

Toad® for Oracle 17.0

## Getting Started



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Toad for Oracle Getting Started

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# Welcome to Toad for Oracle

## Version 17.0



Toad® for Oracle provides an intuitive and efficient way for database professionals of all skill and experience levels to perform their jobs with an overall improvement in workflow effectiveness and productivity. With Toad for Oracle you can:

- Understand your database environment through visual representations
- Meet deadlines easily through automation and smooth workflows
- Perform essential development and administration tasks from a single tool
- Deploy high-quality applications that meet user requirements; perform predictably and reliably in production
- Validate database code to ensure the best-possible performance and adherence to best-practice standards
- Manage and share projects, templates, scripts, and more with ease

The Toad for Oracle solutions are built for you, by you. Over 15 years of development and feedback from various communities like Toad World have made it the most powerful and functional tool available. With an installed-base of over two million, Toad for Oracle continues to be one of the most preferred tools for database development and administration.

It is important to note that Toad for Oracle will only let you do what your DBA has granted you the rights to do via direct privilege grants or indirectly through roles. Toad does not circumvent, augment or otherwise defy your Oracle database security settings. If the DBA does not grant you the CREATE TABLE privilege, then the Create Table in Toad will not work. Likewise If the DBA does not grant you the CREATE PROCEDURE privilege, then the PL/SQL Editor in Toad will be severely limited. You will not be able to compile procedures, functions or packages. Toad only allows you to do what your DBA has permitted you to do.

# About This Guide

The goal of this guide is to help you start using Toad quickly by learning basic features and tasks. Toad is a very diverse and powerful tool, and there are many features not covered here. In many cases, a feature may be introduced in this guide, with further instructions to see the online help. Refer to the online help for thorough documentation on all Toad functionality. You can access the help at any time by pressing F1. You can:

- Use the Table of Contents to get an outline view of all the components of Toad and links to the related documentation. You can also go directly to this page by clicking **Help | Contents**.
- Use the Search tool to find topics based on keywords that you input.
- Use the Favorites tab to bookmark topics to which you refer frequently.

## Toad Resources

Toad provides a wealth of internal and external resources to support you in your work. These resources can help you work more quickly, collaborate across locations, and more.

### Jump Search

You can use Jump Search to find Toad features and functionality within the application. You can also use Jump Search to search the Web, Toad World, Quest's Knowledge Base, Toad Help, Quest videos and product pages, and the Quest Support Portal. A single search returns results from all applicable categories simultaneously.

#### **To use Jump Search**

1. The Jump Search field is located on the main toolbar (far-right side).



2. **Locate a Toad feature.** To find a Toad feature (or functionality) in the application, enter the Toad feature or a related keyword in the search field. For example, enter "Export DDL." Search results are returned in a drop-down list. Then do one of the following:
  - Press ENTER to go to the first search result.
  - If a window is returned, double-click the window to open it.
  - If a menu item is returned, double-click the menu item to open the menu with the item highlighted.
  - If an option page is returned, double-click it to open the page in the Toad Options dialog.

3. **Search the Web and Toad resources.** To search the Web and all Toad resources, including the Help and Toad World, enter one or more keywords into the search field. Results are returned in one or more of the following categories:
  - **Knowledge Base**—Double-click a link to open a Knowledge Base article from the Support Portal.
  - **Toad World**—Click *Toad World* to open the search results in Toad Forum. Double-click a link to open the Toad World forum or blog post.
  - **Product Page and Videos**—Double-click a link to view the Toad product page or helpful product videos.
  - **Toad Help**—Click to open Toad Help.
  - **Search Web**—Click *Search Web* to open search results in the search engine specified in **View | Toad Options | Online**.
4. **Try this example.** To learn how to use Jump Search, review the following example:
  - Enter "code snippets" in the Jump Search field on the main toolbar. Results display incrementally as you enter the search term. Then do one or more of the following:
    - a. Under **Menus and Toolbars**, double-click **View > Code Snippets**. This action opens the **View** menu with the menu item highlighted.
    - b. Click the **Search Web** heading to open search results in the search engine you specified in **View | Toad Options | Online**.
    - c. Double-click a link under **Knowledge Base** to open a Knowledge Base article relevant to your search term.

## How Jump search functions

The following points highlight key functionality of Jump Search.

### Search is based on your license

Jump search results reflect licensing. For example:

- A search on 'Health Check' will not produce results if you have a Standard license.
- A search on 'Code Analysis Rules' will not produce results if you do not have the Professional Edition.

Clicking on a search result, such as **Editor > Save File**, applies the same inherent limitations you would experience in your instance of Toad.

### Items searched

If available with your license, Jump Search searches the following:

- Windows and most controls on all major windows. These search results, or Targets, are contained in a file in the user application data directory named "JumpTargets.dat."

Caveats:

- If the Target is on a connection-bound window and no connection is present you'll be informed.
- If the Target is on, say, Step 3 of a wizard pane, it will take you to the control on step 3, even if this means the window is not in a useable state.  
The error will indicate "Item not available in current window state."
- The "as you type" facility uses a priority-based search algorithm which examines the various components of the Target display string: the window, the path to the Target, and the destination Target itself, and gives priority first to the control, next to the window and then to the path.
- Toad Options.  
**Note:** You can also go to **View | Toad Options** and use the Search field at the bottom of that window to limit your search to Toad Options.
- All menu items and main form toolbar buttons. If you have customized your toolbars, and you removed an item for which you are searching, it will open the toolbar customization dialog to let you know that item is no longer there.
- Files. A variety of file paths are included in the set Toad searches. Among them are:
  - All Toad installation and application directories
  - All Toad MRU files
  - All filenames embedded in Actions
- All of the items of SQL Recall
- Code Analysis Rules. All of the following fields are searched:
  - RuleID
  - Category
  - Type
  - Severity
  - Description
- Toad World User Forums. The Toad World User Forums are searched and links are provided.
- Help Documentation
- Search Web. Double-clicking this link loads your search string into a search engine which opens in your default Web browser. To specify the search engine to use, go to **View | Toad Options | Online**, and then select a name under **Jump Search**.
- Knowledge Base. Displays links to the Toad Knowledge Base articles that match your search term. Double-click a link to open the article.
- Product Page and Videos. Links to the Toad page on the support site and links to videos about Toad.

## Toad Advisor

Toad is self-diagnosing. If you are having difficulties with Toad that you cannot understand nor fix, the Toad Advisor may be able to help you. It offers warnings, alerts, and hints concerning the current state of your Toad installation. If

you are in a managed environment, it specifies which features in Toad are managed, and to what extent.

### To use Toad Advisor

1. Select **Help | Toad Advisor**.
2. Review the results, which are divided into the following categories:

Category	Description
Warnings	Describe things that should be fixed immediately
Alerts	Describe things that may have an impact upon Toad's functionality
Hints	Provide information about your Toad installation that may affect how Toad works
Performance suggestions	Describe settings that could be changed to improve speed of performance

**Tip:** Select a result for additional information in the bottom pane. You can double click the performance suggestions to navigate direction to the relevant Toad option.

## Toad World

Toad World is a unique and valuable resource available to all Toad users. Toad World provides forums, blogs, videos, product information, Beta releases (when available), and Trial downloads for Toad products. Visit Toad World at: <https://www.toadworld.com>.

- [Forums \(all Toad products\)](#)—Find a forum for each product in the Toad family
- [Trial downloads](#)—Find Trial downloads for Toad products

## Toad for Oracle Community

Learn more and connect with the community at the Toad for Oracle Community page on Toad World.

- [Toad for Oracle Community](#)—Learn more about Toad for Oracle and find Trial downloads
- [Toad for Oracle Forum](#)—Ask questions and join the discussion
- [Toad for Oracle Beta](#)—Find the Beta download, ask a question, join the discussion
- [Toad for Oracle Blog](#)—Find How-To's, tip-n-tricks, and product videos

## Idea Pond

In the Toad for Oracle - Idea Pond, you can submit your ideas to improve Toad and vote for other ideas. The Toad team takes your suggestions seriously, and you may even hear back from one of our developers on the topic. We encourage all Toad users—from new to experienced—to let us know how we can improve Toad.

### ***To submit an idea***

1. Log in to the Toad World forums at <https://forums.toadworld.com>.
2. Select the **Categories** tab.
3. In the **Toad for Oracle** category, click **Idea Pond** or go directly to [Toad for Oracle - Idea Pond](#).
4. Click **New Topic** to post your idea.

### ***To vote on an idea***

- To vote for an idea, open the idea by selecting it from the list. Then click the **Vote** button.

## Toad World Forums

From within the Toad application, select **Help | Toad World | Forums** to go to the Toad for Oracle Forum.

### ***Tips for using the forums on Toad World***

- Once you are within a product forum, click the tabs to filter and organize threads.
- You can watch a product forum or follow only your own questions/discussions.
- To modify your notification, email, and profile preferences, log in to the Toad World forums at [Forums \(all Toad products\)](#). Then click your avatar (upper-right corner) and select the **Preferences** icon.
  - On the Preferences tab, select **Categories** to select which forums (categories) to watch.
  - On the Preferences tab, select **Emails** to specify options for email content and activity.
  - On the Preferences tab, select **Notifications** to specify notification behavior related to your posts.

## Toad Web-based Training

Make the most out of your investment by expanding your knowledge of the Toad product line. Web-based training is a perfect accompaniment to your product license. This training walks you through major product features and explains how to perform frequent tasks. You will also see how to utilize time-saving automation functionality.

These self-paced, web-based training courses are available for free. You will receive a certificate of completion for each course once you pass the accompanying test.

### ***To go to the training***

1. You can find Toad for Oracle Web-based training at the Quest Support Portal at: <https://support.quest.com/training-product-select>.
2. Select **Toad for Oracle** from the product list or go to: <https://support.quest.com/toad-for-oracle/training>.



# Retrieve License Keys

***Applies to legacy Toad for Oracle with offline license keys.***

Quest provides a web site to retrieve lost license keys. You must provide the email address associated with the license and your license number.

## ***To retrieve your license key***

1. Select **Help | Licensing**.
2. Click **Retrieve License**.
3. Complete the fields on the web site

# Create Support Bundles

The Support Bundle window provides information about several aspects of your Oracle and Toad setups. In addition, the Support Bundle lets you easily report problems to our peer-to-peer mailing lists or directly to Support.

If Toad itself fails, the Error dialog box displays. This type of an error creates a log, saved as toad.elf. This Eureka LogFile (.elf) contains both the application information and the callstack of the error created, and can be very helpful to Support in solving issues you are having with Toad.

## ***To create a support bundle***

1. Select **Help | Support Bundle**.
2. Review the following for additional information:

Option	Description
Email Support	Click to open the <b>Email Quest Support</b> window which provides instructions and links for contacting Quest Support. Use an existing Case or Service Request ID, or click the links to open a new service request.
Online Support	Click to open Quest Software's award-winning Support Portal in your default browser, with access to Licensing assistance, a searchable Knowledge Base, product downloads, and more.
Attach TOAD.INI (or SQL Tuning Support details) to emails	If selected, this attaches the details to any email sent through the support bundle, whether it is to the peer-to-peer Toad list or to Support.

# Required Privileges for Toad

To use Toad, certain privileges are required both in an Oracle database and in your Windows environment.

## Required Oracle Privileges

Some Toad features require special Oracle privileges. This topic lists required privileges per Toad Edition.

### Base Edition

Window	Privileges
Audit SQL/Sys Privs	To audit occurrences of a SQL statement, you must have the AUDIT SYSTEM privilege. To audit operations on a schema object, the object you choose for auditing must be in your own schema or you must have AUDIT ANY system privilege. In addition, if the object you choose for auditing is a directory object, even if you created it, then you must have AUDIT ANY system privilege.
Current Schema Toolbar	ALTER SESSION system privilege.
DBMS Debugger	DEBUG CONNECT SESSION privilege.

### DB Admin Module

Window	Privileges
Alert Log Viewer	The user account must have the EXECUTE privilege on Oracle's UTL_File package. (The SYS schema has this privilege by default.)
Analyze All	SELECT privileges on the CHAINED_ROWS table to view chained rows.

Window	Privileges
Objects	
DBMS_Flashback	EXECUTE privileges for DBMS_FLASHBACK.
Index Monitoring	To see another user's indexes you must have access to the SYS.OB\$, SYS.IND\$, SYS.USERS\$ and SYS.OBJECT_USAGE views and the ALTER ANY INDEX privilege.
Instance Manager	SYSDBA or SYSOPER privileges to shut down or alter the status of a database.
LogMiner	EXECUTE privileges on DBMS_LOGMNR and DBMS_LOGMNR_D.
Toad Space Manager	The Toad schema must have the privileges to create and alter jobs, create and drop its own tables and procedures, and must have SELECT access on: DBA_TABLESPACES, DBA_DATA_FILES, DBA_FREE_SPACE, and V_\$FILESTAT.

## Windows Privileges and Toad

In order to install and run Toad for Oracle, make a connection, and do basic operations, you must have the following privileges:

Operating System	Requirements
Windows 8.1 and 10	<ul style="list-style-type: none"> <li>Read access to the Oracle client folder</li> </ul>
Windows Server 2012 R2, 2016, 2019 and 2022	<ul style="list-style-type: none"> <li>Read/write privileges on the Oracle Home directories that you use for your connections</li> </ul>

**NOTE:** Toad for Oracle Subscription edition is bundled with Quest Auto Update, a service to periodically check for and deliver product updates. Installation requires administrator privileges on all supported operating systems.

**NOTE:** Other functionality in Toad may require additional privileges.

# Create and Manage Database Connections

Toad can connect to one or more databases. You can create, store, change, and organize these connections all from one convenient location.

## About Database Connections

You can create, store, view, and edit database connections from the **Database Login** window.

### *To open the Database Login window*

From the main Toad menu, select **Session | New Connection**.

To connect to an Oracle database, Toad requires the following:

- Username and password.
- Connection details Host/Port/Service Name provided directly, through TNSNames.ora or LDAP configurations.

Toad does not require an Oracle client to connect to a database.

### **Connecting to a database without an Oracle Client:**

- Toad can connect to databases natively.
- Features requiring Oracle Utilities will be unavailable including but not limited to: SQL\*Plus, Data Pumps, Import/Export Utilities, SQL Loader, TKProf, TNSPing, Wrap.
- Connections may be made using the Direct or TNS Tab.
- For TNS Connections, a TNSNames.ora file is required and may be placed in a folder specified by your TNS\_ADMIN environment variable, or in the same folder as Toad.exe

### **Connecting to a database with an Oracle Client:**

The Oracle client installation generally includes connection configuration files that are used to facilitate communication between your computer and the database. Toad uses the following connection configuration files, depending on the connection type you select.

## Oracle connection files

Connection File	Description
SQLNET.ora	<p>Specifies configuration details for Oracle's networking software, such as trace levels, the default domain, session characteristics, and the connection methods that can be used to connect to a database (for example, LDAP and TNSNAMES). If a method is not listed, you cannot use it.</p> <p>Toad uses the <b>SQLNET.ora</b> file for all connection methods, and consequently you must be able to access this file for any connection method.</p>
TNSNames.ora	<p>Defines database address aliases to establish connections to them. Toad must be able to access the <b>TNSNames.ora</b> file for TNS connections.</p>
IFILE	<p>Toad supports the IFILE directive within <b>TNS Names</b> files. The IFILE directive allows you to link to an external TNS Names file and dynamically include its contents along with the contents of your local TNS Names list. You can include TNS files up to three levels deep in order to organize and manage TNS entries within your company.</p> <p>You can open an IFILE reference by right-clicking the reference and then selecting <b>Open in Other Editor</b>.</p>
LDAP.ora	<p>Defines directory access information using Lightweight Directory Access Protocol (LDAP). Toad must be able to access the <b>LDAP.ora</b> file for LDAP connections.</p>




# Create or Edit a Connection

Use the Database Login window to create and edit database connections.

**Note:** Toad does allow you to enter the connection information directly in the Database Login window, but this method forces you to connect to the database, and you cannot enter some of the additional connection information until after you connect.

To connect to an Oracle Cloud Database, see the online help. You must set it up so you connect from Toad to the cloud database by establishing an SSH tunnel and then directing the Toad connection through the tunnel.

### To create or edit a connection

1. Click  on the standard toolbar to open the Database Login window.  
You can also select **Session | New Connection**.
2. On the Database Login toolbar, click  (**Create New Connection**) to create a connection, or select a connection then click  (**Edit Login Record**) to edit an existing record. The Add Login Record or Edit Login Record window is shown.
3. Complete the **User/Schema** and **Password** fields.
4. Select a connection method:

Method	Description
<b>TNS</b>	Select a database in the <b>Database</b> field. Toad uses the listings in your <b>TNSNames.ora</b> file to populate the list. You must use TNS when connecting to an Oracle Cloud database.
<b>Direct</b>	Enter the <b>Host</b> , <b>Port</b> , and either the <b>Service Name</b> or <b>SID</b> of the database to which you want to connect. You must use <b>Service Name</b> rather than <b>SID</b> to connect to an Oracle 12c Pluggable database.
<b>LDAP</b>	Select the LDAP descriptor in the <b>LDAP Descriptor</b> field.

**Notes:**

- Toad must be able to access the **SQLNET.ora** file to use any of the connection methods.
- Toad must be able to access the **LDAP.ora** file for LDAP connections.
- Toad must be able to access the **TNSNames.ora** file for TNS connections.

If Toad cannot connect to one of these files, a red X displays beside the editor button for that file. For example, the following image indicates that Toad cannot access the LDAP.ora file. You would have to resolve the issue before you could make an LDAP connection.



5. Complete the remaining fields as necessary.

Field	Description
<b>Connect as</b>	Select the connection privilege level field.
<b>Color</b>	You can use connection colors to help you distinguish between open connections. <a href="#">Color Code the User Interface per Connection</a>
<b>Connect Using</b>	<p>Select the Oracle home.</p> <p>Default Oracle homes can be assigned for a connection or for Toad. When a default Oracle home is assigned to a particular connection, any time you make that connection from the connection grid, Toad automatically uses that Oracle home. When a default Oracle home is assigned to Toad, Toad automatically uses that Oracle home any time you create a connection to a new database.</p> <p>See <i>Select a default Oracle Home</i> in the online help for more information about how Toad manages Oracle homes.</p>
<b>Alias</b>	<p>Enter a description or Toad based alias or nickname for the connection.</p> <p>By default the alias only displays in the connections grid, but you can have Toad display the alias instead of the database name. To enable this option, select <b>View   Toad Options   Windows</b> and select the <b>Use alias instead of database</b> checkbox.</p>
<b>Execute Action upon Connection</b>	<p>An Action in the Automation Designer can be automatically executed upon making a connection:</p> <ol style="list-style-type: none"> <li>Highlight the connection and click <b>Edit Login Record</b>.</li> <li>Select <b>Execute Action upon Connection</b> and specify the Action. The Action displays in the Action field of the connection window. You can also select a parameter file.</li> </ol> <p>See <i>Automation Designer Overview</i> in the online help for more information about how to automate frequently used tasks.</p> <p><b>Notes:</b> Toad only executes actions upon connection when you execute through the user interface. Toad does not execute actions when it is executed through command line.</p>
<b>Custom Columns</b>	<p>Complete the custom fields, if you have defined any.</p> <p><a href="#">Organize Database Connections</a></p>
<b>Save Password</b>	<p>Select to have Toad remember the password for only this connection.</p> <p>Note: If <b>Save passwords</b> is selected in the Database Login window (to save passwords for all current and future connections), then this field is selected by default.</p> <p><a href="#">Save Connection Passwords</a></p>
<b>Auto Connect</b>	Select to have Toad automatically make the selected connection on startup.
<b>Favorite</b>	Select this checkbox to mark the connection as one of your favorites. You can have the Database Login window only display your favorites by selecting <b>Show favorites only</b> at the bottom of the window.

Field	Description
<b>Read Only</b>	Select this checkbox to make the connection read only, meaning that you cannot make any changes to the database. This option is especially helpful when you want to access data for a production database but you do not want to accidentally make any changes.

6. Save the login record.

- To save the record without connecting to the database, click **OK**
- To save the record and connect to the database, select the **Connect** checkbox and click **OK**.
- To save the record and reuse the field values to quickly enter new connections, click **Post**.

## Save Connection Passwords


You can have Toad save all passwords automatically or individually save passwords for selected connections.

Passwords are saved in an encrypted file named **Connections.xml**. The encryption is tied to the currently logged in user profile, and it supports roaming profiles and Citrix installations.



**Important:** To save a connection password, you must connect to the database first.

**Note:** If the **Save Password** field is disabled, your ability to save passwords may have been removed during installation. See the *Toad for Oracle Installation Guide* for more information.

### *To save all passwords automatically*

1. Click  on the standard toolbar to open the Database Login window.  
You can also select **Session | New Connection**.
2. Select **Save passwords** at the bottom of the window. All passwords for current and future connections will be saved automatically.

### *To save passwords for individual connections*

1. Click  on the standard toolbar to open the Database Login window.  
You can also select **Session | New Connection**.
2. Clear **Save passwords** at the bottom of the window.
3. Select the connection in the connection grid.  
**Note:** If the connection is not listed in the connection grid, ensure that the **Show favorites only** and **Show selected home only** fields are cleared. If it still does not display, connect to the database again.
4. Click  to open the Edit Login Record window
5. Enter the password in the **Password** field on the right.
6. Select **Save Password**.
7. Click **Connect**.






# Import/Export Connection Settings



You can export and import Toad connection settings. This feature is especially helpful when you need to work with Toad on a different computer or share the settings with another person. If you save your connection password, it is encrypted in the exported file.

- You can export to XML format.
- You can import from XML or INI format.

## *To export connection settings*

1. Click  on the standard toolbar to open the Database Login window.  
You can also select **Session | New Connection**.
2. Click  on the toolbar.
3. In the Export Connections dialog, click  to select a location and enter a file name for your exported connections file.
4. To include connection passwords in the exported file, select **Include encrypted passwords**. Then enter a primary password. The primary password is used to decrypt when importing the connections file.
5. Click **Export**.

## *To import connection settings*

1. Click  on the toolbar.
2. Click  to select the file and the file type.
3. Select **Include encrypted passwords** and enter the primary password to import the connection passwords along with the connections.
4. Click **Import**.

## *To import from LDAP*


- In the Database Browser, click the folder icon.
- Select **Add databases to tree**.

The Database Browser displays columns for **Server**, **Database**, **Comments**, and **Last Connected**.

# Automatically Connect on Startup

Rather than have to manually connect to one or more databases every time you start Toad, you can configure Toad to start selected (or all) connections automatically when you start Toad.

### ***To automatically open connections***



1. Click  on the standard toolbar to open the Database Login window.  
You can also select **Session | New Connection**.
2. In the connections grid, select the checkbox in the **Auto Connect** column.

## Use Previous Connections

Toad saves your previous connections so you can easily connect to them again.

### ***To open a previous connection***


Select one of the following:

- Click  in the standard toolbar to open the Database Login window, and then double-click the previous connection from the grid.
- Click the arrow beside  in the standard toolbar, and then select a connection from the list.

## Change Active Connection in Window

You can easily change the connection in an open window to a connection you currently have open or a connection that you have recently used.

### ***To change the active connection in a window***

Click the arrow beside  in the window toolbar and select an open or recent connection from the drop-down.

## Test Connections


### ***To test connections if the session has dropped***

Select **Session | Test Connections (Reconnect)**

or

**Session | Test All Connections (Reconnect)**

### ***To test connections in the Database Login window***

Select connections in the grid and click . Toad opens a new session to test the connection and lists any errors that occur.


## End Connections

Toad provides a number of ways to end a database connection.

### ***To end one connection***

Select **Session | End Connection**.

Or

Click  in the standard toolbar to end the currently active session. You can also click the arrow by the button to select a different open connection to end.

Or

Right-click the connection name in the toolbar, then select **End Connection**.

### ***To end all connections***

Select **Session | End All Connections**.

## **Commit or Rollback Changes**

You can commit or rollback recent changes to the database from the Session menu at any time while working with Toad.

**Note:** You can configure Toad to either automatically commit changes or prompt to commit on exit. See "*Oracle Transaction Options*" in the online help for more information.

### ***To commit or rollback your changes***

Select **Session | Commit** or **Session | Rollback**.

**Tip:** You can also right-click the connection in the Connection Bar, and select **Commit** or **Rollback**. You can also commit or rollback a session from **Session | Transaction** in the main menu.

# Editor Basics

The Toad Editor lets you write and edit many types of statements and code, and Toad provides many options to customize the Editor's behavior. You should get to know the Editor well, because it supports most of the core functionality of Toad, and much of your work will be done there.

## About the Editor

The Editor window is the foundation for working with many types of statements and code. The Editor attaches itself to the active connection in Toad, but if you do not have a connection you can still use it as a text editor.

This topic describes the basic Editor components. As you use other features in Toad or if you customize the Editor layout, the appearance of the Editor will change.

## Editor Toolbars

The Editor has the following default toolbars. Hover your mouse over a button to determine its functionality. You can show or hide toolbars and buttons to customize your work area. [Show/Hide Toolbars](#)

### File

The main Editor toolbar that contains functionality for changing sessions, opening and saving files, printing, launching external software related to Toad, creating new PL/SQL objects, and launching the SQL Recall tool for saving and viewing statements.

### Edit

Contains basic editing tools for writing and formatting code.

### Execute

Contains buttons related to compiling or executing code.

## Current Schema

Shows the currently connected schema and enables you to change the schema to execute the code against.  
[Change Current Schema](#)

## Desktop

Shows the current desktop layout and enables toggling between SQL and PL/SQL desktops.

The SQL desktop is mainly for working with scripts, while the PL/SQL desktop is for working with procedures, functions and packages.

The desktop determines what tabs are displayed in the Editor:

- The SQL Desktop shows the Data Grid, Trace, Query Viewer, Explain Plan, and Script Output tabs.
- The PL/SQL Desktop shows the Call Stack, Breakpoints, Watches, Profiler, and PL/SQL Results tabs.
- Both show the DBMS Output, Messages, and Team Coding tabs.

## Macro

Contains buttons for creating and running macros. See [Editor Macros](#) for more information.

## Code Analysis

Contains buttons for running Code Analysis. [About Code Analysis](#)

## Team Coding

Contains buttons that support the Team Coding feature.

See *About Team Coding* in the online help for more information.

## Editor Layout

The Editor is organized into the following areas:

### Navigator Panel

The Navigator Panel is a desktop panel that displays an outline of the Editor contents in the active tab. You can click on the items listed to navigate to that statement in the Editor. The Navigator Panel is displayed on the left-hand side by default, but you can change where it is docked.

If the Navigator is not shown, right-click the Editor and select **Desktop | Navigator**.

[Move through Code with the Navigator](#)

### Object Palette

The Object Palette shows a list of the database objects that are in the currently selected schema.

[Pick Objects from the Object Palette](#)

## Editor

The main Editor window displays code in tabs. You can open new tabs for different bits of code, or different types of code. SQL and PL/SQL can go in the same tab. Toad can tell where the cursor is located and compile PL/SQL or run SQL as required.

Note: If you have multiple statements in the Editor, you must trail them with a valid statement terminator such as a semi-colon.

## Desktop Panels

The desktop panels contain many options for tab display, depending on what kind of code you are working with and what you want to do with it. In addition, you can configure how these panels display to make Toad work for you.

[Customize the Editor Layout](#)

## Editor Right-click Menu

The right-click menu of the Editor contains many options to help you work with code. When you are trying to figure out how to do something, right-click the Editor to see if there is a menu or command for it. For example, right click a table and then select **Describe** to open the Describe Objects window. As another example, right click PL/SQL code and then select **Compare To** for options to compare the code with the database object or a file on disk. You can also select the object, then press **F4**.

An advanced context menu is available, similar to how Windows Explorer operates. When you **SHIFT + right-click** the name of an object in the Editor, Toad will show an advanced menu if the object can be resolved. If the object cannot be resolved, Toad shows the normal Editor context menu.

## Shortcut Keys

Toad provides dozens of standard shortcut keys, plus you can assign new ones or customize the standard ones. Toad also allows you to print out your current list of shortcut keys.

[Customize Shortcut Keys](#)

You can customize the shortcut keys. [Customize Shortcut Keys](#)

## Editor Results Area

At the bottom of the Editor are tabs that display results of your actions with code.

Depending on your Toad Edition, any of these tabs display results:

- **Messages:** Displays information based on the context of the work performed in the Editor.
- **Data Grid:** [About Data Grids](#)
- **DBMS Output:** [Use DBMS Output](#)
- **Script Output:** [View Script Output](#)
- **Trace:** See *Auto Trace* in the online help for more information.

- **Query Viewer:** See *Query Viewer* in the online help for more information.
- **Explain Plan:** [Generate Explain Plans](#)
- **Breakpoints:** [About Breakpoints](#)
- **Watches:** [About Watches](#)
- **PL/SQL Results:** [View Debugging Results](#)
- **Call Stack:** [Display PL/SQL as it is Called](#)
- **Profiler:** [Editor Profiler Tab](#)
- **Team Coding:** See *About Team Coding* in the online help for more information.

## Output Area

[About the Output Window](#)

## Editor Options

You can customize the behavior of the Editor in many ways.

### *To set Editor options*

1. Select **View | Toad Options | Editor**.
2. Select an options group and then press **F1** for information about those options.

## About the Output Window

The Output window opens whenever an action produces results. The Output window can be re-sized or moved. By default the window is docked at the bottom of your screen.

In addition, the Output window displays error messages and other general information Toad creates for you. Output is sent to various tabs as needed. Using the right-click menu you can work with the messages displayed in the Output window.

## Various Tabs

Output is sent to various tabs in this window as needed.

Tab	Contents
<b>General tab</b>	This tab provides general information.
<b>&lt;connection&gt; tab</b>	This tab provides information about activities you have performed during a connection. For example, if you end or begin a Debugger session for a specific connection, a log of this activity is displayed in this tab.

Tab	Contents
<b>Spool SQL tab</b>	This tab displays SQL from the Spool SQL command. This is the SQL used by Toad to perform various functions.

## Right-Click Menu

From the right-click menu you can perform the following actions.

Command	Result
<b>Clear</b>	Clears all messages in the active output tab.
<b>View Messages</b>	Displays the selected messages in a dialog box. This is useful when a message is too long to view in the Output window, or contains linefeeds.
<b>Copy</b>	Copies the contents of the Output window to the clipboard.
<b>Print</b>	Prints the contents of the Output window.
<b>Save to File</b>	Saves the contents of the Output window to a text file.
<b>Spool SQL to Screen</b>	Toggles spooling.

## About the Results Grids

At the bottom of the Editor are tabs that display results of your actions with code within the edit window.

Depending on your Toad Edition, any of these may display results:

- Data Grid: [About Data Grids](#)
- DBMS Output area: [Generate DBMS Output](#)
- Script Output area: [View Script Output](#)
- If you have the debugger module, you may also have the Script Debugger displayed.

## Toggle Fullscreen Editor

You can expand the Editor to fill the entire screen, hiding all other desktop panes. The fullscreen Editor does not affect windows such as the Object Palette or Code Snippets.

### *To toggle the Fullscreen Editor*


Select **Toggle Fullscreen Editor** (F2) from the **Edit** menu.



# Open and Save Files

The default in Toad's Editor is the standard Windows-style Open and Save File dialogs.




## **To open a file**

Click  (**Open file**) on the Editor toolbar.

## **To load an object from the database**

Click  (**Load Object from Database**) on the Editor toolbar.

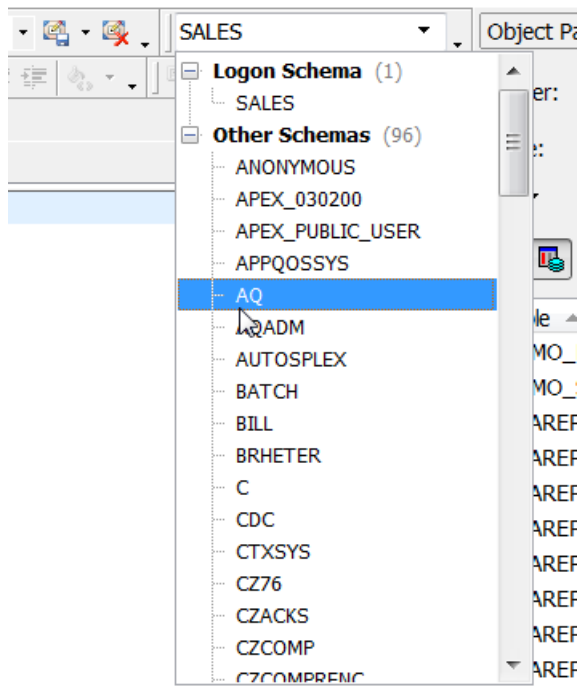
## **To save a file or files**

Click one of the following:  (**Save**),  (**Save As**),  (**Save All Tabs**). Files are saved to a selected disk location.

# Change Current Schema

The Current Schema drop-down, located on the Current Schema toolbar, lets you work with a schema other than the one to which you are connected. This can be useful if, for example, you have tested a SQL statement in your test schema and now want to execute it on several other schemas without disconnecting and reconnecting.

## **Sample Current Schema Drop-down**



By default, the current schema is set to your current connection. When you use this drop-down, Toad issues an ALTER SESSION SET current\_schema command. After you execute, Toad issues the ALTER SESSION SET current\_schema command again to return to the original connection schema.

## **Notes:**

- You must have the ALTER SESSION system privilege to use this feature. If you do not have the privilege, the drop-down is disabled.
- Using this feature eliminates the need to prefix every table name with a schema name, and helps to eliminate ORA-00942 "table not found" errors.

### **To change the current schema**

Select a different schema from the Current Schema drop-down on the Current Schema Toolbar.

The Current Schema drop-down does not work with script execution or debugging commands. However, because Execute as Script is designed to mimic SQL\*Plus, you can use a set schema command to change the schema.

### **To change the schema in scripts**


Include the following command at the beginning of your script:

```
ALTER SESSION SET current_schema = "USERNAME"
```

## Find text in the Editor

The Editor provides multiple ways to find what you are looking for in the Editor window.

All of these tools are located under the **Search** menu on the main Toad Toolbar.

To save the settings as a macro, click  in the dialog toolbar.

Command	Shortcut	Description/Actions
Find	CTRL+F	<p>Opens the Find dialog.</p> <p>Enter a keyword or phrase to search for in the Editor window.</p> <p>There are options for case sensitive, finding whole words, using Regular Expressions (see Regular Expression Searches), and searching forward or backward in the buffer.</p> <p>If text is highlighted prior to opening the Find dialog box, that text will be placed into the <b>Text to Find</b> data entry box. If no text is highlighted, then the word at the cursor will be placed in the <b>Text to Find</b> data entry box. The last <i>n</i> find items are available in the drop-down list. They are NOT saved from Toad session to Toad session.</p> <p>You can also copy other text and paste it into the Find dialog box using <b>CTRL+V</b>.</p> <p>Find may be available for a window even if the Find button is not present on the toolbar. In these cases, you easily can use CTRL+F from the keyboard to access this feature.</p>
Replace	CTRL+R	<p>Opens the Replace dialog, where you can find the keyword or phrase, and then replace it with a different string of text.</p> <p>When you select Regular Expressions, you can use the <b>Replace with Template</b> option to convert \t, \r, and \n in the text specified in <b>Replace with</b> to a tab, carriage return, and newline, respectively.</p>
Show All	None	<p>This command only works after you have performed the Find command. After you use the Find command to search through your text for a word or phrase, you can</p>

Command	Shortcut	Description/Actions
		use <b>Show All</b> to highlight every occurrence of the search phrase. The highlighting is removed with any change to the text in the Editor.
Find Next	<b>F3</b>	This item is only enabled after you have performed a <b>Find</b> . It goes to the next occurrence of the text you were searching.
Find Previous	<b>SHIFT+F3</b>	This item is only enabled after you have performed a <b>Find</b> . It goes to the previous occurrence of the text you were searching.
Goto Line	<b>CTRL+G</b>	If you have a large file, you may want to use this command to move your cursor to a specific line number. You must enter an integer from 0 to the last line number of the buffer contents. You can also use bookmarks to quickly navigate around the buffer contents. <a href="#">Use Bookmarks</a>
Find in Files	None	Finds text in files and supports multiple concurrent searches. <a href="#">Find in Files</a>

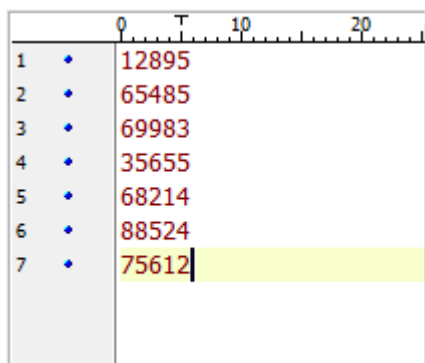
## Create a Find and Replace Macro

Toad enables you to create Find-and-Replace Macros that enables you to quickly perform find-and-replace tasks that you perform often.

### *To create a Find and Replace Macro*

The following is an example of how to create a Find and Replace Macro. In this example, you frequently need to select a few Product IDs from a large table and perform a query on them to make the data more manageable. To accomplish this, you copy the IDs and paste them in the Editor. Then, you create two Find and Replace macros. The first macro wraps the pasted IDs in quotes. The second macro removes newlines and converts them to a comma separated list.

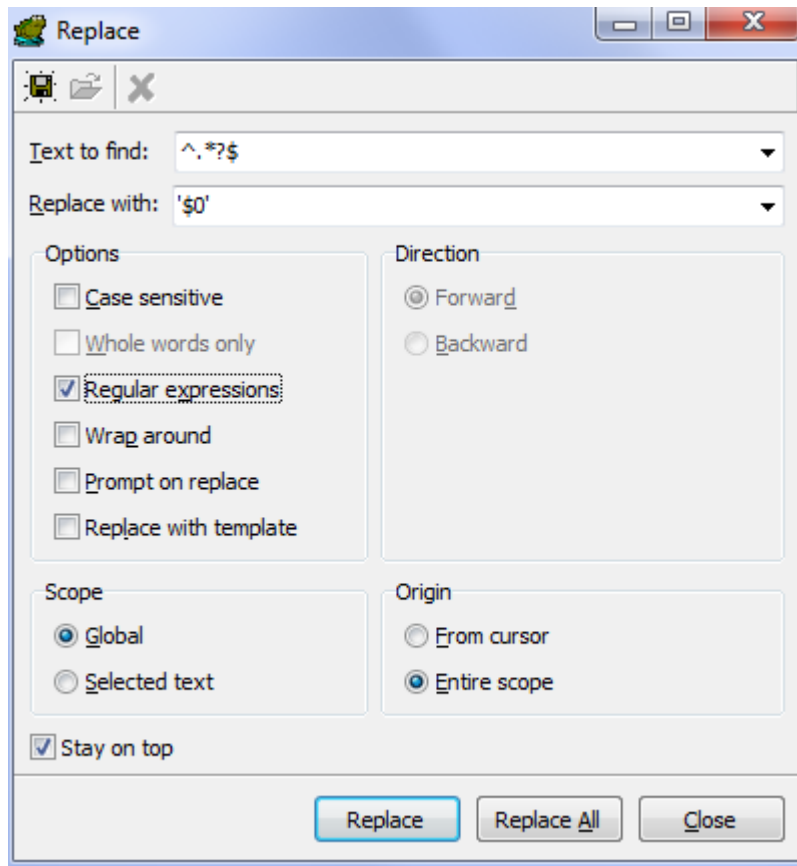
1. Copy the Product IDs from the table, then paste them in the Editor.




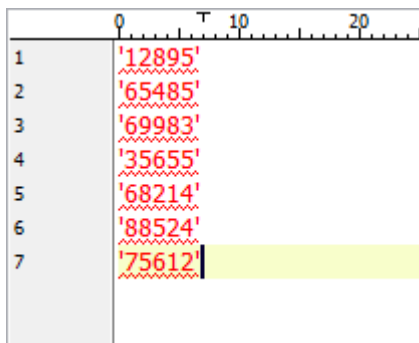
1	•	12895
2	•	65485
3	•	69983
4	•	35655
5	•	68214
6	•	88524
7	•	75612

2. Create the first macro:

- a. Click CTRL+R.
- b. Complete the fields in the Replace window to wrap the IDs in quotes.

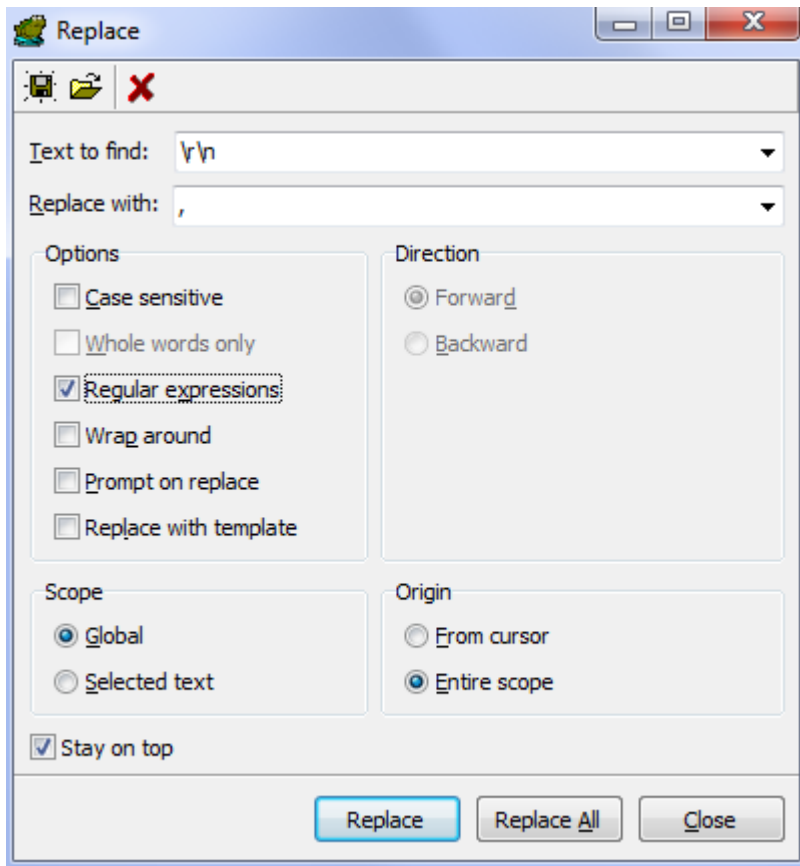



- c. Click  and name the macro *WrapInQuotes*. Click **OK**.
- d. Click **Replace All** in the Replace window. Toad runs the macro against the Editor.

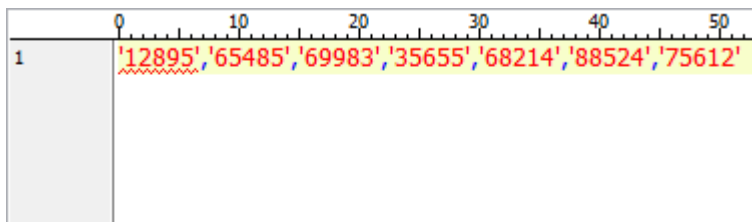


3. Create the second macro:


- a. Click CTRL+R.
- b. Complete the fields in the Replace window to create a comma separated list.

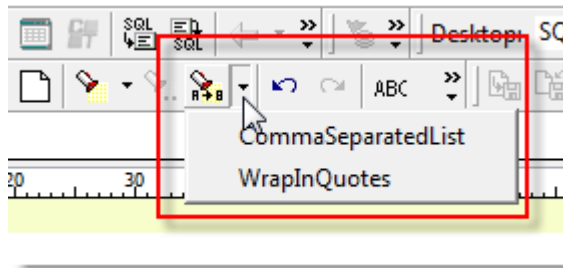


- c. Click  and name the macro *CommaSeparatedList*. Click **OK**.
- d. Click **Replace All** in the Replace window. Toad runs the macro against the Editor.



4. Use the new comma separated list to query the IDs.

5. To reuse these macros in the future, click the down arrow next to the  (**Replace Text**) button in the Edit toolbar. Run the *WrapInQuotes* macro first and then the *CommaSeparatedList* macro.



## Use Bookmarks

Use bookmarks to help you manage files. They mark a position within the Editor so that you can easily jump back to that line. You can set up to ten separate bookmarks within one Editor.

Note: All keystrokes assume you have not altered the default Editor keys.

### **To set a bookmark**

Right-click and select **Toggle Bookmark | Bookmark#** (CTRL+SHIFT+# where # is a number between 0 and 9).

The bookmark number displays in the Editor gutter.

### **To clear all bookmarks**

Right-click and select **Clear All Bookmarks**.

### **To clear one bookmark**

Right-click and select **Toggle Bookmark | Bookmark#** (CTRL+SHIFT+# where # is a previously defined bookmark between 0 and 9).

### **To jump back to a bookmark**

Right-click and select **Go to Bookmark** (CTRL+# where # is a previously defined bookmark between 0 and 9).


Note: The # must be called from the number row on the keyboard. Using the Number pad will not call the bookmark.

## Find in Files

The Find in Files dialog supports multiple concurrent searches. When you select a result, a preview window displays and stays on top so you can easily compare other results.

**Note:** This topic focuses on information that may be unfamiliar to you. It does not include all step and field descriptions.

### **To find in files**

1. Select **Search | Find in files**.
2. Enter the text you want to find in the Search **for field**.
3. Enter the types of files you want to find in the **File mask** box. For example, \*.\* searches for all files and \*.txt searches for all text files. You can search for multiple file types and separate them with a semicolon, such as \*.sql;\*.txt (searches for all .sql and .txt files).
4. Select options in the Find in Files toolbar to include additional search criteria, such as searching sub-folders and using regular expressions.
5. Click .
6. Double-click a file in the results to preview it. The preview window stays on top so you can easily compare other results.

## Move Between Editor Tabs

There are several ways to move between tabs in the Editor.

### **To move between tabs:**

Do one of the following:

- Click the tab you want to open.
- Press **ALT+PageUp** or **ALT+PageDown** to cycle through them.
- If you have opened them using the **CTRL+Click** functionality within the Editor, click the navigation buttons in the Editor toolbar and select either scroll forward and back through them in the order they were opened, or select from a drop-down order.

## Automatically Back Up the Editor

You can have Toad automatically create backups of your Editor files using a temporary filename. If Toad closes abnormally, you are prompted to recover or discard backups when you next open Toad. Auto backup is automatically enabled, with a backup interval of every 3 minutes.

See *Editor Behavior Options* in the online help for more information.

You can also use this feature to recover documents manually.

### **To recover documents from the menu**

Select **File | Recover Documents**.

## Use an External Editor

You can use an external editor of your choice, and copy the text to the external editor, edit the text, and bring the results back into Toad.

### ***To set up your External Editor***

1. Select **View | Toad Options | Executables**.
2. Navigate to and select the executable for the external editor in the **Editor** field.

### ***To open text in External Editor***

Select **Edit | Load in External Editor** (CTRL+F12).

Note: If you have not saved the contents of the Toad Editor to a file, Toad prompts for a filename before launching the external editor.

### ***To return to Toad from the External Editor***

1. Save the file from the external editor and then close it.
2. Open Toad and load the file.

**Note:** Toad prompts you to reload the contents of the file only if the **Prompt for reload on activation if timestamp has changed** option is set in Toad Options.

See *Editor Open/Save Options* in the online help for more information.



# Schema Browser Basics

In Toad you use the Schema Browser to work with database objects.

## About the Schema Browser

The Schema Browser allows you to view, add, and modify database objects. It also displays detailed information about a selected object. For example, the detailed information for a table includes its subpartitions, columns, indexes, data, grants, and so on.

### To open the Schema Browser

Click  on the Toolbar or select **Database | Schema Browser**.

#### Notes:

- Some Schema Browser features are only available with the DB Admin Module, which is included in several Toad Editions or can be purchased separately.
- You can set the Schema Browser to open automatically when a new connection is made. Select **View | Toad Options | Windows** and select the **Auto Open** checkbox of the Schema Browser row.


## Schema Browser Panes

The Schema Browser is divided into two panes to help you review objects and their details:

Pane	Description
List of objects (left-hand side)	<p>The left-hand side of the Schema Browser is also known as the "<b>LHS</b>" (<b>Left-Hand Side</b>) and is referred to as such throughout the documentation.</p> <p>The LHS provides a list of objects that you can view. In general, you select a schema and an object type, and the list refreshes to display the relevant objects. You can filter the objects and save your filters for future use.</p> <p>See <i>About Schema Browser Filters</i> in the online help for more information.</p>

Pane	Description
	<p>The list can display additional information about the objects, such as the tablespace and number of rows. To view additional information, right-click a column in the left-hand side and select additional columns to display. (This feature is unavailable with the tree view display.)</p> <p><b>Tip:</b> In drop-down mode, you can hide leading characters of object names in the left-hand side. Right click a column and select <b>Hide leading characters of name</b>. The display resets when you change the schema or connection.</p>
Object details (right-hand side)	<p>The right-hand side of the Schema Browser is also known as the "<b>RHS</b>" (<b>Right-Hand Side</b>) and is referred to as such throughout the documentation.</p> <p>The RHS initially displays the same list of objects as the left-hand side. When you select an object on the left-hand side, Toad displays its details in the right-hand side. This format makes it easy for you to compare details between objects of the same type.</p> <p>From the Schema Browser you can drop most objects, enable/disable applicable objects, and disable triggers for a table or for an entire schema. You can recompile procedures, functions, packages, triggers, and views, or they can be extracted from the database and loaded into the clipboard or Editor. If Team Coding is enabled, you can view status and collection information.</p>

#### Tips:

- To reset the right-hand side to mirror the list of objects on the left-hand side, click  in the toolbar or select multiple objects on the left-hand side.
- Many of the panes within the Schema Browser have icons to identify the objects. [View Schema Browser Icon Legend](#)
- Many of the objects and panes have enhanced right-click menus. Right-click an object or its details to see what options are available.

## Customize the Schema Browser

You can customize how the Schema Browser displays to better suit the way you work. The most common customization is to change how object types display in the left-hand side. [Select the Left-Hand Side Display Style](#)

Toad also provides dozens of options to further customize the display and behavior of the Schema Browser. Select **View | Toad Options | Schema Browser** to view the options, then press **F1** to view information about them.

## View Schema Browser Icon Legend

Many of the panes within the Schema Browser have icons to identify the objects. Toad includes an Icon Legend that you can use to easily decipher these images.

#### To view the icon legend

- Click  on the Schema Browser toolbar.

# Automatically Refresh the Schema Browser Data Grid

You can set the Schema Browser to automatically refresh the data grid while you are working with a specific object. This setting only lasts for your active dataset, and turns itself off if you select another object or close the Schema Browser.


## *To automatically refresh the data grid*

Select **Auto Refresh** in the Data tab toolbar (right-hand side of the Schema Browser).

# Create Schema Browser Filters

Object filters reduce the number of objects displayed in a schema.

## *To create browser filters*

1. Depending on the Schema Browser style you have selected (tabbed or dropdown vs. treeview) do one of the following:  
Tabbed or dropdown: Select the object type that you want to filter, for example Tables or Roles, and then click  on the Schema Browser toolbar.  
Tree view: Right click the object type in the tree view, then select **Filter object\_type**.
2. Complete the fields as necessary.
3. To save the filter, click **Saved Filters** and select **Save Current Filter As**.
  - a. 'Save filter data for all object types,' or
  - b. 'Save filter data for roles only' (in this example).  
Saves into an SBFLT file. When such a file is reloaded, current settings for other object types are not changed.
4. To customize or review the query before applying it, select **View/Edit Query Before Executing** and click **OK**.  
Notes:
  - Do not change the SELECT list.
  - When entering the IN clause, you must enclose the table name in single quotes ('TEST'). This lets you enter multiple table names ( such as 'TABLE1', 'TABLE2', 'TABLE3') or enter a sub-query.

# Create Default Schema Browser Filters

You can create a default filter for each object type, which is used for all schemas.

## **Notes:**



- Instead of using the same default filter for each object type, you can have Toad automatically save filters per connection or schema name. See *Schema Browser Left-Hand Side Options* in the online help for more information.
- This topic focuses on information that may be unfamiliar to you. It does not include all step and field descriptions.

### To create default filters

1. Select **Session | Schema Browser Filters**.
2. Select an object type on the left and set the filter options. [Create Schema Browser Filters](#)  
**Note:** When you click **OK**, Toad saves default filters in a file named Toad\_DEF.SBFLT in the User Files folder.

## Apply Saved Schema Browser Filters

### To apply a saved filter

1. Click the arrow beside  and select a saved filter from the list.
2. If the filter you want is not listed, complete the following steps:
  - a. Click  in the left-hand side of the Schema Browser.
  - b. Click **Saved Filters** in the upper right of the dialog and select **Load Filter**
  - c. Select the filter and click **Open**.
  - d. Click **OK** to apply the filter and close the dialog.

## Quickly Filter the Schema Browser Left-Hand Side

The QuickFilter is a client-side filter, so it filters all Schema Browser object lists without re-querying the database. This filter works in conjunction with the existing browser filters. () The QuickFilter provides a faster way to filter the list than just using the browser filters.

The QuickFilter field is located below the schema drop-down for the tabbed and drop-down Schema Browser display styles.

### To use the QuickFilter

Enter the filter information. You can use wildcard characters at any point in your filter.

Wildcard	Description
* and %	Use for multiple character wildcards. <b>Note:</b> % is the Oracle standard.


Wildcard	Description
? and _	Use for single character wildcards. <b>Note:</b> _ is the Oracle standard.
!	Use to exclude the following characters. One exclamation point affects the entire string. For example, !A*;B* would return everything that does not start with A or B.

Notes:


- You can use multiple filters by separating them with a semicolon. For example, A\*;B\* would display everything that starts with A or B.
- The QuickFilter maintains a history of up to 25 items, listed most recent first. Right-click the QuickFilter to access this list.

## Filter Data in the Schema Browser

The Schema Browser has the following methods to filter data:

- Filter/Sort—This is a server-side filter that limits which rows are retrieved from the database. This method is much faster than the grid filter when you are filtering a large dataset. Access this filter by clicking the  button in the tab's toolbar.
- Filter Data—This is a client-side filter that retrieves all rows from the dataset before filtering them. Access this filter by right-clicking the data grid.

### To filter data in the Schema Browser

- Click  in the tab's toolbar (right-hand side of the Schema Browser).
- Complete the fields as necessary.

## Clear Schema Browser Filters

### To clear filters on the left-hand side

Click the arrow beside  and select **Clear Filter**.

- 'Clear Filter for <object type>,' or
- 'Clear Filter For All Object Types'

### To clear data grid filters in the Schema Browser

Click  on the Schema Browser right-hand side.

# Data Grid Basics

Throughout Toad, information is presented in a grid format. Within grids, you can customize grid views, filter resultsets, print the grid contents, and other standard operations. If the data set is editable, Toad enables that to be done within the grid.

## About Data Grids

In most data grids you can:

### **Edit data:**

- Post/Revert Edited Data
- Insert and Delete Rows
- Edit Data in Popup Editor
- Use an External Editor
- Access the Calculator

### **Customize the data grid display:**

- Perform Calculations on Grid Cells
- Anchor Column in Data Grid
- View a Single Record
- Preview Selected Column
- Hide Columns
- Sort and Group Data

### **Filter results:**

- Filter Data
- Use Excel-Style Filtering

### **Export data:**

- Export Dataset
- Export Data to Flat File

**View special data types:**

- Date Editor
- View BFILE data
- View CURSORS
- View Nested Table Data
- View Object Data
- View VARRAY Data

**Identifying sensitive data using Sensitive Data Awareness**

Toad can highlight columns used for sensitive data making them easily identifiable. See [Sensitive Data Awareness](#) for more information

## Anchor Column in Data Grid

You can anchor a column on the left side of the data grid (also referred to as locking, fixing, or freezing the column). This can make it easier to track information you must scroll through a large amount of content.

Note: Row numbers automatically display as fixed columns. With the exception of row numbers, fixed columns remain editable.

**To anchor a column**

Right-click a column and select **Fix Column**.


**To remove the column anchor**

Drag the column to the right of the bold fixed column divider bar.

## Hide Columns

You can hide columns from the data grid after running a query.

**To select columns to display**

1. Click  in the upper left corner of a data grid.
2. Clear the checkbox by the column name.

**Tip:** To sort the column list alphabetically, right-click the column list and select **Sort Alphabetically**.

# Understand Time Values

When displaying times with dates, Toad suppresses the time values if they are 12:00:00 AM (midnight). The time portion of the date fraction is zero, so Toad adds no value to the display of the date.

Oracle stores dates as a big fraction number offset from January 1, 4712 B.C. It is then converted to a complete date and time.

Performing the query `Select sysdate from dual` will display the time, and similarly, queries of DATE datatype columns will display the time if it is not midnight.

The time drop-down in **View | Toad Options | Data Grids** does not affect this output of time.

## Sort and Group Data

If the query does not contain an ORDER BY command, you can sort the grid manually.

### *To sort by column*

1. Click a grid column header.
2. Select the appropriate option, and click **Apply**.

## Search Grids

Use this dialog box to find data or columns in a grid. If the records are cached then the search is fast. If Toad has to query ahead in the recordset, then you have to wait for the additional rows to be fetched from the database.

You can use this method to find data in one column, or in many, or items that match two or more criteria.

### *To find data or columns*

1. Right-click the grid and select **Find Data** (CTRL+F).
2. Select the column to search or find.
  - To find a column, select **Find Column** and click **OK**. The data grid advances to the first occurrence of the search criteria.
  - To find data, select **Find Data** and complete the search criteria. When you click **OK**, the data grid advances to the first occurrence of the search criteria.  
**Note:** To find the next occurrence of the search criteria, press **F3**.
  - To filter by data value, select **Filter Data** and then enter the search value. Note: Closing the dialog will undo the filter, but the grid will remain on whatever row you filtered to.
3. **Note:** To find the next occurrence of the search criteria, press **F3**.



# Incremental Searching

## *To find data incrementally*

1. Click in the column you want to search.
2. Type the first few characters of the item you want to find.
3. Press **F3** to continue stepping through the grid.

# Filter Data

Filters reduce the amount of data displayed and let you display only what you want to see. They work by modifying the query used to fetch the data. If you frequently search for the same criteria, you can save the filter for reuse.

## *To filter data*

1. Right-click the data grid and select **Filter Data**.
2. To change the grouping clause, click **AND** to select a different option.
3. Click **press the button to add a new condition**.
4. To change the column, click the listed column and select a new one. The first column in the grid is selected by default.
5. To change the condition, click **equals** and select the appropriate condition (LIKE, EQUAL TO, LESS THAN, and so on).
6. Click **<empty>** and add your criteria.
7. To add additional conditions or groupings, click **Filter** and then select **Add Condition** or **Add Group**.

# Preview Selected Column

You can display or hide a full row below each data row that shows the value of the selected column.

## *To preview current column*

Right-click the column in the Data grid and select **Preview Column**.

# Include Row Numbers and ROWID

Toad can display row numbers and ROWIDs in the Editor data grid.

The total number of rows returned in the resultset will display in the status bar at the bottom of the window only after you have scrolled to the end of the resultset. This is because the resultset is fetched only as required, to improve overall performance. When the last row is fetched, Toad will display the total count.

### ***To display row numbers***

Select **View | Toad Options | Data Grids | Visual** and then select **Show row numbers** (applies to data grid on Browser also).

To return the Oracle pseudo-column ROWNUM in the SQL Results grid

### ***To display ROWIDs***

Select **View | Toad Options | Data Grids | Data** and then select **Show ROWID in editable grids**.

You can achieve the same result by adding the following to the query:

```
select rownum, emp.* from employee emp
```

Remember that rownum is an Oracle pseudo-column, not stored with the table definition or data, but derived when queried.


To return the ROWID in the query, specify the column and the datatype:

```
select rowidtochar(rowid), emp.* from employee emp
```

## **Copy Column Names to the Clipboard**

You can copy the names of selected columns in the data grid to the clipboard. The names are copied in the order they are listed in the grid, for use in WHERE clauses or other tasks where you need a list of column names.

### ***To copy column names***

1. In the data grid, click  (column selector) in the grid header, then select the columns that you want to copy.
2. Select the sort order (alphabetical or grid order, the default).
3. Right-click the selected column list, then select **Copy checked columns to clipboard**.

## Work with Data

Throughout Toad, information is presented in a grid format. Within grids, you can customize grid views, filter result sets, print the grid contents, and other standard operations. Grids that provide query results have additional functionality. In most data grids you can edit data, perform calculations on grid cells, and sort and group data, among many other things.

### Understand Editable Resultsets

A data grid is fully editable providing that the query itself returns a resultset that can be updated. Query statements *must* return the ROWID to be editable. For example:

**Not editable:**

```
select * from employee
```

**Editable:**

```
select employee.*, rowid from employee
```

**Notes:**


- You can substitute EDIT for SELECT \* FROM. Toad translates it into the editable version of the statement. For example, edit employee returns the same result as select employee.\*, rowid from employee.
- If the resultset should be editable but remains read only, make sure the **Use read-only queries** checkbox is not selected on **View | Toad Options | Data Grids | Data** options page.


### Copy Table Data

You can quickly copy data from one or multiple tables to the same table or tables in another schema or database. Toad builds insert statements that use array binding in the variables to copy the data, or if you prefer, create masked data. If you set the array size to 500, then 500 rows are inserted with a single insert statement. The array size is adjustable.

**Note:** Toad copies data from one schema to another between tables that have the same table name. The tables must exist prior to running this command.

### To copy data to another schema

1. Do one of the following:
  - In the Schema Browser, right-click one or more tables, then select **Copy data to another schema**.
  - On the Import/Export tab of the Automation Designer, double-click  (**Copy Table Data**) to add the action to your app, then double-click the action to open the **Properties** dialog.
2. Choose from the menu.
3. Use the **Source/Dest and Options** tab to select destination connection, schema, and options.
4. Use the **Tables, Where Clauses, Data Masking** tab to select tables, add and test a WHERE clause, and specify data masking.

**Tip:** You can check your WHERE clauses by clicking  (**Test Where Clauses**).

## Compare Data

Use the Compare Data wizard to compare data between tables that are within different schemas or in different databases, such as the same tables in production and test environments. Toad then generates a synchronization script that you can run as-is, save as a file, or send to the Editor to be refined.


### To run the Compare Data wizard

1. From the Database menu, select **Compare | Data**.
2. Complete the **Choose Tables** and **Select Columns** pages (see the following descriptions).
3. Click **Next** to run the comparison. Toad displays the results of the comparison and then provides options for generating the comparison script. See [Results Output](#).

## Choose Tables page

Use the tabs of this page to specify the comparison objects and options.

### Tables tab

1. Select the source and target database connections and schemas that contain the tables that you want to compare.
2. Specify database link options as needed:
  - If your first data source is remote, select an existing DB Link.
  - If your first data source is local, leave this box blank.
3. Select the object type, owner, and objects name. Click the > arrow to copy the name to the **Target** side if the source and target selections are the same.
4. (Optional) Add a WHERE clause to further refine the object selection. Click the > arrow to copy the clause to the **Target** side.
5. (Optional) To make the current target the source (switch sides) click  (**Switch Source and Target**).

### Options tab

1. Click **Optimizer Hints** to specify the type of hint to use. When parallel hint is selected, you can specify the degree of parallelism.
2. (Optional) Click **Sort Area Size** to change the current sort area size and the one that Toad goes back to when the window closes. This only affects comparisons that do not go through a Database Link.

## Select Columns page


Select the columns that you want to include in the comparison. Toad notifies you of discrepancies it finds:

- it does not detect a key column
- a column cannot be compared because it does not exist in both tables
- the data types cannot be compared

Toad handles primary keys as follows:

- If a table has a primary key, Toad finds it automatically and identifies it under the **PK** column in the grid.
- If no primary key is found, you can select column(s) under the **PK** column that can be used as a primary key.
- With the primary key identified (automatically or manually), Toad will use those columns to identify whether a row is in both tables, but with differences.
- If no primary key is identified, Toad has no way of identifying a row except by using all of the columns, and rows are either matches, or in one table, or the other.

If structural differences cannot be resolved to enable valid comparison, you can compare the objects themselves.

Click  (**Compare Objects**) at the bottom of the page.

# Results Output



1. Select what you want to do with rows that match: Count them, display them, or ignore them.

Option	Description
<b>Row Count(Match   Differ)</b>	Displays the total number of rows that were compared. <b>Match</b> means the number of rows in each table is the same. <b>Differ</b> means there is a difference in the row count between source and target tables.
<b>Source Only and Target Only</b>	These tabs have the same format and show the number of rows that exist only on the source and only on the target.
<b>Differences</b>	Displays the values of each compared source and target row and highlights differences. This tab displays: <ul style="list-style-type: none"><li>◦ Rows from the source dataset in gray</li><li>◦ Rows from the Target dataset in white</li><li>◦ Column values that differ between source and target are highlighted in yellow.</li></ul>
<b>Matches</b>	This result is displayed if you selected <b>Display</b> as the way to handle rows that match. The row values are shown, which reflect their state in both source and target.

2. Do one of the following:

- Click **Compare** to run the comparison again.
- Select from **Sync** options: Synchronize the data between the tables, send the synchronization script to the Editor, or save the synchronization script to a file. If you choose to synchronize the data, you are prompted whether to commit or roll back the changes.

Notes:

- If you simply close the synchronize window, rather than selecting **Commit** or **Rollback**, Toad displays these icons for you to make that selection:  .
- Toad does an automatic savepoint at the beginning of synchronization. If user cancels the synchronization, Toad rolls back to the savepoint.

From the last three windows of the Compare Data wizard you are now ready to view the differences between your data sources.

- The first window reviews rows in Source 1 that are not in Source 2.
- The second window reviews rows in Source 2 that are not in Source 1.
- The last window reviews all differences.

You must run the SQL code for each window as described below.

## **To make dataset editable**

On the Review Differences page, select the **Editable Dataset** checkbox.

Note: In some editions of Toad, you can delete rows from one table, and insert them into the other directly in the grid.

### **To review rows**

1. Perform any desired optional steps:
  - Click the **View/Edit SQL** button to view or edit the SQL used to compare differences. You can make changes in the Edit SQL dialog box.
  - Click **Check** to verify that the query parses correctly.
  - Click **OK** to apply changes to your query.
  - Click **Execute** to find differences in the columns you want to compare.

### **To delete selected rows**

1. Select the rows you want to delete.
2. Right-click and select **Delete Selected Rows**.

### **To delete all rows**

Right-click and select **Delete All Rows**.

## **Compare Data Duplicates**

Use this dialog box to view record duplicates based on user input.

### **To view record duplicates**

1. Select **Database | Compare | Data Duplicates**
2. Select the **Owner**, **Object Type** and **Object** from the drop-down lists. A list of columns is displayed below. Now, you can do any of the following:

To find this:	Do this:
Find duplicates on all columns	Select <b>Find duplicates on all columns</b> . Do not select any columns in the list.
Find duplicates on just selected columns	Select <b>Find dupes of selected columns</b> . Select one or more columns in the column list.

On the Duplicate Data tabs, an additional column called **Occurences** is added to the end of the grid to display the number of resulting duplicates.

### **To edit duplicate data**

1. From the Table Data Duplicates window, select **Owner** and **Table** from the drop-down lists.
2. Click the **Duplicate Data (Editable)** tab.


3. Click the cell you want to edit and make your changes.

4. Click  on the toolbar.

## Insert and Delete Rows

The dataset must be editable for you to make any changes. [Understand Editable Resultsets](#)


### ***To insert a blank row***

Click  on the data grid toolbar.

### ***To copy an existing row***

Right-click the cell you want to copy and select **Duplicate Row**. If you have a sequence set, then the sequence number advances when you finish editing.


### ***To delete a row***

Click  on the data grid toolbar.


## Post/Revert Edited Data

The dataset must be editable for you to make any changes. [Understand Editable Resultsets](#)

### ***To post data***

1. Make changes to an editable resultset in the data grid.
2. Click  in the grid navigator.

### ***To revert data***

Click  in the grid navigator.

## Edit Data in Popup Editor

You can view and edit data in a Popup Editor. This feature is helpful when there is too much data to view in the data grid.

Note: The dataset must be editable for you to make any changes. [Understand Editable Resultsets](#)

### ***To edit data in the Popup Editor***

Right-click a cell in the data grid and select **Popup Editor**.



# Perform Calculations on Grid Cells

You can perform basic calculations on data grid cells, such as finding the sum or average of the selected cells.

**Note:** This feature is not available if Row Select is enabled. To disable Row Select, right-click the grid and clear the **Row Select** option.

## *To perform calculations on grid cells*

1. Select adjacent cells in the grid.

**Note:** Calculations on non-adjacent cells is not supported.

2. Click  $\Sigma$  in the grid toolbar (CTRL+N). The calculations display in a new row below the grid.

**Tip:** You can also right-click the grid and select **Calculate Selected Cells**.

3. To include additional types of calculations (such as the average or count), click the arrow by  $\Sigma$  and select the appropriate options.

# Use the Calculator

You can access a calculator within Toad data grids. To use the calculator, the table must be editable. [Understand Editable Resultsets](#)

## *To access the calculator*

1. Click in a numeric cell. A drop-down arrow displays.
2. Click the arrow to display the calculator.

# Work with Database Objects

Toad enables you to view, add, modify, and get information about database objects. You can work with these objects quickly and without having to use SQL commands.

## Describe Objects

You can use the Describe Objects feature anywhere in Toad to find objects and display their information in the Describe Objects window. The Describe Objects window displays the same information you would see in the right-hand side of the Schema Browser.

**Note:** You can describe many objects types through database links. However, the following object types are not supported: policy, policy group, java, refresh group, resource groups/plans, sys privs, and transformations.

### *To immediately describe the object*

1. Select the object and press **F4**.  
**Tip:** You can also right-click the object and select **Describe**.
2. If multiple objects have the same name, select the appropriate object from the Multiple Object Found window. (This only applies to the object types in DBA\_OBJECTS.)

### *To specify the object schema and name before describing the object*



1. Press **CTRL+D** to open the Quick Describe window.
2. Enter the object name in the **Object Name** field. You can complete the rest of the fields to refine your search. These fields are helpful when multiple schemas may contain objects with the same name, or when different object types have the same name (for example, a SYSTEM user and table).
3. Click **Describe and Close** to open the object in the Describe Objects window and close the Quick Describe window. If you click **Describe** instead, the Quick Describe window remains open.

# Object Search

Object Search searches all database objects, table columns, index columns, constraint columns, trigger columns, and procedure source code based on a search term. Each of the previously listed items can be searched or excluded from the search by using options.

## *To access Object Search*

Do one of the following:

- From the Toad toolbar, click .
- From the Search menu, select **Object Search**.
- On the DB Misc tab of the Automation Designer, double-click  (**Object Search**) to add the action to your app, then double-click the action to open the **Properties** dialog.

**Tip:** Select **Wrap around** to continuously loop the search, instead of displaying a message that the search is done.

## *To create an object search action*

Click  on the **Automation Designer, DBMisc** tab.

# Search Term

Specify your search term in the box. You can select to search for an exact match, starts with, occurs anywhere, and you can specify a case-sensitive search by selecting that box.

# Object Status

If desired, you can limit your search to Valid or Invalid objects. The default choice is to search both.

# Specifying your Search

The object search is an extremely powerful feature. You can search for almost anything or combination of things you can conceive.

By default, Toad searches through all objects in the schema you specify to find the search term you enter.

You can limit your search to:

- Schemas
- Object names
- Column Names
- Source
- Any combination of these

## Schemas to Search

Select the schemas you want to search. You can right-click in this area to select all, invert your selection, and otherwise control your selection options.

## Search Object Names

When the search object names box is selected, you can select object types from the object list. You can right-click in this area to select all, invert your selection, and otherwise control your selection options.

Note: Currently the DB Admin module is required to search the following objects: Contexts, Dimensions, Directories, Evaluation Context, Library, Operators, Policies, Policy Groups, Profiles, Refresh Groups, Resource Plans, Rules, Rule Sets, Scheduler Chains, Scheduler Jobs, Scheduler Job Classes, Scheduler Programs, Scheduler Schedules, Scheduler Windows, Scheduler Window Groups, and Tablespaces.

## Search Column Names

When the search column names box is selected, you can select object types with columns from the list. You can right-click in this area to select all, invert your selection, and otherwise control your selection options.


## Source Search

The Search Source area of the window uses the Oracle LIKE (databases earlier than 10gR2) or REGEXP\_LIKE (10gR2 and later) operators to determine if the search term exists in a given object's source. For the pre-10gR2 databases, the search searches as if the **Occurs anywhere** option was selected, regardless of what match option is selected in the **Search term** area. For 10gR2 and later databases, if **Exact match** is selected, the search is for an exact match.

# Copy Objects to Another Schema

You can copy objects to another schema.

### *To copy objects to another schema*

1. Click  on the Standard toolbar to open the Schema Browser.
2. Right-click the object you want to copy in the left-hand side and select **Create in another schema**.
3. Select export settings and click **OK**. See *Export DDL* in the online help for more information.
4. Enter the destination connection and destination schemas.
5. To review the script to create the objects, click the Script tab.
6. Click **Execute**.

# Create or Alter Objects


Toad lets you select Oracle object parameters and generate a DDL statement to create or alter objects. It is generally a good idea to review the DDL statement before executing it. When you execute the statement, Toad passes it to the database, and the object is created or altered.

The options to create or alter an object in Toad follow the parameters defined by Oracle. If you need clarification on what an option means or how it should be used, see [Oracle's documentation](#) for more information. Oracle provides detailed documentation about objects, including their purpose, properties, and restrictions.

## Notes:

- Toad strictly adheres to the database security. Consult your DBA to learn what privileges you have.
- You can use an existing object as a template when creating a new one. [Use Existing Object as Template for New Objects](#)

## To create an object

1. Click  on the Standard toolbar to open the Schema Browser.
2. Select **Database | Create | <Object type>**.
3. Complete the fields as necessary.
4. To add the object to the Project Manager, select **Add to Project Manager**.
5. To view the CREATE statement, click **Show SQL** or select the SQL tab.
6. Click **OK** or **Execute** to create the object immediately.

## To alter an object

To alter or edit an object, double-click on it in the Schema Browser. To rename an object (if permitted) press F2.


Note: You cannot make any changes on the **Alter Index | Column** tab because Oracle does not permit an index to be altered that way. To alter an index, send the script to the editor (with a **DROP** command), edit the script, and then run it. As an alternative, you can right-click the index then choose **Create Like**. Enter a name for the new index, make the changes, and then drop the original index.

# Use Existing Object as Template for New Objects

You can use an existing object as a template for creating a new object. Toad loads the original object's properties in the Create window for you to edit as necessary and execute.

**Note:** This feature is not available for all object types.

## To create an object based on an existing one

1. Click  on the Standard toolbar to open the Schema Browser.
2. Right-click the object you want to use as a template in the left-hand side and select **Create Like**.
3. Complete the fields as necessary.


4. To view the CREATE statement, click **Show SQL** or select the SQL tab.
5. Click **OK** or **Execute** to create the object immediately.

## Drop (Delete) Objects

Many objects can be dropped directly from the Schema Browser. **Once you confirm the drop, it cannot be reversed.**

**Note:** If you accidentally drop a table, you may be able to recover it from the recycle bin. [Flashback Tables \(Recover Dropped Tables\)](#)

### *To drop objects*



Select an object in the left-hand side and click  in the toolbar or press DELETE. Tables have additional options:

Option	Description
Cascade Constraints	Deletes all foreign keys that reference the table.
Purge	Bypasses the recycle bin and completely drops the table. Purged tables cannot be recovered.

## Flashback Tables (Recover Dropped Tables)

A recycle bin is available to retrieve tables and associated objects (such as indexes, constraints, and triggers) you have dropped from the database. From the Schema Browser's Recycle Bin page you can access this bin and retrieve dropped tables if necessary.




### *To flashback a table*

1. Click  on the Standard toolbar to open the Schema Browser.
2. Select the Recycle Bin in the left-hand side.
3. Select the table you want to recover from the list and click .
4. Restore the table with the original name or a new one.

## View Parent/Child Datasets in the Schema Browser

When you view a table's data in the Schema Browser, you can split the window to also show child or parent tables in a new detail grid. You can also change the query for the detail grid.

### ***To view parent/child datasets in the Schema Browser***

1. Select a table in the Schema Browser.
2. Select the Data tab and click  on the Data tab toolbar.  
If the table has a single foreign key, Toad automatically displays the related table. If there is more than one foreign key, click the arrow beside  on the detail grid toolbar and select a table. Toad remembers your selection.
3. To edit the query in the detail grid, click  on the detail grid toolbar.

## Create, View and Modify Object Privileges



You can assign object privileges from the Create or Alter User windows, or from the Privileges window.

### ***To access the Add Object Privileges window***

1. On the main toolbar, go to **Database | Create | User**.
2. On the Object Grants tab, click **Add**.
3. Select **All** or **Specify**.
  - If you will specify privileges, select an **Object Type** to select the available privileges.
4. Select an Object Type and choose objects to grant privileges on, using the arrow buttons to move those objects to the Grants grid on the right.

The Privileges window allows you to view, grant, and revoke privileges on a database object. You can view all users and their privileges. If you are not the object owner, you can only grant privileges if you have been given the "grant option."

### ***To access the Privileges window***



1. Click  on the Standard toolbar to open the Schema Browser.
2. Select a table, view, sequence, or procedure on the left-hand side.
3. Click  on the left-hand side toolbar. Grants are highlighted in blue and admin grants in yellow.

**Tip:** If you do not see all users, make sure **Hide privileges granted by other users** or **Hide users/roles with no privileges assigned** is not selected.

## Configure Grantees

From the System Privileges window you can grant or revoke selected privileges to/from a selected user. In addition, you can do the same to a selected role or roles.

### ***To grant or revoke a privilege***


1. Click  on the Standard toolbar to open the Schema Browser.
2. Expand System Privileges.
3. Right click a privilege, then click  (**Configure Grantees**).
4. Check or clear the appropriate boxes to grant or revoke privileges to users or roles.

## Look Up Foreign Keys

When you are editing table data in the Schema Browser, you can look up foreign keys and enter the associated data into the selected table.

Foreign key lookup will also work when the grid is in Read Only mode. You can disable this feature from the Toad Options | Schema Browser | Data and Grids | Enable FK Lookup.

### ***To lookup foreign keys***

1. In the Schema Browser, click the **Tables** tab.
2. Select the table you want to edit and in the details pane click the **Data** tab.
3. Click in a column that has foreign keys. Click again to activate Editing mode. A drill down button displays.
4. Click  to display the rows in the referential table.
5. To enter data in appropriate columns in the data grid, select a row and click **OK**.

## The Foreign Key Lookup Window

Within the lookup window, all foreign key constraints are included. If you want Toad to ignore disabled constraints, see Toad Options | Schema Browser | Data.

You can filter rows by typing or by directly editing the query.

### ***To filter rows by typing***

1. Make sure the **Filter by** box in the lower left is selected.
2. Put your cursor in one of the displayed columns. You can now filter by typing (if you type "ab" it will filter out rows that do not begin with "ab").

### ***To filter rows by editing the query***

1. Click **Edit Query**.
2. Edit the query within the editing window.
3. Specify variables by clicking the **Variable** button and entering variable information.
4. Check that your query syntax is accurate by clicking the **Check** button.
5. Click **OK** to run your new query and filter the lookup grid.



# Compare Objects

## Compare Individual Objects

You can compare individual objects to other objects. If the objects are of the same name and type, the comparison produces a synchronization script, which you can edit if needed, and then run to bring the source and target back into synchronization.

You can initiate the comparison from the Schema Browser or from the Database menu.

### *To compare objects from the Database menu*

From the Database menu, select **Compare | Single Objects**.

### *To compare individual objects from the Schema Browser*

In the Schema Browser, right-click on an object or a pair of objects, then select **Compare**.

Note: You can also select multiple objects from the Schema Browser for comparison. This is not a single-object comparison, and not covered in this topic. If you do select multiple objects, you are redirected as follows:

- If you select more than two objects not owned by a schema, such as users, tablespaces, or profiles, the comparison is directed to the Compare Databases window, which is filtered to only those objects on the Object Set tab. See Compare Databases for more information. [Compare Databases](#)
- If you select more than two schema-related objects, such as tables, views, or packages, the comparison is directed to the **Compare Schemas** window, which is filtered only to those objects on the Object Set tab. [Compare Schemas](#)

### *To configure and run the comparison*

1. On the **Objects** tab:
  - Select the source and target database connection.
  - Under Target, select one of the following:
    - **Live Object** to compare the source object to the actual target object in the database.
    - **Text File** to compare the source object to a script file of the target object.
  - Do one of the following, which will determine the objects that you can choose under **Object Type**:
    - To compare schema objects, select **Schema**, then select a schema for the source and target.
    - To compare non-schema database objects, clear the **Schema** check box.
  - Select from **Object Type**.
  - Select from **Object Name**.

2. On the **Options** tab:
  - For **Schema Objects**: select any additional schema objects that are associated with the selected objects that you want to include in the comparison.
  - For **Tables**:
    - Select whether or not to reorder the target table with DBMS\_REDEFINITION. This package from Oracle enables the redefinition when the table is accepting DML changes.
    - **Include Triggers**—Select to include the triggers on the table.
3. Click **Compare**. The results are shown on three tabs:
  - **Compare Scripts** tab: Shows the source and target DDL that was used to compare the objects in the differences viewer.
  - **Compare Columns** tab: Shows the columns that were compared. You can add the following to this view:

Option	Description
Alphabetical	Arranges columns alphabetically before comparing.
Precision/Scale	Shows and compares the precision and scale of the columns.
Hidden Columns	Shows and compares hidden columns.


- **Sync Script** tab: Shows the sync script that Toad generated from the comparison. This tab is only available if the objects chosen have the same name, and are in different schemas. Using the toolbar options, you can copy the script to the clipboard, open it in the Editor to make changes, or save it to a file.

## Compare Multiple Tables

The Toad Compare Multiple Tables wizard makes it simple to compare more than two tables. You simply point Toad the schemas, then synchronize the data in the tables of those two schemas.

Note: This feature will synchronize the data in the compared tables, but there is not an option to compare the data differences first. To compare the data, go to **Database | Compare | Data**.

### To compare multiple tables

1. Do one of the following:
  - From the main Toad menu, select **Database | Compare | Compare Multiple Tables**.
  - On the DB Misc tab of the Automation Designer, double click  (**Compare Multiple Tables**) to add the action to your app, then double-click the action to open the **Properties** dialog.
2. Make selections according to the following descriptions. The descriptions are listed in the order in which they appear in the wizard. Click Next to move from one page to another.

# Choose Schemas page

## Schemas tab

Select the source and target database connections and schemas that contain the tables that you want to compare. Specify any database link options as desired.

There are two different techniques of synchronization that this feature can perform. Which one Toad uses depends on what you do on this tab.

- If the tables to be compared are in the same database, use the same connection to access the source and target schemas. In this case, Toad can synchronize the tables with just two SQL statements per table: a DELETE and a MERGE. All of the work is performed by the database, so the data does not get fetched to your client PC, and you will not run out of memory if you are synchronizing large tables. This method is the faster method.
- If the source and target schemas are in different databases, select **Allow Toad to create a temporary DB Link from Target to Source**. In this case, Toad creates a private database link on the target database that points back to the source. This allows Toad to join the tables and perform the DELETE and MERGE operations as if the tables were in the same database. The database link has full TNS information, so there is no need for an entry to exist in the **TNSNames.ora** file on the target server. Toad drops the link when the synchronization is finished.

Note: Toad refers to the previous two methods as **Comparison by SQL**.

- If you cannot allow a database link to be created, and the schemas are in different databases, then Toad must fetch all of the rows from each table to your PC and then compare them row by row. This is the slowest and most memory-intensive option. If possible, use the database link when the schemas are in different databases. Note: Toad refers to this method as **Row-by-row comparison**.

## Options tab

This tab enables you to determine what Toad does when it finds anomalies during the initial comparison.

Option	Description
<b>If columns don't match exactly</b>	Select what you want to do if the source and target tables do not have the same number of columns.
<b>If a table contains unsupported datatypes</b>	Select what you want to do if a table contains an unsupported datatype. See <a href="#">Potential comparison problems</a> for examples.
<b>If any table is to be skipped</b>	Select what you want to do when incompatibilities are found during the comparison.
<b>If an error occurs during synchronization</b>	<p>Select what you want to do if there are synchronization errors.</p> <p>Commits are automatic, but you have some control over them with this option:</p> <p><b>Rollback current table and continue</b> directs Toad to issue a commit after each table (except if the synchronization of that table is rolled back due to an error).</p> <p><b>Rollback all tables and stop</b> directs Toad to either commit at the end of the process or roll it back when the first error happens.</p>

Option	Description
	Note: It is not possible to provide the option to commit or do not commit, because DDL occurs at the beginning and end of each compare and synchronization (disable/enable of constraints and possibly triggers, create/drop database link), and therefore commits are implicit in most cases.
<b>Triggers</b>	By default, triggers on the compared tables are disabled so that they do not cause DML to be performed on child tables that may also be compared and synchronized by Toad. Double operations like this will cause errors. Clear this selection if you need the triggers to fire.


## Choose Tables page

To compare all of the tables with matching names in your selected schemas, do nothing on this tab. Otherwise, use this page to specify how to match table names, handle table names that do not match or compare a subset of the tables in the selected schemas.


Option	Description
<b>Match tables automatically</b> and <b>Table names match exactly</b>	Both of these options are enabled by default and indicate that you do not want to refine the table selection further.  Otherwise: <ul style="list-style-type: none"> <li>To compare a subset of the tables, deselect <b>Match tables automatically</b>.</li> <li>To map table names that do not match, deselect <b>Table names match exactly</b>.</li> <li>Or, deselect both if neither of those criteria apply.</li> </ul>
<b>Table name filter</b>	To load only specific tables based on their names, enter standard filter syntax here.
<b>To match target tables to source tables</b>	Select <b>Add before table name</b> or <b>Add after table name</b> if the tables in one schema have a different naming convention than tables in the other schema. Examples: <p>Source has TABLE1, TABLE2, TABLE3 Target has TBL_TABLE1, TBL_TABLE2, TBL_TABLE3 You want to compare TABLE1 with TBL_TABLE1, etc. Put TBL_ in <b>Add before table name</b>.</p> <p>Source has TABLE1, TABLE2, TABLE3 Target has TABLE1_TBL, TABLE2_TBL, TABLE3_TBL You want to compare TABLE1 with TABLE1_TBL, etc. Put _TBL in <b>Add before table name</b>.</p> <p>Source has TABLE1, TABLE2, TABLE3 Target has TBL1, TBL2, TBL3 You want to compare TABLE1 with TBL1, etc. Put TABLE in <b>Search for</b> and TBL in <b>Replace with</b>.</p>

Option	Description
	<p>Source has TBL_TABLE1, TBL_TABLE2, TBL_TABLE3</p> <p>Target has TABLE1, TABLE2, TABLE3</p> <p>You want to compare TBL_TABLE1 with TBL_TABLE1, etc.</p> <p>Put TBL_ and leave <b>Replace with</b> blank.</p>
<b>Reload</b>	Click this option to reload the list of tables after applying filters.
<b>Include</b>	<p>Select this checkbox for every table that you want to include in the synchronization.</p> <p>To map non-identical table names, use the dropdown selector in the <b>Target</b> column to map a target to the source table listed in that row under <b>Source</b>.</p>
<b>Validate</b>	To check the compatibility of the source and target tables for comparison, click this option. See <a href="#">Potential comparison problems</a> for examples.

## Choose Output page

Option	Description
<b>Sync target tables immediately</b>	<p>Select this option to start the synchronization the moment you click  to start the processing.</p> <p>When this option is selected, <b>Array DML</b> is active and selected by default. Array DML means that Toad will apply deletes in batches of up to 1000 rows at a time, and inserts/updates in batches of up to 100 rows at a time. Array DML greatly increases the speed of the synchronization, so you should leave it selected. In this mode, update statements update every column in the rows being synchronized, even if only one column value actually changed. If you do not agree with this methodology, uncheck <b>Array DML</b>. Note: If a large percentage of the rows in a large table need to be synchronized, running the synchronization without Array DML may be very slow compared to using Array DML.</p>
<b>Create one script...</b>	Select <b>Create one script for each table</b> or <b>Create one script for all tables</b> and then specify the output folder or file name.

## Compare and Sync page

Click  to start the processing. Toad shows the progress and results of the operations on the tables that you specified.

The grid shows a row for each table to be compared. Toad makes two passes through the list, first to evaluate the tables for compatibility and to disable foreign keys, and the second to perform the comparison and synchronization. The comparison type is shown:

- For **Comparison by SQL** (performed by the database), Toad displays the number of rows that are deleted and merged (inserts and updates).
- For a **Row-by-row comparison** (performed by Toad on your PC), this window displays details about the rows that are inserted, deleted, and updated, as well as the number of matching rows (the **Matches** column). The **Time Remaining** column shows how much time remains on each step (one step is deletes, the other is insert and update).

## Potential comparison problems


The following chart shows potential validation problems that can arise from incompatible source and target tables. In this table, **Supported in Row By Row Comparisons** refers to comparisons performed by Toad on your PC, and **Supported in Comparison by SQL** refers to comparisons performed by the database.

(Potential) Problem	Supported in Row By Row Comparisons	Supported in Comparison by SQL
LONG, LONG Raw datatype	Yes	No
User-defined datatypes	No	No
Nested tables and arrays	No	No
BFILE datatype	No	No
CLOB, NCLOB, BLOB, XMLTYPE	No	Yes, if not using DB Link
All other datatypes	Yes	Yes
Columns in diferent order	Yes	Yes
Missing Primary Key	No	Yes
Different Primary Keys	No	No
Identity Columns	No	No
Extra columns in source	Optionally, Yes	Optionally, Yes
Extra columns in target	Optionally, Yes	Optionally, Yes

## Compare Schemas

The Compare Schemas Wizard provides an easy to use interface for doing comparisons among two or more schemas. Based on your specifications, the wizard generates a script that you can save to a folder on your computer or run immediately to synchronize the two schemas. The wizard also enables you to add or check in the script to source control.

### To run the wizard



1. (If comparing from databases) Connect to the source and target databases that contain the schemas to be compared.
2. Do either of the following:
  - From the Toad menu, select **Database | Compare | Schemas**.
  - On the DB Misc tab of the Automation Designer, double-click  (**Compare Schemas**) to add the action to your app, then double-click the action to open the **Properties** dialog.
3. The Choose Schemas page is shown. You can compare:
  - One source schema or snapshot file to one or more target schemas or snapshot files
  - Multiple pairs of schemas between a source and target database
  - One or more pairs of snapshot files.
4. Select one of the following sets of steps for the type of comparison that you want to run.

### To compare one source schema/snapshot file to one or more target schemas/snapshot files


1. Under **Source**, select **Database** or **Snapshot**, then select the connection and schema or snapshot file as appropriate.

2. Do one of the following under **Target**:

*To select one target at a time:*

- a. Click .
- b. In the Add Schema dialog, select either **Database** or **Snapshot**, then select the target connection and schema or snapshot file as appropriate.
- c. Click **OK** to add the selection to the Connection/File list.
- d. To add another target, click  then repeat the steps.

*To select multiple targets at once:*


- a. Under **Target**, click the arrow next to  then select **Add Multiple Schemas**.
  - b. Select **Same Database** to compare different schemas within the same database, or select **Different Databases** to compare the same schema from different databases.
  - c. Do one of the following, depending on what you selected in the previous step:
    - (If you selected **Same database**) Select the database under **Connection**, then double-click the schemas under **Available Schemas** to move them to the Selected Schemas list.
    - (If you selected **Different databases**) Select the comparison schema under **Schema**, then double-click the target connections from **Available Connections** to move them to the Selected Connections list.
  - d. Click **OK** to add the selection to the Connection/File list.
3. Click **Next**.
  4. Select options from the Choose Options window. See [Choose Options](#)
  5. Click **Compare** to run the comparison.
  6. See [Using the Comparison Results](#).

### ***To compare multiple pairs of schemas between a source and target database***

1. Under **Source**, select **Database**.
2. Under **Source**, select the source database under **Connection**, then select **<multiple schemas>** from the **Schema** dropdown.
3. Under **Target**, select the target database under **Connection**.

4. (Optional) Under **Target**, use the **Schema filter** box to match the schemas to a particular pattern. For example, in the screenshot below, I could change the filter to "COMP%" to only compare the schemas that begin with the letters COMP.
  - Select **Match schema names automatically** to have Toad automatically match the source and target schemas by name when you run the comparison. The match is shown in the lower half of the window. (Note: Built-in schemas like SYS, SYSTEM, ORDSYS, etc, are excluded. Look for "MultipleSchemasToIgnore" in the **Toad.ini** file if you want to edit the list of schemas that Toad will ignore).
  - Deselect **Match schema names automatically** to choose the schemas to compare manually. Toad will display the schemas found in the Source and Target Connections, and it will check the ones it finds that exist in both schemas. You can change the Target schema if you want to match a source to a schema by a different name, and you can check/uncheck in the **Include** column to indicate which schema pairs to compare.
5. Click **Next**.
6. Select options from the Choose Options window. See [Choose Options](#)
7. Click **Compare** to run the comparison.
8. See [Using the Comparison Results](#).

### ***To compare one or more pairs of snapshot files***

1. Under **Source**, select **Snapshot** then select **<Multiple Files>** for Snapshot File.
2. Do one of the following:
  - **Specify Files:** Click click  to add a pair of snapshot files to the comparison. Repeat this step as many times as needed to add all of the source-target snapshot file pairs.
  - **Specify folders:** Select this option to specify source and target folders that contain the snapshot files. Use this option only if all of your source files are in one folder and all of your target files are in another folder, and the pairs of files to be compared have the same file names.
3. Click **Next**.
4. Select options from the Choose Options window. See [Choose Options](#)
5. Click **Compare** to run the comparison.
6. See [Using the Comparison Results](#).

## **Choose Options**

Note: You can right-click to select **Check All** or **Uncheck All** and **Expand All** or **Collapse All** if needed.

Option	Description
<b>Compare   Object Types</b>	Select the object types that you want to compare. Unchecked items are ignored. Note: You can right-click to select <b>Check All</b> or <b>Uncheck All</b> and <b>Expand All</b> or <b>Collapse All</b> if needed.
<b>Compare   Output</b>	Output of the synchronization script is optional and can be saved later, but for multiple comparisons it is more convenient to configure output than to save the files later.



Option	Description
	<ul style="list-style-type: none"> <li>• <b>Base Output Folder:</b> Toad creates a subfolder for each compared pair of schemas in the specified folder.</li> <li>• <b>Snapshot Files:</b> These checkboxes are only enabled when the schema being compared is from a live database, not a snapshot file. Select one or both to have snapshot files saved.</li> <li>• <b>Comparison Results:</b> Difference details and the difference summary can be output as follows: <ul style="list-style-type: none"> <li>• Select <b>File:</b> to save the results in the folder specified for <b>Base Output Folder</b>.</li> <li>• Select <b>Email</b> to email the results instead of being saved to file. To use the email option, you must configure the <b>Email Settings</b> in Toad Options (<b>View   Toad Options</b>).</li> </ul> <p>The <b>Sync script</b> that Toad produces to synchronize the source and target schemas can be emailed, saved to file, or sent to the source control location that is specified with the <b>Source Control</b> options. The source control system itself must be specified in the Team Coding configuration.</p> </li> </ul>
<b>Options   Objects</b>	Select additional comparison criteria for objects that you are comparing.
<b>Options   Storage</b>	Select which storage attributes to compare.
<b>Options   Script</b>	Select the items to include in the synchronization script.
<b>Filters</b>	<p>Further refines the object selection.</p> <p><b>Compare Object Names:</b> Compares only objects that have a name that matches (or does not match) the pattern you supply.</p> <p><b>Maximum number of differences:</b> Stops the comparison if the specified number of differences is found in a pair of schemas.</p> <p><b>Exclude File:</b> Prevents certain objects from appearing in the synchronization script (details on how to create an exclude file are given in the "Compare and Review" section).</p> <p><b>Object Set:</b> Lists which objects are to be compared. If no objects of a particular type are listed here, then all objects of that type will be compared. For example, suppose you selected both "Tables" and "Views" in "Object Types", and in the Object Set grid, you listed three tables. Of all the tables in the schema, only those three will be compared. Because you did not specify any views in the Object Set, all views in the schema will be compared.</p>

## Using the Comparison Results

When the initial comparison is complete, the bottom half of the window shows the results for the selected pair of schemas on a series of tabs.




- Right-click on an object on the **Difference Details** tab to view additional options.
- To exclude an object from the synchronization script, uncheck it in the **Difference Details** list. You can then create an exclusions list by right-clicking in the window, then selecting **Create Exclusion File from unchecked items**. A file will be produced based on your selection. This file contains further instructions on how to edit it, if needed. To filter based on the exclusion file, click Back to go back to the Options page, then specify the file under **Exclude File**. You can then run the comparison again with the objects excluded.
- To find a particular object in the **Difference Details**, click anywhere within the list and then press **CTRL+F** on your keyboard to get a filter dialog. Press **ESC** to undo the filter.

## Compare Databases

The Compare Databases wizard provides an easy way to compare two or more databases, either live or from a snapshot. Based on your specifications, the wizard generates a script that you can save to a folder on your computer or run immediately to synchronize the two databases.





This feature is only available with the DB Admin Module, which is included in several Toad Editions or can be purchased separately.

### To run the wizard

1. (If comparing from databases) Connect to the source and target databases that you want to compare.
2. Do either of the following:
  - From the Toad menu, select **Database | Compare | Databases**.
  - On the DB Misc tab of the Automation Designer, double-click  (**Compare Databases**) to add the action to your app, then double-click the action to open the **Properties** dialog.
3. Under **Source**, select **Database** or **Snapshot**, then select the connection or snapshot as appropriate.
4. Click .
5. In the Add Schema dialog, select either **Database** or **Snapshot**, then select the target database or snapshot file as appropriate.
6. Click **OK** to add the selection to the Connection/File list.
7. To add another target, click  then repeat the steps.
8. Click **Next**.
9. Select options from the Choose Options window. See [Choose Options](#)
10. Click **Compare** to run the comparison.
11. See [Using the Comparison Results](#).

## Choose Options




Note: You can right-click to select **Check All** or **Uncheck All** and **Expand All** or **Collapse All** if needed.

Option	Description
<b>Compare</b>	Under <b>Object types</b> and <b>Database settings</b> , select the objects and settings that you want to compare and, if applicable, synchronize. Unchecked items are ignored. Note: You can right-click to select <b>Check All</b> or <b>Uncheck All</b> and <b>Expand All</b> or <b>Collapse All</b> if needed.
<b>Output</b>	<p>Output is optional and can be saved later, but for multiple comparisons it is more convenient to configure output than to save the files later.</p> <ul style="list-style-type: none"> <li>• <b>Base Output Folder:</b> Specify a folder to contain the synchronization script that Toad produces and other output.</li> <li>• <b>Snapshot Files:</b> These checkboxes are only enabled when the schema being compared is from a live database, not a snapshot file. Select one or both to have snapshot files saved.</li> <li>• <b>Comparison Results:</b>  <b>Difference details</b> and the <b>difference summary</b> can be output as follows: <ul style="list-style-type: none"> <li>• Select <b>File:</b> to save the results in the folder specified for <b>Base Output Folder</b>.</li> <li>• Select <b>Email</b> to email the results instead of being saved to file. To use the email option, you must configure the <b>Email Settings</b> in Toad Options (<b>View   Toad Options</b>).</li> </ul> <p>The <b>Sync Script</b> that Toad produces to synchronize the source and target databases can be emailed or saved to file.</p> </li> </ul>
<b>Options</b>	<p>Select additional comparison criteria for objects that you are comparing and that you want in the synchronization script.</p> <p>Note: If you plan to run the synchronization script and you selected <b>User/Role privileges</b> under <b>Object types</b>, make certain <b>Don't synchronize passwords for users and roles</b> remains selected if you do not want the target passwords to be overwritten by the source passwords.</p>
<b>Filters</b>	<p>Further refines the object selection.</p> <p><b>Maximum number of differences:</b> Stops the comparison if the specified number of differences between databases is found.</p> <p><b>Object Set:</b> Select this option to filter the comparison to a set of specific objects.</p> <ul style="list-style-type: none"> <li>• Click  to open a dialog that enables you to specify an object type, schema, and filter rule for that object type. You can then further refine the list by deselecting objects as needed.</li> <li>• Click  to save this rule to a file as an Object Set for use in later comparisons.</li> <li>• Click  to load a saved object set to this comparison.</li> <li>• To make it easy to load more than one object type, clear <b>Close on rows loaded</b>. It prevents Toad from closing the dialog after your first selection and then prompting to clear the grid when you click  again.</li> </ul>

Option	Description
	<ul style="list-style-type: none"> <li>Select <b>View/edit query before executing</b> to make changes to the query that runs the object selection.</li> </ul> <p>If no objects of a particular type are listed here, then all objects of that type will be compared.</p>

## Using the Comparison Results

When the initial comparison is complete, the bottom half of the window shows the results for the selected pair of schemas on a series of tabs.

- Right-click on an object on the **Details** tab to view additional options. Tip: Right-click an object in the list, then select **Show sync script for selected items** to view the DDL that is in the script for the selected object.
- To exclude an object from the sync script, uncheck it on the **Details** tab.
- You can save the selected objects to a file by clicking  on the toolbar of the **Details** tab.
- Use the **Summary** tab to view the differences in the two databases, grouped by objects that were compared. You can save this as html by clicking  on the toolbar.
- Use the **Sync Script** tab to view the DDL changes that will be made to the target database when you run the script. You can save this script to a variety of file types by clicking  on the toolbar or by right-clicking within in the tab and then selecting **Save**. You can also print the script from the right-click menu.

# Rebuild Objects

## About Rebuilding Objects

Use the Rebuild Multiple Objects window to identify objects that need to be rebuilt, and then set criteria to rebuild them simultaneously.

[Rebuild Multiple Objects](#)

You can also rebuild one index or table at a time from the Schema Browser, with a simpler interface.

## Rebuild a Table




Use this wizard to rebuild a table, including dropping and renaming columns.

Notes:

- You can simultaneously rebuild multiple tables with the Rebuild Multiple Objects feature.
  - [Rebuild Multiple Objects](#)

- You must own the schema in order to rebuild a table from it.

### **To rebuild a table**

1. Click  on the Standard toolbar to open the Schema Browser.
2. Right-click the table in the left-hand side and select **Rebuild | Table**.  
**Tip:** You can also select **Database | Optimize | Rebuild Table**.
3. Add, edit, or remove columns as needed, then click **Next**.
4. Select **Data**, **Table Parameters**, and **Index Parameters** as needed to specify any new settings for the table, then click **Next**.  
**Note:** The parameters in this window are defined by Oracle. See [Oracle's documentation](#) for more information.
5. View the ALTER statement. On this page you can:
  - Click  to save the script.
  - Click  to edit the script.
  - Click **Run** to execute the rebuild.


Note: If the table was checked out from Team Coding, it is automatically updated after the rebuild is run.

## Rebuild an Index

This procedure explains how to rebuild a single index.

Note: You can rebuild multiple indexes and tables at the same time. [Rebuild Multiple Objects](#)




### **To rebuild an index**



1. Click  on the Standard toolbar to open the Schema Browser.
2. Right-click the index in the left-hand side and select **Rebuild Index**.
3. Select parameters as necessary.  
**Note:** The parameters in this window are defined by Oracle. See [Oracle's documentation](#) for more information.
4. To view the ALTER statement, select the **SQL** tab.
5. Click **OK**.

## Rebuild Multiple Objects

The Rebuild Multiple Objects feature allows you to simultaneously rebuild multiple indexes, tables, or LOB segments.



## To rebuild multiple objects

1. Select **Database | Optimize | Rebuild Multiple Objects**.
2. Select the Indexes, Tables, or LOB Segments tab.
3. Click the arrow beside  to load objects.
4. To quickly eliminate objects that do not need to be rebuilt:
  - a. Select the Thresholds and Performance Options tab, and complete the **Consider objects for rebuild only if** fields.
  - b. Select the tab where you the loaded objects.
  - c. Click the arrow beside  and select **Delete rows for items that fail consideration thresholds**.
5. To have Toad recommend indexes to rebuild:
  - a. Select the checkbox beside indexes you want to examine.
  - b. Select the Thresholds and Performance Options tab and complete the **Mark indexes for rebuild only if** fields.
  - c. Select the Indexes tab and click .

**Tip:** You can click  to automatically rebuild the recommended indexes, or click  to generate a rebuild script for the recommended indexes (the script is copied to the clipboard and you can paste it into the Editor).
6. Complete the other tabs as necessary. Review the following for additional information:

Tab/Option	Description
<b>Thresholds and Performance Options tab</b>	Use the following option to...
Use 'Online' option	Have Toad rebuild or move the table or index while it is in use.
<b>Storage Clause Adjustments - Extents tab</b>	Use the following option to...
Change Extent Sizes to the Following	<p>Change the extent sizes, which overrides any options set in the top part of the window.</p> <p>If you opt to use this feature, make sure you examine the index before you use it. Because the percent used is a factor, this value can only be obtained by examining the indexes. Note that this is not the PCTUSED storage parameter. This refers to the actual percentage of allocated storage space for the index being used.</p>
Adjust Extent Sizes to Minimize # of Extents	<p>Minimize the number of extents. When this option is selected, the new extent size for each index is calculated as follows: working size equals the total size multiplied by the percent used.</p> <p>This working size is then passed through the <b>Make extent this size</b> or <b>Round All Extent Sizes to the Nearest Power of...</b> algorithm, as selected. The resulting value is the new initial_extent size. It is also the new next_extent size. Pctincrease is</p>

Tab/Option	Description
	<p>set to zero.</p> <p>Caution: If some indexed tables are used as large temporary tables but are usually empty, Toad may recommend that you rebuild them because they have zero percent used. If you use <b>Adjust Extent Sizes</b> during the rebuild, Toad would build the index with small extents that may not hold all of your data later. Avoid this by either using global temporary tables, or do not rebuild indexes with a percent used of zero.</p>
<b>Storage Clause Adjustments - Tablespaces Tab</b>	<p>Select options to move all objects to different tablespaces, or selectively dependent upon their size.</p> <ul style="list-style-type: none"> <li>• If you choose to move indexes to a tablespace based upon the size of the index, and have chosen <b>By Index Size</b> on the Extents tab, size is based on the total size of the index.</li> <li>• If you choose to move indexes to a tablespace based upon the size of the index, and you have chosen <b>By Extent Size</b> on the Extents tab, then the size is based on the INITIAL extent size, as opposed to the NEXT extent size.</li> </ul>
<b>Email Notifications tab</b>	<p>Select whether to send email notifications after completion. The email is sent to the recipients defined on the Email Settings options page.</p> <p>See "Email Settings" in the online help for more information.</p>

7. Select the checkboxes for objects to rebuild and click  to rebuild them immediately or  to create a rebuild script (the script is copied to the clipboard and you can paste it into the Editor).

## Work with Code

Toad provides an intuitive and efficient way to write, run, and test your SQL and PL/SQL code. Toad supports efficient code management for a single developer or a whole team of developers.

### Write Statements and Scripts

#### Move through Code with the Navigator

The Navigator panel displays an outline of the code in the active window. You can click on the items listed to navigate to that statement in the Editor.

##### ***To access or hide the Navigator***

Right-click the Editor and select **Desktop | Navigator**.

The left pane contains a list of statements, objects or package contents that are contained in the Editor. The list is displayed in a hierarchy, with each element broken out separately. To hide any of these elements, right-click the hierarchy and select **Navigator Options**.

##### ***To display the entire statement***


Hover the pointer over an item in the Navigator. Information about it is displayed as a tooltip.

##### ***To jump to the statement***

Click on the statement in the Navigator and the cursor jumps to that point in the Editor.

##### ***To refresh the navigator panel***

Do one of the following:

- Save the current file
- Click the **Refresh**  button.



# Pick Objects from the Object Palette

The Object Palette shows all of the objects and their columns in a selected schema. The Object Palette can be docked to the main Toad window, so that it is available within any of your Toad windows, or you can drag it away from its default location to use as a floating palette in a position of your choosing.

When you work in the Editor, you can use the Object Palette as a quick-reference tool to view the objects that you might want to use as you write SQL, rather than opening the Schema Browser for that purpose. You can also drag a table or column name from the Object Palette to Editor.

When the active connection changes the Object Palette automatically refreshes to reflect the new active connection. Or, you can use the refresh button to refresh the list (this method queries the database).

## ***To access the Object Palette***


From the View menu, select **Object Palette**.

## ***To undock and redock the Object Palette***

To undock and float the palette to a new location, drag the heading area to the desired position.

To redock the palette, double click the heading area.


## ***To view columns***

In the Object Palette, click . Columns are displayed for the selected object at the bottom of the palette.

## ***To view objects from a different schema***

1. At the top of the Object Palette, click the **Schema** drop-down.
2. Select the new schema from the list. Objects from that schema now display in the object list.

## ***To change the style in which objects are listed***

1. Click the drop down arrow beside .
2. Select the style in which you want to view objects.

## ***To insert an object into an Editor***

1. Place your cursor in the Editor in the location where you want the object.
2. In the Object Palette, double-click the object you want to insert.

## ***To perform a DESCRIBE on an object***

1. In the Object Palette, select the object you want to describe.
2. Press **F4** to display the DESCRIBE window.

## ***To filter the Object Palette***

1. In the Object Palette toolbar, click the appropriate filter button:
  - Project Manager filter
  - Filter tables. [Create Schema Browser Filters](#)
2. Enter the filter criteria to limit the objects shown.

# Use Code Completion Templates

Code Completion Templates enable you to store sections of code as a template and then use a keystroke (**CTRL+SPACE**) to select the named template from a list, which inserts it where your cursor is in the Editor. This feature reduces the amount of time that you spend writing the same code over again.

Code templates are more than a single phrase and can contain line feeds, substitution variables and a cursor position indicator.

## **Example**

```
entire cursor block (crbl)
```

```
DECLARE
```

```
CURSOR c1 IS
```

```
SELECT | FROM WHERE;
```

```
c1rec IS c1%ROWTYPE;
```

```
BEGIN
```

```
OPEN c1;
```

```
LOOP
```

```
FETCH c1 INTO c1rec;
```

```
EXIT WHEN c1%NOTFOUND;
```

```
END LOOP;
```

```
CLOSE c1;
```

```
END;
```

*Where:*

- crbl is the name of the template
- entire cursor block is the description of the template
- subsequent content is the body of the template

Note: Do not leave spaces between the end of the template description and the final right bracket! NT4.0 API calls to manage profile strings have a bug that will cause reading of the templates file to fail.

## **To edit or create a Code Template**

Toad provides a list of default templates. As you use this feature, however, you can create templates that work better for your purposes, and you may want to edit the default templates or create new ones. You can view and manage Code Templates from the Editor section of the Toad Options. See *Code Templates Options* in the online help for more information..

## **To use a Code Completion Template**

1. Place the cursor where you want the template code to be inserted in the Editor.
2. Type the name of the template (for example **crbl**) and then press **CTRL+SPACE** to load the body of the template. If you do not know the name of the template, press **CTRL+SPACE** to select it from a list. This list is also shown if you type a name that does not exist.
3. When a template containing substitution variables is selected, you are prompted to enter values. Enter the values in the dialog, then press **OK**.

If Toad finds a single pipe ( | ) in the template body, it repositions the cursor at that point when the substitution of the template is complete. The pipe is removed, as it is used only as a marker for the cursor position. Only one pipe can be used this way in a code template.

## Create Templates for Make Code Statement Functions

You can create your own **Make Code Statement** templates.

You can set options for these templates.

See *Code Assist Options* in the online help for more information.

### To create a Make Code template

1. From the Toad Options window, select **Editor | Code Assist**.
2. In the **Make Code** area, click **Add**.
3. Use the following variables to create your own language template:
  - %SqlVar% - this is the MakeCode variable entered in the Toad Options | Editor | Code Assist | MakeCodeVariable box. Using a variable here is optional.
  - %SqlLength% - This will be replaced by the number of characters in all selected SQL, on one or multiple lines.
  - %SqlText% - This is replaced by the first line of SQL you have selected.
  - %SqlTextNext% - This will be replaced by any subsequent lines of SQL you have selected. This is cumulative and includes ALL subsequent lines of SQL.

Note: For the best output result, it is recommended that the %SqlTextNext% variable be included on a separate line. Use the left and right brace for comments.

Remarks (such as template name) should be included in brackets.

4. Click **OK**.

## Examples:

Using the following SQL:

Select \*

from

Employees

and using the following code templates, you will get the results below.

Template	Result
{C# Language Template} string %SqlVar%& = "%SqlText% " + "%SqlTextNext% "	string SQL = "Select * " + "from " + "employees "

Template	Result
	;
{C++ Language Template}  char %SqlVar%[%SqlLength%]; strcpy(%SqlVar%,"%SqlText%"); strcat(%SqlVar%,"%SqlTextNext%");	char SQL[23]; strcpy(SQL,"Select * "); strcat(SQL,"from "); strcat(SQL,"employees");
{ Java Language Template }  "%SqlText% " + "%SqlTextNext% "	"Select * " + "from " + "employees "

## Create and Manage Code Snippets

You can create and reuse code snippets in the Editor.

Note: The file associated with these items is located in:

C:\Users\<user>\AppData\Roaming\Quest Software\Toad for Oracle\<version>\User Files\CodeSnippets.dat

### To use Code Snippets

1. From the View menu, select **Code Snippets**.
2. Select a **category of code** from the box at the top of the window.
3. Select the code from the list. You can do the following:
  - View a description of the code in the area below the code list
  - Double-click the code to insert it into the active editor tab
  - Drag and drop code into the editor

### To Edit Code Snippets

1. In the Toad Options window (View | Toad Options), select **Code Snippets**.
2. In the Code Snippets list, select the category of snippets you want to edit and then click **Edit**.
3. Select the snippet you want to edit, and click **Edit**.
4. Edit the Oracle Function or the description and click **OK**.

### To Add Code Snippets to an existing category

1. In the Toad Options window (View | Toad Options), select **Code Snippets**.
2. In the Code Snippets list, select the category of snippets and then click **Edit**.
3. Click **Add**.
4. Enter the code in the **Oracle function** box.

5. Enter a description in the **Description** box.
6. Click **OK**.

### ***To Add Code Snippets to a new category.***

1. In the Toad Options window (View | Toad Options), select **Code Snippets**.
2. In the Code Snippets list, click **Add**.
3. Enter a category name in the **Category** box.
4. Enter the code in the **Oracle function** box.
5. Enter a description in the **Description** box.
6. Click **OK**.

### ***To highlight a snippet***

1. Place your code in the snippet you want to highlight.
2. From the Editor menu, select **Highlight Snippet** (CTRL+H).

## Complete Code from a Pick List

Toad helps you write code by displaying a pick list with relevant object or column names. For example, if you start typing SYS and invoke the pick list, the SYSTEM user would be included in the pick list.

Toad provides options for you to customize this behavior, such as adjusting the length of time before the pick list displays. See *Code Assist Options* in the online help for more information.

### ***To display the pick list***


Press CTRL+T, or begin typing a name and pause 1.5 seconds.

**Note:** There are additional shortcut keys you can use with Code Insight. See *Code Insight Pick List Shortcuts* in the online help for more information.

## Use Query Templates

Toad has standard query templates, such as Show Dependent Objects or Column Counts, and you can also create your own custom query templates. When you use a query template in the Schema Browser, Toad builds the query with the selected objects and opens the query in the Editor.

### ***To use a query template***

1. Click  on the Standard toolbar to open the Schema Browser.
2. Select the objects you want to use for the query on the left-hand side.
3. Right-click the objects and select **Custom Queries | <Query Name>**.



Custom queries are designed to select from the data dictionary about the tables you select, rather than making custom SELECT statements. For example, the following query is not valid as a custom query because there is no specific object stated:

```
select * from <ObjectOwner>.<ObjectList>>
```

However, this more specific query is valid:

```
select *
from dba_tables
where owner = <ObjectOwner>
and table_name in <ObjectList>
```

### ***To create a new query template***

1. Right-click in the left-hand side of the Schema Browser and select **Custom Queries | Edit Custom Queries**.
2. Click  above the query list.
3. Enter your new query name, and query.
4. Click  to create the query and add it to the selection list.

## Format Code

You can have Toad format your code in the Editor. For example, you can insert spaces instead of tabs or change the case for SQL commands.

### Before formatting

```
CREATE OR REPLACE FUNCTION purge_syn_file RETURN number IS v_sqlstring v
number; v_result varchar(2000); done boolean; v_sqlname varchar2(40
); v_rowcount number; v_classid number(11,0); CURSOR purged_files_t
CURSOR c IS SELECT table_name FROM user_tables a JOIN ctables b ON a.tabl
"VIEW"); BEGIN FOR r IN c LOOP DBMS_OUTPUT.put_line(r.table_nam
,table_name,estimate_percent => DBMS_STATS.auto_sample_size,method
); END LOOP; END; v_sqlstring := 'truncate table purged_stvm_temp'
; EXECUTE IMMEDIATE v_sqlstring; SELECT COUNT(*) INTO v_count FROM
THEN BEGIN v_sqlstring := 'truncate table active_file_id'; EXECUTE IM
; EXECUTE IMMEDIATE v_sqlstring; EXCEPTION WHEN OTHERS THEN
WHERE table_name = 'TEMP_FILE'; IF v_count = 1 THEN BEGIN v_sqls
; v_sqlstring := 'drop table TEMP_FILE'; EXECUTE IMMEDIATE v_sqlstri
IF; SELECT COUNT(*) INTO v_count FROM user_tables WHERE table_name
```

### After formatting

```

CREATE OR REPLACE FUNCTION purge_syn_file
RETURN NUMBER
IS
  v_sqlstring  VARCHAR2 (4000);
  v_hex_value  VARCHAR2 (100);
  v_decin      NUMBER;
  v_next_digit NUMBER;
  v_result     VARCHAR (2000);
  done         BOOLEAN;
  v_sqlname    VARCHAR2 (40);
  v_count      NUMBER;
  v_md5_count  NUMBER;
  v_bdelete    CHAR (1);
  v_rowcount   NUMBER;
  v_classid    NUMBER (11, 0);


  CURSOR purged_files_temp_cursor
  IS
    SELECT * FROM purged_files_temp;

```

Code formatting is controlled by the Formatter.


See *Formatter Options* in the online help for more information.

### To format a statement

Select the statement you want to format and click 'Format Code'  on the Editor toolbar, or select the drop-down arrow to select:

- Format Case Only,
- Profile Code, or
- Formatter Options (opens the Options window).

### To format an entire script

Click  on the Edit toolbar.

You can also right-click the script and select **Formatting Tools | Format Code**.

## Highlight Statements

You can highlight bits of code so that an explain plan is run on only that code, or so that you can see what Toad is including as a part of the statement before you Execute it. Highlighting code uses the same logic as SHIFT+F9.

### To highlight a SQL Snippet

Place your cursor in the code you want to highlight and then press **CTRL+H**.

# Fold Code Segments

Code folding lets you collapse portions of your code so that you can see more of the code you need to see. Then you can expand it when you need to work with the folded code.

## *To enable code folding*

From **View | Toad Options | Editor | Behavior**, select **Enabled** under **Folding**.

## *To fold and unfold code selection*

The folding indicator is the icon in the code gutter that you click. By default, it is as follows:

To fold a segment, click  in the Editor gutter.

To unfold a segment, click  in the Editor gutter.

## *To set the appearance of the fold indicator*

To change the style of the fold indicator, go to **View | Toad Options | Editor | Behavior**, then select from the **Style** dropdown.

To change the colors of the fold indicator, go to **View | Toad Options | Editor | Font and Styling**, then select **Fold Indicator** (appearance when a code block is expanded or **Fold Indicator, Active** (appearance when a code block is folded).

# Change Text to Upper or Lower Case

Capitalization Effects that you have set up in the Toad Options can override your Upper Case and Lower Case conversions.

## *To change the selection to Upper Case*

Select **Edit | Upper Case** (CTRL+U).

## *To change the selection to Lower Case*

Select **Edit | Lower Case** (CTRL+L).

## *To change the selection to Lower Case*

Select **Edit | Initial Caps** (CTRL+I).

Note: The Editor provides one level of Undo for any action. Select **Undo** from the **Edit** menu, or use the CTRL+Z keystroke combination.

# Swap with Previous Line

The **Edit | Swap This/Prev Lines** menu item switches the line your cursor is on in the SQL script with the previous line.


For example, if the cursor is on Line 8, then when you swap, what was on line 8 would now be on line 7 and what was on line 7 would now be on line 8.



# View and Merge Differences


Use the Compare Files utility to compare files and scripts with other files and scripts, as well as database objects with revisions in the VCS. This utility provides a split window composed of read-only versions of the files that are different, plus an editable third window where the merged source code is assembled.

## *To open the Compare Files utility*

Select **Utilities | Compare Files**, or click  on the toolbar of any Toad feature that works with files.


Depending on where you open the utility, there may or may not be files displayed. If files are not displayed, you are prompted to select them. If both files are in the same directory, you can select them both at once. Otherwise, you are prompted to select both left and right sides separately.

## *To customize the Compare Files interface*

Click  to set the options.

# View Differences

The upper two comparison windows make use of standard diff tool features:



- The differences are color-coded with a legend to explain them at the bottom of the Compare Files window. By default, the Compare Files window finds the next/previous differences by block, rather than by line. You can change this option by clicking  (**Options**) in the Compare Files toolbar, then selecting **Finds next difference line**.
- The Compare Files toolbar provide tools for copy/paste, finding text, moving up and down through differences, showing only different or matching lines, and switching sides.

Compare Files also shows a Differences Map on the left side of the window. The Differences Map is a visual summary of the differences and lets you quickly change sections of the file. Colored lines show the relative position of line mismatches. An arrow represents the part of the text currently visible in the comparison window. You can click the thumbnail view to position the view at that point in the documents.

Note: If the Differences Map is not shown, click  in the Compare Files toolbar.


## *To show line numbers and white space*

On the toolbar:

- Click  to show line numbers.
- Click  to show white space.

## *To view a list of differences*

Click  on the toolbar. The report shows each difference and its line number.


Click  on the toolbar to view a comparison summary. The summary shows the number of matches and the number of differences in the code on the right, as compared to the code on the left.

## *To view differences line by line*

Click  on the toolbar. This opens the line viewer pane below the split differences window.


## Merge the Code

The proposed merged source code is shown in the Merged Source window at the bottom of the Compare Files window. You can revise the merged source code as needed, using tools on the toolbar, in the comparison windows, and through direct edit.

Note: If the Merged Source window is not shown, click  on the toolbar.



Important! The Merged Source code is always based on the source in the *left-hand* comparison window.

### To switch sides

Click  on the toolbar to base the Merged Source on the source that is currently in the right-hand comparison window. The Merged Source code is updated to match that code because it is now in the left-hand side comparison window.

### To refine the merged code

You can use any of the following methods to refine the merged code. See also the Examples at the end of this topic.

Select a line, then click the left or right arrow   on the toolbar to use that line in the Merged Source. For example, to use the line from the left-hand window, click the arrow that points to the left.


Click the diamond beside any line to add that line to the merged code in the Merged Source window. When you choose a line, that change is marked as resolved and the diamond fills in with solid color.

Make any inline changes directly to the Merged Source code as needed.

### To view the status of your merge work

The status bar below the Merged Source window keeps track of how many issues there are to resolve and how many are resolved.

### To revert merge changes


Click  on the toolbar to reload and compare the files again. Existing changes in the Merged Source window are cleared with this action.


### To accept the merged code

You cannot overwrite either of the two input files. Use the **Save** button to save the merged code to a new file. This preserves the original two files in case they are needed.


## Examples


**Deleted line:** A line was deleted (therefore it exists on the left side but not the right). The following options are possible:

*Option 1:* Click the diamond next to that line on the left (or click  ) to keep that line in the Merged Source.


*Option 2:* Click the diamond next to that line on the right (or click  ) to delete that line from the Merged Source.


**Modified line:** A modified line exists on both the left and right sides. The following options are possible:

*Option 1:* Click the diamond next to that line on the left (or click  ) to use that line from the left in the Merged Source.

*Option 2:* Click the diamond next to that line on the right (or click ) to use that line from the right in the Merged Source.

**Added line:** A line was added (therefore it exists on the right side but not the left). The following options are possible:

*Option 1:* Click the diamond next to that line on the left (or click ) to delete the corresponding line from the Merged Source.

*Option 2:* Click the diamond next to that line on the right (or click ) to keep the corresponding line in the Merged Source.

## Preview Query Results

Use the **Describe (Parse) Select Query** function to see what columns would be returned if the query were executed. This is useful for tuning a LONG query before it is executed.

### *To describe a query*

Select **Editor | Describe (Parse) Select Query** (CTRL+F9).

## Save Query Results

Any of Toad's window query results can be saved to the Windows Clipboard or to a file by the procedure below. Some dialog boxes do NOT have a **Copy to Clipboard** or **Save to Disk** function. This duplicates that functionality.

### *To save query results*

1. Turn on spooled output to disk file: **Database | Spool SQL | Spool SQL To File**.
2. Run the desired Toad window (for example, the Schema Differences window) select each desired tab.
3. From the User Files folder, open **DEBUG.SQL**.
4. Copy each **SQL** into the Editor window.
5. Run each **SQL** in the Editor window, substituting hard coded values for the bind parameter variables, or just enter them when prompted in the Variables dialog box.
6. Save the grid contents to clipboard or disk file, using **right-click, Export Dataset**.

## Copy Statements between Toad and Development Tools

The Editor window contains two functions that simplify copying SQL statements from Toad to code development tools such as Delphi, Visual Basic (VB), C++, Java, or Perl, and from those code development tools back to Toad. These functions are available from the Editor **File** toolbar or by using keyboard shortcuts.

**Strip Code Statement** (CTRL+P) 

**Make Code Statement** (CTRL+M) 

## Strip Code Statement

The Strip Code Statement function strips off the code development tool syntax from the SQL statement, ready to execute in Toad.

For example, if you take the following Visual Basic code from the Visual Basic development tool, copy it, paste it into Toad, and run Strip Code Statement, it changes the SQL statement from this:

```
Sql = " select count(*) as cnt"
Sql = Sql & " from all_tables"
Sql = Sql & " where owner = 'DEMO'"
Sql = Sql & " and table_name = 'EMPLOYEE'"
```

to this:

```
select count(*) as cnt
from all_tables
where owner = 'DEMO'
and table_name = 'EMPLOYEE'
```

Now the SQL is ready to execute in Toad.

If you have multiple SQL statements in the Editor, highlight the statement you want to strip before executing the Strip Code Statement function.

## Make Code Statement

The Make Code Statement function adds the code development tool syntax to the SQL statement in the Editor and makes it ready to paste into the appropriate development tool.

When making code statements, rather than changing the code in the Editor window as the Strip Code Statement function does, the Make Code Statement function takes the currently highlighted SQL statement, translates it into the code development tool syntax, and copies it to the clipboard. You can now switch to the code development tool and paste in the results. A message displays in the status panel such as VB statement was copied to the clipboard.

If you have multiple SQL statements in the Editor, highlight the statement you want to make before executing the Make Code Statement function.

**Note:** You can access these same options via the toolbar. The button to the right of the two buttons for **Make...** and **Strip VB code statement from SQL** lets you perform your latest selection with one click; it remembers your most recent selection from the list via the drop-down arrow.

## How to Select the Code Development Tool

The default selection is Visual Basic. Click the arrow beside either button on the Editor toolbar to change the default selection.

You can also select the code development tool in the **View | Toad Options | Editor | Code Assist | Make Code** box.

The **Make Code Format** box lets you select a language syntax for Toad to convert a SQL statement into (Make Code Statement function) and out of (Strip Code Statement function). Currently, Delphi, Visual Basic, C++, Java and Perl are supported.

See *Code Assist Options* in the online help for more information.

You can also create your own language templates.

## View Code Statistics

Toad can provide you with some basic statistics about your code.

**Note:** Because of the way the parser counts lines, the number of lines of code and blank or comment lines may vary. Use these statistics as an estimate rather than an exact count.

### To view formatting statistics


1. Open the code in the Editor.
2. Right-click and select **Formatting Tools | Profile Code**.

## Work with the Query Builder

### Query Builder Overview

The Query Builder window provides a fast means for creating the framework of a Select, Insert, Update, or Delete statement. You can select Tables, Views, or Synonyms, join columns, select columns, and create the desired type of statement.

### To access the Query Builder

Click  on the main toolbar.

Note: You can also select **Database | Report| Query Builder**.

Area	Description
Query Builder workspace tabs	Use the Query Builder workspace tabs (the Model Area) to graphically lay out a query.
Tree View	The pane on the left displays the current query in tree view.
Generated Query Tab	<p>Automatically generated SQL as a result of the diagram displayed in the Query Builder workspace. The Query Results tab displays the results of the created query. The Messages tab displays warnings regarding the query. Click on the error to highlight the related object.</p> <p>The Generated Query content is editable.</p> <p>When the diagram and the generated query no longer match, these buttons become available on the Query Results toolbar:</p> <ul style="list-style-type: none"> <li>- Update Diagram</li> <li>- Update SQL</li> </ul> <p>Text also indicates, "Diagram and SQL Code are Not Synchronized. Click Here or Press Ctrl +SHIFT +D to Synchronize.</p>

### ***To navigate the Query Builder***

Click on items or use the keyboard:

- Up and down arrow keys move you around in lists
- SPACE checks and clears boxes
- TAB moves forward one area (table, menu, list, etc)
- SHIFT+TAB moves back one area.

### ***To set Query Builder Options***

Select **View | Toad Options | Query Builder**.

Press **F1** for information about the options.

### ***To get more information about building queries***

See the **Build Queries** section of the Table of Contents in the online help.

## **How to use the Model Area**

On the Query Builder tab, click **+** to open an **INLINEVIEW** tab.

Pages are numbered with column/row combinations:

[1,1]	[2,1]
[1,2]	[2,2]

Nested and in-select subquery links are represented as follows:

- Subqueries by a dashed line.
- Union queries by a symbol that represents the type of union. Double-click the line to change the type of union.

Use the Query Builder workspace to visually join or manipulate the Tables, Views, or Synonyms. You can click in a table header and drag the table to anywhere in the model area.

### ***To specify columns for the query***

Click in the checkbox for each desired column. A checkmark will be displayed in the box. The selected column's information will display in the navigation tree, and the column will be included in the query.

Note: If no table columns are selected, then all columns will be included in the query.

### ***To establish your own joins***

Drag a column from one table to another table column. When the line is drawn, you can double-click the line to adjust its properties such as Inner Join vs. Outer Join, or Join Test. For example, equal (=), less than (<), greater than (>), and so on.

### ***To view joins***

Double-click a **join line** in the Model Area.




### ***To describe a table***

You can use the F4 key to describe a selected table. If a table is not selected when you press **F4**, the last selected table will be described. [Describe Objects](#)

## Build a Query

Follow this procedure to get started using the Query Builder.

### ***To build a query***

1. Drag-and-drop **Tables**, **Views**, or **Synonyms** from the Schema Browser, Project Manager, Object Palette, or the Object Search window to the Query Builder workspace tab.
2. Click in the checkbox by a column to add it or remove it from the active query's SELECT clause.
3. Drag-and-drop columns from one table to another to create joins between the tables.
4. Add any WHERE, GROUP BY, HAVING, or ORDER BY clauses by right-clicking on the column and selecting **Include in n** clause. Right-click and adjust properties for clauses where necessary.
5. To create a new clause, drag-and-drop columns from a table to WHERE, GROUP BY, HAVING or ORDER BY in the Query Browser tree node.
6. Click  on the toolbar to save the model to disk.
7. Click the **Generated Query** tab to view or edit the generated query.
  - a. If you update the diagram and the SQL code is not synchronized, click  in the Generated Query toolbar to update the code.
  - b. If you update the code, click  in the Generated Query toolbar to update the diagram.

See also [Create a Subquery](#)

## Create a Subquery

You can easily create a subquery or nested subquery. Subqueries can be created from the FROM clause or the WHERE clause.

Columns must be dragged directly from the table area to be placed in subqueries, or from the current statement. After initiating the subquery using one of the methods below, create the subquery as you would a normal query.

### ***To create a subquery in the WHERE clause***

1. Drag a column into the **WHERE** node.
2. In the Condition dialog, use the simple or complex mode.  
If you click **Nested Subquery**, the new subquery is created in the workspace.

### ***To create an EXISTS subquery***

1. Right-click the **WHERE** clause in the tree view.
2. Select **Add EXISTS Subquery** or **Add NOT EXISTS Subquery**.

### ***To create a subquery in the FROM node***

1. Right-click the **FROM** clause in the tree view.
2. Select **Add | New Named Subquery** (or **New Inline View**).

## **Populate the Where Clause**

There are two ways to populate the WHERE clause in SQL generated by the Query Builder: as an individual WHERE, or as a global WHERE.

### ***To populate the where clause***

1. Do one of the following:
  - Right-click on the column under the SELECT node and select **Include in Where Clause**.
  - Drag a column from the select node to the WHERE node.

Add conditions and select or clear any outer joins you want to apply.

**Note:** To build a more advanced query, click the Expert tab and enter your code by typing it in the top box or double clicking on functions and data fields to enter them.


2. Click **OK**.

Repeat until all conditions are added.

Note: When you add multiple columns to a WHERE clause, they are automatically placed

3. If a condition should be an OR condition, rather than an AND, right-click on it and select OR.

### ***To create a global WHERE clause***

1. Right-click in the Table Model area.
2. Select SQL | Global Where Clauses.
3. Click .
4. Enter or build your condition.
5. Click **OK** to close the definition window.
6. Click **OK**.

### ***Example***

To construct the following query:

```
SELECT DEPT.DEPTNO, DEPT.DNAME, DEPT.LOC
```


```
FROM DEPT
```

```
WHERE (((UPPER (RTRIM (DNAME)) = 'SALES') AND (DEPT.DEPTNO < 40)) AND ((DEPT.LOC = 'CHICAGO')OR ((DEPT.LOC IS NULL = '')))
```

Do the following:

1. Open the **Query Builder**.
2. In the **Object Palette**, select the Scott schema and double-click the DEPT table to add it to the model.
3. Right-click **DEPT** and choose **Select All**.



4. Drag the **DEPTNO** column to the **WHERE** node.
5. Select **<** in the operator box, click **Constant**, and enter **40** in the condition box.
6. Click **OK**.
7. Drag the **LOC** column to the **WHERE** node.
8. In the WHERE definition dialog, click the **Expert** tab. Click **OK** to confirm.
9. Double-click **IS NULL** in the SQL Operators area and then click **OK**.
10. Drag the **DEPTNO** above **LOC** in the tree view.
11. Right-click the **LOC** column and select **OR**.
12. Right-click on **OR | LOC** and select **Properties**. Select **=** in the operator box, click **Constant**, and enter **CHICAGO** in the condition box.
13. Click **OK**.
14. In the table model area (the area around the table images), right-click and choose **SQL | Global Where**. Click .
15. In the top edit box, enter **(UPPER (RTRIM (DNAME))) = 'SALES'**.
16. Click **OK** and then click **OK** again.

View the generated query. It should display as described above.

You can automatically populate the Having clause in the SQL generated by the Query Builder in one of two ways.

Note: To create a HAVING clause, you must have added columns to the GROUP BY node.

HAVING entries should be in the form of <expression1> <operator> <expression2>.

### ***To populate the HAVING clause***

1. Do one of the following:
  - Right-click the desired column in the tree, and then select **Include in Having Clause**.
  - Drag a column from a table in the Table Model area to the HAVING clause.
2. Enter or build the condition.
3. Click **OK**.
4. Repeat until complete.

### ***Global HAVING clauses***

In order to include a global HAVING clause, there must be a GROUP BY clause as well.

### ***To create a global HAVING clause***


1. Right-click in the Table Model area.
2. Select **SQL | Global Having**.
3. Click the **Add** button.
4. Enter or build your condition.
5. Click **OK** to close the definition window.
6. Click **OK**.

### ***Example***

To construct the following query:

```
SELECT emp.empno, emp.ename, emp.job, emp.mgr, emp.sal,  
emp.comm, emp.deptno  
FROM emp  
GROUP BY emp.deptno, emp.comm, emp.sal, emp.mgr, emp.job,  
emp.ename, emp.empno  
HAVING ((emp.sal + NVL (emp.comm, 0) > 4000))
```

Do the following:

1. Open the **Query Builder**.
2. In the Object Palette, select the Scott schema.
3. Double-click the **EMP** table to add it to the model.
4. Right-click **EMP** and choose **Select All**, then clear **Hiredate**.
5. Drag DEPTNO, COMM, SAL, MGR, JOB, ENAME and EMPNO to the **Group by** node.
6. Right-click in the Table model area and select SQL | **Global Having**. Click  to add a new Global Having clause.  
  
Enter the Having clause to say:  
EMP.SAL + NVL(EMP.COMM, 0) > 4000
7. Click **OK** twice.

View the generated query. It should display as described above. This query selects all the employees whose salary plus commission is greater than 4000.

The NVL command substitutes a null value in the specified column with the specified value, in this case, 0.

## Use a Generated Query

The Generated Query tab shows the SQL statement that is automatically generated when you work on your query. Any changes made to the model or column criteria will automatically regenerate this SQL statement.

### *To copy the query to the clipboard*


Do one of the following:

- Select a query and press **CTRL+C**
- Click the **Send text to clipboard** button
- Select the query, right-click and select **Copy**

### *To send the query to the Editor*

Click  in the Generated Query toolbar.

### *To execute the query*

1. Click  (**Execute Query**).
2. View the results on the Query Results tab.

## Generate ANSI Syntax

You can convert a SQL statement to ANSI from the Generated Query tab of the Query Browser, or you can set Toad to convert it automatically.

### *To convert a SQL statement from the Query Builder*

In the Generated Query tab, select the query to convert and click the **ANSI join syntax** button.

### *To create ANSI syntax automatically*


Select **Toad Options | Query Builder**.

Press **F1** to view information about the options.

## Tune the query

From the Generated Query tab you can select tuning options for your current query.

### *To tune the query*

1. Click the arrow next to the  (**Optimize**) drop-down.
2. Select a tuning method.  
Note: Advanced SQL Optimization requires the SQL Optimizer module.  
This feature is available in the Xpert Edition and higher.
3. Press **F1** for information about the selected method.

## Save Query Results

Any of Toad's window query results can be saved to the Windows Clipboard or to a file by the procedure below. Some dialog boxes do NOT have a **Copy to Clipboard** or **Save to Disk** function. This duplicates that functionality.

### *To save query results*

1. Turn on spooled output to disk file: **Database | Spool SQL | Spool SQL To File**.
2. Run the desired Toad window (for example, the Schema Differences window) select each desired tab.
3. From the User Files folder, open **DEBUG.SQL**.
4. Copy each **SQL** into the Editor window.
5. Run each **SQL** in the Editor window, substituting hard coded values for the bind parameter variables, or just enter them when prompted in the Variables dialog box.
6. Save the grid contents to clipboard or disk file, using **right-click, Export Dataset**.

# Execute Statements and Scripts

## About Executing Scripts

Toad provides many different options for you to execute scripts:

If you want to...	Review the following:
Execute a script in the Editor	<p>Use <b>Execute as script</b> (F5) in the Editor. <a href="#">Execute Scripts in the Editor</a></p> <p><b>Considerations:</b></p> <ul style="list-style-type: none"><li>• Long-running scripts can tie up the Editor.</li><li>• Does not support bind variables and cannot produce editable data. Alternately, you can execute the code as a statement. <a href="#">Execute Single Statements</a></li><li>• Fetches all matching records at the same time, which may cause it to execute slower and use more resources.</li></ul>
Execute a long-running script without tying up Toad (execute a script outside of Toad)	<p>Use Toad Script Runner for scripts that may take a long time to execute or to execute a script in an external application.</p> <p>See <i>Execute Scripts with Toad Script Runner</i> in the online help for more information.</p> <p><b>Considerations:</b></p> <ul style="list-style-type: none"><li>• Compared to executing a script in Toad, Toad Script Runner does not offer all of the Editor's features</li><li>• You can also use SQL*Plus to externally execute scripts. SQL*Plus does not have data grids or other Toad features, and it does not support Unicode. <a href="#">Execute SQL with SQL*Plus</a></li></ul>
Execute multiple scripts	<p>You can use the Automation Designer or Script Manager. See the following in the online help for more information:</p> <ul style="list-style-type: none"><li>• Automation Designer Overview</li><li>• Script Manager Overview</li></ul>
Schedule execution	<p>Create a Toad Action and schedule it to run.</p> <p>See <i>Schedule Actions and Apps</i> in the online help for more information.</p>
Execute through the command line	<p>Execute scripts or Toad Actions with scripts from the command line. See the following in the online help for more information:</p> <ul style="list-style-type: none"><li>• Command Line Syntax</li><li>• Execute Actions from the Command Line</li><li>• Automation Designer Overview</li></ul>


# Execute Single Statements


You can easily execute a single statement in the Editor. Toad's parser identifies and executes the statement or compiles the PL/SQL at the cursor.

**Note:** If you select code and execute, Toad ignores the parser results and executes the portion that is selected. This may cause errors, especially if you select more than one statement. It is better to place your cursor in the statement you want to execute and let Toad select the statement.

This method fetches matching records in batches to improve performance.

## *To execute a statement in the Editor*

Place the cursor in the statement and click  on the Execute toolbar (F9).

Note: To cancel the execution, click  in the Execute toolbar.

# Execute Scripts in the Editor

Toad's **Execute as script** command is generally the best method when you want to execute multiple statements or a script in the Editor. However, there are some important differences between executing scripts and a single statement. For example, executing scripts:

- Does not support bind variables
- Cannot produce editable datasets
- Fetches all matching records at the same time, which may cause it to execute slower and use more resources than executing a single statement

# Execute long-running scripts

If you want to execute a script that may take a long time to run, executing with Toad Script Runner may be the best choice. Toad Script Runner is an external execution utility, which allows you to keep working in Toad while the script executes in the background.

See *Execute Scripts with Toad Script Runner* in the online help for more information.


## **Notes:**

- Toad does not support all SQL\*Plus commands. See the online help for more information.
- Linesize in Toad defaults to 80, just as in SQL\*Plus. If you want to change this to a longer amount, you can do it using the SET LINESIZE command in your script.
- To load and immediately execute a script file, select **Editor | Load and Execute a Script File**.

## *To execute the contents of the Editor as a script*

Click  on the Execute toolbar (F5).

Caution: If any changes have been made, the script in the current window is *automatically saved*, and then executed as a script.

Note: To cancel the execution, click  in the Execute toolbar.

## Execute scripts with the @ command

When you run something containing the @ command (such as @whereami.sql) as script in the Editor, Toad follows a hierarchy of where to look for the whereami.sql file to execute.

The hierarchy it follows is:

1. Parent script directory (If you load scripta.sql that has an @scriptb.sql command in it, Toad first looks in the directory where *scripta.sql* is located).
2. Current Editor directory (File | Open in Editor).
3. Toad dir/User Files.
4. SQLPATH environmental variable.

## Execute SQL with SQL\*Plus

You can open a DOS box to execute the contents of the Editor using SQL\*Plus.

### Important:

SQL\*Plus does not support Unicode.

Toad does not support all SQL\*Plus commands. See *SQL\*Plus Commands* in the online help for more information.

**Note:** If you change data in the script session, the changes will not reflect in Toad until you commit the changes in the script session. Also, any session control statements executed in the script session (such as ALTER SESSION) are not visible to the Toad session.

### To access MS DOS for SQL\*Plus

From the Editor menu, select **Execute SQL via SQL\*Plus**.

## Save Statements (SQL Recall)

### Save and Reuse SQL Statements

Through SQL Recall, you can save any SQL statement to your Toad environment so that it can be reused. If statements are not saved, they are eventually discarded as new statements are executed and added to the list.

### To view the SQL Recall pane

From the main Toad menu bar, select **View | SQL Recall (F8)**.

- Recently executed statements are stored on the **Recent** pane.
- Saved statements are stored on the **Saved** panel of SQL Recall.

Statements can be saved in two ways:

- **Unnamed:** When you save a statement without a name, it is saved to the Saved tab with a Toad-assigned name of Statement (n), where *n* is a number that increments by one for each new saved statement.
- **Named:** The best way to save SQL statements is to save them as *Named SQL*. When a statement has a name, you can:
  - easily access it in the Editor.
  - easily determine what it does, rather than having to read through the code.

Statements are saved under categories. Categories enable you to organize your statements, for example by application or type of data. Toad provides a Default category which contains any statements not placed in a specific named category.

### ***To save a statement without naming it***

1. In the **Recent** pane of SQL Recall, select the statement or statements that you want to save.
2. Right click and then select **Add to Saved**.
3. Select a category or specify a new one, and then click **OK**. The statement is saved to that category on the Saved tab.

### ***To save a SQL statement as Named SQL***

1. Do one of the following, depending on where the statement is displayed:
  - Editor:** In the Toad toolbar, select **Editor | Add to Saved SQLs**.
  - SQL Recall:** If the statement is still in the Recent tab, click **Add to Saved** to move it to the Saved tab. Once a statement is on the Saved tab, right-click the statement, then select **Properties**.
2. Select a category or specify a new one.
3. Provide a name in the **Name** field. Note: The name is case sensitive. For example, you can save both **sql1** and **SQL1**.
4. Select a schema for the saved SQL.
5. Select the database that contains the specified schema.
6. Click **OK**.

### ***To open a Named SQL statement in the Editor***

1. Select one of the following options:
  - Press **CTRL+N** in the Editor and select the statement from the pick list.
  - Enter *MyNamedSQL* in the Editor, where *MyNamedSQL* is the name of your saved SQL statement. Toad replaces the SQL name with the saved statement at execution.
  - Double-click or drag the statement from the SQL Recall pane.

## **Execute a saved SQL statement**

Once a saved SQL statement (named or unnamed) is open in the Editor, you can:

- Execute it from the Editor. [Execute Single Statements](#)
- Execute it from the Connection Panel of the Project Manager. See the online help for more information about Project Manager.

# Export or import a saved SQL statement

Toad allows you to export and import saved SQL. [Import/Export Saved SQL](#).


## Import/Export Saved SQL

You can export your saved SQL from SQL Recall for use by others, and you can import saved SQL into your own Toad environment.

You can export your recent statements, your saved statements, or both, or you can select specific categories or statements to export.


**Note:** This feature was introduced in Toad 11, and consequently you can only import these files with Toad 11 and later versions.

### To export saved SQL

1. Select **View | SQL Recall (F8)**.
2. If you want to export specific statements, select them.
3. Click  on the SQL Recall toolbar.  
**Tip:** You may need to expand the SQL Recall pane to see the button.
4. Under **Statements**, select the types of statements to export\*:  
**All:** export all statements from **Recent** and **Saved** tabs.  
**Recent:** export only the statements on the **Recent** tab.  
**Saved:** export only the statements on the **Saved** tab.  
**Selected:** export only the statements that you explicitly select.
5. Under **Format**, select the output format:  
**SQL Recall data file:** Save as the file type used by Toad to store recent and saved statements.  
**Single File:** Save as a single text-based file.  
**Individual Files: One file for each Saved category and one for all Recent statements:** Save one file for each Saved category and save all Recent statements in one file. (Whether these outputs will be present depends on what you selected under Statements.) If you select this option, select an extension under **File Extension**.

\*Note: Recently executed statements are always stored in one file. Saved statements are stored either by category name or by a user-defined name, depending on how you specified the export.

### To import saved SQL

1. Click  on the SQL Recall toolbar.  
**Tip:** You may need to expand the SQL Recall pane to see the button.
2. Select the saved SQL export file.
3. Select **Append** mode to add the imported SQL to your existing library of recent or saved statements, or select **Replace** to replace the existing library of recent or saved statements with the contents of the imported file. Important! A **Replace** cannot be undone, and your existing statements will be permanently overwritten



by the imported ones, including any category names.


4. Click **OK**.

# Work with PL/SQL Objects

## Load Database Object

Use the **Load Database Object** dialog to load an existing object into the **Stored Edit/Compile** window for further editing.

### *To load an object from the database*

1. Click  in the Editor window.
2. From the Schemas/Owners drop-down:
  - Enter the first letter of the schema to perform an incremental search of the list.
  - Select the **Schema/Owner** of the object you want to load
  - Select the **type of object** you want to load from the drop-down list.
    - For databases with few objects, just select **All**.
    - For databases with many objects, select a **type of object** and then **filter** to show a manageable list in the left hand panel below.
3. From the left hand panel, you can do one of the following:
  - Click an object to select it.
  - Enter the first few letters of the object you want to perform an incremental search.

Note: You can turn the preview off by using the **Show Source** checkbox.

## Reload Object

The reload object options give you an easy way to synchronize your PL/SQL source with objects also existing on the database.

You can reload objects in one of several ways.


### *To reload an object from the Navigator*

1. In the Navigator, select the object you want to reload.
2. Right-click and select **Reload**.

### *To reload all objects from the Navigator*

1. In the **Navigator**, select the object you want to reload.
2. Right-click and select **Reload All**.


### ***To reload from the Toolbar***

1. Place your cursor in the object in the Editor that you want to reload.
2. Click  (**Reload object from database**) on the toolbar.


## **Create New PL/SQL Object**

Use the Create New PL/SQL Object dialog to create a new database object. Toad opens a dialog that enables you to specify the parameters for the CREATE statement and allows you to select a default or custom template to speed the creation of the object.

### ***To create a new PL/SQL Object in the Editor***

1. Click  on the Editor toolbar. (If this button does not display, you may need to add it. [Show/Hide Toolbars](#))
2. Select the type of object you want to create.
3. Enter the name of your new object in the New Object Name box, or leave this blank for now and enter a name when you save the object.
4. Select a template.

### ***To create a new PL/SQL Object from the Schema Browser***

1. In the schema browser object type drop-down, select the object type that you want to create (package, procedure, function, and so on).
2. Click . The button is context-sensitive based on your object type selection and launches the appropriate dialog.
3. Provide the information and select a template.

## **Default Templates**

The following default templates are stored in the **Toad for Oracle\User Files** folder:

Template	Purpose
NEWPROC.SQL	Create a Procedure
NEWFUNC.SQL	Create a Function
NEWPackage.SQL	Create a Package spec
NEWPackageBody.SQL	Create a Package body
NEWType.SQL	Create a Type spec
NEWTypeBody.SQL	Create a Type body
NEWTrigger.SQL	Create a Trigger spec

In addition, there are two template types that you can use only within packages. These are **Package Function** and **Package Procedure**. See *Use Templates within Packages* in the online help for more information.

## Custom Templates

You can use a text editor to create new templates and edit the default templates. The new or revised template will be shown in the template selection drop-down when you create a new object.

### **To create a custom template**

1. Select **Toad Options | Proc Templates** from the Toad menu.
2. See *Procedure Template Options* in the online help for more information.

## Keyword substitutions in templates

There are several keywords in the templates for which Toad will automatically substitute in values when you open the templates.

%YourObjectName% Object Name

%SYSDATE% Workstation date, for example, mm/dd/yyyy

%DATETIME% Workstation date and time, for example, mm/dd/yyyy hh:mm:ss am

%DATE% Workstation date, for example, mm/dd/yyyy

%TIME% Workstation time, for example, hh:mm:ss am

%USERNAME% Username specified in Toad Options, Editor node

%TRIGGEROPTS% Trigger Options for triggers only, for example, "Before insert on, for each row"

Note:

- \*YourObjectName\* is also supported for backwards compatibility.
- The keywords ARE NOT case sensitive.
- The date and time formats come from the Windows Control Panel settings.

In addition to these, you can specify custom keywords before you create the object. See *Procedure Template Options* in the online help for more information.

## Extract Procedures

You can extract a procedure from existing code into a new stored procedure or locally defined procedure.

Creating the new procedure and call depend heavily on the parser to determine which identifiers in the text selection must be declared as parameters in the new procedure. If Toad cannot parse the code, no extraction occurs.

### **To extract procedures**

1. Select the code you want to extract in the Editor.
2. Right-click and select **Refactor | Extract Procedure**.
3. Select a procedure type.

Note: If you select stored procedure, you can choose to either include the CREATE OR REPLACE in the DDL instead of just CREATE.

4. Enter the procedure name.

**Tip:** The new procedure and the resulting procedure call are created and inserted so that the code is syntactically correct, but no formatting is done to the code. You can have Toad format the code by pressing SHIFT+CTRL+F.

## Generate DBMS Output

Oracle provides a package, called DBMS\_OUTPUT, which is specifically designed with functions for debugging PL/SQL code. It uses a buffer that your PL/SQL code writes into, and then a separate process queries the buffer out and displays the contents.

The Editor has a **Right-Click menu** option that will generate a DBMS\_OUTPUT statement for a highlighted variable. The same menu has an option to create a blank DBMS\_OUTPUT statement.

### *To generate an output line from a variable*

1. Highlight the variable in the Editor.  
Right-click and select **Output Statements | Make Output Statement**.  
**Note:** The statement is created on the clipboard.
2. Paste the statement in your code where you want it.

### *To generate a blank output statement*

1. In the Editor, right click and select **Output Statements | Blank Output Statement**.
2. Paste the statement in your code.

### *To view DBMS Output*

On the main toolbar, select **View | DBMS Output**.

DBMS\_OUTPUT results only display after the procedure has completed execution, not while you are single stepping through the code. In nested procedure calls, all procedures must have run to completion before any DBMS Output content is displayed.

## Execute SQL Statements within PL/SQL

You can easily execute a SQL statement embedded within PL/SQL. Toad extracts the SQL statement and adjusts the syntax as necessary. Any identifier which is not a column of a referenced object is treated as a bind variable. If the identifier is a reference to a PL/SQL constant, the bind variable value defaults to the constant value.



### *To execute a SQL statement within PL/SQL*

Place the cursor in the statement and press SHIFT+F9. A new window displays with the extracted SQL statement.




## Execute PL/SQL

You can execute stored procedures, functions, packages or triggers in the Schema Browser or in the Editor.

### To execute stored code from the Schema Browser

1. Click  on the Standard toolbar to open the Schema Browser.
2. Select a PL/SQL object then click .

### To execute stored code from the Editor

1. Click  on the Standard toolbar to open the Editor.
2. Open a PL/SQL object.
3. Click  or  on the toolbar.

# Debug

## About Debugging

You can debug PL/SQL and SQL scripts in Toad.

Notes:

- There are minimum Oracle database requirements for using this feature. [Minimum Oracle Requirements for Debugging](#)
- The debugger is not designed to work with word-wrapped lines, since the Editor will then have a different set of line numbers than what is stored in Oracle. Toad provides a warning message about this if you open the procedure Editor while word-wrapping is enabled. To disable word-wrap, select **View | Toad Options | Editor | Behavior** and clear **Word wrap**.
- To avoid modifications to code that is being debugged, Toad does not allow you to run a query while you are running a debugging session.

## Types of Debugging

Toad provides the following debug features:

Debug type	Description
DBMS Debugger	Debugs PL/SQL. Using the Debugger, you can set breakpoints, watches, and see call stacks. In addition, you can view DBMS output. <b>Note:</b> When using the PL/SQL Debugger and connecting to a RAC instance, you must have the TNSNAMES entry for the instance with the server directed the use connection or session here. Or, you must connect directly to an instance of the cluster without letting the server assign an instance.
JDWP Debugger	Toad also provides a JDWP debugger for debugging PL/SQL. You must configure the JDWP Debugger prior to initial use. See <a href="#">Configure JDWP Debugger</a> for more information. To use the JDWP debugger, select <b>Debug   JDWP Debugger</b> .

Debug type	Description
Script Debugger	Debugs SQL scripts. You can set breakpoints, run to cursor, step over, trace into, and halt execution of your scripts.
Attach External Session	External debugging allows you to debug PL/SQL that is run from an external session, such as another Toad window, SQL*Plus, or any other development tool which calls Oracle stored procedures.

Debugging in Toad requires you to select one type of debugging at a time for all database instances open per instance of Toad. For example, if you have three database connections in one instance of Toad, they must all be in the same debugging state. If you then opened another instance of Toad, with the same or different connections, they could be in a different debugging state.

## Compile with Debug Information

To use the debugger fully with PL/SQL or Java packages, you need to compile your object with debug information. [Start Debugging](#)

In addition, if you are debugging an object that has dependent objects, you cannot step into the dependents unless they, too, are compiled with debug information. [Handle Dependencies and References](#)

## Compile without Debug Information

To reduce the size of your code when it is ready for production, you should compile without debug information. [Prepare PL/SQL Code for Production.](#)

## Get more information on Debugging

- Toad's online help includes tutorials on how to debug. See *Debugging a Procedure or Function Tutorial* in the online help for more information.
- See the **Debug** section of the Table of Contents in the online help for additional topics on debugging.

# Debug PL/SQL

## Minimum Oracle Requirements for Debugging

For all databases, you must have the Oracle Probe API v2.0 or later installed in order to debug PL/SQL using Toad. To check the Oracle Probe API version

1. Make sure a package called **DBMS\_DEBUG** exists in the SYS schema.

To find out what version of the Probe API you have, run the following anonymous PL/SQL block in the SQL editor with a DBMS Output window tab selected:

```
declare
probe_major_ver varchar2(10);
probe_minor_ver varchar2(10);
```

```
begin
dbms_debug.probe_version(probe_major_ver, probe_minor_ver);
dbms_output.put_line('MAJOR=' || probe_major_ver);
dbms_output.put_line('MINOR=' || probe_minor_ver);
end;
```

If the DBMS Output window displays:

```
MAJOR=2
MINOR=2
```

Then the version of Oracle Probe API is 2.2.

## Database Version Notes

You must have the DEBUG CONNECT SESSION privilege, or Oracle will not let you use DBMS\_DEBUG.

## Additional notes

- You cannot use the Evaluate/Modify window to change argument values.
- Watches on package variables are only allowed for Probe v2.2 or higher.






# Start Debugging

You debug PL/SQL objects in the Editor.

When you open a complete package or type in the Editor, the spec and body open in separate tabs by default. However, Toad provides options to control how objects are split, reassembled, and saved. See *Editor Open/Save Options* in the online help for more information.

To use the debugger fully with PL/SQL or Java packages, you need to compile your object with debug information. You cannot step into code or step over unless the object was compiled with debug. You can only execute. In addition, if you are debugging an object that has dependent objects, you cannot step into the dependents unless they, too, are compiled with debug information.

## To start debugging

1. Open a PL/SQL object in the Editor.
2. Click  on the main toolbar or select **Session | Toggle Compiling with Debug**. This enables debugging.
3. Compile the object on the database.
4. Select one of the following actions on the Execute toolbar to begin debugging:
  -  - Click to **Execute PL/SQL with debugger**
  -  - Click to **Step over**
  -  - Click to **Step into**
  -  - Click to **Run to cursor**

# Set Parameters

Some PL/SQL has variable parameters that need to be set before you can run the code. If values for these variables are not set, an Oracle error may display when you run the code.

Note: The values entered in the Set Parameters window are for the column values, not the argument values of triggers. [Set Parameters in Triggers](#)

## To set parameters

1. Select **Debug | Set Parameters**.
2. Enter any necessary values in the **Arguments** grid.

Notes:

When the input type is set to **Expression**, anything in the **Value** column is used as-is in the anonymous block. This is useful for setting input value to, for example, the return value of a function or a SELECT statement.

In the case of a SELECT statement, Toad detects that it is a SELECT statement and inserts the required INTO clause into the anonymous block. The SELECT must return a single value (single row, single column), such as the count number in the following example, because the code is initializing one variable.

Example input expression:

```
SELECT COUNT (*) FROM user_objects WHERE object_name LIKE 'EMP_TEST_%'
```

How it translates to input in the anonymous block:

```
SELECT COUNT (*)
```

```
INTO var_P1
```

```
FROM user_objects
```

```
WHERE object_name LIKE 'EMP_TEST_%';
```

**Expression** and **Null** are mutually exclusive. If neither of those columns are selected, the value is treated as a literal.


3. Select the **Output Options** tab to specify how you want output displayed. Review the following for additional information:

PL/SQL Results	Select one of the following...
Print OUT arguments/RETURN values to DBMS Output	Select this option to send the results to the DBMS Output window.
Fetch Cursor Data	Select this option to load REF CURSORS output into memory. <b>NOTE:</b> To be able to view the cursor data after execution, this option must be selected.
Print to DBMS Output (char/number columns only)	Select to fetch data from the REF CURSOR and print it to DBMS output one row per line. You can also select the following options: <ul style="list-style-type: none"><li>• Fixed column width (characters)—Select to modify the generated code to apply the Oracle RPAD() function to all values printed to DBMS output, passing the user-specified width. This will not only right-pad values with spaces, but also truncate values longer than the given width.</li></ul>



- Row fetch limit per cursor—Limits the number of rows fetched. Applies to both DBMS output and table options.

**Note:** Toad raises an exception if a line is more than 255 characters long. This option will only print values of char/number datatypes. For other datatypes, the name of the datatype is printed in square brackets.

4. To rebuild the code and see the variables, click . Important! This rebuilds the code and all changes to the anonymous block will be lost.
5. Set Profiler parameters as needed. [Use a PL/SQL Profiler](#)

## Set Parameters in Triggers

When a trigger is executed, a preprogrammed operation occurs on a table. You'll notice that debugging triggers is different from debugging procedures or functions. First, the values entered in the Set Parameters window are for the column values, not the argument values. [Set Parameters](#)

Before you can run a trigger, you have to set the parameters for that trigger. Each type of trigger has a different set of parameters that are required.

**Note:** When you have entered a value into the Value column of the grid, if you want to make it NULL again, type **NULL**. If you simply delete the value, the value will revert to an empty string.

### INSERT

When you are debugging an INSERT trigger, the values you enter are used as the values to be inserted. The record you insert is then rolled back so that no changes are made to the database during debugging.

#### *To debug an insert trigger*

In the Value field, enter a **value** to be inserted.

**Note:** The INSERT INTO... code is not valid until you enter column values.

### UPDATE

Enter values for the SET... clause AND the WHERE... clause. The UPDATE TABLE... code is not valid until you enter the column values.

#### *To debug an update trigger*

1. In the Value field, enter **values for the SET...** clause.
2. In the WHERE value field, enter **values for the WHERE...** clause.

**Note:** The updated record will be rolled back so that no changes are made to the database during debugging.

### DELETE

When debugging a DELETE trigger, you must enter values for the WHERE... clause.

### *To debug a delete trigger*

Enter the **WHERE...** values in the Value field. The DELETE FROM... code is not valid until the column values are entered.

## Multiple Trigger Priorities

In the case of multiple BEFORE or AFTER actions, trigger types take priority and will be performed as follows:


- INSERT
- UPDATE
- DELETE

## Handle Dependencies and References

You can use the Debugger to check for dependencies, and compile them.

### Manually compiling dependent & referenced objects

#### *To compile dependencies manually*

Click  or its drop-down on the debug toolbar and select the appropriate option.

### Automatically Compiling Dependent Objects

Toad can automatically compile any procedures that call the current procedure.

#### *To set options to handle dependent objects*

1. From the View menu, select **Options**.
2. In the left pane, select **Debugger | General**.
3. In the Compile Dependencies area, select one of the following:
  - Yes - Toad will always compile dependencies.
  - No - Toad will never compile dependencies.
  - Prompt - Toad will check for dependencies and ask if you want to compile them.

See *Debugger Options* in the online help for more information.

## Viewing Dependencies and their Status

You can visually view dependencies and their status.

#### *To view dependencies and references*

1. From the Schema Browser, **objects panel**, click the **Procedures, Functions, or Packages** tab.
2. Select the procedure you are debugging, then in the details pane, click the **Deps(uses)** and **Deps (used by)** tabs. Status of the procedure is listed in the Status column in the details pane as **valid** or **invalid**.

## Display PL/SQL as it is Called

The Call Stack window displays the chain of functions and procedures as they are called, in the order they are called, with the most recent function or procedure listed on the top.

At the end of each procedure name is the current line number in that procedure. So, if you step into procedure B from line 5 of procedure A, then the call stack will look like this:

Procedure B(1)

Procedure A(5)

When using the JDWP Debugger, the Call Stack window displays call stack frames in the left pane and variables in the right pane. The Variables pane allows you to set values: right-click the variable and select **Set value**.

### ***To access the call stack***

From the Desktops area, click the **Call Stack** tab.

### ***To add the call stack tab to the Desktop***

Right-click in the **Desktops** area and select **Desktop Panels | Call Stack**.

## Stop the Debugger

If you are debugging a long procedure, you can stop the debugger while it is working.

### ***To stop the Debugger while it is debugging***

1. Click .


The status panel will reset from **Running** to **Idle**.

2. When you have finished debugging your PL/SQL code, discard the debug symbol table: compile it again by pressing **F9**.

## Prepare PL/SQL Code for Production

When you have finished debugging your PL/SQL code, the debug symbol tables are left in the code. This makes your code larger and can slow performance. To eliminate this issue, compile the code and its dependencies and references one last time without debug information.

### ***To compile without debug information***

1. On the main toolbar, turn the debug toggle  button to the off position (not depressed).
2. Compile the code. This recompiles without the debug symbol tables.

## View Debugging Results

Toad sends your PL/SQL debugger output results to the **PL/SQL Results** window. This window is located on a tab in the output area of the Editor.

When the PL/SQL execution terminates, the PL/SQL Results window displays the input and output of the code, in a format similar to that shown in the **Set Parameters** window (parameter name, data type, input, and output). If there

is a cursor result, you can view the data stored in each REF CURSOR that is returned via out parameters or as a function result.

From this window, you can create new unit tests (Code Tester for Oracle and utPLSQL), run Code Tester for Oracle unit tests, and also open Code Tester for Oracle. [Create and Run Unit Tests From Execution Results](#)

The PL/SQL Results window has the following limitations:

- Works only with strongly-typed REF CURSORs.
- Works only when the REF CURSOR type is declared in a package belonging to the currently logged-in user.

### **To view cursor data**

- Before you execute the PL/SQL, select **Fetch cursor data** in the Set Parameters window. [Set Parameters](#)
- After you execute the PL/SQL, double-click (**CURSOR**) in the PL/SQL Results window.

### **To access the PL/SQL Results tab**

If you cannot see the PL/SQL Results window at the bottom of the Editor, try one the following:

- In the Editor toolbar, select **PL/SQL Results** from the **Desktop** drop-down menu.
- Right-click in the Editor window and then select **Desktop | PL/SQL Results**.
- If PL/SQL Results is already active but still not visible, then you may need to resize or reposition the docked windows to make it visible.

## **Use DBMS Output**

### **Enable DBMS Output**

Toad uses the Oracle-provided DBMS\_OUTPUT package, which contains functions for debugging PL/SQL code. When enabled, it uses a buffer that your PL/SQL code writes into and then a separate process queries the buffer out and displays the contents.

When you are running debugging in the Editor and DBMS output is enabled, a **DBMS Output** tab automatically displays the results of DBMS\_OUTPUT.PUT\_LINE() statements in the Editor. You can also edit the DBMS Output content to make comments, delete specific lines of output, and so on. The standard copy, cut, and paste keys also work in the DBMS Output box.

To view DBMS Output in the Editor, you must enable DBMS Output before executing PL/SQL. The output displays after the procedure has completed execution, not while you are stepping through the code. In nested procedure calls, all procedures must have run to completion before any DBMS Output content is displayed.

Note: Output only displays after the procedure has completed execution, not while you are single stepping through the code. In the case of nested procedure calls, all procedures must have run to completion before any DBMS Output content is displayed.

### **To enable or disable DBMS output**

At the top of the DBMS Output window, click the **Enable/Disable** toggle button.

### **To generate DBMS Output**

[Generate DBMS Output](#)

### ***To automatically insert DBMS\_OUTPUT statements***

You can use Toad's Auto Debugger feature to automatically insert DBMS\_OUTPUT statements where applicable and remove them when done. See *Automatically Insert DBMS\_OUTPUT Statements (Auto Debugger)* in the online help for more information.

### ***Troubleshooting***

If you do not see DBMS Output, try the following suggestions:

- Right-click the lower pane and select **Desktop | DBMS Output**.
- Make sure the **Toggle Output On/Off** button is on (🟢) in the DBMS Output tab.
- Then, set the interval in the Polling Frequency box. If the toggle is on, Toad periodically scans for and displays DBMS Output content.
- Contact your Oracle DBA to make sure the DBMS\_OUTPUT package is enabled on your database.

## **View DBMS Output**

DBMS\_OUTPUT results only display after the procedure has completed execution, not while you are single stepping through the code. In nested procedure calls, all procedures must have run to completion before any DBMS Output content is displayed.

### ***To open the DBMS Output window***

On the main toolbar, select **View | DBMS Output**.

## **Edit DBMS Output**

You can edit the output display in the DBMS Output window. This allows you to note what you did to receive the output.

For example, when debugging a procedure named **MyProc** that expects a single number parameter, you can execute the procedure from an Editor window with the following statement:

```
begin MYPROC(1); end;
```

Prior to executing the above, you can document the call in the DBMS Output with a comment:

Calling MyProc with 1

Then turn DBMS Output **ON** and execute **MyProc**. The DBMS\_OUTPUT statements will display after your notes about the call.

## **Create and Run Unit Tests From Execution Results**

After you execute or debug PL/SQL, results of the execution are available in the **PL/SQL Results** window. The window will be provided as a standalone window or as an Editor tab depending on where in Toad you initiated execution. When shown in the Editor, it's docked as a tab at the bottom of your screen, by default. From the **PL/SQL Results** window you can create complete unit tests using your execution input parameters and the output produced.

Toad supports creation of unit tests for the following frameworks:

- Code Tester for Oracle
- utPLSQL

You can also run Code Tester for Oracle tests from this window. Toad supports a subset of the Code Tester functionality for creating a new test, but Toad provides a direct link to Code Tester if you need more advanced functionality.

## Prerequisites

### Code Tester for Oracle

- There must be a Code Tester repository on the database to which you are connected from Toad, and the Code Tester repository must be a version that is supported by the version of Toad that you are using. The repository version must be 3.0 or greater.
- The feature is enabled only if there are results in the PL/SQL Results window.
- To create a new test, all input and output values must be of a type supported by Code Tester.

Note: Code Tester does not have to be running to create or run tests in Toad.


### utPLSQL

- You must have a compatible version of utPLSQL framework installed. Only utPLSQL versions 3.1.4 through 3.1.9 are certified to work with Toad 17.0.
- The connected schema must have access to the framework either through the use of public synonyms or appropriate grants on the framework's objects.

## Creating Unit Tests

### Code Tester for Oracle

#### *To create a Code Tester unit test*

1. Click  (**Create Unit Test**) to open the Create Test dialog.
2. In the Create Test Case dialog, complete the test information. You can change values as needed.  
Note: By default, you are prompted to create a new test definition when you create the test case. Select **Attach to Existing** to attach the test case to an existing definition.

#### *To run a Code Tester unit test*

Click  (**Execute Code Tester for Oracle tests...**).

#### *To open Code Tester*


Click  on the PL/SQL Results toolbar or on the Code Tester Results dialog (after you run the test).

#### *To add Code Tester unit tests to Team Coding*

You can include your unit tests in your Team Coding projects. This enables you to manage the revision history of your tests in the same way that you manage the revisions of your other controlled objects. The user/schema who created the tests in Toad must be included in (or added to) the Team Coding project for the tests to be controlled. For more information, see *Configure Team Projects*.

## utPLSQL

### To create a *utPLSQL* unit test

1. Click  to open the [Create Unit Test Window](#).
2. The dialog has been populated with a new unit test using your inputs and the outputs produced. Set any additional properties and click **Send to Editor** to send the test suite DDL to the Editor for finalization.
3. Review the code in the Editor, make changes as needed, and compile the test suite.

Note: utPLSQL test suites are Oracle packages. You must compile the spec first and then the body as you would with any other new package.

## Debug Scripts

### Script Debugger Overview

The Script Debugger is an extension to the Editor that you can use to debug short scripts. Using the Script Debugger, you can do the following in addition to standard Editor functions:


- Set Breakpoints
- Run to Cursor
- Step Over
- Trace Into
- Halt Execution

Note: Standard source control fully integrates with the Script Debugger. However, you cannot use Team Coding with the Script Debugger.

### To use the Script debugger

- Select **Debug | Script Debugger**.
- Or select **View | Toad Options | Debugger | General** and then select **Script** in the Debugger section.

### To commit changes

Click  on the main toolbar. This will commit changes in both sessions.

## View Script Output

After you run a script, Toad displays the output and maintains a running list of system variables and user variables. This lets you keep track of what has been set.

Use the toolbar buttons to copy or print the output, and to save the output to a file or Excel spreadsheet.

Tab	Description
Output	Displays any output from the script you are running, such as errors, status of system variables,

Tab	Description
	and data in output format.
Errors	Displays errors. Click an error to go to the location in the script where the error occurred. Double-click an error to jump to possible solutions.
Grids	Display the data selected by the script. One grid displays for every select statement.
History	Displays output for all the scripts run during this session, or until the history tab is cleared. This tab is hidden by default, but can be turned on in the options. See <i>Execute and Compile Options</i> in the online help for more information.
Environment	Displays user, system, and bound variables and their values for the script.

## Set Breakpoints

### About Breakpoints

Breakpoints are markers in your code where you want to stop execution during debugging. The breakpoints window displays as a tab in the desktop panel beneath the main Editor window. If you cannot see the Breakpoints tab, you may need to add it to your desktop.

From the Breakpoints window, you can easily work with your breakpoints. You can select from the toolbars on the window itself, or you can use the right-click menu to access more functions.

#### *To add the breakpoints tab to your desktop*

Right click in the desktops area and select **Desktop Panels | Breakpoints**. The breakpoints tab displays.

#### *To open the breakpoints window*

In the desktop area, click the **Breakpoints** tab.

See the online help for more information about using Breakpoints.

### Set a Breakpoint

You can set (add) a breakpoint from several places.

#### *To set a breakpoint in the Editor*


Do one of the following:

- Single-click in the Editor **gutter** to set or reset a breakpoint.
- Press **SHIFT+F5** to set or reset a breakpoint on the current line in the Editor.

The breakpoint is indicated by a stop sign in the gutter.



### ***To set a breakpoint from the Breakpoints window***

1. Click  on the toolbar (or double-click the breakpoint).
2. Fill in the appropriate information and click **OK**.

### ***To set a breakpoint from the Breakpoints Tab***

Press **INSERT**.

### ***To set a breakpoint from the Debug Menu***

1. Click in the **line** where you want the Breakpoint.
2. From the **Debug** menu, select **Add Breakpoint at cursor**.

See the online help for more information about Breakpoints.

## **Set Watches**

### **About Watches**

Toad supports watches on implicit and explicit variables, including some complex data types such as explicitly and implicitly defined records, %ROWTYPE records, and cursors.

From the Watches window, you can easily work with your watches. You can select from the toolbars on the window itself, or you can use the right-click menu to access more functions.

Note: You can also hover your mouse over a variable to check the value without formally setting a watch.

### ***To access the Watches window***

Click the Watches tab in the **Output area**.

**Note:** If the watches tab is not visible, right-click and select **Desktop Panels | Watches**.


You can right-click a watch and select **Export Watches**, in addition to other options.

See the online help for more information about using watches.

## **Add a Watch**

### ***To add a watch from the Editor***

Note: If the Watches window was not open, you will need to open it to view watches.

1. Click a **variable** in the Editor.
2. Do one of the following:
  - Click  in the toolbar.
  - Right-click in the **Editor**, select **Debug** and then **Add Watch at Cursor**.
  - Press **CTRL+F5** to add the variable at the cursor to the list of watches. The watch is added but the Watch Properties dialog box does not display.

### ***To add a watch from the Watches window***

Right-click and select the **Add Watch** menu item.

### ***To add a watch from the Debug Menu***

1. Click in the **variable** you want to watch.

From the **Debug** menu, select **Add Watch at cursor**.

Note: If text is selected when **Add Watch at Cursor** is chosen, Toad sets the watch on the selected text. If no text is selected it uses the text under the cursor. This change occurs so that if you have a recordname.fieldname, you can highlight only recordname to set a watch on it. If you have an expression like v\_List(2), where v\_List is a varray, then you can highlight the entire expression to put a watch on it.

## **Use Smart Watches**

Toad can automatically watch every variable in the active procedure or function. If you step into a new tab, the smart watches window refreshes with the values on the new tab.

Smart watches are disabled by default and display collapsed.

If the smart watch window contains cursors or records, the cursor/record is listed as a node and each individual item as an entry underneath it. These are, by default, displayed collapsed. You can expand them by clicking the + sign beside the node.

### ***To enable smart watches***

In the Watches window, select the **Enable Smart Watches** checkbox. [About Watches](#)

## **Configure the Smart Watch window**

By default, watches and smart watches are arranged side by side in the Watches desktop panel. You can also flip the watch window to show watches over smart watches instead of watches next to smart watches (the default).

### ***To flip the watch panels***

Click .

## **Move Smart Watches to the Watch panel**

Unlike standard watches, smart watches are not saved when you leave the window as they are created dynamically from the code you are actively using. However, if you want a watch to persist when you move into a different procedure or function, you can drag the watch from the smart watches panel to the watches panel. In the case of a watch that contains multiple parts, you choose to drag the node, which will copy everything under it, or only one of the items within the node.

### ***To move a smart watch to the watch window***

- Do one of the following:
- Drag the smart watch from the smart watches panel to the watches panel.
- Select a watch, right click, select **Add**.
- Select a **Smart Watch**, click the **Add Watch** button on the toolbar.

# Analyze Code

## About Code Analysis

Code Analysis is an automated code review and analysis tool. It enables individual developers, team leads, and managers to ensure that the quality, performance, maintainability, and reliability of their code meets and exceeds their best practice standards.

- Code Analysis is available in the Editor, which ensures code quality from the beginning of the development cycle. In the Editor, Code Analysis evaluates how well a developer's code adheres to project coding standards and best practices by automatically highlighting errors and suggesting smarter ways to build and test the code.

[Analyze Code in the Editor](#)

- Toad also provides a dedicated Code Analysis window, where you can perform more detailed analysis, evaluate multiple scripts at the same time, and view a detailed report of the analysis.

See *Perform Detailed Code Analysis* in the online help for more information.

### Notes:

- This feature is available in the Professional Edition and higher.
- This feature was named CodeXpert prior to Toad 11.

## Rules and Rule Sets

Code Analysis compares code against a set of rules for best practices. These rules are stored in rule sets.

The Code Analysis rules and rule sets can be adjusted to suit the requirements of different projects. Regardless of whether developers are responsible for their own code quality or if this needs to be managed centrally, Code Analysis can be adapted to fit either need.

See *Create or Edit Rule Sets* in the online help for more information.

## Code Analysis Metrics

Code Analysis uses a variety of metrics to evaluate code, including the following:

- **Computational Complexity (Halstead Volume)**—Measures a program module's complexity directly from source code, with emphasis on computational complexity. The measures were developed by the late Maurice Halstead as a means of determining a quantitative measure of complexity directly from the operators and operands in the module. Among the earliest software metrics, they are strong indicators of code complexity. Because they are applied to code, they are most often used as a maintenance metric.
- **Cyclomatic Complexity (McCabe's)**—Cyclomatic complexity is the most widely used member of a class of static software metrics. It measures the number of linearly-independent paths through a program module. This measure provides a single ordinal number that can be compared to the complexity of other programs. It is independent of language and language format.

- **Maintainability Index (MI)**—Quantitative measurement of an operational system's maintainability is desirable both as an instantaneous measure and as a predictor of maintainability over time. This measurement helps reduce or reverse a system's tendency toward what is known as *code entropy* or degraded integrity, and to indicate when it becomes cheaper and/or less risky to rewrite the code than to change it. Applying the MI measurement during software development can help reduce lifecycle costs.

The Code Analysis Report includes detailed descriptions of the code metrics and how they work.

See *Perform Detailed Code Analysis* in the online help for more information.

## Get more information

See the online help for additional topics on Code Analysis.

## Analyze Code in the Editor

By default, Code Analysis automatically checks the code in the Editor for rule violations and underlines them.

The default rule set is composed of the Top 20, which is a key set of rules compiled by Steven Feuerstein and Bert Scalzo, Toad experts and authors of Toad and Oracle-related books, articles, and blogs.

**Note:** To turn off automatic Code Analysis in the Editor, clear the **Check Code Analysis rules as you type** field in the Code Analysis options.

### To analyze code in the Editor

Click  in the Editor toolbar, or right-click and select **Analyze | Analyze Code**.

The Code Analysis Statistics window displays, and CRUD (create, read, update and delete) information and rule violations display in the tabs below the Editor.

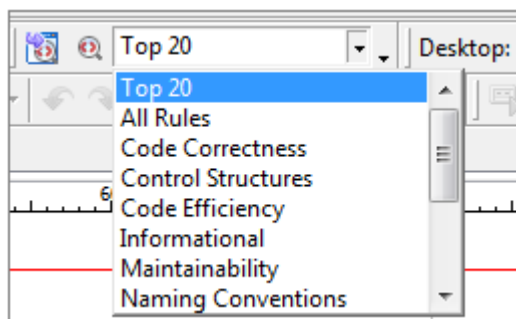
**Note:** You can also click  in the Code Analysis toolbar.

### To describe rule violations

1. To view a brief description of the violation, hover over the blue line.
2. To view a detailed description of the violation, right-click the blue line and select **Code Analysis Violations | Explain Rule**.

### To change the rule set

Select a different rule set in the Code Analysis toolbar.



# Optimize SQL

## Optimization

Toad offers several features to help you optimize queries or view the performance statistics for the server. Although Toad provides access to these statistics and/or Oracle utilities, this section describes only how to use the features within Toad, not how to interpret the results.

For an excellent guide on SQL tuning, we suggest *Oracle SQL - High Performance Tuning* by Guy Harrison available from Prentice Hall Press.

See the online help for more information about these features.

Feature	Description
Optimize Current SQL	Use Auto Optimize SQL to quickly optimize a single SQL statement. Toad searches for faster alternatives and allows you to compare them to the original statement and each other.
SQL Optimizer	If you have a Toad Edition that includes the SQL Optimizer package, you can use it to help you optimize your code.
Explain Plan	Explain Plan shows the path and order in which Oracle will process your statement. By processing Explain Plan on variations of a statement, you can see how the adjustments will affect the execution.
SQL Trace	SQL Trace is a server-side trace utility that displays CPU, IO requirements, and resource usage for a statement. SQL Trace is a much more complete utility than Auto Trace; however, viewing the results can be difficult because the output file is created on the server.
Auto Trace	Auto Trace is a mini version of SQL Trace that displays quick results directly on the client. In Toad, the results are displayed beneath the Editor window.

## Profile PL/SQL

### About the Profilers

You can use the DBMS Profiler or the hierarchical profiler, depending on their availability in your database version.

### Hierarchical Profiler

The PL/SQL hierarchical profiler organizes data by subprogram calls, and stores the results in database tables letting you create custom reports.

See [Oracle's documentation](#) for more information.

Information provided includes:

- Number of calls to the subprogram
- Time spent in the subprogram
- Time spent in the subprogram and descendent subprograms
- Detailed parent-child information

## DBMS Profiler

The Probe Profiler API profiles existing PL/SQL applications and identifies performance bottlenecks. The collected profiler (performance) data can be used for performance improvement efforts or for determining code coverage for PL/SQL applications. Application developers can use code coverage data to focus their incremental testing efforts.

The profiler API is implemented as a PL/SQL package, DBMS\_PROFILER, that provides services for collecting and persistently storing PL/SQL profiler data.

Caution: Statistics may not be collected properly if you are running the profiler on an Oracle server on a Tru64 platform.

Improving application performance is an iterative process. Every iteration involves the following:

- Exercising the application with one or more benchmark tests, with profiler data collection enabled.
- Analyzing the profiler data, and identifying performance problems.
- Fixing the problems.


To support this process, the PL/SQL profiler supports the notion of a run. A run involves executing specified SQL commands through benchmark tests with profiler data collection enabled.


### Collected Data

With the Probe Profiler API, you can generate profiling information for all named library units that are executed in a session. The profiler gathers information at the PL/SQL virtual machine level that includes the total number of times each line has been executed, the total amount of time that has been spent executing that line, and the minimum and maximum times that have been spent on a particular execution of that line.

The profiling information is stored in database tables. This enables the ad-hoc querying on the data: It lets you build customizable reports (summary reports, hottest lines, code coverage data, and so on) and analysis capabilities.

## Set Up the Profiler


This feature requires that certain objects exist on the server before you can use it. If they do not already exist, Toad prompts you to create them when you click .

**Note:** To remove the profiler objects, click the arrow next to  and select **Remove Profiler**.

## Additional Requirements for the DBMS Profiler

You must have the SYS.DBMS\_PROFILER package to use the DBMS profiler.

### To install the package

1. Login to an Oracle database through **Toad** as **SYS**.
2. Load the **Oracle home>\RDBMS\ADMIN\PROFLOAD.SQL** script into the Editor.
3. Click  on the Execute toolbar (F5).

4. Make sure that **GRANT EXECUTE** on the **DBMS\_PROFILER** package has been granted to **PUBLIC** or to the users that will use the profiling feature.

## Additional Requirements for the Hierarchical Profiler

To use the hierarchical profiler, you must enable it in the Toad options. Select **View | Toad Options | Execute/Compile** and then select **Use hierarchical profiler on Oracle 11g and newer**.

You must also have the DBMS\_HPROF package to use the hierarchical profiler, which is available in Oracle 11g and later.

### *To verify the package is installed*

1. Login to Oracle through **Toad** as **SYS**.
2. Make sure that **GRANT EXECUTE** on the **DBMS\_HPROF** package has been granted to **PUBLIC** or to the users that will use the profiling feature.



## Use a PL/SQL Profiler

To use the hierarchical profiler, you must enable it in the Toad options.

### *To enable the hierarchical profiler*


Select **View | Toad Options | Execute/Compile** and then select **Use hierarchical profiler on Oracle 11g and newer**.

### *To use a profiler*

1. Click  on the main Toad toolbar to turn on profiling.  
**Note:** If the profiler is not set up, Toad notifies you. [Set Up the Profiler](#)
2. Open the procedure in the Editor and click  on the Execute toolbar. The Set Parameters and Execute window displays.
3. Complete the parameters and profiler settings.

#### **Notes:**

- The profiler options are described by Oracle.
- See [Oracle's documentation](#) for more information.
- For the hierarchical profiler, you must select a directory on the Profiler tab. If you do not, Toad displays an error. It is recommended that you consult your DBA on the appropriate directory to select.

4. Click  again to turn off profiling.

**Note:** Be careful to not leave the profiler toggled on when you switch to other Toad windows. Otherwise, Toad collects profiler data from the queries performed to populate those windows.

5. Review the profiler information. Select one of the following options:
  - Select **Database | Optimize | Profiler Analysis**. The Profiler Analysis window displays. [View Profiler Results](#)

- Click the **Profiler** tab beneath the Editor. [Editor Profiler Tab](#)

**Notes:**

- If the Profiler tab is not visible, you can display it by right-clicking in the tab area and selecting **Desktop Panels | Profiler**.
- By default, anonymous blocks and lines not executed are not displayed. You can display them by right-clicking the tree-view and selecting them from the menu.

## View Profiler Results

The Profiler Analysis window provides data on profiler runs that is consistent with the data displayed in the Profiler tab of the Editor. [Editor Profiler Tab](#)

The top half of the window is a graph of the showing the percent of time required to run each component of the procedure.

**Note:** If you can see the pie chart labels but not the pie chart itself, resize the window horizontally to give it more space to draw.

### *To access the Profiler Analysis window*

Select **Database | Optimize | Profiler Analysis**.

### Run Details

**Opening a run:** Selecting this displays the graph for all units within that run. Expanding a run in the tree view will list the details of the run including Unit Type, Owner, Unit Name, and Total Time to execute.

**Opening a unit:** You can also select a specific unit of the selected run.

When drilling down on a unit, we see the lines of code executed and profiled. The column headers include Line Number, Passes (how many times each line of code was executed), Total Time to execute the line, Min Time, Max Time, and the line of Code itself. The graph changes to display the information within that unit.

**Displaying in Editor:** If you select a valid unit in the tree view, right-click and select display in Editor, the Editor displays the selected unit.

## Editor Profiler Tab

Within the Editor, the Profiler tab displays profiler runs, as root nodes, and profiler units as child nodes. The latter are the actual code units that were executed during a profiler run. They can include anonymous blocks, procedures, functions, and packages executed while the profiler run data was being collected. In the line item profiler, child nodes contain the actual line data. In the hierarchical profiler, child nodes contain sub program calls.

This tab provides an overview of the data, but does not offer the graphs that the Profiler Analysis window does.

Selecting a line item within the nodes automatically opens the referenced SQL source and displays the line referenced by the profiler.

**Note:** Because each Editor tab is associated with a separate Profiler instance, navigating through your code this way may reset the node display in the Profiler tab.

### *To display the Profiler Analysis window for the current data*

Click **Details**.

### *Executable Line Indicators*



When you open a profiler run or unit into the Editor and have the option **show executable line indicators in gutters** selected, executable line indicators display as follows:

Indicator	Meaning
Blue dot with green square	Line was executed
Blue dot with red circle	Line was not executed

If Toad cannot determine when the unit was last executed, then the standard blue dot line indicators will display.

#### *Hierarchical Profiler Filters*

You can filter the results of your hierarchical profiling session. This can be useful in making sure that you only see the results that are useful for you.

Toad will automatically filter out the system information that is added when the profiler is active. You can manually turn these on if you want to see that information.

#### **To create a filter**

1. From the Profiler tab at the bottom of the Editor, right click the grid and select **Filter**.  
Note: If you do not see the filter option, make sure you are actually using the hierarchical profiler.
2. Click **Add** to add a new filter to the filter grid. Enter the criteria you want to use to hide data. You may use the % wildcard within the filter.
3. Enable or disable any filters desired by selecting or clearing the **Enable** box.
4. Repeat steps 2 and 3 if necessary.
5. Click **OK**.


## Generate Explain Plans

### Generate Explain Plans

Explain Plan is an Oracle function that analyzes statements for performance issues. The Explain Plan determines the execution plan that Oracle follows when executing a specified SQL statement. The results of the Explain Plan include the order that Oracle searches and joins tables, the types of access employed (index search or full table scan), and the names of indexes used.


**Note:** Toad requires a plan table to store the Explain Plan results and creates one by default if you do not have one. The Explain Plan table should be created in the Toad schema or an individual user schema, but not both.

#### **To generate an Explain Plan**

1. Place the cursor in a statement and click  on the Execute toolbar (CTRL+E). Results display in the Explain Plan tab below the Editor.

**Note:** Toad prompts you to create the plan table if it does not exist.

2. To change the content and format of the Explain Plan:

If you want to...	Complete the following:
Select a different display format (tree, text, graphical)	<p>Right-click the Explain Plan and select <b>Display Mode</b>. Select the display format you want to view.</p> <p><b>Note:</b> The Explain Plan tree display lists the contents of the plan table for the given statement ID. The query used to retrieve information for this tree is based on the one given by Oracle in utlxplp.sql. See <a href="#">Oracle's documentation</a> for more information.</p>
Add or remove information	<p>Right-click the Explain Plan and select <b>Adjust Content</b>. For example, you can hide or display information (such as the cardinality) or select information to display as a column. Columns display to the left of the plan.</p> <p>This option is only available in the tree display.</p>
View the plan's object usage	<p>Right-click the Explain Plan and select <b>Object Usage</b>.</p>
View single record	<p>Right-click the Explain Plan and then select <b>Single Record View</b>. This feature presents the information in a format that is easy to view and edit, which is very helpful when the record contains long or complicated information.</p> <p><b>Tip:</b> Click  to edit the display options, such as the sorting order and alignment.</p>

## Save Explain Plans

You can save explain plans automatically in Toad or manually save them as an external file. The first option allows you to compare a current or historic Explain Plan to the saved file in the future.

### To save Explain Plans automatically

1. Select **View | Toad Options | Oracle | General**.
2. Select **Save previous Explain Plan results**.

### To save Explain Plans to an external file

1. Run an Explain Plan.
2. Right-click the plan and select **Save to XML file** or **Save image**.

**Note:** To open an XML explain plan, right-click the Explain Plan area and select **Load plan from XML**.

# Customize the Toad Interface

Toad provides many ways for you to customize the interface to suit your work style and improve your productivity. Most areas of the interface are customizable, from the toolbars and menus, to the grids and workspace itself. You can also set custom defaults for actions, commands, and other tasks that Toad performs for you.

## Customize Connections


### Color Code the User Interface per Connection

You can use connection colors to help you distinguish among open connections. The color coding displays prominently on all windows related to the connection throughout Toad's user interface. For example, you may use red for all production databases and yellow for all test databases. The color coding also extends to any options that display a list of connections, making selecting the desired connection fast and easy.

The color coding displays as follows:

- Any open window related to that connection
- Window and Connection bar buttons
- Status bars

#### **To select a connection color**


1. Click  on the standard toolbar to open the Database Login window.  
You can also select **Session | New Connection**.
2. Select a color in the **Color** column in the connection grid, or under **Color** on the right-hand side.

## Organize Database Connections

The Database Login window displays your connections in a grid format, known as the *connections grid*. You can organize the connections and reduce the number of connections that are displayed.

### ***To open the Database Login window***

Do one of the following to open the Database Login window:

- Click  in the standard toolbar.
- Select **Session | New Connection**.

## **Display Only Favorite Connections**

You can mark the connections that you use frequently as favorites and then hide the other connections until you need to use them.

### ***To select favorite connections***

- In the connections grid, select the **Favorite** check box of the connection you want to make a favorite.

### ***To view only favorites in the connections grid***

- Below the connections grid, select the **Show favorites only** check box.


### ***To view all connections in the connections grid***

- Below the connections grid, clear the **Show favorites only** check box.

## **Add Custom Columns**

You can add columns to the connections grid. For example, you may want to add a **Locations** column if you manage databases in multiple physical locations, or you may want to add an **Environment** column to distinguish between Test and Production databases.

### ***To add a custom column***

1. Click  in the Database Login window toolbar.
2. Click **Add**.
3. Enter the name for your custom field.

## **Group Connections (Create Tree View)**

You can group connections by column header to create a tree view. You can add multiple column headers to add grouping levels.

### ***To group connections in the data grid***

1. Drag a column header into the gray area above the grid.
2. Drag additional column headers to add grouping levels.


### ***To remove grouping***

- Drag the column header into the connections grid.

## Hide/Display Columns

If you have a small screen area, you can hide some of the columns that display in the connections grid.

### *To hide or show columns*

1. Click  in the left-hand side of the grid headers.
2. Select the columns you want to display, or clear the check box for columns you want to hide.

## Display Only Connections for Selected Oracle Home

If you have many connections using different Oracle homes, you may want to display only those using a particular home in the grid.


### *To limit connections to one Oracle home*

1. Select the Oracle home you want to display in the **Connect using** field on the right side of the Database Login window.  
**Note:** You can only connect to one Oracle home at a time. This field is disabled if you are already connected to a database. See "Select a default Oracle Home" in the online help for more information.
2. Click the **Show selected home only** check box at the bottom of the window.

## Display Tabs for Each Server or User

By default, the connections grid does not contain tabs; it is a unified grid that displays all connections. You can change the grid to display separate tabs for each server or user. Each tab contains a grid of its database connections.

### *To display tabs for each server or user*

1. Click  at the top of the Database Login window and select **Tabbed by Server** or **Tabbed by User**.
2. In addition, select **Multi-tab** to display the tabs using multiple rows.

### *To filter the tabs*

1. To filter the tabs displayed, right-click a tab and select **Filter Tabs**. Then enter a text string in the search box. If you clear the **Partial Match** check box, only exact matches are returned. The filter persists while the Database Login window is open.
2. To remove the filter, right-click a tab and select **Clear Filter**.

# Customize Workspaces

## About Workspaces

A *Workspace* is a customized set of windows and connections in Toad that you can name and save. Multiple Workspaces are supported.


You can open one workspace to work in a specific environment, such as Testing, and then quickly switch to another one, such as Development, without having to open one set of windows and connections and close the other.

You can create your own or use the starter Workspace named "Default Workspace." It is initially empty (that is, contains no windows or connections). This Workspace is the only one which cannot be deleted.

## Use Custom Workspaces

When you create different workspaces, you can easily resume work in the correct context as soon as you open Toad. Create as many workspaces as you need.

### *To create a Workspace*


1. Right-click in the main Toad toolbar then select **Workspaces** to make certain the Workspaces toolbar is shown.
2. In the Workspace toolbar, click  to name and save your Workspace. Your open windows and connections are saved and will be reestablished the next time you open this Workspace.

### *To open a saved Workspace*


- Select the workspace from the Workspaces toolbar.

When you open a saved Workspace, you are notified that open connections that are not part of this workspace will be closed. Save any changes that you want to keep before closing those windows and connections.

### *To save changes to your Workspace configuration*

- Click  in the Workspace toolbar to save changes to your Workspace configuration (newly opened windows and connections).

### *To rename a Workspace*

- Click  to rename the current workspace.

### *To sort Workspaces*

- Workspaces are sorted in the list alphabetically, by default. To toggle this feature on or off, select **Options | Toolbars/Menus | Toolbars** and select or clear the **Sort workspaces alphabetically** check box.

# Use Shortcut Keys

## Customize Shortcut Keys

Toad provides dozens of default standard shortcut keys, plus you can assign new ones or customize the standard ones. Toad also provides default menu hot keys. These are the underlined keys shown in a menu item that you press along with the ALT key to open that menu item or command. You can change the underlined character from its default.


**Note:** If you have customized your shortcut keys, you will not automatically be able to use new shortcuts added in future Toad upgrades. However, you can reset your shortcut keys to the default in order to gain access to all new shortcuts.

See *Shortcut Keys Options* in the online help for more information.

### **To change a menu hot key**

1. Right-click the toolbar and select **Customize**.
2. Right-click the menu item you want to change.
3. Change the underlined character by changing the location of the ampersand in the **Name** field. For example, **&Tools** underlines the **T**, while **T&ools** underlines the **o**.


### **To change shortcut keys**

1. Click  on the standard toolbar.  
**Tip:** You can also select **View | Toad Options**.
2. Select **Toolbars/Menus | Shortcuts**.
3. Select the command for which you want to set or change the shortcut keys.
4. Type the keystrokes you want to use.  
The shortcut key is changed as you type. If there is a conflict with another shortcut key, an asterisk (\*) displays in the Conflict column. You can then find the conflict and remove it.  
**Note:** This option only allows you to use one keystroke after a control key (such as CTRL or ALT).

## Print a List of Shortcut Keys

You can print a list of the shortcut keys that are provided with Toad.  
See the online help for a list of popular shortcut keys.

### **To print the list of shortcut keys**

1. Click  on the standard toolbar.  
**Tip:** You can also select **View | Toad Options**.
2. Select **Toolbars/Menus | Shortcuts**.

3. Click the Category or Shortcut column to sort the list.
4. Click **Print**.

# Customize Toolbars, Menus and Commands

## Enable Self-Configuring Menus

Toad menu bars can be set to configure themselves based on your work patterns. Toad collects usage data on the commands you use most often, then personalizes the menus by moving the most used commands closer to the top of the list and hiding commands that you use rarely.

### *To have menus configure themselves*

1. Right click the toolbar or menu and select **Customize**.
2. Select the Options tab.
3. Select **Menus show recently used commands first**

## Show/Hide Toolbars

You can show specific toolbars and hide the other ones to customize your workspace.

### *To change the toolbars you display*

1. Right-click the toolbar area.
2. Select the toolbars you want to display, and clear the toolbars you want to hide.

## Rename Toolbars, Menus or Commands

Toad allows you to rename a toolbar, menu or command as desired.

1. Right click the toolbar or menu and select **Customize toolbars**.
2. Right-click the item that you want to change.
3. Enter the new name in the **Name** field. To define a hotkey, include an ampersand (&) before the letter you want to assign as the hotkey.

Note: These are not the same as Toad shortcut keys, but rather the underlined letter for keyboard navigation.

## Create New Toolbars, Menus and Commands

If you want to heavily modify an existing toolbar or menu, it may be easier to create your own custom toolbar or menu instead.



### To create a custom toolbar or menu

1. Right-click the toolbar/menu and select **Customize toolbars**.
2. Create the new toolbar/menu. Review the following for additional information:

To create this...	Complete the following:
toolbar	<ol style="list-style-type: none"><li>a. Click <b>New</b>.</li><li>b. Enter a name your new toolbar. A blank toolbar displays in the user interface below the existing toolbars.</li></ol>
menu	<ol style="list-style-type: none"><li>a. Select the <b>Commands</b> tab.</li><li>b. Select <i>New Menu</i> in the <b>Categories</b> field.</li><li>c. Select <i>New Menu</i> in the <b>Commands</b> field and drag it to the menu bar where you want it located. The pointer changes to a vertical I-bar at the menu bar. <b>Tip:</b> You can create sub-menus by dragging a new menu into an existing one.</li></ol>
command	<ol style="list-style-type: none"><li>a. Select the <b>Commands</b> tab in the Customize window.</li><li>b. Drag the command from the <b>Commands</b> field to the toolbar/menu. An I-bar pointer marks where the command will be dropped</li></ol>

## Add, Reorder and Remove Commands

You can customize Toad commands to suit your requirements.

1. Right click the toolbar or menu and select **Customize toolbars**.
2. Do any of the following:

If you want to...	Complete the following:
Change the order of commands	Drag the item on the toolbar/menu to where you want it. An I-bar pointer marks where the command will be dropped.
Add commands	<p>Complete the following:</p> <ol style="list-style-type: none"><li>a. Select the <b>Commands</b> tab in the Customize window.</li><li>b. Drag the command from the <b>Commands</b> field to the toolbar/menu. An I-bar pointer marks where the command will be dropped.</li></ol>
Remove a command or menu	Right-click the item and select <b>Delete</b> .

## Show Additional Menus

You can display additional menus, such as Team Coding or Create Objects, that are hidden by default.

### ***To display additional menus***

1. Right-click the menu bar and select **Customize toolbars**.
2. Select the **Commands** tab.
3. Select **Menus** in the **Categories** field.
4. Click the menu you want to add (for example, Team Coding) in the right pane and drag it to the menu bar where you want it located. The pointer changes to a vertical I-bar at the menu bar.

## **Delete a Menu**

You can delete a menu from the current workspace. This does not delete the menu permanently. You can restore it by using the **Restore toolbar defaults** action.

### ***To delete a menu***

1. Right-click in the **menu bar** and select **Customize toolbars** to display the customize window.
2. Right-click the **menu** you want to remove. Select **Delete** from the menu. The menu is removed.

## **Reset Default Toolbars and Menus**

You can restore customized or deleted toolbars and menus to their defaults.

### ***To reset default toolbars and menus***

Right-click a toolbar and select **Restore toolbar defaults**.

It is possible to remove all the toolbars from the Editor. If this happens, you can restore the toolbars to your windows without resetting all the default settings.

### ***To restore lost toolbars from the Editor***

1. Right-click the Desktop panels tab area.
2. Select **Customize toolbars**.
3. Select the Toolbars tab.
4. Select the Editor toolbars you want to display.

## **Lock Toolbars**

By default, the toolbars are locked to prevent a toolbar from being moved or changed accidentally. You can unlock and relock the toolbars easily.

### ***To unlock or lock toolbars***

Right-click any toolbar and clear **Lock Toolbars** to unlock the toolbars or select **Lock Toolbars** to lock them again.

All toolbars are locked or unlocked with this command.

You can still customize a toolbar even when toolbars are locked.

# Effect of Upgrades on Customizations

When you customize Toad menus and toolbars, understand how they are affected the next time you upgrade Toad:

- Toolbar and menu customizations are not auto-imported when you upgrade Toad. This allows you to see new Toad windows in your menus.
- If you wish to restore your previous Toad settings, including your menu and toolbar customizations, go to **Utilities | Copy User Settings**.
- New commands in a Toad upgrade are not added to custom toolbars. However, you can see both new commands and commands that have been completely removed from the toolbars and menus.
- Commands that were removed from the toolbar but not the menu bar (or the other way around) do not display in the **Unused** area. Because of this, it may not be obvious that you have removed a command from one location and not the other.

## **To view new/removed commands**

1. Right-click the toolbar/menu and select **Customize**.
2. Select the **Commands** tab.
3. To view new commands, select *[New]* in the **Categories** field.
4. To view commands you removed, select *[Unused]* in the **Categories** field.
5. To add a new/removed command to a menu/toolbar, drag the command to the toolbar/menu.

# Customize the Editor

## Customize the Editor Layout

You can easily configure which panels display on your Editor desktop and where they display. You can select panels to display one at a time or in groups. When you have configured it, you can save the desktop with its own name, returning to it whenever the need arises. In addition, you can turn on Auto-save current desktop, and however you have the desktop set when you change tabs or close Toad will be how your desktop is defined the next time you open the Editor. You can also split the Editor to easily compare code revisions.


### **To display panels one at a time**

1. Right-click the Editor and select **Desktop**.
2. Select the panel you want to display or hide.

### **To configure your desktop**

1. Right-click the panel area near the bottom of the window.
2. Select **Desktop | Configure Desktop Layout**.
3. Select the panels you want to display in the Show column, and click the drop down menus in the Dock Site column to change where the panel is docked. By default, all except the Navigator will be docked below the Editor.

### ***To save your desktop***

1. Click  on the Desktops toolbar.
2. Enter the name you want to use for this desktop.

### ***To use a saved desktop***

From the drop-down desktop menu, select the desktop you want to use.

### ***To restore a desktop***

Click the drop-down arrow on  and select **Revert to last saved desktop** or **Restore desktop defaults**.

### ***To split the Editor***

1. Right-click the Editor and select **Split Editor Layout**.
2. Select **Left-Right** or **Top-Bottom**.

### ***To remove the split layout***

Right-click in the Editor and select **Split Editor Layout | Not Split**.

## **Use Bookmarks**

Use bookmarks to help you manage files. They mark a position within the Editor so that you can easily jump back to that line. You can set up to ten separate bookmarks within one Editor.

Note: All keystrokes assume you have not altered the default Editor keys.

### ***To set a bookmark***

Right-click and select **Toggle Bookmark | Bookmark#** (CTRL+SHIFT+# where # is a number between 0 and 9).

The bookmark number displays in the Editor gutter.

### ***To clear all bookmarks***

Right-click and select **Clear All Bookmarks**.

### ***To clear one bookmark***

Right-click and select **Toggle Bookmark | Bookmark#** (CTRL+SHIFT+# where # is a previously defined bookmark between 0 and 9).

### ***To jump back to a bookmark***

Right-click and select **Go to Bookmark** (CTRL+# where # is a previously defined bookmark between 0 and 9).

Note: The # must be called from the number row on the keyboard. Using the Number pad will not call the bookmark.

## **Auto Replace Substitutions**

A substitution is a text phrase that corresponds to replacement text. For example:

- If you specify a substitution pair of ACT = ACTIVITY\_CENTERS, when you type ACT and press space (or other word delimiters), ACT is automatically replaced by ACTIVITY\_CENTERS
- If you specify a substitution pair of NDF = NO\_DATA\_FOUND and you type NDF and press a delimiter, NDF is automatically replaced by NO\_DATA\_FOUND

Auto Replace Substitutions are different from aliases in that you can use any group of characters to define and complete the replacement. Aliases do not change the text in the SQL. They are a method of referring to a table by a different name. Substitutions will actually change the text within your code to match the target keystrokes.

### **To edit Auto Replace entries**

1. From the View menu, select **View | Toad Options | Editor | Auto Replace**.
2. Make changes in the **Auto Replace** grid.

When auto-replace is active, Toad uses several characters as auto replace activation keys. Toad will automatically replace an activation key with the substitution value when it reaches a terminator, for example the space key. For example, if you type **teh**, Toad replaces it with the word *the* in the Editor. Or, you can enter the word **pack** and Toad will expand it to *package*.

An activation key will cause a matched replacement string immediately before the cursor to be replaced by the substitution value. For example, if you have **dept = DEPARTMENT** in your auto replace file, you can enter the following:

- **dept[space]** and the Editor will expand to DEPARTMENT .
- **dept:** and the Editor will expand to DEPARTMENT:.
- **dept;** and the Editor will expand to DEPARTMENT;.

Note: The activation key is always included in the expanded substitution.

You can edit this list of keys in the box if you have other needs.

Also from the Editing options window, you can import and export auto substitution files.

Toad comes with a handful of substitution pairs. You can edit and add to the list from the Auto Replace dialog. You can then export the settings to a text file. Alternately, you can create or edit a substitutions file manually and then import it.

**Export:** Saves the auto replace settings to a separate text file. If you make many changes to your auto replace settings, it is recommended that you export them regularly for back up.

Note: If you do not export your settings to a file before you import a file, they will be lost.

**Import:** You can import a text file into Toad. This file can be created independently or by exporting the settings you have created in Toad.

Importing a file overwrites the current settings.

Because it can be tedious to add large amounts of information to the substitution file directly from the interface, you may want to edit or create a text file directly.

Use the format of string=replacement string. For example:

```
aax=AAX_ACCESSGROUP_APPLICATION
aca=ACA_ACTIVITY_ACTION
acc=ACC_ACTIVITY_CATEGORY
acd=ACD_ACTION_DESCRIPTION
acp=ACP_ACTIVITY_CONTACT_PARTIC
```


# Customize the Schema Browser

## Select the Left-Hand Side Display Style


You can customize how the Schema Browser displays to better suit the way you work. The most common customization is to change how object types display in the left-hand side. Once you select a basic display style, you can rename, hide, or rearrange the object types on the left-hand side and detail tabs on the right-hand side.

[Customize Schema Browser Tabs](#)

### Tips:

- To hide the right-hand side of the Schema Browser, press F12. You can press F12 again to display it again.
- To hide or display images and tips in the left-hand side, click  in the Schema Browser toolbar and select the appropriate option.
- In drop-down mode, you can hide leading characters of object names in the left-hand side. Right click a column and select **Hide leading characters of name**. The display resets when you change the schema or connection.

### To select the left-hand side display style

1. Click  in the Schema Browser toolbar.
2. Select one of the following options:


Option	Description
Drop-down	Displays object types in an alphabetical drop-down field.
Tabbed (single row of tabs)	Displays object types as a single line of tabs. You must scroll through the tabs to view all object types.
Tabbed (multi line tabbed)	Displays multiple rows of tabs instead of the scroll bar.
Tree view	Displays object types in a tree view.

**Note:** You may need to close any open instances of the Schema Browser for the new browser style to display.

## Customize Schema Browser Tabs


The Schema Browser displays object types on the left-hand side and detail tabs on the right-hand side. You can rename, rearrange, and hide the object types that display in the left-hand side or the tabs on the right-hand side.

### To customize tabs and object types

1. Click  on the Schema Browser toolbar.
2. Select **Configure LHS Object Types** to customize the left-hand side, or select **Configure RHS Tabs** to customize the right-hand side.

3. Customize the display settings.

If you want to...	Complete the following:
Rename an object type or tab	Enter a new name in the <b>Caption</b> field.
Hide an object type or tab	Clear the <b>Visible</b> field.
Rearrange tabs	Select a tab and click the up or down arrow on the right. Note: You can only rearrange the order of object type tabs if you are in a tabbed view. <a href="#">Select the Left-Hand Side Display Style</a>

4. To save the left-hand side settings as a configuration file, click  at the bottom of the window.



**Notes:** You can save and load different configurations. This gives you more flexibility when you are working, because you can easily change the display to suit different tasks.



## Group Favorite Objects

You can group objects that you use frequently into a tab on the Schema Browser. These different objects can be grouped into one or several folders. Folders are specific to an instance (not a connection or a schema).

**Note:** The configuration file for this tab is saved as **Projects.lst** in the User Files folder.


### To group favorite objects

1. Click  on the Standard toolbar to open the Schema Browser.
2. Select *Favorites* in the object list in the left-hand side.
3. Add one or more folders to group the objects:
  - a. Click  on the Favorites toolbar.
  - b. Enter a folder name.
4. Add objects to a folder.

To do the following:	Complete these steps:
To search for and select objects	<ol style="list-style-type: none"> <li>a. Click  on the Favorites toolbar.</li> <li>b. Search for objects. <a href="#">Object Search</a></li> <li>c. Highlight the objects you want to add in the Results tab and click .</li> <li>d. Select the folder where you want the object.</li> </ol>
To add objects directly	<ol style="list-style-type: none"> <li>a. Right-click an object in the left-hand side and select <b>Add to SB Favorites List</b>.</li> <li>b. Select the folder where you want the object.</li> </ol>
To add scripts/files	<ol style="list-style-type: none"> <li>a. Right-click the folder where you want the item in the Favorites list and select <b>Add Files</b>.</li> </ol>

To do the following:	Complete these steps:
	b. Select the file and click <b>Open</b> . <b>Note:</b> Multi-select files to add more than one at a time. c. Select the folder where you want the object.

**Tips:**

- To remove objects from a folder, select the object in the Favorites list and click .
- To empty or remove favorites folders, right-click the folder and select **Remove Folder** to remove the folder and its contents or **Empty Folder** to leave the folder in the list but remove its contents.


## Customize Schema Drop-Downs

You can customize schema drop-downs by creating a list of favorites, hiding schemas, setting the default schema for connections, and other options. Changes apply to all windows with the schema drop-down, such as the Editor and Schema Browser.

### **To set a default schema**

Right-click the schema in the schema drop-down and select **Set <schema name> to Default Schema**.

### **To customize schema drop-downs**

1. Right-click the schema drop-down and select **Customize**.
2. Select schemas to categorize and click the **>** button.
3. To hide schemas, select *Hidden Schemas* in the **Category** field for the schema.
4. To create a new category, enter the category name in the **Category** field for the schema. The new name becomes available in the Category drop-down.
5. To change when the schema is categorized, select the **When to Categorize** field for the schema and click .



## Use other Quest Products with Toad

You can access the features of the following Quest products from within Toad to expand your ability to manage your code and your database.

[Integrate Toad with Code Tester for Oracle](#)

[Launch Quest SQL Optimizer for Oracle](#)

[Test in Benchmark Factory for Databases](#)

## Integrate Toad with Code Tester for Oracle

Code Tester for Oracle automates the process of testing PL /SQL programs, making it possible for you to identify bugs and verify program correctness in a fraction of the time it has taken previously. Toad contains a subset of Code Tester functionality to allow you to create unit tests as an integral part of your code execution.

See [Run and Store Unit Tests](#) for more information.


**Note:** Toad contains a subset of Code Tester functionality. Code Tester for Oracle itself is a standalone product. For full information about using Code Tester, please open Code Tester and see its relevant documentation.

## Launch Quest SQL Optimizer for Oracle

This feature is available in the Xpert Edition and higher.

Quest SQL Optimizer for Oracle® automates the SQL optimization process and maximizes the performance of your SQL statements. SQL Optimizer for Oracle analyzes, rewrites, and evaluates SQL statements located within database objects, files, or collections of SQL statements from Oracle's System Global Area (SGA). Once SQL Optimizer identifies problematic SQL statements, it optimizes the SQL and provides replacement code that includes the optimized statement. SQL Optimizer also provides a complete index optimization and plan change analysis solution. It provides index recommendations for multiple SQL statements or a SQL workload, simulates index impact analysis, and generates SQL execution plan alternatives.

### ***To launch SQL Optimizer for Oracle***

Click  on the File toolbar.

**Note:** This icon is also available in additional locations, such as the Auto Optimize SQL and the Create and Alter windows for some object types.

## **Test in Benchmark Factory for Databases**

Benchmark Factory® for Databases - Oracle Edition is a database performance and code scalability testing tool that simulates users and transactions on the database and replays production workload in non-production environments. This enables developers, DBAs, and QA teams to validate that their databases will scale as user load increases, application changes are made, and platform changes are implemented.

You can connect to Benchmark Factory from Toad, set Performance Test Settings and send the test to Benchmark Factory for further analysis.

### ***To open Benchmark Factory***

Select one of the following:

- Schema Browser pages - Right-click on the object to be tested and select **Test Performance**.
- Code Road Map - Right-click on the object to be tested and select **Test Performance**.

**Note:** When you choose to send an object to Benchmark Factory, you need to set Benchmark Factory properties in addition to the parameters required by the database object. See the Benchmark Factory documentation for more information.

## 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.

## Contacting Quest

For sales or other inquiries, visit [www.quest.com/contact](http://www.quest.com/contact).

## 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