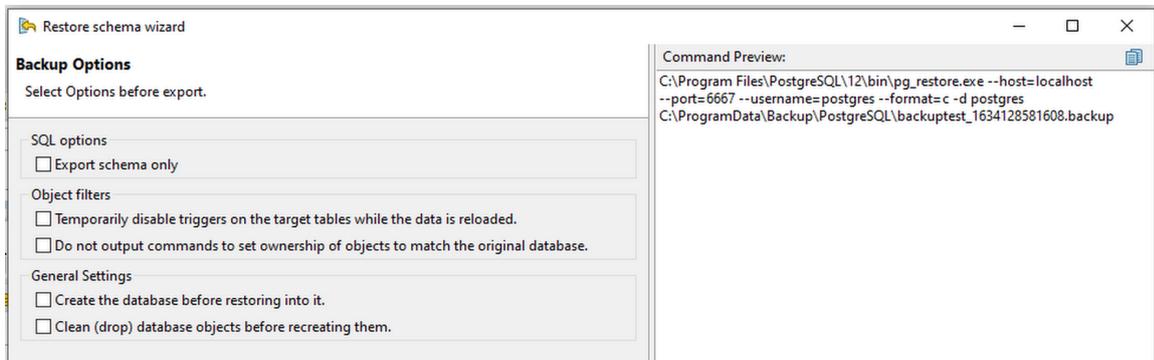


To restore a database in PostgreSQL/EDB

1. In **Object Explorer** right click on a database and select **Restore**.
2. Provide the path to pg_restore for PostgreSQL/EDB.
3. Provide the path to your backup file. It is normally a *.backup* file when the backup format is custom. When the backup format is TAR, the backup file's format is *.tar*. When the format is directory, the input will be a directory.

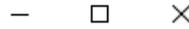


4. On the next page, you can select various options which will be provided to the platform's CLI tool.



5. Select **Finish** and you will be asked whether you want to run the operation in background.
6. If you run the operation in background, you can see the progress in the **Progress Monitor** and can still use Toad Edge for other purposes.
7. However if you choose to run the operation in foreground, you can still see the progress and other relevant information via logs.

Restore schema wizard



Restoration process

Restoration process started.

Restoring schema



Logs:

```
RUNNING: C:\Program Files\PostgreSQL\12\bin\pg_restore.exe --host=localhost --port=6667  
--username=postgres --format=c -d postgres C:\ProgramData\Backup\PostgreSQL  
\backuptest_1634128581608.backup
```

INFO: Schema restored successfully.

Preferences

Many aspects of Toad Edge and its behavior can be configured in the Preferences.

To open Preferences

- On Windows: Select **View | Preferences** or press ALT + P
- On macOS: Select **Toad Edge | Preferences** or press $\text{⌘} + P$ or $\text{⌘} + ,$

The settings are divided into several categories:

- [General](#)
- [Database](#)
- [Worksheet](#)
- [Data](#)
- [Templates](#)
- [Export](#)
- [Folder Paths](#)
- [Appearance](#)
- [Feedback](#)

General

Startup Options

Option	Description
Restore active connections	If enabled, database connections that were active before exiting the application will be reconnected again on startup
Verify drivers existence on application start	If enabled, automatically check whether the drivers listed in the Database tab actually exist
Play Toad wave on application start	By default, Toad Edge plays a toad sound when it is launched. Uncheck this box to disable the sound

Dialogs and Wizards

Option	Description
Use quotation marks in SQL output	This option concerns mostly new database object wizards. If enabled, names of database objects created via these wizards will be quoted if necessary (e.g. when the name uses both uppercase and lowercase letters or if it contains special characters)
Show warning when connecting to unsupported database	In Toad Edge you might be able to connect to databases that are not fully supported and some features might be missing. Check to display a warning message when you are connecting to a database that is not supported.

User Interface

Option	Description
Number of connections in application toolbar	Determines the number of connections that appear in the Connect button drop down menu in the application toolbar. If you have more connections than the number set here, they will be shown in the order in which they were last used or modified
Show database object count in Object Explorer	If enabled, the number of objects of each type is shown next to the object node in the Object Explorer
Format script on load	This option automatically formats SQL scripts in Object Detail Script tab and also whenever you export a script to Worksheet
Confirm before closing Toad Edge	If enabled, a prompt is displayed when you attempt to close the application
Selected tab in table's Detail Explorer	Determines the selected tab of table's details explorer
Confirm before restarting Toad Edge	If enabled, a prompt is displayed when you attempt to restart the application.

Connection Parameters

Option	Description
Maximum number of sessions	Enter the maximum number of concurrent sessions per connection. Enter a value from 1 to 99. With AutoCommit turned off only one session is open.

Timezone setting

Option	Description
Timezone	Choose the timezone to change the timezone for the PostgreSQL, EnterpriseDB, and Redshift platforms.

Database

Option	Description
<i>platform</i>	Each tab lists available drivers for each of the database platforms

Timeout Settings

Option	Description
Database connection timeout	Sets the timeout for database connections. If Toad Edge is unable to establish connection to a database within the timeout period, the connection will fail automatically

in seconds	
Query execution timeout in seconds	Sets the timeout for query execution. If the database is unable to run a query within the timeout period, it will fail automatically

Worksheet

SQL Worksheet

Option	Description
Enable Syntax Highlighting	Highlights SQL keywords, database objects and aliases by default
Enable Syntax Check	By default, checks the syntax of SQL code in Worksheet and underlines errors
Hide results when typing	If enabled, automatically hides Result when you start typing in Worksheet
Vertical layout of result set	If enabled, vertical layout of Result Set is used by default. Otherwise, horizontal layout is used
Show line numbers	Shows/hides line numbers in Worksheet
Show range indicator	If enabled, highlights SQL statement line ranges (e.g. lines 9-13) in the vertical bar on the left side of the Worksheet
Maximum results in a worksheet	This determines the number of maximum result sets for a SQL worksheet. Maximum result sets can be set up to 5 and modified result sets will be effective from new worksheets.

Content Assist/Autocompletion

Option	Description
Enable Content Assist	Enables/disables Content Assist entirely
Activate automatically	By default, Content Assist is automatically activated when you type a specific character and wait for a set amount of time. You can disable this option and instead activate the tool manually by pressing (<i>CTRL</i> (<i>#</i>) + <i>SPACE</i>)
Delay in milliseconds	This determines the delay between typing a Content Assist trigger character and the suggestion popup appearing
Content Assist trigger characters	Specifies which characters can be used to activate Content Assist . Once you type any of them and wait for a set amount of time, the suggestion popup will appear
Sorting and Filtering	Determines how the suggestions will be sorted
Alias Handling	Enables/disables the use of aliases when using Content Assist to autocomplete your queries

Data

Data Grid Options

Option	Description
Display {null} for NULL values	If enabled, NULL values are represented by the {null} string. Otherwise, blank cells are shown instead
Show tooltips over results	By default, tooltips are displayed when you hover over data values that have been truncated due to the small column width
Show web links preview	You can enable this option to view website previews when you hover over data values that contain a website address
Use fetch limit	The fetch limit determines how many rows should be fetched from a table at once. If you disable this option, Toad Edge will fetch all rows at once. This might hinder Toad Edge performance depending on the size of the tables fetched
Number of fetched rows	If the fetch limit is enabled, this option determines how many rows should be fetched from a table. Once you scroll past the fetched rows, another set of rows is fetched
Show row numbers	You can enable this option to display a row number column in the data grid

Grid Copy Options

Option	Description
Column separator value	You can customize the column separator for copying the data. By default, a tab is the column separator.
Row separator value	You can customize the row separator for copying the data. By default, a new line is the row separator.

Data Manipulation

Option	Description
Confirm any DROP, REVOKE and TRUNCATE actions	If enabled, you will be prompted before performing some actions using Toad Edge such as dropping objects, truncating tables or revoking permissions. Note that you will not receive a prompt when you try to perform the above actions using a SQL query in Worksheet
Confirm record deletion	If enabled, you will be prompted every time you try to delete rows from a table in Object Detail
Trim leading spaces when editing string data	Removes spaces in front of the string values you insert into your table when you edit its values directly (in Object Detail or Result Set)
Trim trailing spaces when editing string data	Removes trailing spaces in the string values you insert into your table when you edit its values directly (in Object Detail or Result Set)

Date and Time Data Format

Option	Description
Date format	Determines the format of Date and Datetime types
Time format	Determines the format of Time and Datetime types

Numeric Data Format

Option	Description
Decimal symbols	Sets the symbol used to separate integers and decimals in number data types
Digit grouping symbol	Sets the symbol used to separate thousands in number data types
No. of digits after decimal	Determines how many decimal digits are shown for Decimal type values. The actual maximum number of decimals is always limited by the scale of the specific decimal type column

JSON Data Settings

Option	Description
Number of records used for JSON schema recognition	Values in JSON data type column can have a varying number of different columns. Toad Edge analyzes the first X number of records and generates the column structure in Object Explorer based on the columns of these records. The number of analyzed records can be changed here. See JSON support and JSON Editor for more information
Max number of keys in the same level	Determines how many key of the same depth level will be displayed in JSON column structure in Object Explorer
Max number of levels	Determines how many nested levels will be displays in JSON column structure in Object Explorer
Load keys on demand	If enabled, the records used to model JSON column structure in Object Explorer will be loaded only when you expand the JSON column node

BLOB Viewers

Option	Description
File Viewers	<p>In this section you can configure which viewer should be used to open BLOBs (binary large objects) of specific formats:</p> <ul style="list-style-type: none">• Default - if possible, BLOBs are opened in an internal Eclipse editor. If not, default system application is used instead• System - BLOBs are opened in default system application associated with the specific file format• Text - BLOBs are opened in a plain text editor

Templates

This section allows you to define and customize your own code templates. See [Templates](#) for more information.

Export

Option	Description
Open file after execution	Determines whether exported XML and HTML files should be automatically opened after the export is completed

XML

Option	Description
Encoding	Sets the default encoding for exported XML files

Naming

Option	Description
Name of the root tag	Determines the name of the tag that should be used in XML to indicate the start and the end of the entire row/record section
Name of the row tag	Determines the name of the tag that should be used in XML to indicate the start and the end of a single row/record

Options

Option	Description
Trim string values	Removes leading and trailing spaced from exported string values if enabled
Include null fields	If enabled, null values are listed in exported XML files as {null}
Indent size	Determines the indentation size of tags in exported XML files
CDATA export selection	Here you can configure which data type values should be enclosed in character data (CDATA) tag

HTML

Option	Description
CSS Style	You can choose the CSS style applied to exported HTML files here

Folder Paths

Option	Description
Document path	This path is used as a default for many file related operations in Toad Edge such as exporting/importing and saving/loading files

Repository mapping mask

The default file path used when creating a repository. See [Repository](#) for more information

Appearance

This sections contains settings related to colors and fonts used in the application. For example, you can change syntax highlighting colors, Worksheet fonts or background colors of certain UI elements.

Feedback

Option	Description
Error Reporting	Toad Edge can detect unexpected exit and then send an anonymous error log to the application developers.

Third party components

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Bean Validation API 1.1.0.Final

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