

# TOAD<sup>®</sup>

## USER'S GUIDE

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Version 7.2



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# Introduction

## **TOAD**

TOAD is a powerful low-overhead tool built around an advanced SQL and PL/SQL editor. It was designed from the developer's perspective, and the result is an easy to use, fast, and effective interface. The GUI browsers provide quick access to database objects.

You don't have to be a PL/SQL expert to access database objects when you're using TOAD. You can view the Oracle Dictionary, tables, indexes, stored procedures, and more-- all through a multi-tabbed browser.

PL/SQL script writers can use the advanced editing features to save time and increase productivity. Code can be created from shortcuts and code templates. You can even create your own code templates.

Use TOAD to

- Create, browse, or alter objects (tables, views, indexes, etc.) including Oracle8 TYPE objects
- Graphically build, execute, and tune queries
- Edit, debug, and profile "stored procedures" including procedures, functions, packages, and triggers
- Search for objects
- Find and fix database problems with constraints, triggers, extents, indexes, and grants

This guide is a how-to and reference for new users and users already familiar with TOAD. The guide does not cover every TOAD window, option, and function. The guide covers the following major windows and topics:

- SQL Editor
- Procedure Editor
- Schema Browser
- PL/SQL Debugger (optional)
- DBA (optional)

Once you are comfortable navigating around a few of these windows you'll discover that the other TOAD windows have a similar design. The manual also covers the following major topics:

- Logon/logoff
- Navigation and shortcuts
- Additional features and windows

Note that this User's Guide was prepared in December 2001. New or changed TOAD features since December 2001 are not reflected in this version of the guide. Refer to TOAD Help for the latest information.

Note that colors are presented in the .PDF, which commercial TOAD users can download from [www.quest.com](http://www.quest.com). The printed version of the TOAD User's Guide is in black and white, so the color differences are not always distinguishable.

For details on installing and uninstalling TOAD, refer to the *TOAD Getting Started Guide*.



You can always access TOAD Help while you are in TOAD by pressing the **F1 Key**.



# Logon/Logoff

When you start TOAD a Login screen displays. The screen lists your previous connections (server, user, and the date and time of the connection). Click **Show Connection Options** to see the connection options. You can create a new connection to Oracle or select from a list of previous connections. If the **Build Oracle Alias List** checkbox is checked, TOAD will fill the database dropdown with the database aliases listed in the TNSNAMES.ORA file. The **View > Options > Oracle** page contains a **Default passwords to user name** option which is unchecked by default. If checked, when you double-click to select a previous logon from the list of previous logons, the default password will be the same as the username.

The previous connections list can be sorted by clicking on the Server, User, or Last Connect column header. Click once on a header, and the associated list is sorted chronologically, or in ascending order. Click twice on a header, and the associated list is sorted in descending order.

The date format comes from the workstation setting in Settings > Control Panel > Regional Settings > Date > Short date style option.

## Server Login

You get to this dialog via the **File > New Connection** menu item, or when TOAD starts up.

You can create a new connection to Oracle or select from a list of previous connections. TOAD will fill the database dropdown with the names of previous sessions and any aliases in TNSNAMES.ORA.

**To create a new connection**

- 1 Type the name of the database in the dropdown combo box labeled **Database**. The server name you use must have an entry in the TNSNAMES.ORA file.
- 2 Type the name of the USER in the textbox labeled **User/Schema**.
- 3 Type the PASSWORD for the user in the textbox labeled **Password**. Asterisks will display instead of characters as you type.
- 4 Click **OK**  
**OR**  
Press <ENTER>.

### To use a previous connection

If the **View > Options > Oracle > Save passwords for Oracle Connections** option is checked

AND/OR

If the **View > Options > Oracle > Default Passwords to User Name** option is checked and your password for the previous connection that you want to use is the user name

THEN

You can double-click a previous connection from the list in the left panel to automatically logon.

Otherwise, follow these steps.

- 1 Select a previous connection from the list in the left panel.
- 2 Type in the Password.
- 3 Click **OK** or press <ENTER>.

TOAD saves the **USER/DATABASE** combinations between TOAD sessions, but does not save the password.

**DO NOT ENABLE THE Save passwords for Oracle connections OPTION UNLESS YOU HAVE A SECURE ENVIRONMENT.**

### To delete a previous connection

- 1 Select a connection from the Server, User, Last Connect list.
- 2 Press the <DELETE> key.

### To run TOAD offline

- 1 Click the <Cancel> button on the Server Login window.
- 2 Open the offline text editor via the main toolbar button.

### **If you are having trouble running TOAD with Personal Oracle 8.1.5**

If you are using TOAD with Personal Oracle 8.1.5 or later and receiving errors like “No Listener” try the following:

- 1 Open a Command Prompt.
- 2 Type “lsnrctl” and <ENTER>
- 3 Type the command “start”

## **Logon Options**

The Login window has five options.

### **Force SQL\*Net (ignore Net8)**

When checked, TOAD ignores the Net8 DLL's on your system and attempts to connect to Oracle via the SQL\*Net DLL's. When the Oracle Home has been found, the DLL with the HIGHEST revision number is loaded. If **Force SQL\*Net** is chosen, Net8 DLL's are skipped. This also means that a client install with just Net8 will result in a failure.

### **SQL\*Net Compatible Net8**

This option only applies to Oracle 8.0.x databases. When checked (ON), you get the row and character position from bad queries, and the cursor is positioned to the point of error. The downside is that no Oracle 8 functions are supported. When unchecked (OFF), you do not get the error row or column position, but you do get the Oracle 8 functions. This option does not apply to Oracle 8i because Oracle restored the error position function. It assumes that Net8 is installed. The DLL is loaded according to the above, but the new Net8 functions are ignored.

**Build Oracle Alias List**

This is the default. When this option is checked, TOAD cycles through your TNSNAMES.ORA file, and the next time you start TOAD it builds connection names in the **Database** dropdown list.

**Use Last Oracle Home**

This will use the Oracle Home that was last installed.

**Use the TOAD Home**

This will use the Oracle Home selected through the SQL\*Net Help dialog.

### Operating System Authentication

TOAD can accept logins where the operating system validates the user and password. Select the database alias and leave the **Username** and **Password** textboxes empty. Oracle will prefix your workstation login and attempt a login. To configure this on the server side, the init.ora initialization parameters file must have:

```
remote_os_authent = true
```

```
os_authent_prefix = "OPSS"
```

or whatever prefix you select.

For example, Joe Smith logs onto the ORA805 database, enters "ORA805" in the Database textbox, and leaves Username and Password empty. His NT login is "JSMITH", which gets prefixed with "OPSS" giving a username of "OPSSJSMITH." Oracle attempts a login and TOAD starts up.

The next time you bring up the Server Login window, any previous logins that were O/S authentication logins will have username = "EXTERNAL". You don't need to type over the word EXTERNAL in the username textbox when reconnecting.

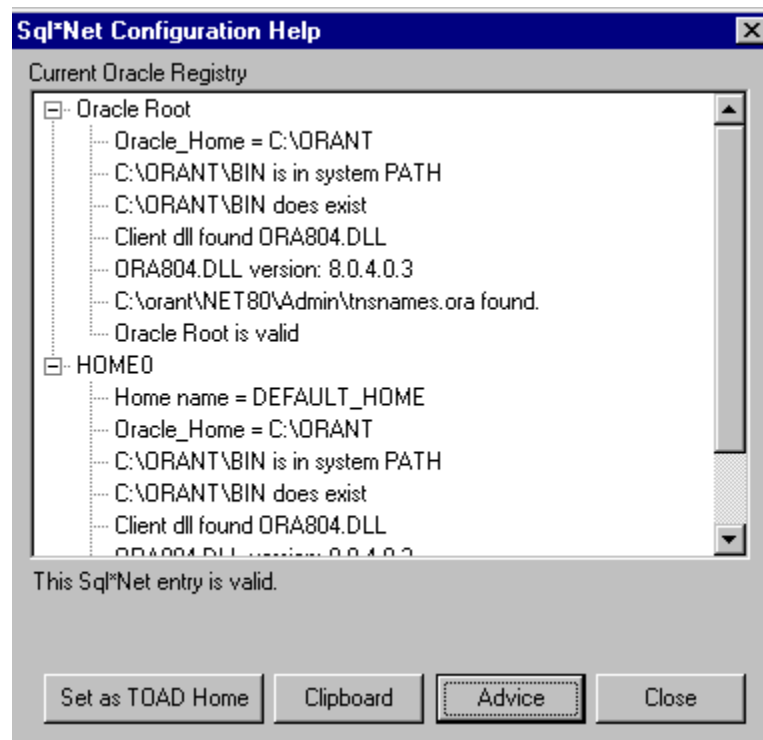
You can use Oracle usernames without passwords in TOAD. Whatever you enter in Database, Username, and Password boxes are passed to the database. If the database permits default passwords, you can connect.



### SQL\*Net Help button

This button displays all Oracle Homes and lets you pick one Oracle Home as your TOAD Home. It also lets you see which Oracle Homes are valid installs. The information can be copied to the clipboard and pasted into an email for technical support issues.

Note that TOAD Home can only be used if the **Use the TOAD Home** box in the Login window is already checked. If it is not checked and you want to apply it, you can check the option, quit TOAD, restart TOAD, and the option will apply.



If a SQL\*Net entry is not valid, you can click the **Advice** button for suggestions.

### Save Passwords for Oracle Connections

One of the TOAD options is **Save Passwords for Oracle Connections**. The default for this option is unchecked. This option involves the TOAD.INI file. Normally, only the schema and database are saved to the TOAD.INI file for each new Oracle connection. When unchecked, TOAD puts in the Username for the password. When checked, the password is saved in TOAD.INI.



Before you check the **Save passwords for Oracle Connections** box, be sure you work in a secure environment where your TOAD.INI file will not fall into the wrong hands.

### To turn on the *Save Passwords for Oracle Connections* option

- 1 Go to **View > Options > Oracle**.
- 2 Click **Save Passwords for Oracle Connections** to check that option.
- 3 Either quit TOAD and restart  
**OR**  
Click the **Save All Options** button in the main toolbar.

If you do not check the **Save Passwords for Oracle Connections** checkbox, then the username is copied to the password box because most development schemas are created as user/user. So, during login, the password = Username.

### Encrypt saved passwords

Next to the **Save Passwords** option is the **Encrypt saved passwords** box. If checked, the password is encrypted so that if the TOAD.INI file is pulled into a text editor, only encrypted text is displayed. So, another user can't see your password by simply pulling the TOAD.INI file into a text editor.

If you have previous passwords in the TOAD.INI file and choose to encrypt a password, then all previous passwords are automatically encrypted. So, you don't have to go through and encrypt each password individually. The same rule applies to unchecking Encryption. All previous passwords will also have their encryption feature removed.

## Connecting to Personal Oracle

If you are having trouble connecting to Personal Oracle or creating a SQL\*Net alias for PO7 or PO8, try one of the following four entries for the database name on the TOAD login window:

**2:**  
**BEQ-LOCAL**  
**LOCAL**  
**TCP-LOOPBACK**

For Schema/Passwords try one of the following pairs:

**DEMO/DEMO**  
**SCOTT/TIGER**  
**SYS/CHANGE\_ON\_INSTALL**  
**SYSTEM/MANAGER**

## End Connection

You might want to close a connection without exiting TOAD.

### To close a specific connection without exiting TOAD

- 1** Go to the **File > End Connection** menu.
- 2** A popup window lists one or more sessions.
- 3** Click the session you want to end.
- 4** Click **OK**.

All windows associated with that session are closed. If you have any **Prompt to save before close** options on, you will be prompted to save the editor contents so that they are not discarded.

TOAD also has an **End All Connections** option, accessed from the **File** menu, which will close all connections.





# Schema Preparation

The following features of TOAD require the creation of database objects: Saved and Recalled Explain Plans, TOAD Features Security, and Oracle 8i Profiler Analysis. The scripts to create these tables are in the \TEMPS folder as follows:

Saved/Recalled Explain Plans	TOADPREP.SQL
TOAD Features Security	TOADSECURITY.SQL
Oracle 8i Profiler Analysis	TOADPROFILER.SQL

You can create these objects in every schema in which you intend to use them (i.e., every schema would have these same tables), but the ideal solution would be to create a new user TOAD, create the objects once in the schema TOAD, and grant access to them to all users via synonyms. These scripts contain the statements for accomplishing all of this; however, the connection to Oracle used to execute the script must have the rights to do so.

If you do not want to create a separate TOAD schema or if you want to create the required tables in several schemas, you can load and execute the script file NOTOAD.SQL for Saved/Recalled Explain Plans. This script will place all of the necessary objects for Saved/Recalled Explain Plans in the current schema for the current Oracle session.

**NOTE:** On the **View > Options > Oracle** page, you can specify the name of the Explain Plan table that TOAD should utilize. If you change the default setting from TOAD\_PLAN\_TABLE to PLAN\_TABLE, TOAD will use your existing table, and you do not have to create the TOAD table. On the other hand, if you still do not execute the TOAD scripts, you will not be able to recall previous Explain Plan results.

It is not necessary to execute TOADPREP.SQL in order to use TOAD. If you do not execute the script, TOAD will not display previous Explain Plan results.

Explain Plan will still function on the SQL Edit window providing you specify PLAN\_TABLE on the options window rather than TOAD\_PLAN\_TABLE. If you decide NOT to store previous Explain Plan results, you should disable the option **Save previous Explain Plan results** on the **View > Options > Oracle** page.

By default, TOAD uses the user name plus the date and time to generate a unique statement id for the Explain Plan. (You can change the user name TOAD uses for Explain Plan via the **View > Options > Oracle > User Name for Explain Plan** textbox.) If the user has a longer than normal user name, you might need to expand the Statement\_ID column of the Plan table.

# Basics

This section contains basic information about TOAD navigation, buttons, Hot Keys, Right-Click Menus, and the main menu.

## Mouse

TOAD is designed to be used with a mouse. In addition to pointing and clicking on items, the right-click button displays Right-Click Menus that are associated with different areas of TOAD. *Right-Click Menus are discussed in the Right-Click Menu section of this chapter, page 30.*

### Expand/Collapse buttons



*The expand symbol*



*The collapse symbol*

Some sections will have a list of categories with expand buttons next to each category item. Click the expand symbol to expand the list. If the category is already expanded, you can click the collapse symbol to collapse the list.

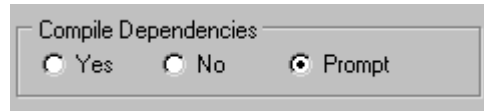
### Drill Down buttons



*The drill down button*

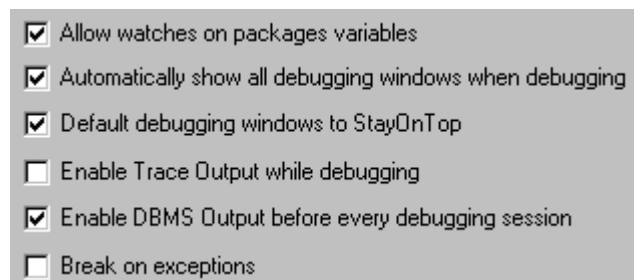
Drill down buttons indicate another level of information. Click the drill down button to “drill down” another layer, which is usually another window.

### Radio buttons



Radio buttons let you select one choice. You cannot select more than one radio button from a radio button list at the same time. To select a radio button click in the button area (or on the corresponding text to the right of the button), and a black dot will display in the selected button.

### Checkboxes



You will find checkboxes throughout TOAD. The program is designed to be flexible, and with checkboxes you control how TOAD looks and functions. Unlike the radio buttons, you can check multiple items in a checkbox list. Options you've set in one checkbox might affect options in another checkbox.

#### To place a check in a checkbox or remove a check from a checkbox

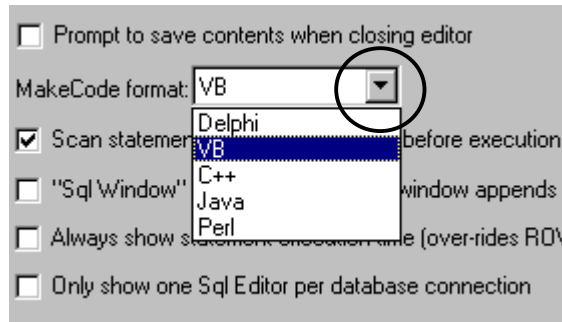
Click in the checkbox area or label area

#### OR

Tab to the area with the checkboxes and press the up and down arrow keys until your option is highlighted. Press the space bar.



### Dropdown lists



Dropdown lists are used throughout the TOAD screens. The down arrow activates a dropdown menu from which you can choose an item.

### Textboxes

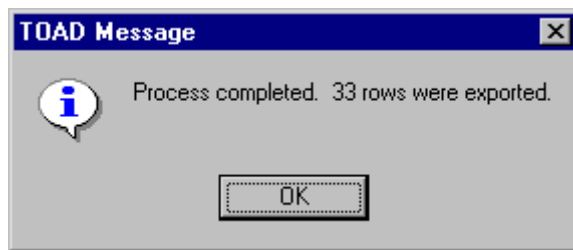


For textboxes, click in the textbox area and then type in the text or numeric entry.

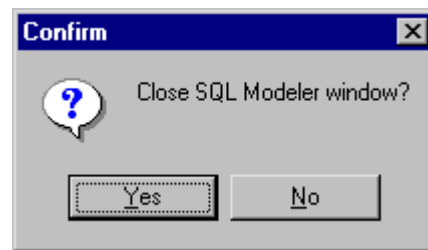
### Types of Message Boxes

TOAD uses the industry standard symbols for its four types of message boxes.

- i** This indicates an information box.
- ?** This indicates a question box that requires a decision from you.
- X** This indicates a stop message.
- !** This indicates an exclamation (very important) message.



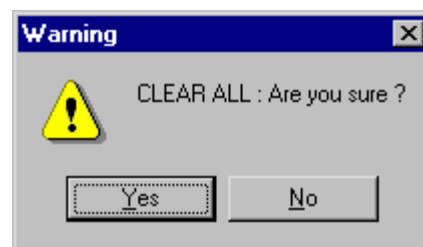
*Information box*



*Question box*



*Stop box*



*Exclamation box*

## Keyboard

You can use the keyboard for navigation and selection.

### **TAB**

The TAB key lets you advance the cursor forward from one area of a window to another area. The first item in the area you tab to will highlight.

For textboxes, you can TAB to the textbox, and the text cursor displays ready for you to type.

### **UP/DOWN ARROWS**

The UP ARROW and DOWN ARROW let you move your cursor up and down the items or list of whatever area your cursor is positioned in. In a dropdown list the UP and DOWN ARROWS scroll through the choices in the list. The UP and DOWN ARROWS are referred to as the UP and DOWN keys.

### **LEFT/RIGHT ARROWS**

The LEFT ARROW and RIGHT ARROW let you move left and right across a list of radio button choices. Once you reach your choice, TAB to move out of the area (or click outside of the area with your mouse), and your choice remains. You can also use the UP/DOWN arrow keys to move through the radio button choices.

For the Expand and Collapse buttons the LEFT ARROW collapses the list and the RIGHT ARROW expands the list.

You can also activate Expand and Collapse buttons using the <+> and <-> keys on the numeric keypad. The plus sign “+” expands the list and the minus sign “-” collapses the list. For hierarchy lists, the multiplication sign “\*” expands to all levels.

**SPACEBAR**

The spacebar lets you check and uncheck checkboxes or click buttons with focus.

**ENTER**

ENTER is similar to a mouse-click. It activates whatever button has focus. For example, if you <TAB> to a CANCEL button and press <ENTER>, you will cancel your choices and exit the window. Pressing <SPACEBAR> on buttons with focus also clicks the buttons.

**ESC**

ESC cancels most modal dialogs.

**Not Accessible by Keyboard**

TOAD was designed for a mouse, and some areas of TOAD can only be accessed by using the mouse.

For example, you cannot tab to a drill down button. You have to click the drill down button to bring up its associated window.

## Hotkeys – adding/altering

The Editor Options Dialog list of key assignments contains a list of the basic editing functions. <CTRL><INSERT>, <SHIFT><INSERT>, and <SHIFT><DELETE> are mapped to copy (<CTRL>C), paste (<CTRL>V), and cut (<CTRL>X) automatically.

When you highlight a command, you can alter the key assigned to that command OR add an additional key. All commands allow for two-part keystrokes; for example, Control-K, 0 for the command "set Bookmark 0."

### To set the command for "Bookmark0" to "Control-K, 0"

- 1 Click the **Edit > Editor Options > Key Assignment** item.
- 2 Expand the **Bookmarks** list by clicking the expand "+" button.
- 3 Click **Set Bookmark 0**.
- 4 Click the **Edit Sequence** button.
- 5 The **Edit Key Pair** step window displays.
- 6 Press <CTRL>K. The key sequence displays in the window.
- 7 Click **Next**.
- 8 The optional **Step 2** window displays.
- 9 Press 0.
- 10 Your second key, 0, displays in the window.
- 11 Click **Finish**.
- 12 Press OK in the Editor Options window to save the setting.

Note that keystrokes such as <CTRL>J or <SHIFT><INSERT> are ONE stroke keys.

DO NOT CLICK the buttons **ADD** or **DELETE** unless the keys you just entered are in addition to the default keystrokes OR you want to remove the displayed keystrokes entirely. If you click **DELETE** while looking at a command, the hotkey for that command is removed.

## Right-Click Menus

A Right-Click Menu is specific to the window that you are in. Some items in the menu are shortcuts to commands or windows that can be found elsewhere, and some items are unique to the Right-Click Menu and cannot be found anywhere else in TOAD.

















### **To access a Right-Click Menu**

Press the right mouse button (right-click)

**OR**

For the Procedure Edit and SQL Edit windows you can also press F10.

## Main Toolbar

-  Open a new **SQL Edit** window with the current active connection
-  Open a new **Schema Browser** window with the current active connection
-  Open a new **Procedure Edit** window with the current active connection
-  Open a new **SQL Modeler** window with the current active connection
-  Open a new **Explain Plan** window with the current active connection
-  Open a new **DBMS Output** window with the current active connection
-  Open a new **Object Search** window with the current active connection
-  **Save all Options** normally saved when exiting TOAD
-  Open **TOAD Reports**
-  Open a new **Offline Text Editor** window (no Oracle connection required)
-  **Toggle PL/SQL Profiling On/Off**
-  **Toggle Compiling with Debug**
-  **Configure TOAD Options**
-  **Integrated Tools**
-  **Run Script**
-  **Configure/Execute External Tools**



**Commit any changes to this schema**



**Rollback any changes to this schema**



**Show windows by connection**, minimizes non-selected MDI child windows, restores MDI child windows for the selected Oracle connection



**Open a new Oracle connection to the database**



## Save TOAD Options



The Save TOAD Options button saves external files, which are basically your current TOAD settings and values.

This is useful if you are about to run a query that could crash or run for a long time. You might want to Save TOAD Options before running such a query, just as a precaution. It saves all TOAD options to files in your TOAD and TOAD\TEMPS folders including settings from the TOAD Options dialog, Editor Options settings, Recall Previous SQL lists, Lists of MRU (Most Recently Used) files, Table Name alias list, etc.

## Offline Text Editor



The Offline Text Editor button opens an Offline Text Editor window. So, you can edit scripts without being connected to an Oracle database.

For example, by modifying the script files that define how the TOAD Editor should highlight keywords, you could edit HTML files and have TOAD highlight the HTML markup tags in various colors.

The file language types supported are: PL/SQL, HTML, INI, JAVA , and TEXT.

The View > Options > Parser Scripts dialog is where you set up the file associations for file name extension.

Configure the editor options by loading a file for a language into the offline editor and choosing Edit > Editor Options.

## Configure/Execute External Tools



This opens the **Tool Options** window which lets you add programs that can be launched from TOAD. The **Add** button opens a **Tool Properties** window that lets you add programs, select icons, pass in parameters to the program, create shortcuts (click in the Shortcut box and enter the new keystroke), and add macros. After you've added programs to the Tool Options window, they are available from the Configure/Execute External Tools dropdown list. The icon of the last program you execute from the dropdown replaces the Configure/Execute External Tools icon. You can then execute the last program by clicking its icon on the toolbar.

An **Auto add** button searches the registry for a set of preinstalled programs. You select the programs that you want to add. It finds the program file, an icon, and establishes the working directory as the same directory where the executable resides.

# SQL Editor

If you have never used TOAD, the SQL Edit window is a good starting point. The window contains an editor to compose SQL statements or scripts and a results grid to display the results from SELECT SQL statements. At the end of the chapter, step-by-step examples are provided for various SQL Edit procedures.

The SQL Editor lets you type, edit, execute, and tune. When you first start TOAD you are in a SQL Edit window. The SQL Edit window has two panels. The SQL Editor is the top panel and the results panel, the lower panel, displays fetched data. The results panel contains tabs for Data, Explain Plan, Auto Trace, DBMS Output, and Script Output. If you have the optional PL/Formatter, a tab for Code Statistics is also on the panel. A horizontal splitter between the editor and results panel lets you size each component accordingly.












## 3 ways to invoke the SQL Edit window

- Click the first button in TOAD's main toolbar.
- Select menu item **Database > SQL Editor**.
- Set the SQL Editor to **StartUp on new connection** in the **View > Options > Startup** dialog.



The SQL Edit window has two toolbars. The top toolbar is for SQL Edit specific functions. The bottom toolbar, or edit toolbar, is for common editing functions such as copy, cut, and paste. The edit toolbar is also on the Procedure Edit window.

## SQL Editor Toolbar buttons

	Execute the complete or highlighted statement
	Execute the statement at the cursor
	Execute all of the current window as a script
	Recall Previous SQL statement
	Recall Personal SQL statement
	Insert a row into an editable SQL Results Grid
	Delete the current row of data from the SQL Results Grid
	Update SQL Results Grid edits to the database (not a commit!)
	Reverse changes to the current query not yet posted
	Load a file into the SQL editor
	Specify a file to save the current editor contents
	Save to File
	Take the current SQL statement and create a development tool code statement
	Take a development tool code statement and strip out the Oracle SQL statement
	Execute Explain Plan for the current statement
	Tune the selected SQL statement with the SQLab Xpert module
	Change active session for this window

## Shortcut Keys

### **F1**

You can press F1 to display the help file.

**<ALT><UP>** and **<ALT><DOWN>** will scroll through the SQL history.

### **A few keys to note**

### **F4**

Describes an object (table, view, procedure, function, or package) in a popup window. You access an Object Describe window by placing the cursor on the name of a table, procedure, function, package or view in a Procedure Editor or SQL Editor and pressing F4. The Object Describe windows are similar to the Schema Browser windows for the corresponding object types.

### **F6**

Toggles the cursor between the SQL Editor and the results panel

### **F10**

Displays the Right-Click Menu for the section (Editor or results paned) that the cursor is in

### **<CTRL>T**

Columns Dropdown – You put the cursor on the table name, and a popup window lists the columns in that table.

### **<ALT><UP>**

Goes to the previously executed statement that you've run

**<ALT><DOWN>**

Goes to the most recently executed statement

**<HOME>**

Goes to the beginning of the line

**<CTRL><HOME>**

Goes to the top of the editor. In the data grid, goes to the first row of the column the cursor is in

**<END>**

Goes to the end of the line

**<CTRL><END>**

Goes to the last row of the column you are in

CAUTION: You need to be careful when using <CTRL><END>. TOAD shows queries quickly. Even in a table with a million rows the response to the initial query is almost immediate. This is because TOAD only fetches and displays what it needs. But with <CTRL><END> TOAD has to fetch EVERYTHING. This can be a long process. If a table has only a hundred rows, TOAD can quickly fetch data when you press <CTRL><END>, but if a table has a million rows, the process could be time consuming.

If you need to examine rows at the end of a large recordset, refine your query with something like:

```
Select * from table
Where primary_key > value
```

and re-execute it.

KEYSTROKE	FUNCTION
F1	Display SQL Editor section of TOAD Help file
F2	Toggle between full screen Editor and Editor/Results Panel display
<SHIFT>F2	Toggle full screen grid
F3	Find next occurrence
<SHIFT>F3	Find previous occurrence
F4	Describe Table, View, Procedure, Function, or Package in popup window
F5	Execute as script
F6	Toggle cursor between Editor and Results Panel
F7	Clear all text
F8	Recall previous SQL statement (invokes SQL Statement Recall window)
F9	Execute statement
<CTRL>F9	Verify statement without execution (parse)
<SHIFT>F9	Execute current statement at cursor
F10	Display Right-Click Menu
F12	Pass the editor contents to the specified External Editor
<CTRL>A	Select all text
<CTRL>C	Copy
<CTRL>D	Show Procedure Arguments
<CTRL>E	Execute Explain Plan on the current statement
<CTRL>F	Find text (invokes Find Text window)
<CTRL>G	Goto line (invokes Goto Line window)
<CTRL>L	Convert text to lowercase
<CTRL>M	Make Code Statement
<CTRL>N	Recall Named SQL Statement (invokes SQL Statement Recall window)

<CTRL>O	Open a text file
<CTRL>P	Strip Code Statement
<CTRL>R	Find and Replace (invokes Find and Replace Text window)
<CTRL>S	Save File
<SHIFT><CTRL>S	Save File As
<CTRL>T	Display Columns dropdown
<CTRL>U	Convert text to uppercase
<CTRL>V	Paste
<CTRL>X	Cut
<SHIFT><CTRL>Z	Redo last Undo
<ALT><UP>	Display Previous Statement
<ALT><DOWN>	Display Next Statement (for use after <ALT><UP>)
<CTRL><HOME>	In the data grids, go to the top of the recordset In the results grid, go to the first row of the column the cursor is in In the editors, go to the first row, first column of text.
<CTRL><END>	In the Data Grid, go to the end of the recordset In the editors, go to the last row, last column of text. <i>See CAUTION NOTE in this section, page 38.</i>
<CTRL><SPACE>	Activate code completion template
<CTRL><TAB>	Cycle through the collection of MDI Child windows
<CTRL><ENTER>	Execute current SQL statement at cursor
<CTRL>. (period)	Auto complete tablenamees



## Using the SQL Editor

### Selecting a table to edit

To edit a table, you can't simply type *Select* and the tablename. Nothing will happen. You have to include a rowid in your select statement.

For example, if your tablename is DEPT and you type

```
Select dept.rowid, dept.* from dept
```

and press <CTRL><ENTER> or F9 to execute, you can edit the data. *You must have Show ROWID in Data Grids checked in View > Options > Data Grids – Data in order for ROWID to display in the results.*

Alternatively, you can type the TOAD EDIT command to translate the command into a SELECT SQL statement with ROWID column.

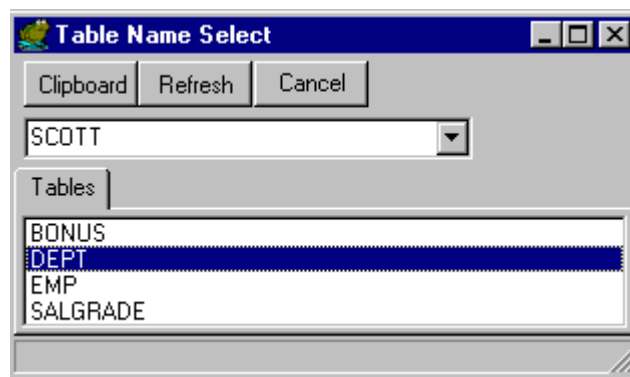
```
Edit dept
```

and press <CTRL><ENTER> or F9 to execute. Then you can edit the data.

### Table Names Select



Show Tables window button



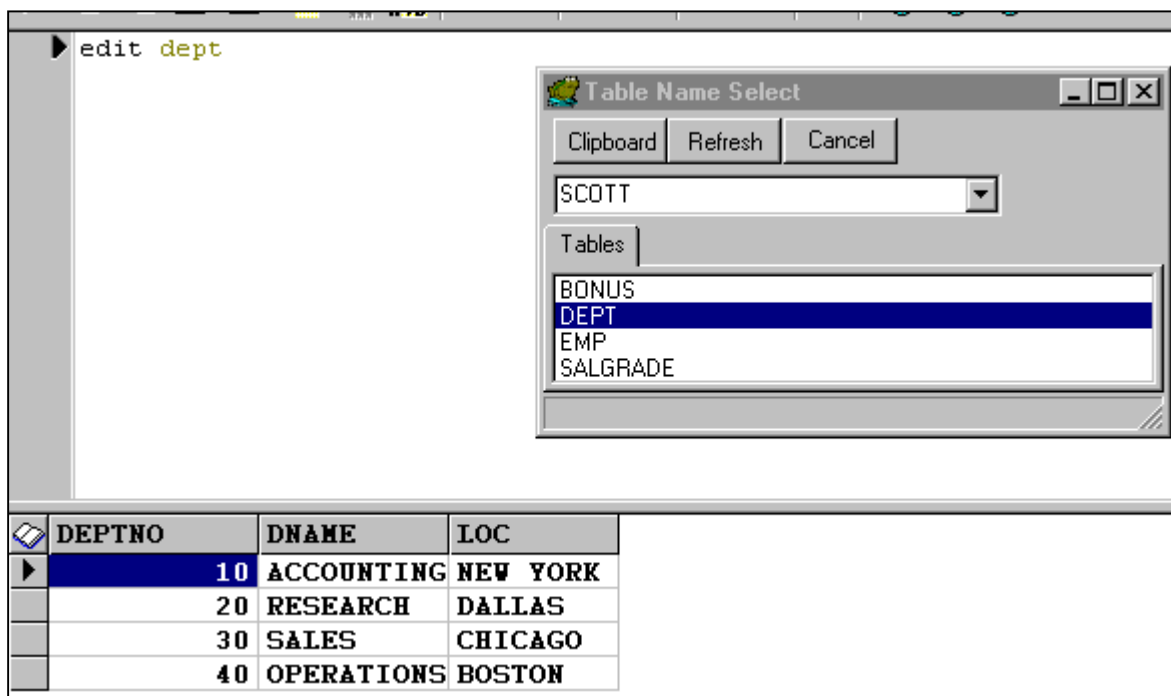
If you want to choose a table and can't remember the title or schema, click the Show Tables window button and the Table Names Select window displays from which you can choose the owner and the table. You can even click on a table name and drag and drop that name to the SQL Edit window.

Then type Edit before the name, and add a space.

Example: `edit dept`

Press F9.

Your selected table displays in the Results Grid.




Notice the status panel indicator at the bottom of the screen turns green. This indicates that the table data can be edited. When the indicator is red, the data cannot be edited, but it can still be selected and copied.

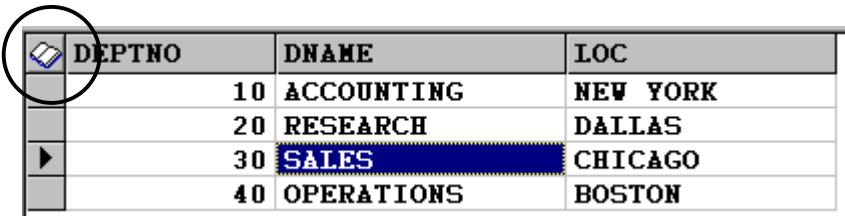


*Status Panel Indicator: green=editable red=not editable*

Single Record View

 *Single Record View button*

The **Single Record View** button is present throughout TOAD data windows and result grids. It is located on the top left of the table.



DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

Click the Single Record View button, and the Single Record View window displays for the record of the item you’ve selected. The arrow buttons in the window let you move up and down the columns. You can also insert records, delete records, and post edits.













Single Record View

DEPTNO: 30  
DNAME: SALES  
LOC: NEW YORK

Ok Cancel

*Here, the location for Department 30, Sales, was changed from Chicago to New York.*

- |   |               |   |               |
|---|---------------|---|---------------|
|  | First record  |  | Delete record |
|  | Prior record  |  | Edit record   |
|  | Next record   |  | Post edit     |
|  | Last record   |  | Cancel edit   |
|  | Insert record |  | Refresh data  |

## Commit



### Commit

The Commit command executes an Oracle Commit. Other users can only see the old data until you commit. Commit writes the transaction to the database. Rollback cancels that transaction.

You can choose Commit from the **Database > Commit** menu item or click the **Commit** button from the main toolbar. This performs a commit for all windows that are open in the current session.

Commit can be ON or OFF. The status panel on the bottom of the window shows you the status of Commit. Data is not available to other users until you choose Commit. So, with Commit OFF you can make changes without affecting other users.

### To Turn Commit ON or OFF

Go to **View > Options > Oracle**.

Check or Uncheck the **Commit automatically after every statement item**.

 *The status panel shows the status of Commit*

Notice a related option on the next line is **Prompt for Commit when closing TOAD if autocommit is disabled**. If the **Commit automatically after every statement** is unchecked, and the **Prompt for Commit when closing TOAD option** is checked, TOAD will ask you whether or not you want to perform a commit to the changes before you close a session.



### Update Grid Edits

As soon as you start editing a table, the **Update Grid Edits** button is enabled. The **Update Grid Edits** command sends the latest edits (or data) to the database. If autocommit is ON at the time the Update Grid Edits is activated, the data will be committed. If autocommit is OFF, the data is buffered in the transaction.

When you edit data in a row, the changes are not sent to the Oracle transaction buffer until you change rows (click in another row). However, if you only have one row, you can't change rows. That's where the Update Grid Edits command is useful. You can edit in the row and then, without changing rows, click the Update Grid Edits button, and the data is sent to the Oracle transaction buffer. If autocommit is OFF, it stays in the buffer. If autocommit is ON, the data is committed.

If Commit is ON and you type in a row and then change rows, the data is available to other users. With Commit OFF, you can make changes, but other users will see the old data until you choose Commit.



### Reverse Changes

Next to the Update Grid Edits button is the **Reverse Changes** button. This lets you reverse the changes you've made that have not yet been posted to the database. For example, typing in col 1, pressing <TAB>, typing in col 2, pressing <TAB>, then clicking the **Reverse Changes** button will reset col 1 and col 2 to their previous values.

## Explain Plan

Explain Plan (also called Execution Plan) displays steps that will occur in the selected SQL statement. This lets you visually see the steps. The purpose of Explain Plan is to determine the execution plan Oracle follows to execute a specified SQL statement. The Explain Plan function inserts a row describing each step of the execution plan into a specified plan table. If you are using cost-based optimization, Explain Plan also determines the cost of executing the statement, based on the statistics that have been stored for the table.

### NOTE:

Viewing **previous** Explain Plans via **View > Explain Plan** will not work unless you first run the TOADPREP.SQL script, which is explained in this section. <CTRL> E Explain Plans in the SQL Editor will work regardless of TOADPREP.SQL, but if you have not run TOADPREP.SQL you must set the **View > Options > Oracle > Explain Plan Table name** option to point to your own plan table (Plan\_Table). Make sure the **View > Options > Oracle > Save Previous Explain Plan Results** option is checked.

### To execute Explain Plan on a SQL Statement

In the SQL Editor, place the cursor on a SQL statement, go to **SQL Window > Explain Plan Current SQL** (OR <CTRL>E)

If **View > Options > Oracle > Save previous Explain Plan results** is checked on, then Explain Plans are stored in:

TOAD\_PLAN\_SQL and  
TOAD\_PLAN\_TABLE

### TEMPS – TOADPREP.SQL

The Explain Plan window will not display previous Explain Plans unless you run TOADPREP.SQL which creates the tables needed for storage and retrieval of Explain Plans. You must have System or DBA access in order to run the TOADPREP.SQL script.

Excerpt from the README file:

For the TOAD temp tables, run TEMPS\TOADPREP.SQL to create a separate TOAD schema. Or if you do not want a separate schema for the TOAD temp tables, run TEMPS\NOTOAD.SQL.

TOADPREP.SQL uses the USER\_DATA and TEMPORARY\_DATA default tablespaces to create several objects. You will need these tablespaces in your database in order to execute TOADPREP.SQL. If your database does not employ these tablespaces, you will need to either:

Substitute your current data tablespace and current temporary data tablespace with the USER\_DATA and TEMPORARY\_DATA tablespaces

OR

Create the USER\_DATA and TEMPORARY\_DATA tablespaces. (1MB should be sufficient.)

### To Load and Execute TOADPREP.SQL

- 1 Connect to the SYS or SYSTEM schema, or a schema with the DBA role.
- 2 Go to **File > Open File**.
- 3 Open your **TOAD > TEMPS** folder.
- 4 Double-click on **TOADPREP.SQL**.
- 5 This loads TOADPREP.SQL into your SQL Editor.
- 6 Click the Execute as Script button.

NOTE: You will receive error messages from the drop statements. This is because there is nothing to drop. You can click Continue.

The first time you run TOAD you need to execute TOADPREP so it can create the two tables of information that Explain Plan needs (TOAD\_PLAN\_SQL and TOAD\_PLAN\_TABLE).

### To run Explain Plan

- 1 Load a SQL Script into the SQL Editor.
- 2 Click on a SQL statement such as Select, Insert, Update, or Delete.
- 3 Select **SQL-Window > Explain Plan Current SQL** menu item.
- 4 Explain Plan results display in the results grid.

Notice the Explain Plan results have expand and collapse buttons. They let you display the details that you need to see.

If you attempt to activate an Explain Plan and you have not created the needed TOAD temp tables, you get an error message telling you the table or view does not exist.

You can copy the Explain Plan hierarchy to the Windows clipboard or send it to the printer with a right mouse-click over the Explain Plan output and selecting either the **Copy to Clipboard** or **Print Results** menu item

### View Explain Plan

View Explain Plan displays a list of the previous Explain Plans that you've executed. You must execute TOADPREP.SQL in order to save and recall Explain Plan results. See the Schema Preparation chapter for more information on TOADPREP.SQL.

### To Access View Explain Plan

- 1 Go to the **View > Explain Plan** menu item.
- 2 Click the **Explain Plan** item.
- 3 A list of previous Explain Plans displays.

**NOTE:** You must have the **View > Options > Oracle > Explain Plan Table Name** menu item entered, or you will not be able to view previous plans. The default entry is TOAD\_PLAN\_TABLE.



## **Explain Plan Treeview**

The Explain Plan treeview lists the contents of the TOAD\_PLAN\_TABLE for the given statement id.

### **Operation**

The concatenation of the OPERATION and OPTIONS columns of the plan table.

### **Object Name**

The value of the OBJECT\_NAME column of the plan table.

### **Rows**

Number of rows accessed. This comes from the CARDINALITY column of the plan table. If appropriate, the number is converted to K (thousands), M (millions), or G (1000 millions, or billions).

### **Bytes**

Number of bytes accessed. This is the value of the BYTES column of the plan table. If appropriate, the number is displayed in Kilobytes, Megabytes, or Gigabytes.

### **Cost**

The value of the COST column of the plan table. If appropriate, the number is displayed in K (thousands), M (millions), or G (1000 millions, or billions). This column is not applicable to rule-based optimization.

### **TQ**

The 4<sup>th</sup> character from the end and the last 2 characters of the OBJECT\_NODE column, which is used to keep track of the order in which operations' output is consumed for parallel queries.

**In/Out**

The (abbreviated) value of the OTHER\_TAG column in the plan table. It indicates how this step relates to the previous and subsequent steps, with regard to parallel query execution.

<u>Abbreviation</u>	<u>Meaning</u>
(blank)	Serial execution
P->S	Parallel to Serial
P->P	Parallel to Parallel
PCWP	Parallel combined with Parent
S->P	Parallel from Serial
PCWC	Parallel Combined with Child

**PStart**

This column represents the DISTRIBUTION and PARTITION\_START columns of the plan table.

<u>Abbreviation for PStart</u>	<u>Meaning</u>
ROWID	Row Location
KEY	KEY
KEY(I)	KEY(INLIST)
<i>n</i>	Partition number for first partition in range
<i>n, m</i>	Partition and sub-partition number for first partition in range

**PStop**

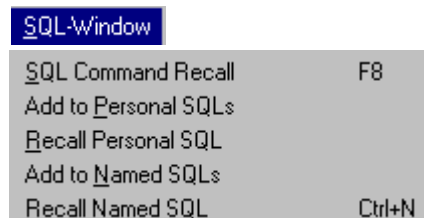
This column represents the PARTITION\_STOP column of the plan table.

<u>Abbreviation for PStop</u>	<u>Meaning</u>
ROW L	Row Location
KEY	KEY
<i>n</i>	Partition number for last partition in range
<i>n, m</i>	Partition and sub-partition number for last partition in range

An operation's location in the treeview is determined by the values of LEVEL, ID, PARENT\_ID and POSITION for the row containing it.

*Refer to Oracle documentation for more information on how to read and interpret an Explain Plan output.*

## Recall and Add SQL



You access the Add and Recall SQL dialogs items through the **SQL-Window** menu. The purpose of Add/Recall SQL is to create a list of previously executed SQL statements in order to recall them at a later date, instead of having to retype them.

There are three different types of Add/Recall SQL statements:

- Recall Previously Executed
- Recall Personal SQL
- Recall Named SQL

### SQL Recall Window

The SQL Recall window has buttons that let you move to the **Next** or **Previous** statement. It also has buttons to **Append**, which means add the statement to your current SQL script, or **Replace** which would replace your current script with whatever SQL statement you select. You can copy statements to the clipboard by clicking the **Clipboard** button. The **Remove** button lets you remove selected statements from your list. **Cancel** closes the window and returns you to the Editor.

There are also tabs to display **All SQLs** and **Single SQL** which show more detail of a long SQL statement. On the **All SQLs** tab, the grid row height is vertically adjustable on a row-by-row basis. Move the mouse over the record selector and drag up or down.

You can even search by clicking in the **SQL Contains** textbox, typing the text you want to search for, and clicking **GO**. The list will filter for statements that contain your search item.



### SQL Command Recall or Recall Previous SQL

#### To Recall a SQL command

Click the **Recall Previous SQL** button in the SQL Edit window toolbar

**OR**

Press **F8**

**OR**

Select **SQL Command Recall** from the SQL – Window.

The SQL Statement Recall window displays. It includes options for searching in SQL statements, deleting SQL statements, and displaying all or selected SQL statements.

The Recall window displays a list of the last *X* number of statements executed. The default number is 100, but you can change this in the options. *See the Options for the SQL Editor topic, page 58, for more details.* The list of SQL statements is written to and read from the SQLS.DAT file from the TOAD folder.

#### Running a Recalled SQL Statement

After a SQL statement is recalled and placed in the SQL Editor, press **<CTRL><ENTER>**, or **<SHIFT>F9**. TOAD will search backwards one line from the current cursor position to find a SQL statement to execute.

#### Add to Personal SQLs

Selecting this command from the **SQL-Window** menu adds the SQL statement that's in the SQL Editor to your personal SQLs. You can later recall the statement by using the Recall Personal SQL command.

TOAD saves all statements in this list between sessions of TOAD, in a file named PERSSQLS.DAT in the TOAD folder.

### To Add a SQL Statement to the Personal SQL List

- 1 Select the statement by highlighting it in the editor.
- 2 Click menu item **SQL –Window > Add to Personal SQLs**.



#### Recall Personal SQL

You access the window by clicking the **Recall Personal SQL** button in the SQL Edit toolbar or via the **SQL-Window > Recall Personal SQL** menu item.

You have to add a Personal SQL Statement before you can Recall a Personal SQL Statement. Recall Personal SQL only lists the ones that you've added to the list.

This window functions identically to SQL Statement Recall, except that the list and order of statements is controlled by the TOAD user.

### Add to Named SQLs

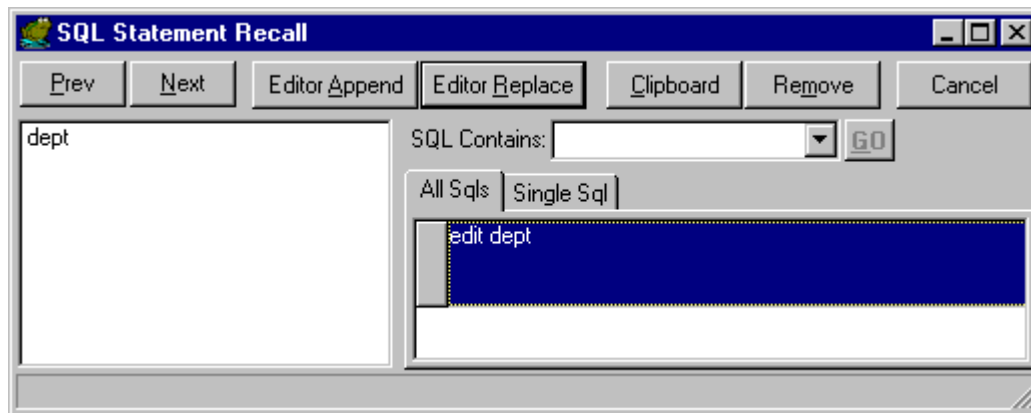
This window lets you add a SQL statement to a user's named favorite list.

### To Add a SQL Statement to the Named SQL List

- 1 Select the statement by highlighting it in the editor.
- 2 Click menu item **SQL – Window > Add to Named SQLs**.
- 3 Type the name you want to assign.
- 4 Click **OK**.

#### Recall Named SQL

You get to this dialog via the **SQL Window > Recall Named SQL** menu item (or press <CTRL>N).



*The SQL Statement Recall window for Recall Named SQL*

Use this dialog to pick a SQL statement from your named list of SQLs, then copy it back to the SQL Edit window for execution. The Recall SQL window for Recall Named SQL lists the names on the left panel and highlights the corresponding SQL statement on the right panel.

The SQL statements are stored in the NAMEDSQL.DAT file in the TOAD\TEMPS folder.

This window is a combination of SQL Command Recall, Recall Personal SQLs, and Recall Named SQL.

### More about Recall

Every statement executed in a SQL Edit window is added to a most-recent-first list. You can select/recall a statement from this list on the Statement Recall window. You can also remove statements from this list.

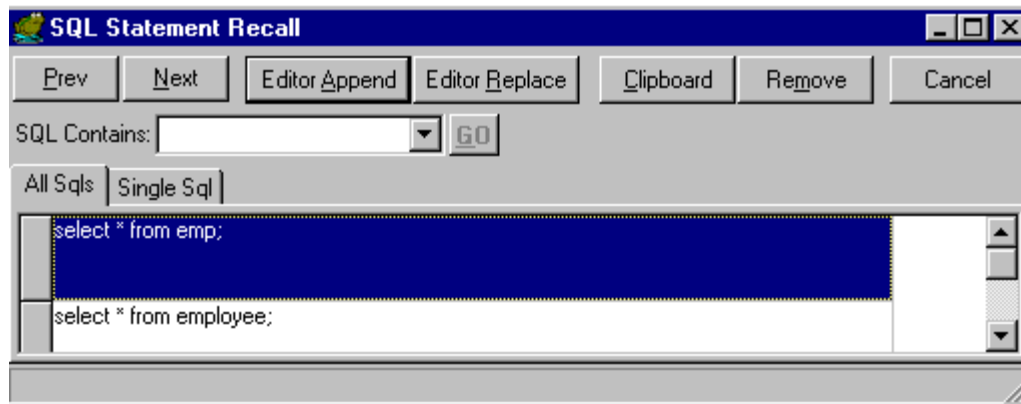
All statements (to a maximum set in User Options) are saved between sessions of TOAD, in the file SQLS.DAT in the TOAD folder.

You can scroll through the previous statements directly within a SQL Editor edit panel by pressing <ALT> <UP> or <ALT> <DOWN>.

You can check the **Save Only Statements that are Valid** checkbox in the View > Options > SQL Editor page. This checkbox item will only save those SQL statements that execute successfully. This prevents the list from containing misspelled column names, etc.

### Append versus Replace

There is an option on the **View > Options > SQL Editor** page > **SQL window button on SQL Recall window Appends rather than replaces**. This changes the default button to be set to **Append** rather than **Replace** for the SQL Recall window. When you press F8 to recall a statement (or recall a statement via a menu item), if Append rather than Replace was checked, the Append button will be the default button, but you can still select the Replace button. If you double-click in the grid it activates the default button. If you select a statement in the grid and press <ENTER> it also activates the default button.



### Bind Variables

You can execute SQL statements in the SQL Editor using bind variables, where a colon leads the bind variable name, e.g.,

```
Select * from employee where last_name = :NAME
```

and TOAD will present the **Variables** popup window for you to input the value for the **NAME** bind variable. The values you enter are stored and retrieved for subsequent queries in the PARAMS.TXT file in the TOAD\TEMPS folder.

### Substitution Variables

You can also execute SQL statements with substitution variables, where the ampersand leads the substitution variable name, e.g.,

```
SELECT * FROM &schema.EMPLOYEE
```



and TOAD will present the same Variables popup window for you to enter the value for **&schema**. If you want to query DEMO.EMPLOYEE, enter **DEMO**. If you wanted to query SCOTT.EMPLOYEE, enter **SCOTT**.

## Options for the SQL Editor

You access the TOAD Options menu via the Configure TOAD Options button on the main toolbar or by selecting the **View > Options** menu item.



SQL Editor Options are spread across three dialogs: **Options > SQL Editor**, **Options > Editors**, and **Edit > Editor Options**.

*See page 79 for more information on the Edit > Editor Options Menu.*

The **Options > SQL Editor** page contains numerous options.

### Process statements in threads/allow queries to be cancelled

Default – Unchecked

If checked, TOAD will issue each query in a separate thread. The **Cancel** button will display on the SQL Edit window toolbar to the right of the Change Active Session button, enabling you to cancel a long running query before any data is returned. The disadvantage to having this option checked is that more processing must occur, so data retrieval is slower.

### Process Update, Insert, and Delete statements in background

Default – Unchecked

If this option is checked, UPDATE, INSERT, and DELETE statements will be processed in the background. When executed, the statements are actually copied to a separate background process window to provide a visual indication that the statement is running. The background window contains Commit and Rollback buttons. Processing lengthy statements in the background frees up TOAD, as well as your machine, for other tasks.

**Process PL/SQL statements in background**

Default – Unchecked

If checked, PL/SQL statements will be processed in the background. When executed, the background process window will display showing the execution. The background window contains Commit and Rollback buttons.

**Save only statements that are valid**

Default – Unchecked

If this option is checked, TOAD will only save the SQL statements that ran successfully, for recall via F8 SQL Statement Recall dialog.

**# of SQL statements to save *textbox***

The default number is 100.

This box lets you enter a custom number of SQL statements to save to your **Recall Previous SQL** list. The list is saved to and retrieved from the SQLS.DAT file. Only the most recently used SQL statements are saved.

**Save SQL statement before statement Execution**

Default – Unchecked

If checked, then for the statement recall TOAD saves the SQL statement before executing it, in case something happens during the execution.

If checked, the **Save only statements that are valid** option will not apply.

**Show columns rather than view text following a DESCRIBE Viewname**

Default – Checked

This only applies if **View > Options > Editors > Use Popup windows when executing DESC statements** is checked.

If checked, TOAD will show the columns of the view, in the SQL Edit results grid. If unchecked, TOAD will fetch and show the view text in the SQL Edit window.

**Allow Clear All Text (buttons and F7 hotkey)**

Default – Checked

If checked, you can press the **F7** key to clear all text from the SQL Edit window, without a confirmation dialog. If unchecked, **F7** will not work, but you can still use the **Edit > Clear All** menu item.

**Prompt to save contents when closing editor**

Default – Unchecked

If checked, TOAD will prompt you to save any text you typed in the editor.

**Make Code Format *dropdown list***

Default - VB

This dropdown list lets you select the language syntax for TOAD to convert a SQL statement into (Make Code Statement function) and out of (Strip Code Statement function). Currently, Delphi, VB, C++, Java, and Perl are supported.

**Make Code Variable name *textbox***

Default – SQL

This lets you enter the variable name.

**Scan statements for bound variables before execution**

Default – Checked

If checked, TOAD will scan SQL statements for bound variables and ask you for the values before execution. If unchecked, TOAD will tell you that the variables are not bound.

**“SQL Window” button on SQL Recall window appends rather than replaces**

Default – Unchecked

If checked, the default button and behavior will append the selected SQL to the current contents of the SQL Edit window. If unchecked, the default button and behavior will REPLACE the current contents of the SQL Edit window.

**Always show statement execution time (overrides ROW:COL display)**

Default – Unchecked

If checked, TOAD will show the statement execution time in the status panel. If unchecked, TOAD will show the statement execution time until you perform further editing, then the status panel will show the row and col location of the cursor in the editor.

**Only show one SQL Editor per database connection**

Default – Unchecked

If checked, TOAD will permit only one SQL Editor window to be opened per connection. This is similar to the one Schema Browser and one Procedure Editor per connection options.

**Close query (grid) when clearing the SQL Editor**

Default – Checked

If checked, this clears the query grid to Explain Plan tab whenever you clear the SQL Editor.

**Milliseconds for DESC popup timer *spinner***

This lets you set the amount of time that will elapse between when you type a period in a statement that invokes the tables popup window and when the tables popup window automatically pops up. The spinner can be set from 50 to 2000 (2000 would be 2 seconds).

**Automatically poll for DBMS Output if Output detected**

Default - Unchecked

If checked, when you run a block with a "DBMS\_OUTPUT.PUT\_LINE" statement in it, TOAD will automatically turn on DBMS Output polling. If unchecked, TOAD will poll for DBMS Output only if you press the button to turn polling on.

## Executing Statements

**If the SQL Edit window has a single statement that you wish to execute**

Press **F9**

**OR**

Click the **Execute Statement** button on the toolbar.

**If you only want to process a portion of the edit text**

Highlight that portion AND :

Press **F9**

**OR**

Click the **Execute Statement** button.

**To execute a single statement among many statements (separated by at least one blank line)**

Click or place the caret/cursor within the statement you want to execute AND:

Press **<SHIFT> F9** OR **<CTRL><ENTER>**

**OR**

Click the **Run Current Statement** button on the toolbar.

TOAD supports query statements, DDL statements, blocks of procedure SQL, etc. TOAD recognizes substitution variables in quotes as follows:

If & is escaped, TOAD will not prompt for a value.

If & is the last character in a string, it is not considered a substitution variable.

## Execute SQL Scripts

The SQL Edit window can process SQL scripts that contain DDL statements, Insert statements, and more. Some SQL\*Plus commands are ignored as TOAD processes a SQL script. For scripts that contain other SQL\*Plus commands, you can still execute your script using the **SQL-Window > Execute SQL Window via SQL\*Plus** menu item.

As TOAD processes a SQL script, you can also embed one script within another via the “@” sign. For example,

```
REM This is the start of my script.  
  
insert into table values (1);  
  
@c:\scripts\doscript.sql  
  
insert into table values (2);
```

etc.

If a full path is not provided, TOAD uses the following priority to search for non-pathed files:

1. Current directory in use by the editor
2. Same path of parent script if present
3. \TEMPS\
4. SQLPATH environment variable



NOTE: A script that is opened in the SQL Editor, edited, and then executed via SQL\*Plus is **AUTOMATICALLY SAVED TO DISK** before TOAD passes it to SQL\*Plus for execution.



**SQL\*Plus Script Execution statements that are supported include:**

SPOOL Filename and SPOOL OFF (also SPO). Non-pathed files are created in the \TEMPS\directory. SPOOL works differently in TOAD than in SQL\*Plus. TOAD only outputs data, and the headings are not included.

SET ECHO (ON/OFF) – defaults to ON

SET ESCAPE/ESC (ON/OFF) – defaults to ON

SET ESCAPE/ESC ‘\’ (\ is any character) – defaults to \

SET HEADING/HEA (ON/OFF) – defaults to ON

SET FEEDBACK (ON/OFF) – defaults to ON

*Note: Set Feedback N (N = a number) is not supported*

SET SERVEROUTPUT/SERVEROUT (ON/OFF)

SET TERM (ON/OFF) – defaults to ON

DEFINE/DEF and UNDEFINE/UNDEF

PAUSE

EXIT/QUIT (without parameters)

PROMPT/PRO

CONNECT/CON and DISCONNECT/DISC. Following a CONNECT in a script, the original session is reconnected after the script terminates.

REM/REMARK

/ Slash

DESCRIBE

SHOW (show errors)

Embedded script files are now supported using @ or RUN.

**The following SQL\*Plus Script Execution statements are ignored:**

SET TAB

VERIFY

PAGESIZE

LINESIZE

## Table/View Aliases

Setting up table or view aliases permits a shortcut for entering columns of a query.

The ALIASES.TXT file is in the TOAD\TEMPS directory. It should look like this:

```
table_name=alias
```

such as:

```
AAX_ACCESSGROUP_APPLICATION=aax
ACA_ACTIVITY_ACTION=aca
ACC_ACTIVITY_CATEGORY=acc
ACD_ACTION_DESCRIPTION=acd
ACP_ACTIVITY_CONTACT_PARTIC=acp
ACT_ANALYSIS_CATEGORY_TYPE=act
ADD_ADDENDUM=add
ADT_ADDRESS_TYPE=adt
AFP_ACTIVITY_FIRM_PARTIC=afp
AGX_APPLICATION_GROUP_ITEM=agx
DEPARTMENT=dept
```

To use, simply type something like:

```
select dept.
```

and a column list will popup for the DEPARTMENT Oracle table.

If you set up these table aliases in ALIASES.TXT, they will be presented on the SQL Modeler dialog when you select that table to build your query.

To complete the SELECT SQL statement above, use Auto Replace Substitutions named similarly to the table aliases. These are accessible through the **Edit > Editor Options > Auto Replace** tab. However, it would take you a long time to add a reasonably sized schema, so it is recommended that you edit \TEMPS\PLSQLSUB.TXT. It should look like this:

```
aax_ = AAX_ACCESSGROUP_APPLICATION aax
aca_ = ACA_ACTIVITY_ACTION aca
acc_ = ACC_ACTIVITY_CATEGORY acc
acd_ = ACD_ACTION_DESCRIPTION acd
acp_ = ACP_ACTIVITY_CONTACT_PARTIC acp
act_ = ACT_ANALYSIS_CATEGORY_TYPE act
add_ = ADD_ADDENDUM add
adt_ = ADT_ADDRESS_TYPE adt
afp_ = AFP_ACTIVITY_FIRM_PARTIC afp
agx_ = AGX_APPLICATION_GROUP_ITEM agx
dep_ = DEPARTMENT dept
```

i.e., string = string to replace it with

You might want to use the underline \_ because it is not as likely that a command will end with the underline \_ symbol. Having the alias at the end keeps things tidy. If you type:

```
select dept.
```

the popup should appear. Select your column name, then continue.

```
select dept.NAME
from dep_
```

Press the spacebar, and it autocompletes...

```
select dept.NAME
from DEPARTMENT dept
```

If you edit ALIASES.TXT or PLSQLSUB.TXT, be sure to close and reopen TOAD to re-read the list.

### **Tablename Completion**

An alternative to using AutoReplace for tablename is tablename completion.

Type the first few letters of a table name in your schema, then press **<CTRL>.(period)**. TOAD looks up the list of tables matching the letters. If only one matches, the table name is automatically completed in the editor. If there is more than one match, a popup list appears for you to select the desired table

For example, if you type **dep** and press **<CTRL>.(period)**, a list of all tables beginning with dep will popup.

## Configuring the Editor

The editor in TOAD is used on the SQL Editor and Procedure Editor windows to edit SQL text. The same editor is used in read-only mode on many other windows throughout TOAD. This section highlights some of the configurable features. The Editor Options, which include some of the following options, are discussed in detail in the next section. Right-Click Options are also discussed in detail in the Right-Click section of this chapter.

- **User configurable Syntax Color Highlighting**

The editors in the SQL Edit and Procedure Edit windows support flexible syntax highlighting. The highlighting is configurable in the Editor Options window, and the list of reserved words used in each window is also customizable by editing the parser script file. If during a TOAD session you have used any window or function that retrieves the tablenames for the active Oracle session, tablenames will be colorized as well.

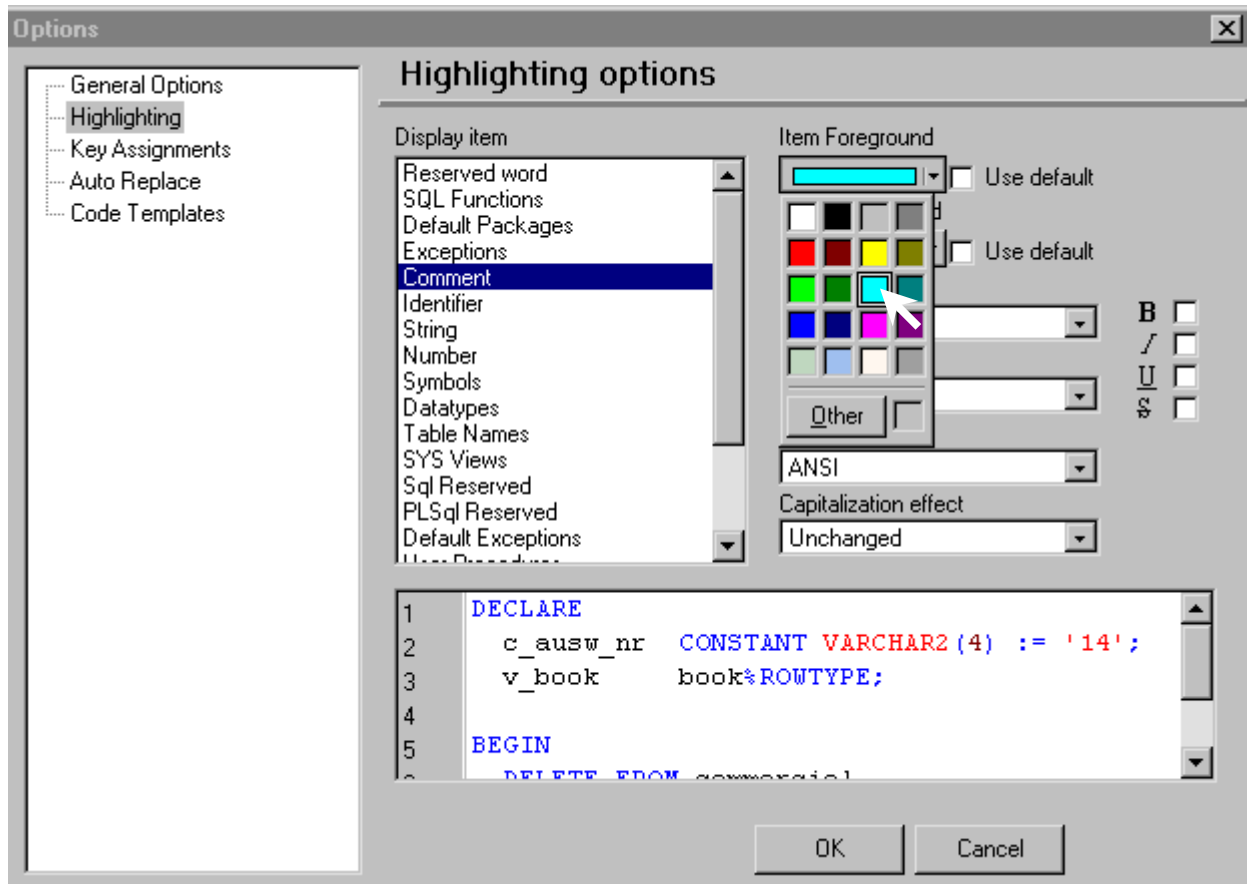
In order for the editor to support syntax highlighting, the following files distributed with TOAD must be located in the TOAD\TEMPS directory:

PLSQLSCR.TXT, for syntax parser scripts

PLSQL.DCI, for code templates

You must have the **View > Options > Editors > Load view names from database at time of first editor window** option checked.

The **View > Options > Procedure Editor > Highlight names of stored procedures** option is checked by default.



*Here, the default color of green for comment is being changed to light blue and italics has been unchecked.*

### Editor Parser Scripts

The primary configuration for the editor comes from an editor parser script text file that is loaded at runtime. This file is editable but be VERY careful if you decide to edit this file because NO technical support for altered scripts will be provided.

The particular editor parser script is determined from the language of the object in the editor buffer. In the SQL Edit window editor, this language is always PLSQL. In the offline text editor and in the Procedure Editor you can also have languages HTML, INI, JAVA, and TEXT. The language is determined from the file extension, e.g., HTML, and is configured in the **View > Options > Parser Scripts** page > **Language / File Extension Associations** grid. The list of languages and editor parser scripts shipped with TOAD is:

Language	Editor Parser Script File
HTML	HTMLSCR.TXT
INI	INISCR.TXT
JAVA	JAVASCRIPT.TXT
PL/SQL	PLSQLSCR.TXT
TEXT	TEXTSCR.TXT

All editor parser script files are stored in the TOAD\TEMPS folder.

### **Long and Short PL/SQL Editor Parser Scripts**

There are two flavors of the PL/SQL editor parser script installed for your selection: SHORTSCR.TXT and LONGSCR.TXT. SHORTSCR.TXT is the same as PLSQLSCR.TXT. LONGSCR.TXT contains more items to syntax highlight and might perform slower, depending on your editor contents. The additional 200 items in LONGSCR.TXT are commonly used package functions and procedures in the SYS schema, such as DBMS\_OUTPUT, DBMS\_PIPE, DBMS\_JOB, DBMS\_SQL, DBMS\_STANDARD, and DBMS\_UTILITY. Each additional item to syntax highlight takes a little more execution time. If you want to utilize the LONGSCR.TXT parser script file, copy LONGSCR.TXT over PLSQLSCR.TXT. If you want to restore the shorter format for the editor parser script file, copy SHORTSCR.TXT over PLSQLSCR.TXT.

If you want to add or remove Oracle SQL Reserved words, PL/SQL Reserved words, or Oracle Keywords from the lists that are syntax highlighted, then edit the PLSQLSCR.TXT file. If you want to add or remove words from the syntax highlighting of the other languages, edit the corresponding editor parser script for that language.

#### **▪ Bookmarks**

Bookmarks help you manage files. They are especially useful when you are trying to manage large files. Mark a position within the SQL Editor so that you can easily jump back to that line. You can set up to 10 separate bookmarks within one editor.

Bookmarks can be accessed from the Right-Click Menu.

### **To set a bookmark**

Press <CTRL><SHIFT># where # is a number between 0 and 9. A small green box containing the bookmark number will appear in the editor gutter.

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

Press <CTRL># where # is a previously defined bookmark between 0 and 9.



Note that these keystrokes assume you have not altered the default editor keys. *See the Key Assignments topic, page 95, for more information.*

Once a file is closed, the bookmarks are reset.

- **User defined keystrokes for common editing commands**

Click **Edit > Editor Options > Key Assignments** to access the Key Assignments window.

Select the command from the left panel, and its associated Key Assignment displays in the right panel. The **Add** or **Edit** buttons display easy-to-follow steps so that you can add new key assignments or edit existing ones. The **Delete** button deletes the highlighted key assignment.

- **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 configurable 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.

To access Auto Replace, go to the **Edit > Editor Options > Auto Replace** tab. TOAD already has a few Auto Replace Substitutions specified: teh = the, ndf = NO\_DATA\_FOUND, (c) = ©.

The TOAD parser scripts come with a handful of Substitution pairs, but you may edit and add to the list on the Editor Options window. Once saved from this window, the substitution pairs will be saved to an ASCII file named [Language]SUB.TXT in the TEMPS directory.

The Auto Replace substitutions for each language type are stored in separate files in the TOAD\TEMPS folder.

Language	Auto Replace Substitution File
HTML	HTMLSUB.TXT
INI	INISUB.TXT
JAVA	JAVASUB.TXT
PL/SQL	PLSQLSUB.TXT
TEXT	TEXTSUB.TXT

Thereafter, you can continue to alter the substitutions in the Editor Options window or directly in the [Language]SUB.TXT file.

- **Code Completion Templates**

Code templates expand upon the Auto Replace Substitution concept, but a manual keystroke (**<CTRL><SPACE>**) is required to perform the substitution. Code templates are more than a single phrase and can contain line feeds. If a vertical pipe character is in the code template, the cursor will be placed at that point in the template. Code templates are loaded from the text file [Language].DCI from the TOAD\TEMPS folder, where [Language] can be HTML, INI, JAVA, PLSQL, or TEXT.

Example: One of the code templates defined in PLSQL.DCI is:

```
[crbl | entire cursor block]
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 macro for the template (the text YOU type)

"entire cursor block" is the description of the template

everything following until the next template 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 which will cause reading of the templates file to fail.**

If you type "crbl" and press <CTRL><SPACE>, TOAD will load the body of the template and place the cursor at the position of the vertical pipe char. If the word or phrase under the cursor does not match an existing macro verbatim, a dropdown list of all macros is displayed.

\\TEMPS\\PLSQL.DCI contains sample templates which you can alter to suit your needs.

You can edit the code completion templates directly in the Edit > Editor Options dialog, **Code Templates** tab, or via text editor on the \*.DCI files.

- **Undo/Redo**

These basic editing commands are accessed from the **Edit** menu.

<u>Command</u>	<u>Keyboard Shortcut</u>
<b>Undo</b>	<CTRL>Z
<b>Redo</b>	<SHIFT><CTRL>Z

- **Comment Code Block**

This function comments the selected block of text by adding "--" before each line. This is available on the Right-Click Menus of the editors and is also on the Main Edit menu.

- **Uncomment Code Block**

This function uncomments the selected block of text by removing "--" from the beginning of each line. This is available on the Right-Click Menus of the editors and is also on the Main Edit menu.

- **Locate Closing Parenthesis (Find Closing Block)**

Finds the closing parenthesis, "END" for matching "BEGIN", or "END IF" for matching "IF."

If you select/highlight a left parenthesis, "BEGIN", or "IF", this function will show the matching right parenthesis, "END" or "END IF."

**Find Closing Block** can only be accessed on the Right-Click Menus of the SQL Editor and Procedure Editor.

- **Find, Find Next, Find Previous, and Replace**

You access the Find and Replace editing options from the Edit menu.

<u>Function</u>	<u>Keyboard Shortcut</u>
<b>Find</b>	<CTRL>F
<b>Find Next</b>	F3
<b>Find Previous</b>	<SHIFT>F3
<b>Replace</b>	<CTRL>R

On the Find and the Find and Replace dialogs (Edit > Find, Edit > Replace), you can check the **Regular expressions** checkbox to use regular expression syntax for your search. Regular expressions specify text by its characteristics rather than its exact characters. For example, you can find and replace tabs with spaces. The following are some examples of regular expressions.

\r Carriage return

\n New line

\f Form feed

\t Tab character

\b Backspace

\s Space

- **Show All following a search**

To get to this function, click **Edit > Show All**.

Only to be used after a FIND. After you use FIND to search through your text, for a word or phrase, you can click **Show All** from the **Edit** menu and Show All will display wavy red lines under every occurrence of the search phrase. The lines will be removed following any change to the text in the editor.

- **Configurable Print Options**

The **Edit > Editor Options > General Options** tab provides printing options. You can check/uncheck the Syntax Highlighting option from the **View > Options > Printing** page.

**Use Syntax Highlighting when Printing Source Code**

This option is checked by default, which means the report will print using the same colors that are displayed in the window. So, color printing is the default for printing SQL Edit text or Stored Procedure Edit code.

If you uncheck the **View > Options > Printing** tab > **Use syntax highlighting when printing source code** option, then the SQL text or Stored Procedure Edit code will be printed in standard black and white.

If you get garbage characters on your color printout, turn off the **Use syntax highlighting when printing source code** and then try to print again.

## Editor Options

Editor Options can be selected, deselected, and modified on the popup dialog window that is available either from the Right-Click Menu of the editor (on the SQL Edit or Procedure Edit windows) or from the **Edit > Editor Options** menu item.

The Editor Options lists categories in the left panel: General Options, Highlighting, Key Assignments, Auto Replace, and Code Templates. Click any of these items to display its corresponding options in the right panel.

The editor options are stored in the [Language]KEYS.BIN and [Language]OPTS.TXT files in the TOAD\TEMPS folder, where [Language] is either HTML, INI, JAVA, PLSQL, or TEXT. When a change is made to the Editor Options, the appropriate OPTS.TXT and KEYS.BIN files are written out. Do not attempt to edit these files with a text editor. Use the **Editor Options** dialog.

Language	Editor Options Files	
HTML	HTMLKEYS.BIN	HTMLOPTS.TXT
INI	INIKEYS.BIN	INIOPTS.TXT
JAVA	JAVAKEYS.BIN	JAVAOPTS.TXT
PL/SQL	PLSQLKEYS.BIN	PLSQLOPTS.TXT
TEXT	TEXTKEYS.BIN	TEXTOPTS.TXT

### NOTE:

The **Key Assignments**, **Auto Replace**, and **Code Templates** items have **Load from File** and **Save to File** buttons. Each of these buttons lets you set up two or more collections of keystrokes, auto replaces, and code templates. This is useful on multi-user machines. For example, one user might prefer to use one set of assigned keys, auto replaces, and code templates, and another user might have a different set for a preference.

## General Options

General Options contains four categories:

**Printing Options**

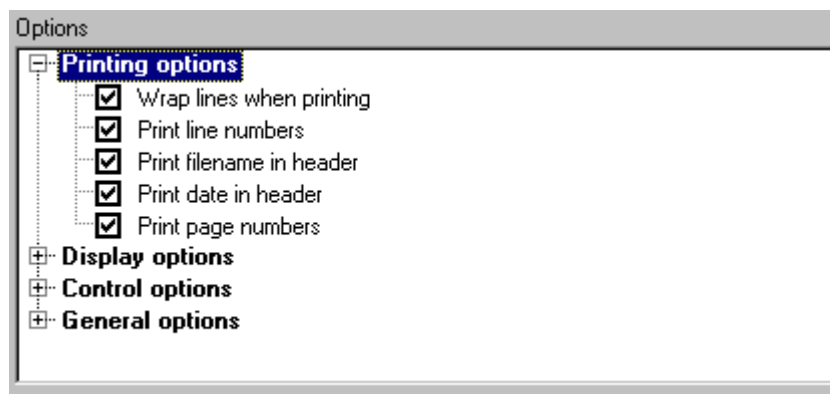
**Display Options**

**Control Options**

**General Options**

Click the “+” next to each option to expand its corresponding checklist.

If the checklist is expanded, click the “-” to close the corresponding checklist.



*Here, the Printing Options list is expanded. A click on the minus sign will collapse the list. A click on the pluses in the other options will expand their corresponding lists.*



## Printing Options

These options are used when you print the editor comments to paper.

### **Wrap lines when printing**

Default – Checked

When checked, this option automatically wraps lines when printing.

### **Print line numbers**

Default – Checked

When checked, this option prints the line numbers.

### **Print filename in header**

Default – Checked

When checked, this option prints the filename in the header.

### **Print date in header**

Default – Checked

When checked, this option prints the date in the header.

### **Print page numbers**

Default – Checked

When checked, this option prints the page numbers on your printout.

## Display Options

The display options let you control what is displayed in the editor.

### Display line numbers in gutter

Default – Unchecked

When checked, this option will display line numbers in the gutter, which is a vertical region on the left of the editor used to display bookmarks, breakpoints, line numbers, and allow for multiple line selection with the mouse. If unchecked, line numbers will not display. You may want to increase the width of the gutter, in the **Gutter Width** textbox, to display large line numbers.

### Show right margin

Default – Unchecked

When checked, this option displays a light gray vertical line indicating the right margin. When unchecked, no line to indicate the right margin will appear.

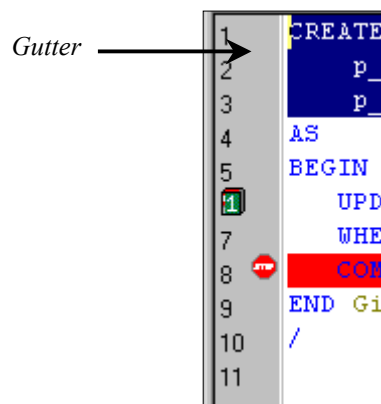
In the SQL Editor or Procedure Editor, you can also drag and drop the vertical right margin line left or right to change it.

NOTE: No word-wrapping occurs at the right margin line. Word-wrapping is discussed later in this chapter in the *Show Word-Wrap Column* section.

### Show gutter

Default – Checked

If checked, the gutter displays. If unchecked, the gutter does not display. If you have chosen to display line numbers, but you have the Show gutter option unchecked, your line numbers which would display in the gutter will not display.



**Show word-wrap column**

Default – Checked

When checked, this displays the word-wrap column, which is basically a dashed vertical gray line on the right side. You have to enter a value in the word-wrap column value box in order for this to display. The default is 0, which means no word-wrap column will display. So, you need to check the **Show word-wrap column** checkbox AND enter a value in the word-wrap column box. For example, if you enter 20, a dashed vertical line displays in column 20, and any lines longer than 20 characters will wrap. The vertical word-wrap line can be dragged and dropped to the left or the right, so you don't have to drill down to the editor options dialog when you want to change the column settings. Word wrapping will not begin until you also check the **General options > Word-wrap lines** checkbox.

**Block cursor on overwrite**

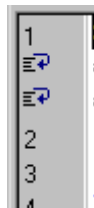
Default – Checked

If this option is checked when you press the insert key to change to overwrite mode, the cursor is displayed as a block because it's in overwrite mode, providing a visual reminder that it's in overwrite mode. If the option is unchecked, the cursor remains unchanged when you switch to overwrite mode, as opposed to changing to a block.

**Show wrapped lines with the |> (arrow) glyph**

Default – Checked

If checked, this option displays a glyph |> in the gutter for wrapped lines.



**Show control characters**

Default – Unchecked

If checked, the control characters (such as paragraph marks, end-of-line characters, spaces, and TABs) will display onscreen in your scripts.

**Apply capitalization effects**

Default – Unchecked

When checked, this option will apply the capitalization effects that you select from the Highlighting Options section.

## Control Options

### **Allow TCustomSyntaxMemo to be an IDragSource**

Default – Checked

When checked, this option lets you select and drag text from an editor to another Windows application or another TOAD window.

### **Title as Load/Save Filename parameter**

Default – Checked

This option is not applicable and not activated.

### **Track columns in vertical movement**

Default – Checked

If this is checked, the editor will attempt to restore the current column position as you key up or down through the lines of text. If the text is wide enough, the current column position is maintained, otherwise it places the cursor at the end of the line.

If this is unchecked, as you key up or down through the lines of text, the cursor column position decrements as the lines of text get shorter.

### **Respond to dropped files**

Default – Checked

If checked, this lets files be dragged and dropped from Explorer to a TOAD editor.

**Override word-wrap based on line start char**

Default – Unchecked

You can specify a character or characters on the Editors Options dialog

**Word-wrap override chars** textbox that will override word-wrapping for that line only.

For example, if you want to specify that “>” will override word-wrapping for a line, enter it, set word-wrap to column 16, and you’ll get:

```
This is over 16 chars  
and will word wrap
```

But when you begin the line with your specified character “>”

```
>This is over 16 chars and will not word wrap.
```

## General Options

### Auto indent

Default – Checked

If you have an indentation already set, when you type, it automatically indents the following lines.

### Tab to next column

Default – Checked

When checked, the <TAB> key moves the cursor to the next column.

### Auto select word on double-click

Default – Checked

When checked, if you double-click on a word in the editor it becomes selected.

### Insert TABs into text for TAB chars

Default – Checked

Tabs are inserted into the text when the <TAB> key is pressed. Otherwise, an appropriate number of spaces are inserted.

### Insert mix of TAB/SPACE for optimal fill

Default – Checked

If checked, the editor will fill the required gap with a minimum number of characters composed of TABs and spaces.

Type this:

```
This line of code starts in column 5  
So does this line
```

If the option is checked you get this:

```
    this line of code starts in column 5
<TAB><SPACE>so does this line
```

Unchecked, you get this:

```
    this line of code starts in column 5
<SPACE><SPACE><SPACE><SPACE>so does this line
```

### **Cursor beyond EOL**

Default – Unchecked

When checked, you can type text or move the cursor past the right edge of each line of text.

### **Word-wrap lines**

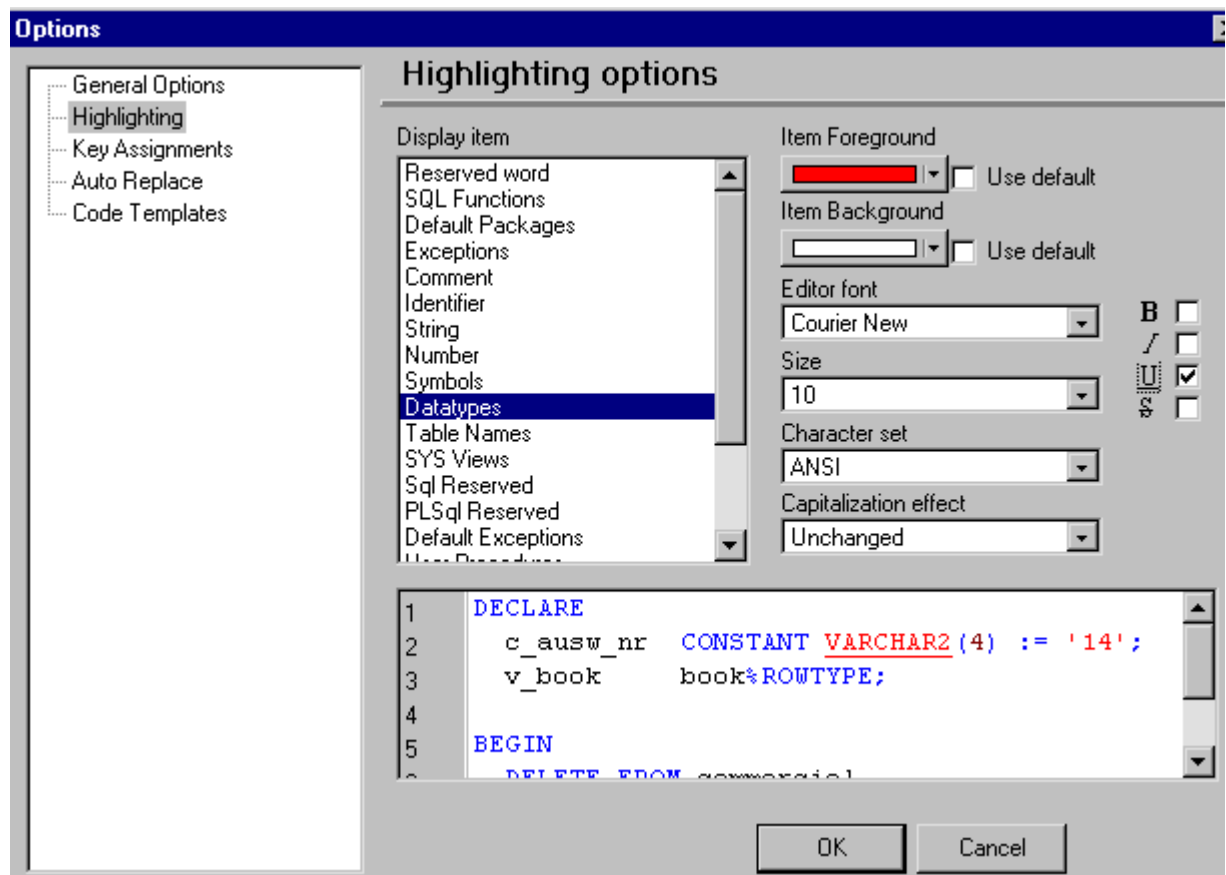
Default – Unchecked

When checked, text will automatically wrap at the Word-wrap Column margin. If this option is selected, you cannot type beyond the right margin even if the Cursor beyond EOL option is checked.



## Highlighting

The highlighting options are designed to allow you to select colors, fonts, and capitalization preferences for different items, names, etc. in the current schema. For example, *Reserved word* refers to Oracle reserved words. You can change the foreground or background colors for Reserved words, the font, the type size, and even the capitalization. This lets you customize the way your code will appear for whatever is easiest for you to read. A preview pane is provided in the lower part of the window that shows you how the selections you make affect the preview example.



Here, the underline option is checked for datatypes. In the preview screen, the datatype is underlined.

**The following items can be syntax highlighted independently:**

- Reserved Words
- SQL Functions
- Default Packages
- Exceptions
- Comments
- Identifiers
- Strings
- Numbers
- Symbols
- Datatypes
- Tablenames
- View Names
- SYS Views
- SQL Reserved Words
- PL/SQL Reserved Words
- Default Exceptions
- User Procedure Names

For example, you could syntax highlight SYS view names like this:

```
|SELECT * FROM Table_Privileges
```

And the result would be “Table\_Privileges” in light red, initial caps.

You can syntax highlight tablenames in your schema applying different colors and capitalization effects like this:

```
SELECT * FROM ALLOCATION
```

And the result would be “ALLOCATION” in light green, in uppercase letters.

### Display Item

This lists the display items from which you can choose to modify how they will appear. The last three display items, Selected Text, Left Margin, and Gutter, do not refer to actual code content. They have only certain options enabled.

### Selected Text

This is an item in the display items that refers to the colors that will display when you select text by either clicking and dragging the mouse over a section of text, or pressing <SHIFT> and one of the arrow keys to select a portion of text. You can change both the foreground and background colors that will display for the selected text. You can preview your new selected text colors before clicking OK, by selecting text in the preview window and seeing how the new colors affect the selected text. The other selection areas such as font are disabled when you click on the Selected Text item. Only the foreground and background color sections are enabled.

### Left Margin

This item only enables the background color choice. If the background color default box is already checked, the dropdown menu will be disabled. In such a case, you must uncheck the default box to enable the dropdown menu. The dropdown menu displays a color palette from which you can choose the color for the left margin vertical bar.

**Gutter**

This item only enables the background color choice. If the Use Default box for the background color is already checked, the dropdown button is disabled. In such a case, you need to uncheck the Use Default box so that the dropdown button is enabled.

**Default**

The default item lets you change the appearance of your default text if you want to use colors or fonts that are different from the defaults.

***About the color palette***

The dropdown button for the background and foreground colors displays a small palette with 20 colors from which you can choose. If you click the **Other** button, a larger palette displays that contains 48 basic colors and lets you customize your own color choices.

**Item Foreground**

This option includes a dropdown list from which you can choose a color from the color palette. You can also click the **Use Default** box to the right of the dropdown button, to select the default foreground color. If the Use Default box is already checked, the dropdown button is disabled. In such a case, you must uncheck the Use Default box so you can enable the dropdown button.

**Item Background**

Like item foreground, this option includes a dropdown list from which you can choose a color from the color palette. You can also click the **Use Default** box to the right of the dropdown button to select the default foreground color. If the Use Default box is already checked, the dropdown button is disabled. In such a case, you must uncheck the Use Default box so you can enable the dropdown button. If you are going to change the item background, make sure that it will have enough contrast from the item's foreground color to be easily readable.

**Editor Font**

This is a dropdown list of fonts that you can select. The default is Courier New.

NOTE: The editor supports only one font name for all display items.

**Size**

This is a dropdown list of point sizes that you can select. The default size is 10 point.

NOTE: Some fonts won't have all the point sizes that are in the list. You need to look at the preview window and see if your selection actually changes the size of the display font.

**B,I,U,S**

These are checkboxes for bold, italics, underlined, or strikethrough text effects. Multiple checkboxes, or effects, can be selected for each item.

**Character Set**

This is a dropdown list of character sets from which you can choose. The default is ANSI.

### Capitalization Effect

This dropdown list lets you choose how your item will be capitalized. However, the **Apply Capitalization Effects** checkbox that is in **General Options > Display Options** must be checked in order for your capitalization effects to display.

Your choices are:

**Unchanged** – No special capitalization will be applied.

**Lowercase** – The item will appear in all lowercase letters.

**Uppercase** – The item will appear in all uppercase letters.

**Initial Caps** – The item will appear with only the first letter of each word in caps.

For object names that contain the underscore character, the first letter after the underscore will also be capitalized, e.g., Table\_Name.

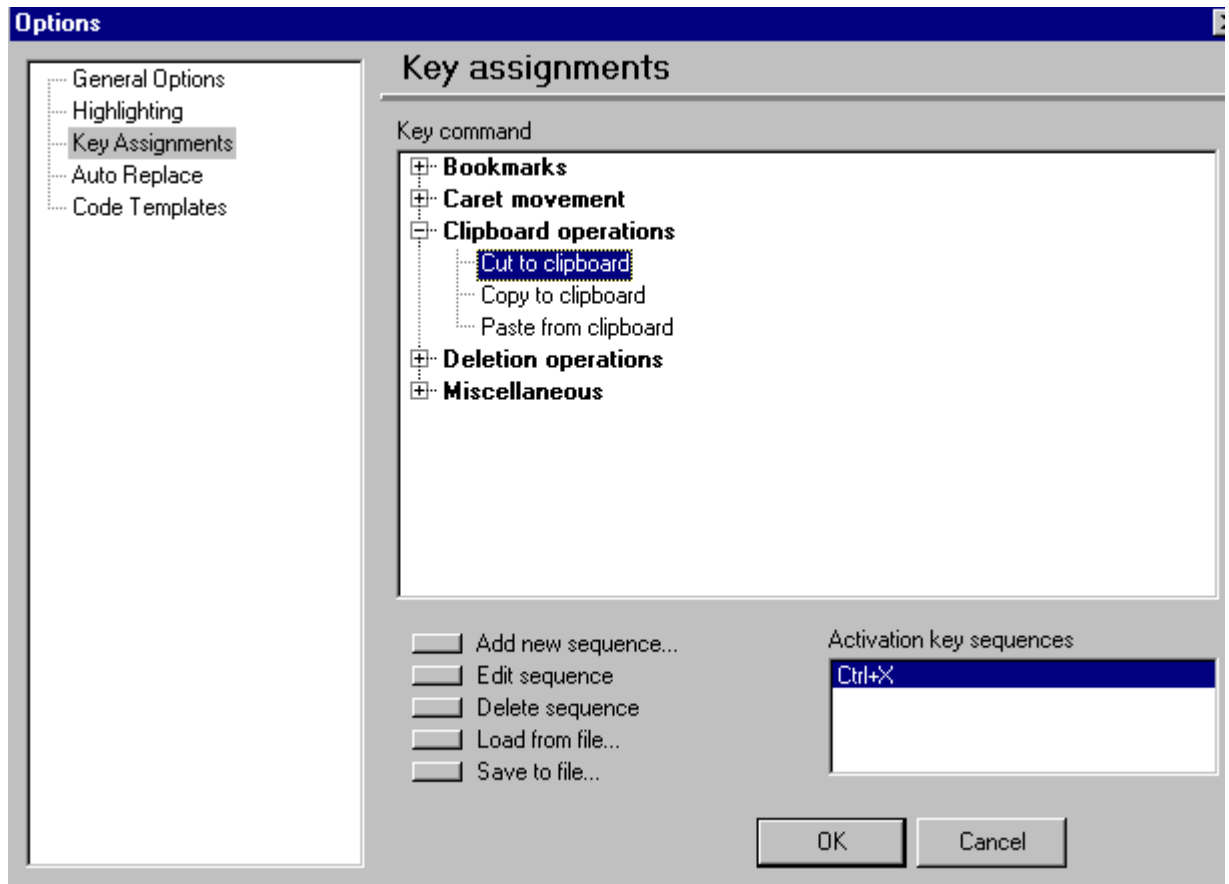
Capitalization effects are only applied to your text after you change lines up or down in the editor. E.g., type:

```
select * from table_name
```

and you will not get capitalization effects until you press <ENTER> or go up or down one or more lines then it is translated to:

```
SELECT * From Table_Name
```

## Key Assignments



Clicking on the Key Assignments item displays the corresponding Key Assignments options. The Key command categories listed are:

- Bookmarks**
- Caret movement**
- Clipboard operations**
- Deletion operations**
- Miscellaneous**

Click the expand button to expand a category's list.

Select an item from the list, and that item's keyboard shortcut will display in the Activation key sequences window.

#### **Add new sequence**

This brings up a series of step boxes that let you add a new sequence by simply typing the sequence in the step boxes.

#### **Edit sequence**

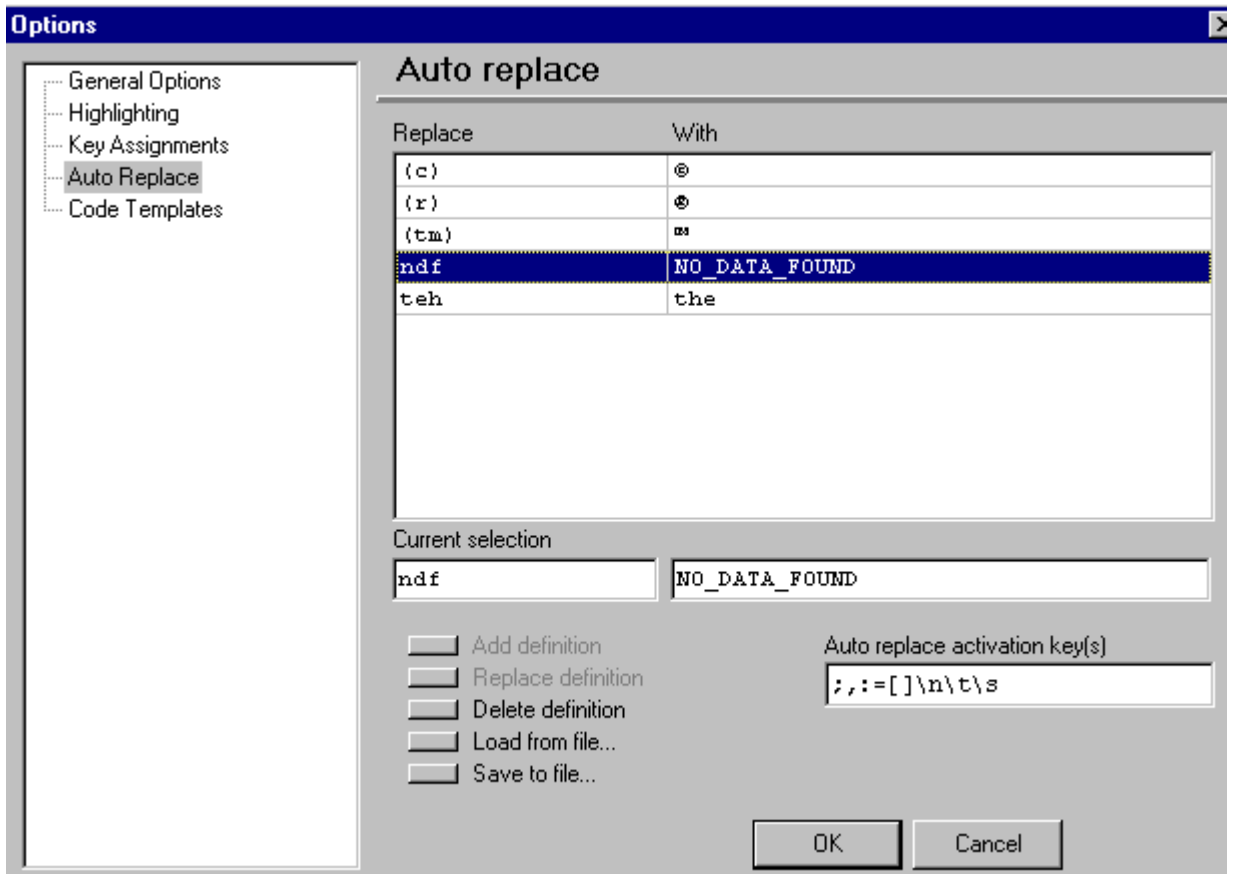
This lets you edit the existing sequence through a series of step boxes.

#### **Delete sequence**

This deletes whatever sequence is currently highlighted in the Activation key sequences window. If a list of sequences is in the box, you can click a sequence from the list to highlight it and then click the delete sequence button to delete that highlighted sequence.



## Auto Replace



Click on Auto Replace to display its corresponding options menu.

TOAD already has 5 Auto Replace items.

If type this	Replaces with this
(c)	©
(r)	®
(tm)	™
ndf	No_Data_Found
teh	the

### **Add definition**

This box is enabled after you click in the **Current selection** window and type a character. The first blank window is where you type the text that you want automatically replaced. The window to the right is where you type the replacement text. Then click the **Add definition** button to add this to the Auto Replace list. Remember to Click **OK** before exiting the window. If you exit the window without clicking **OK** the new definition will not be added.

### **Replace definition**

This button is enabled after you make a selection from the already defined Auto Replace list, click in the With window (the window next to the current selection window), and type a character in the With window. After you type the new entry that you want to replace the current selection with, click **OK** and the list will be updated.

### **Delete definition**

This button is enabled after you select a definition from the existing Auto Replace list. Click the **Delete definition** button to delete the definition from the list. Click **OK** and the definition will be deleted.

### **Auto Replace activation keys**

; , : = [ ] \n \t \s

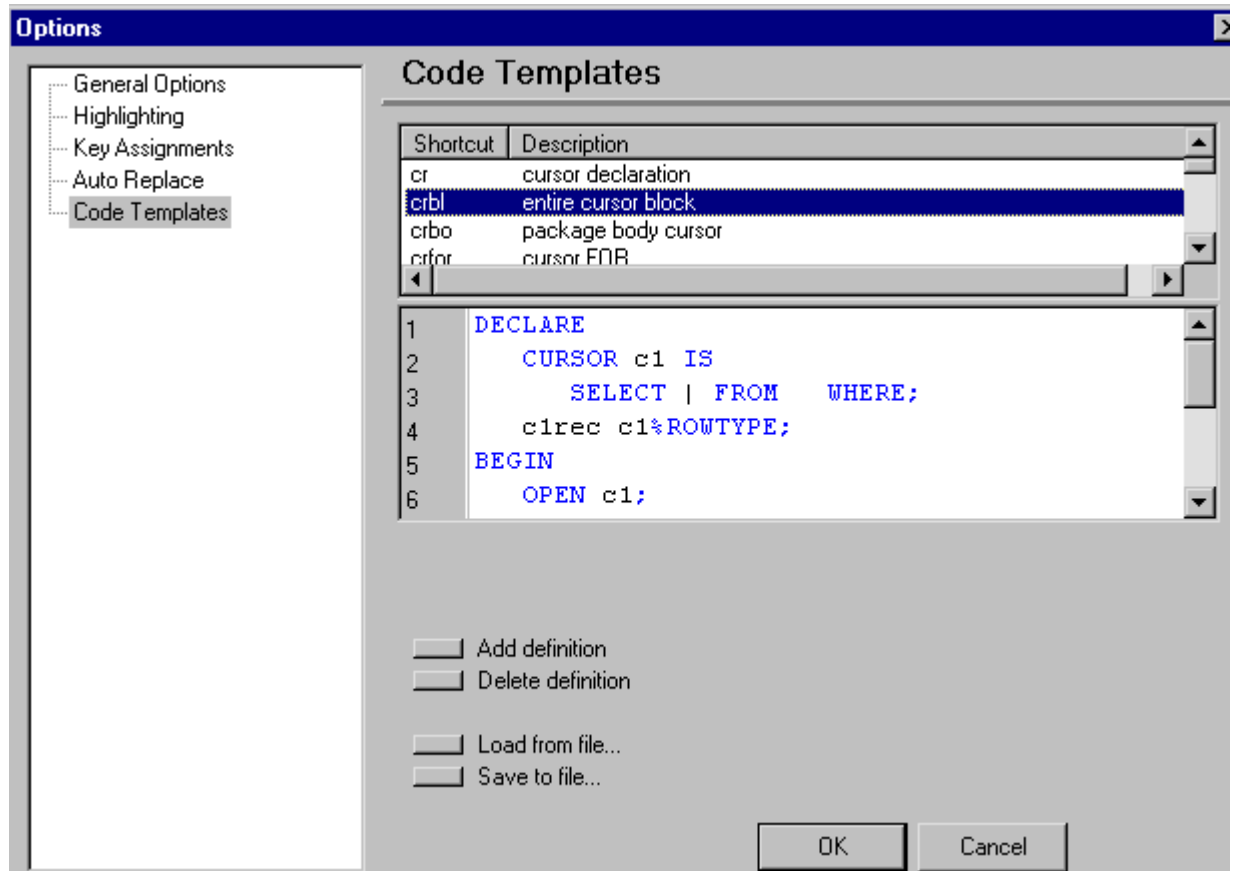
These keys will separate one word from another and trigger the editor to check for and replace one word for another. “\n” is a carriage return, “\t” is a <TAB> character, and “\s” is a space.

For example, if you type “this;that” then “this” will be autoreplaced when the “;” key is pressed.

The autoreplace items are saved and recalled from the TOAD\TEMPS\[Language]SUB.TXT file, where [Language] could be HTML, INI, JAVA, PL/SQL, or TEXT. You can directly edit the SUB.TXT file to add, delete, or change the autoreplace substitutions without having to go through the Editor Options dialog.

Language	AutoReplace File
HTML	HTMLSUB.TXT
INI	INISUB.TXT
JAVA	JAVASUB.TXT
PL/SQL	PLSQLSUB.TXT
TEXT	TEXTSUB.TXT

## Code Templates



**Add definition**

Click the **Add definition** button, and a new line with the word *new* appears in the shortcut templates window. You can then type in the shortcut name. Then tab and type in the description.

**Delete definition**

The **Delete definition** button is enabled when you click on a line from the Shortcut/Description window. To delete a definition, select the **Shortcut/Description** you want to delete, click the **Delete definition** button, and then click **OK**.

Code template items are saved and recalled from the TOAD\TEMPS\[Language].DCI file, where [Language] could be HTML, INI, JAVA, PLSQL, or TEXT. You can directly edit the .dci file to add, delete, or change the code templates without having to go through the Editor Options dialog.

Language	Code Templates File
HTML	HTML.DCI
INI	INI.DCI
JAVA	JAVA.DCI
PL/SQL	PLSQL.DCI
TEXT	TEXT.DCI

## Right-Click Menu

Click the right mouse button while you are in the SQL Editor to access the corresponding Right-Click Menu. This provides a shortcut to the functions listed in the menu. You can also press **F10** to display the Right-Click Menu.

The Right-Click Menu includes the following:

### **Format SQL**

TOAD's internal formatting mechanism only supports single DML statements (update, insert, delete). If you use the internal formatter on anything other than individual DML statements you will get errors.

To format a DML statement, highlight the statement you want formatted, right-click and select **Format SQL**.

If you have PL/Formatter or Formatter Plus installed, **Formatting Tools** will display in the menu instead of Format SQL.

### **Find Closing Block**

Finds the closing parenthesis, "END" for matching "BEGIN", or "END IF" for matching "IF"

### **Optimizer Mode**

This changes the optimizer mode for the entire session. Options include Choose, Default, Rule, First Rows, and All Rows.

## SQL Results Panel

The SQL Results Panel has five tabs: Data, Explain Plan, Auto Trace, DBMS Output, and Script Output. If you have the optional PL/Formatter, a tab for Code Statistics is also on the panel.

### Data tab



The Data Grid is discussed in detail in the **Data Grids** chapter of this manual.

The SQL Results Data Grid lets you view output from select statements. The Grid lets you take the results of a query and perform a variety of functions and display options. It's more flexible than using SQL\* Plus, because you can format the results visually or graphically.

If you type and execute

```
Select * from tablename
```

in the SQL Editor, you can see all rows and columns of the given table in the results grid.

#### Editable Data Grid

The data grid that displays the results of the SQL queries is fully editable providing that the query returns an updateable resultset. Query statements **MUST** return the ROWID to be updateable.

For example:

```
select * from employee
```

would not be updateable whereas:

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

would be updateable.

To overcome this obstacle, you can substitute EDIT Items which TOAD will translate into the updateable version of the statement.

For example:

```
edit employee
```

If the resultset is editable but remains read-only, make sure the **View > Options > Data Grid – Data > Default to Read-Only** option is not checked.

A red or green box displays in the status panel indicating whether the recordset is editable (green) or not editable (red).

### LONG and LONG RAW

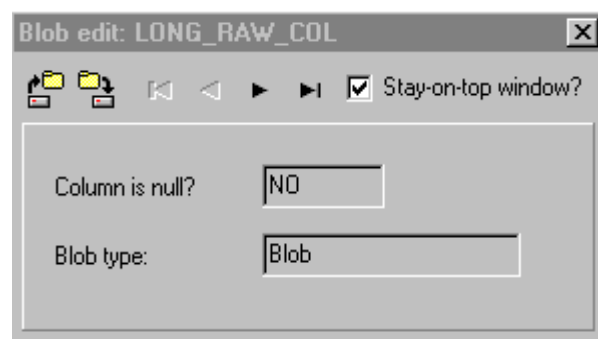
*NOTE: LONG is similar to CLOB, and LONG RAW is similar to BLOB. TOAD can handle all four of these datatypes.*

TOAD does not display the data for LONG RAW columns in a SQL Edit Grid. LONG columns are columns that contain character data up to 2 gigabytes. You define them as “long” in your SQL script. LONG RAW columns contain binary data that cannot be displayed such as GIFs, Word docs, etc.

LONG columns display the first several characters, and LONG RAW columns display as (BLOB).

	ID	LONG_RAW_COL
▶	1	(BLOB)

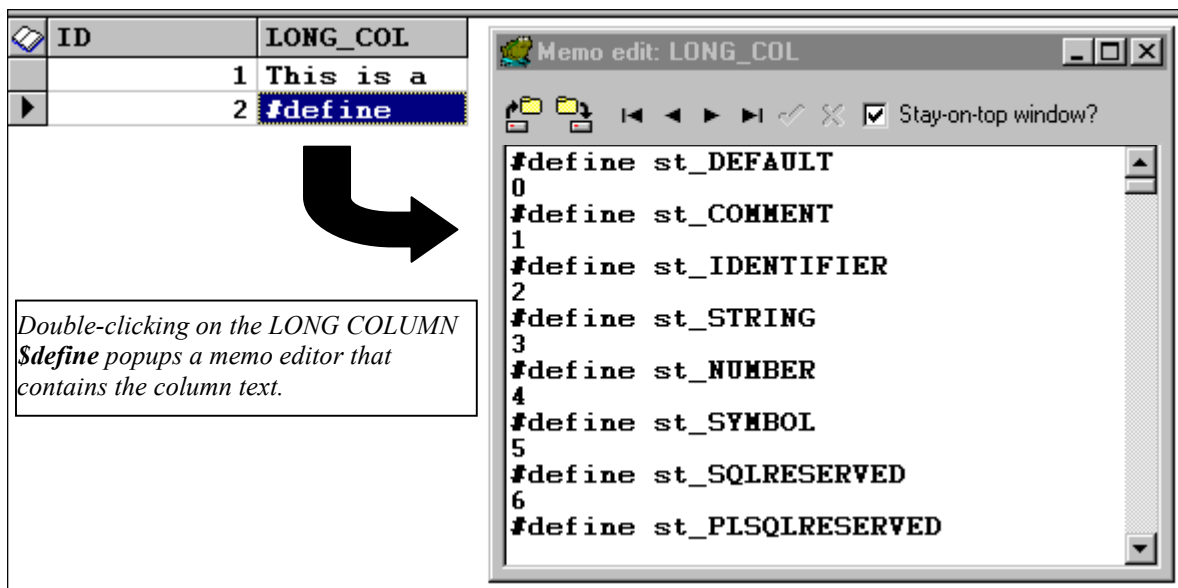
*LONG RAW columns display as (BLOB).*



*Double-click a LONG or LONG\_RAW column to display the popup memo editor.*

You edit these columns by double-clicking on the column and editing from the popup windows that display. For LONG columns, the Memo Editor window is displayed. For LONG RAW columns the Blob Edit window is displayed. If the popup window does not display, go to **View > Options** on the **Data Grids** tab and make sure the **Popup memo editor on double-click** option is checked. It must be checked for the above functionality to work.

The popup editor for LONG columns displays the column text. You can edit in the editor or load a file into the editor. The popup editor for **LONG RAWS** provides Load From File or Save to File functionality.



**Load From File** lets you select a file from your hard drive and place it into the LONG RAW column in the Oracle database.

**Save To File** lets you take the data from the LONG RAW column from the database and save it to a file on your hard drive.

Note that the recordset has to be editable for the popup editors to edit the data. You can still use the popup editors to have a read-only view of the data.



## To Edit LONG and LONG RAW Columns

### LONG Columns

The recordset has to be editable for the popup editors to edit the data.

- 1 Create a table: "create table long\_test (id number, long\_col long)"
- 2 Edit the table: "edit long\_test"
- 3 Insert a row: enter "1" for ID, then double-click on the long col cell
- 4 Enter text.
- 5 Click the right arrow. "select \* from long\_test" should view all records, including (at least the first few chars) the long cols.

### LONG RAW Columns

- 1 Create a table: "create table long\_raw\_test (id number, long\_raw\_col long raw)"
- 2 Edit the table: "edit long\_raw\_test"
- 3 Insert a row: enter "1" for ID then double-click on the long raw col cell
- 4 Pick a file to import.
- 5 Click the right arrow **Next Record** button. "select \* from long\_raw\_test" should view only id, long\_raw\_col should display (BLOB).

### 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. Whether or not you use time, it's in there. It will also work accurately well past Y2K.

Performing a 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 dropdown in the **TOAD Options > Data Grids - Data** dialog is for display purposes and does not affect the storage of time values.

## Explain Plan tab

The Explain Plan tab displays the Explain Plan for the selected SQL statement.

The Explain Plan also displays additional information, including partition information for Oracle 8 and above. The interface has tabs for Operation, Object name, Rows, Bytes, Cost, TQ, In/Out, PStart (Partition Start), and PStop (Partition Stop).

Explain Plan can be printed from the SQL Editor and the Kill/Trace window via the right-click menu item.

### NOTE:

Viewing **previous** Explain Plans via **View > Explain Plan** will not work unless you first run the TOADPREP.SQL script.

*Explain Plan is explained in detail in the Explain Plan section on page 46.*

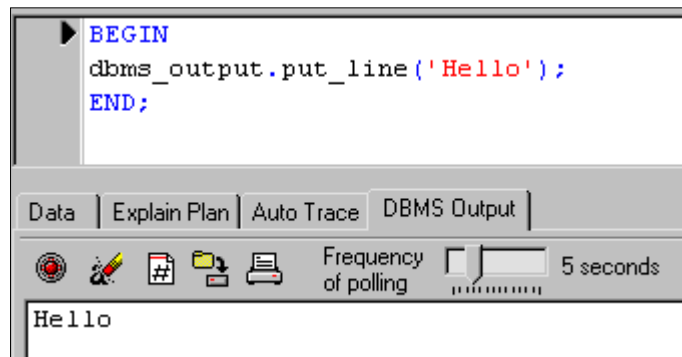
## Auto Trace tab

Auto Trace displays the results of every statement issued while in auto trace mode. It helps with tuning. When you run a query you can find out some performance statistics related to that query. Auto Trace is not recommended if a query is going to return a lot of rows, because it will force a read of all data from the results of a query.

You can enable/disable Auto Trace through the SQL Edit Right-Click Menu. If Auto Trace is disabled and you select the Auto Trace tab, TOAD will ask you if you want to enable Auto Trace. If you select Yes, it will be enabled

## DBMS Output tab

When you execute a DBMS Output statement, the DBMS Output will automatically display in the DBMS Output tab of the results grid.



**Turn Output On/Off**, turns DBMS Output function ON or OFF, light is red if DBMS Output is OFF and green if DBMS Output is ON



**Clear window**



**Set Output Buffer Size**, invokes the Set DBMS Output buffer window where you can set the size



**Save to File**



**Print Output window**

### Frequency of polling

You can set the frequency of polling (2 seconds to 15 seconds).

You can also open a new DBMS Output window by selecting the Open a new DBMS Output window button.



**Open a new DBMS Output window**

*DBMS Output is discussed in the Procedure Editor chapter.*

## Script Output

When you execute a script the results automatically display in this tab. When executing as script, you are not prompted to save changes because the script is not saved to a temp file. You can print from the Script Output tab via the right-click > Print menu item.

## SQL Templates

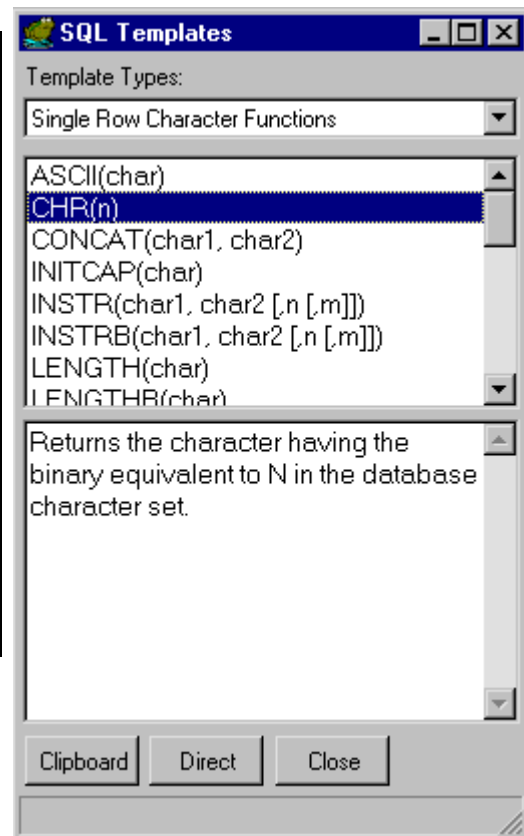
SQL Templates (Help) is a popup reference for Oracle SQL functions and expressions. To access the SQL Help Templates, go to the common edit toolbar in the SQL Edit window and select **Show SQL Help**. You can also access SQL Templates from the Procedure Editor window.

The items' associated text files are located in the TOAD directory in the TEMPS folder. You can modify the files.

FILE NAME                      ASSOCIATED TEMPLATE

STRFUNCS.TXT	Single Row Character Functions
NUMFUNCS.TXT	Single Row Number Functions
GRPFUNCS.TXT	Group Functions
DATFUNCS.TXT	Date Functions
DATEFMTS.TXT	Date Format Options
CNVFUNCS.TXT	Data Conversion Functions
MSCFUNCS.TXT	Other Misc. Functions
NMBRFMTS.TXT	Number Format Options
PSEUDO.TXT	Oracle Pseudo Columns
OPTHINTS.TXT	SQL Optimizer Hints
PREDFXCP.TXT	Defined Exceptions
USRFUNCS.TXT	User Provided Function List

*These templates are user configurable by editing the text file. This is especially useful for configuring PREDFXCP.TXT and USRFUNCS.TXT.*



*In the SQL Templates window, an explanation of the item or function displays in the lower panel. The items can be dragged and dropped into your SQL script.*



### Show SQL Help

#### To Access and Use SQL Help Templates

- 1 Click the **Show SQL Help** button that is located on the common edit toolbar.
- 2 Select an item from the dropdown list.
- 3 An explanation of the item or function will display in the lower panel.
- 4 You can drag and drop the item to your SQL Editor.  
**OR**  
You can click the **Direct** button to automatically copy and paste the item into your SQL script.  
**OR**  
You can click the **Clipboard** button to copy the item to the clipboard.

## Make Code Statement and Strip Code Statement

The SQL Edit window contains two functions that simplify copying SQL statements from TOAD to code development tools such as Delphi, VB, C++, Java, or Perl, and from those code development tools back to TOAD. The functions are called **Make Code Statement <CTRL>M** and **Strip Code Statement <CTRL>P**.

### Make Code Statement

Adds the code development tool syntax to the SQL statement in the SQL Editor, and makes it ready to paste into the development tool code.

When making code statements, rather than changing the code in the SQL Edit 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 copied to the clipboard.”

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

For example, taking this code and running Make Code Statement for VB code changes the SQL statement from this:

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

to this:

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



### Strip Code Statement

Strips off the code development tool syntax from the SQL statement, ready to execute in TOAD.

For example, taking this VB code from the VB development tool, copying it, pasting it into TOAD, and running Strip Code Statement, 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 SQL Editor, highlight the statement you want to strip before executing the Strip Code Statement function.

### Selecting the Code Development Tool

You select the code development tool in the

**View > Options > SQL Editor** tab > **Make Code Format** dropdown list.

The **Make Code Format** dropdown list 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, VB, C++, Java, and Perl are supported. The default selection is VB.

### External Editor

You can use an external editor to edit the SQL Editor contents. To set up, go to the **TOAD Options > Editors > External Editor Command Line**. Enter the drive letter, path, and executable name of the external editor you want, e.g., **c:\winnt\notepad.exe**. While in the SQL Editor or Procedure Editor, press <CTRL><F12> to invoke the external editor, which will start and load up the current TOAD Editor contents. Use the external editor, save the contents back to the SQLPLS.SQL file in the TOAD folder, quit the external editor, and click back on TOAD, which might ask you if you want to reload the contents of the SQLPLS.SQL file. Select Yes.

- You will be prompted to reload the contents of the file only if the **View > Options > Procedure Editor > Reload files when activating TOAD if the file time stamp is changed** option is checked.
- SQLPLS.SQL is used if the editor contents are not associated with a file. Otherwise, the actual file is used.

## Options for the Editors

You access this menu via **View > Options > Editors** menu item.

### Show Views on Table Selector

Default – Unchecked

If checked, will show views, along with tables, on the Table Select window. Tables are listed on one tab, and Views are on a separate tab.

### Show Synonyms on Table Selector

Default – Unchecked

If checked, will show synonyms, along with tables, and optionally views, on the Table Select window. Tables, views, and synonyms are listed on separate tabs.

### Use syntax highlighting on tablenamees

Default – Checked

If checked, will show tablenamees in the SQL Edit window and other editors, using the syntax highlighting feature. If unchecked, tablenamees will appear in black text.

### Treat underbar character as part of object names

Default – Unchecked

If checked, will select the entire word when double-clicked, including characters to the left and right of the underscore character, "\_". If unchecked, will select only the portion of the double-clicked word up to the underscore character.

**Display columns dropdown list after typing object name followed by a period**

Default – Checked

If checked, will display the columns dropdown list. If unchecked, will not display the columns dropdown list.

**Return column names in lower case from Selection Windows (and drag-drop)**

Default – Unchecked

If checked, will return selected column names into the editors in lower case. Otherwise they are returned in upper case.

**Allow RTF when copying to/from clipboard**

Default - Checked

If checked, TOAD will copy color markups, for pasting into email or other RTF enabled applications. If unchecked, the text will be copied to the clipboard as standard black text.

**Show Editor toolbars on SQL Editor and Procedure Editor**

Default - Checked

This option displays the editor toolbars on the SQL Editor and Procedure Editor windows when checked. If unchecked, the editor toolbars will not display.

**Use popup windows when executing DESC statements**

Default – Checked

If checked, TOAD will present you with a popup window of complete object detail when executing a "DESC object\_name" statement. If you prefer the results to be presented in the SQL Results grid, then uncheck this option. Regardless of this option setting, selecting an object and pressing **F4** will use the popup windows.

**Use StayOnTop Popups**

Default – Checked

If checked, the **F4** popup Object Describe windows will use the Windows **Stay on Top** feature. You access a Describe window by placing the cursor on a table, procedure, function, package or view in a SQL Editor or Procedure Editor and pressing F4. The Object Describe windows are similar to the Schema Browser windows for the corresponding object types.

**Sort columns Popups alphabetically**

Default - Checked

If checked, items in the columns popup will display alphabetically.

**Load the following from the TOAD.EXE\TEMPS location****Templates for new procedures in the Procedure Edit**

Default – Checked

If checked, will load the NEWFUNC.SQL, NEWPACK.SQL, NEWPROC.SQL, and NEWTRIG.SQL new PL/SQL template files from the network or local workstation where TOAD.EXE and TOAD.HLP are running from.

**Code Templates (Control-Space drop-downs) for editor windows**

Default – Checked

If checked, will load PLSQL.DCI code completion templates from the network or local workstation where TOAD.EXE and TOAD.HLP are read.

**Source for the SQL Templates window**

Default - Checked

If checked, will load the .TXT files that populate the SQL Templates window from the network or local workstation where TOAD.EXE and TOAD.HLP are read.

**External Editor Command line**

Enter the drive letter, path, and executable name of the external editor you want, e.g., **c:\winnt\notepad.exe**. While in the SQL Editor or Procedure Editor, press <F12> to invoke the external editor, which will start and load up the current TOAD Editor contents.

**Load table names from database at time of Login for each connection**

Default – Unchecked

TOAD caches tablenames and only queries tablenames the first time they are needed per Oracle session. If checked, this option will cause TOAD to requery Oracle for tablenames every time they are needed to fill a list of tablenames. If the table list is already cached, the list will override the global browser filter for tables when the Schema Browser window is opened.

**Load View names from database at time of first editor window**

Default - Unchecked

If checked, view names will automatically load when you open an editor. This allows syntax highlighting for view names.

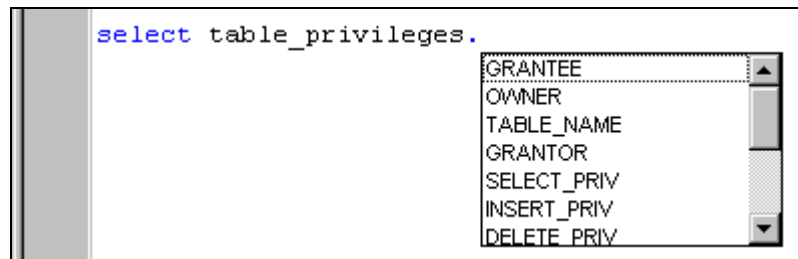
## SQL Editor Tasks

This section will take you step-by-step through various tasks that you might want to perform with the SQL Editor.

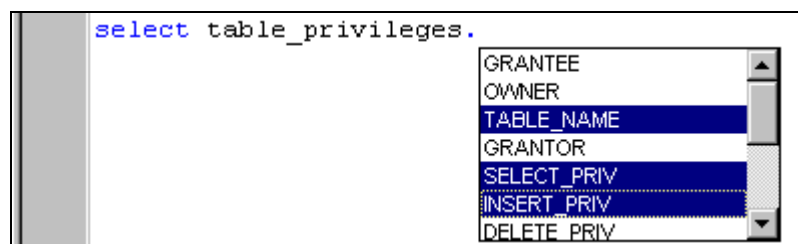
### To look up table columns while you construct a query

*This applies to any table or view that you can access, including objects from other schemas, SYS, SYSTEM, etc.*

- 1 After you type the table name (or view name) and the period, press **<CTRL>T** (or wait a few seconds)
- 2 A list of columns displays.



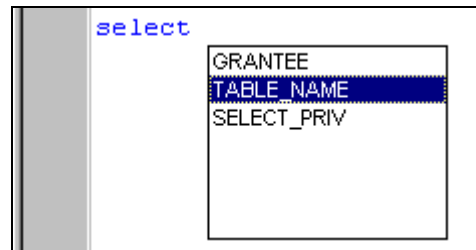
- 3 Click the item you wish to select. To select more than one item, hold down the **<CTRL>** key and **click** the items you wish to select.



- 4 Press <ENTER> OR Press <TAB>
- 5 TOAD places the selected column or columns into the SQL Editor to build your query.

```
select table_privileges.TABLE_NAME,  
       TABLE_PRIVILEGES.SELECT_PRIV,  
       TABLE_PRIVILEGES.INSERT_PRIV
```

After a query populates the SQL Results Grid, you can press <CTRL>T to display a list of the columns from the SQL Results Grid.



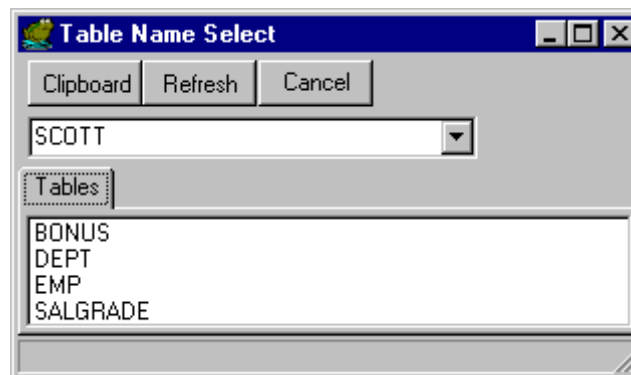


### To copy Table Names into the SQL Editor

You can copy the Table, View, or Synonym names from the Table Name Select dialog to the SQL Editor.



*The **Show Tables window** button, in the common edit toolbar, pulls up the **Table Name Select** window.*

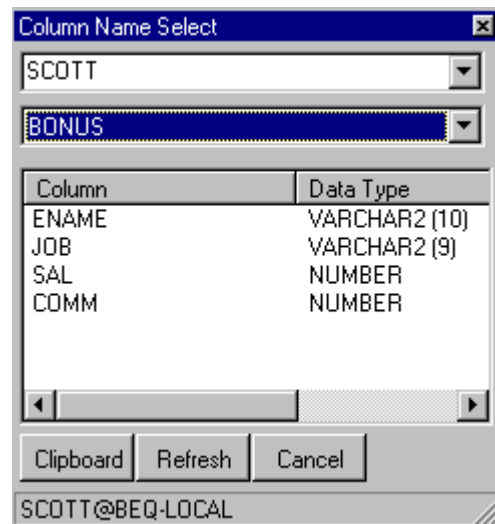


- 1 From a **SQL Edit window** or a **Procedure Edit window**, on the common edit toolbar select the **Show Tables window** button.
- 2 The **Table Name Select** window displays.
- 3 Click the item you wish to select. To select more than one item, hold down the <CTRL> key and **click** the items you want to select.
- 4 You can drag and drop the item(s), or copy <CTRL>C and paste <CTRL>V.

## To copy Table Column Names into the SQL Editor



The **Show Columns** button, in the second SQL Editor and Procedure Editor toolbar, pulls up the **Column Name Select** window.

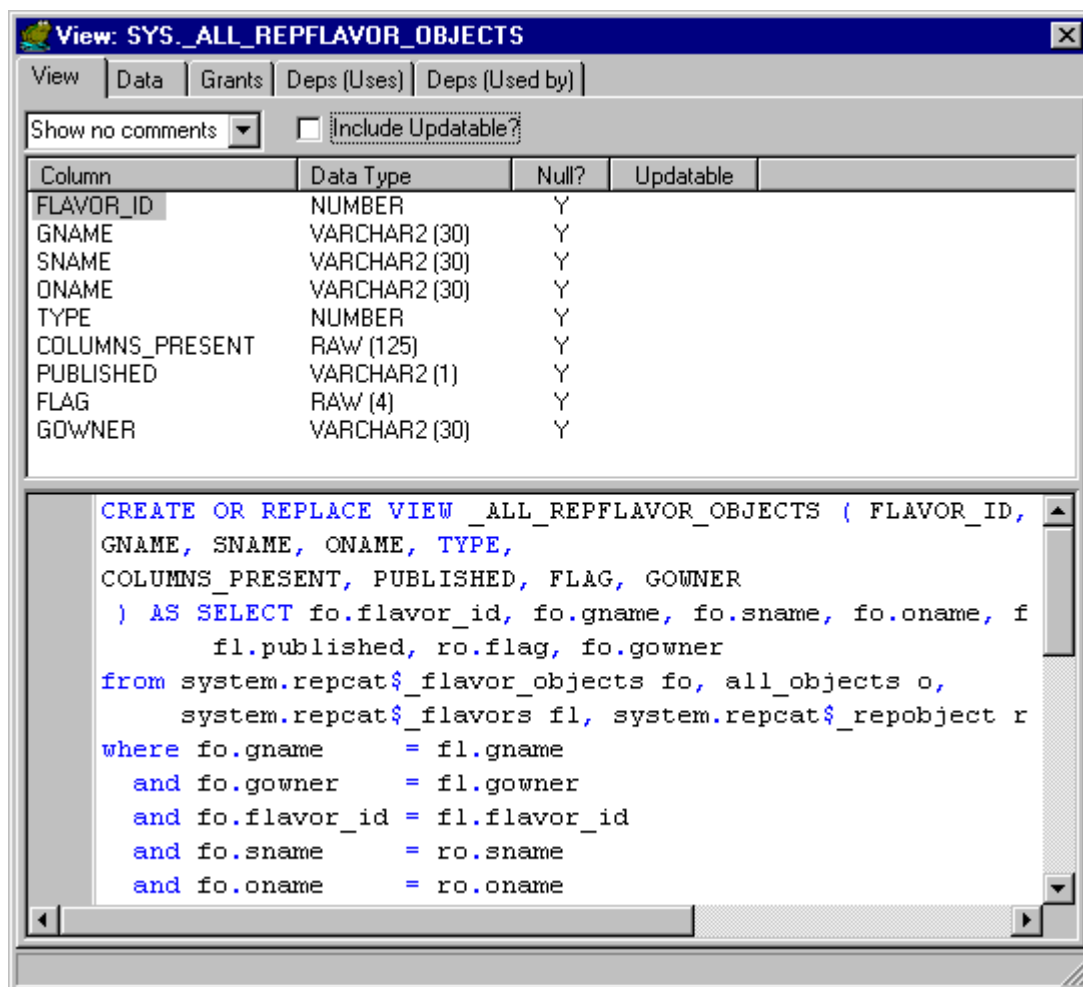


- 1 From the **SQL Edit window** or **Procedure Edit window**, on the common edit toolbar select the **Show Columns window** button.
- 2 The **Column Name Select window** displays.
- 3 Click the item you wish to select. To select more than one item, hold down the <CTRL> key and **click** the items you want to select.
- 4 You can drag and drop the item(s), or copy <CTRL>C and paste <CTRL>V.

### To get a description of an object while you are typing in the SQL Editor

*This applies to Tables, Views, Procedures, Functions, and Packages.*

- 1 Place the cursor on the object you want described.
- 2 Press **F4**.
- 3 A popup window displays that describes the object.



### To use TOAD to copy Oracle data to another Windows application

You can query some data and process it further in another Windows application, like Excel.

- 1 Execute a query, e.g. `[select * from employee]`.
- 2 Right-click over the SQL results grid to display the **Right-Click Menu**.
- 3 Select the **Select Columns** menu item.
- 4 The **Select Columns** window displays.
- 5 **Uncheck** the undesired columns until the columns you want are the only ones checked.
- 6 Select the **Save As** menu item from the **Right-Click Menu**. This saves the results to the Windows Clipboard.
- 7 Check the **Include Column Headers** checkbox that is listed in the **Save Grid Contents** dialog.
- 8 Switch to the target Windows application.
- 9 Paste in the results.

## Ways to get code into the SQL Editor

This section shows you the various ways you can enter or bring code into the SQL Editor.

### Typing

- 1 Start with a blank window in the SQL Editor.
- 2 Type in some SQL code.
- 3 Execute it.
- 4 Refine it.
- 5 Save it to disk.

### Loading a file



*The **Load a file into the editor** button. You can click the triangle to display a dropdown list of the last 10 files you opened while you were in the SQL Edit window. Once the window is closed, the list is reset.*

- 1 Click the **Load a file into the editor** button on the **SQL Editor** toolbar.
- 2 A **Select File for Edit** window displays.
- 3 Click the desired file.
- 4 Click the **Open** button.
- 5 The file loads into the SQL Editor.

### OR

Drag and drop a file from **Windows Explorer** to the **SQL Editor**.

### File > Reopen File

You can also open a file into the SQL Editor, or Procedure Editor, via the **File > Reopen File** menu. There is a list of the last 10 files opened. This list is saved and restored to the file SQLFILES.TXT in the TOAD\TEMPS folder.

### Recall previous SQL



*The Recall Previous SQL button*

- 1 Select the **SQL-Window > SQL Command Recall** menu item  
**OR**  
Press **F8**  
**OR**  
Press the **Recall Previous SQL** button.
- 2 The **SQL Statement Recall window** displays. It lists the last 100 queries that you executed in the **SQL Edit window**.
- 3 Select a query from the list.
- 4 It is copied to the SQL Editor.

On the TOAD Options dialog **View > Options** menu item, **SQL Editor** node, you can choose to save only the SQL commands that executed without errors. To do this, check the **Save only statements that are valid** checkbox. This is a useful filter because otherwise the recall list will fill with queries until you get it right.

```
select items from dept (invalid)
select item from dept (invalid)
select item from department (valid)
```

Another option lets you enter the number of previous SQL statements that you want to save and recall. The default is 100. The list of previous SQL statements is stored to and retrieved from SQLS.DAT. *See the Recall and Add SQL topic, page 52, for more information.*

### Recall a Personal SQL that you created



*The Recall Personal SQL button*

- 1 Enter a query.
- 2 Select menu item **SQL-Window > Recall Personal SQL**.  
**OR**  
Select the **Recall Personal SQL** button from the SQL Editor toolbar.
- 3 The **SQL Statement Recall** dialog displays.
- 4 Select the desired SQL.

The list of personal SQL statements is stored to and retrieved from PERSSQLS.DAT.

### Create and Recall a Named SQL statement

- 1 Enter a query.
- 2 Select menu item **SQL-Window > Add to Named SQLs**.
- 3 Enter a name, e.g., “Salary Query”
- 4 Select menu item **SQL-Window > Recall Named SQL**.  
**OR**  
Press <CTRL>N.
- 5 Select the query to return to the SQL Editor.
- 6 The **SQL Statement Recall window** displays. The queries are organized by the names that you select.

The list of named SQL statements is stored to and retrieved from NAMEDSQL.DAT.

**Recall a Code Completion template that you previously set up**

- 1 Edit [Language].DCI in the TOAD\TEMPS folder, where [Language] could be HTML, INI, JAVA, PLSQL, or TEXT. For the SQL Editor the language would be PLSQL.
- 2 Enter the shortcut keys for the code snippet, the complete name, and the code, in the same format as the samples already in the .DCI file.
- 3 In the **SQL Editor**, type in the shortcut keys, e.g., “crbl”
- 4 Press <CTRL><SPACE>.
- 5 TOAD looks up the code completion template and plugs it into the SQL Editor. *See the Code Templates topic, page 99, for more information.*





## Data Grids

Each data grid includes context menu items and a print dialog. The data grid is used in the SQL Editor, Schema Browser (Tables > Data and Views > Data), SQL Modeler, and Master/Detail Browser. The SQL Modeler and Master/Detail Browser do not have as many data grid context menu items as the SQL Editor and the Schema Browser.

## Right-Click Menu

The Right-Click Menu for the Data Grid provides numerous display, printing, and exporting options.

### **Memo Editor**

The Memo Editor is for LONG, CLOB, CHAR, or VARCHAR data type columns. Blob Edit is for LONG RAW/BLOB data type columns. For example, for columns that are long (200 characters or more), when you double-click, a text editor displays. For date columns, a date picker is displayed where you can select a date from a calendar presentation.

### **To view and/or edit the contents of a large column Memo Edit**

If the **View > Options > Data Grids > Popup Memo Editor on Double-Click** setting is checked,

- 1 Double-click a column to edit its value in the **Memo Edit** popup window.

Otherwise,

- 1 Right-click to display the **Right-Click Menu**.
- 2 Click the **Memo Editor** menu item.
- 3 If you want to make changes to the data in the Memo Edit popup window, the resultset must be editable. Otherwise, the Memo Edit popup window is read-only.

### **Print Grid**

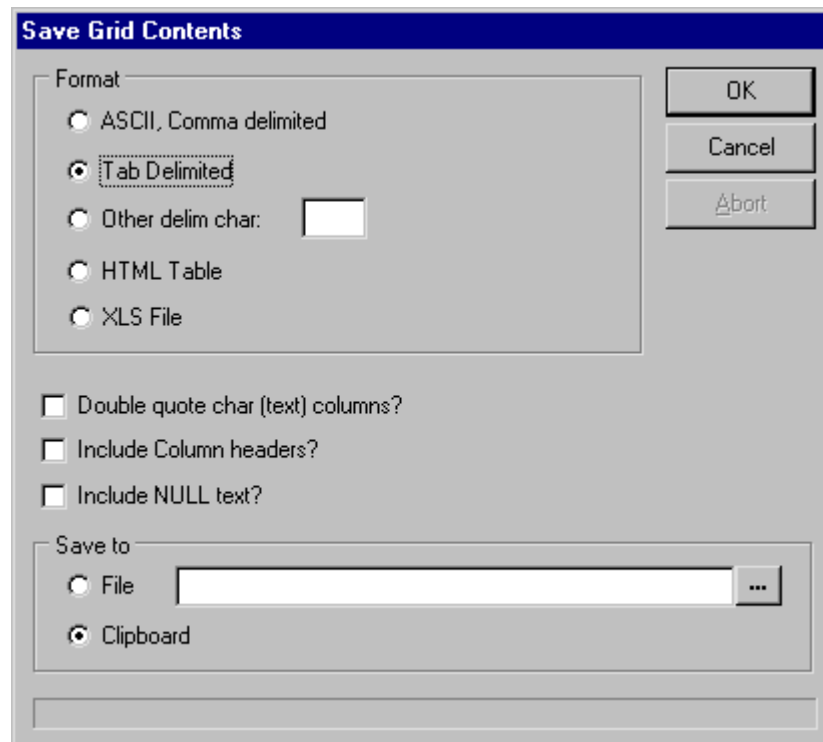
This invokes the Report Link Designer which is discussed later in this chapter.

### Save As

The **Save As** dialog from the Right-Click menu displays the **Save Grid Contents** window which contains format and file location options.

### Delimiters

Some programs require commas, which is a popular standard, to distinguish the data from one column to another column. The ASCII standard for dividing data is the <TAB> character. The Save As dialog from the Right-Click Results Grid Menu lets you choose a comma delimiter, a tab delimiter, or you can enter a different delimiter character.



**Format radio buttons**

Default – Tab Delimited

- **ASCII, Comma Delimited** – Divides data between columns with commas
- **Tab Delimited** – Divides data between columns with tabs
- **Other Delim Char** – You type the character you want to use as a delimiter
- **HTML Table** – Generates <TR></TR> and <TD></TD> HTML tags (tags for table rows and columns) and puts the values between the tags
- **XLS File** – Saves the file as an Excel file

**Double Quote Char (text) Columns**

Default – Unchecked

If this option is checked, text will be enclosed in double quotes.

Example:

```
7369      "SMITH"  "CLERK"      7902      12/17/1999
```

**Include Column Headers**

Default – Unchecked

If this option is checked, the column headers will be included in the text output.

Example:

```
EMPNO      ENAME      JOB      MGR      HIREDATE      SAL
7369      SMITH      CLERK      7902      12/17/1980      800
```

**Include NULL Text**

Default – Unchecked

If this option is checked, the word NULL will be included for empty cells (cells that contain no information).

Example:

```
7698      BLAKE      MANAGER      7839      05/01/1988      NULL      30
```

**Save to** radio buttons

Default – Clipboard

### **File**

If you choose File, you can type in the file location or you can click the drill down button to find your target directory.

### **Clipboard**

Save to Clipboard saves the text to clipboard ready for you to Paste to another application such as Word or Excel.

After you click OK, TOAD will display a confirmation message that states the number of rows that were exported.

### **To copy the rows to the windows clipboard, or save them to a file**

**1 Right-click** in the results grid and select the **Save As** menu item.

**OR**

Click the **Grid > Save As** menu item.

**2** The **Save Grid Contents** window displays.

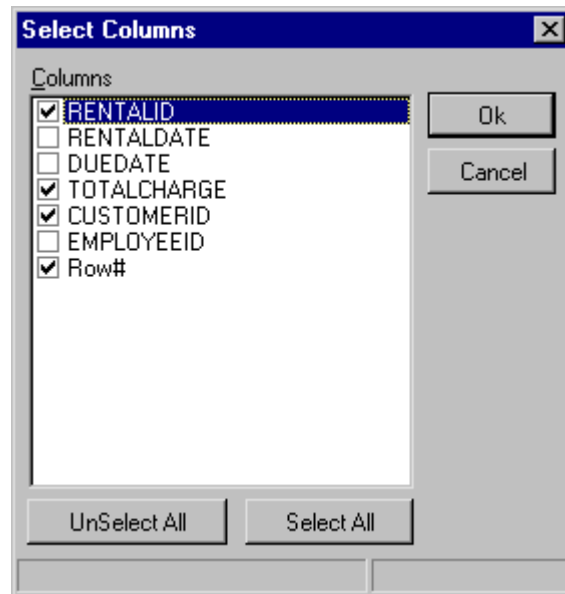
**3** From the **Save Grid Contents** window, select your settings.

**4** Click **OK**.

The data is copied to the clipboard or saved in a text file.

### Select Columns – Row Numbers

Check or uncheck the columns you want to see. The Select Columns window includes a checkbox for Row Numbers. This lets you display or hide row numbers in the data grids.



### To rearrange the order of the columns

- 1 Select the column you want to move by clicking on its header in the grid.
- 2 Drag the column(s) left or right as desired.

If after rearranging your columns, you copy the data to the clipboard, or save the data to a file, the data will be in the new column order.

### To temporarily hide selected columns

- 1 Select the **Select Columns** item from the **Right-Click Menu**.
- 2 Uncheck the columns you want to hide. They will NOT be included when you copy to clipboard or save to file.

This does NOT requery the data from the database. It just temporarily hides the columns.

### To set the column widths to a custom width setting

If you want to see more or less of a column,

- Move the mouse pointer to the grid headings, over the border between two columns, and drag it left or right.

If the columns of a query are the same from query to query, then TOAD retains these custom column widths. You could add a WHERE clause, or an ORDER BY, etc., re-execute the query, and the column widths would remain the same.

If the columns of a query are different, than the grid columns will be sized according to the **View > Options > Data Grids - Visual > Size data to the width of column headers, Size grid columns to the width of the data** and **Allow columns to be less than the header width** options.

### Export to Flat File

When you Export to Flat File, you export data to an ASCII file without column delimiters. The spec file indicates start and end points for columns, which you can edit.

On the **Options** tab select the table to export. You must set up the Specifications File which will define the table name, table owner, how many lines in the output file will be covered by a single record of data, the columns of data, what line they will appear on, the starting column, and the length of each column of data.

#### Spec File tab

This is where you set up where your columns will begin and end.

#### Spec Filename

You can type in your filename or use the drill down to choose a target path.

#### Execute

This button exports the data to the file.

**Save Spec File**

This saves your specifications file and all your edits.

**Generate Columns**

This creates columns for your specifications file based on the DDL for the table, not the width of the actual table data.

*Example of a specification file:*

```
TABlename=EMPLOYEE
TABLEOwner=DEMO
LINESPERRECORD=1
COL1=EMPLOYEE_ID,1,1,5
COL2=LAST_NAME,1,6,15
COL3=FIRST_NAME,1,21,15
COL4=MIDDLE_INITIAL,1,36,1
COL5=JOB_ID,1,37,4
COL6=MANAGER_ID,1,41,5
COL7=HIRE_DATE,1,46,22
COL8=SALARY,1,68,10
COL9=COMMISSION,1,78,10
COL10=DEPARTMENT_ID,1,88,3
```

The basic format for the column definition lines is:

COLx=COL\_NAME,Output\_row\_num,Start Col,Num Columns

A sample flat file as exported will look like this:

7369	SMITH	JOHN	Q	667	7902	12/17/1984	800		20
7499	ALLEN	KEVIN	J	670	7698	2/20/1985	1600	300	30
7505	DOYLE	JEAN	K	671	7839	4/4/1985	2850		13
7506	DENNIS	LYNN	S	671	7839	5/15/1985	2750		23



### Flat File Export from Table window

You can also create a flat file from a table using the **Database > Export > Table as Flat File** menu item. On the Options tab, you would select the schema and the table to export.

### SQL Loader tab

This tab lets you set up the import parameters for the file that you are exporting so that you can later import it through Oracle SQL Loader.

### Find Data

The Grid Data Find window lets you search through selected columns for selected values or characters. You can specify whether you want the search case sensitive, and whether or not you want to have partial matches.

### To find data

- 1 From the **Right-Click Menu** or from the main **Grid menu** select **Find Data**. The Grid Data Find window displays.
- 2 Select the **Column** you want to search.
- 3 Enter the keyword or **Value** to find.
- 4 Click the **ADD** button.
- 5 Select the desired case sensitive and partial match options.
- 6 Click **OK**.

TOAD will search all records for the value, and position the recordset to the first matching value. If the records are cached, the search is fast. If TOAD needs to query ahead in the recordset, you'll have to wait for additional rows to be fetched from the database.

This dialog lets you enter a multiple column search criteria.  
Example: ENAME = 'SMITH' AND JOB = 'CLERK'

You can press <F3> to find the next row with the specified value.

### Duplicate Row

This item lets you copy an entire row.

#### To copy one row to create a new one

- 1 Edit the recordset.
- 2 Click in a cell of the row you want to copy.
- 3 Select the **Grid > Copy Row** menu item (also accessible from the Right-Click Menu).
- 4 This copies the entire row to the bottom of the SQL Results grid, ready for you to edit. *NOTE: the recordset MUST be editable before the Copy Row function will work.*
- 5 After you edit the cell contents, move to the row above in order for the row to be sent to Oracle. If you want to cancel from adding this row, press the <ESC> key.

### Record Count

This displays a message window that shows the count of the number of records in the recordset. Record count is cancelable in the SQL Editor, the Schema Browser, the Master/Detail Browser, and the SQL Modeler.

### Set Sequence Field

This invokes the Set Sequence Column window which lets you apply a previously created sequence to the selected column on the data grid. After the sequence is applied, if you add a new record in the table and leave the sequenced column blank, TOAD will auto-generate the next number in the sequence applied to the column. Columns with assigned sequences are displayed in aqua.

The following example uses Set Sequence Field.

Run the following scripts in the SQL Editor. They will create a table called SEQ\_TABLE with columns titled FIRST\_NME, LAST\_NME, and ID\_NMR. It creates a Sequence called SEQA that starts with 1, increments by 1, and has a maximum value of 4.

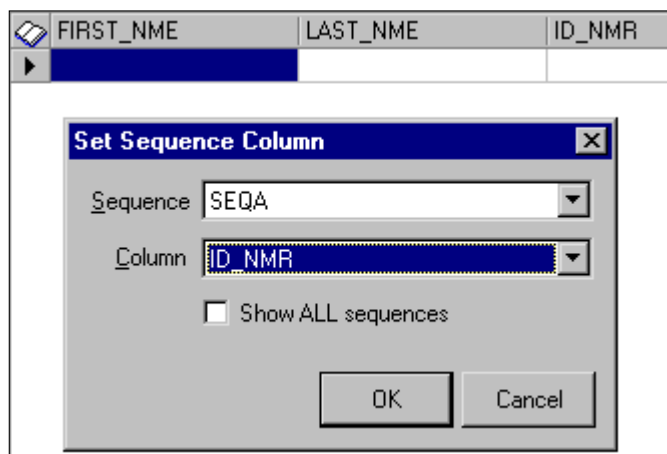
```
DROP TABLE SEQ_TABLE CASCADE CONSTRAINTS ;
```

```
CREATE TABLE SEQ_TABLE (  
    FIRST_NME CHAR (20) ,  
    LAST_NME CHAR (20) ,  
    ID_NMR NUMBER (4) NOT NULL,  
    CONSTRAINT UNIQUEID  
        UNIQUE (ID_NMR))
```

```
CREATE SEQUENCE SEQA START WITH 1 INCREMENT BY 1 MINVALUE 1  
MAXVALUE 4 NOCACHE NOCYCLE NOORDER
```

Next, you need to display the data grid for SEQ\_TABLE. You can do this through the SQL Editor or the Schema Browser. For this example, use the Schema Browser.

- 1 From the Schema Browser > Tables list select the SEQ\_TABLE. In the details panel, click the **Data** tab. The cells are currently empty of data.
- 2 Right-click in the data grid and select **Set Sequence Field**.
- 3 The **Set Sequence Column** window displays.
- 4 From the Sequence dropdown select **SEQA**. From the Column dropdown select **ID\_NMR**.



- 5 Click OK.
- 6 Insert data in the record for FIRST\_NME and LAST\_NME.
- 7 When you click the Insert Record button 1 is automatically entered
- 8 Insert 3 more records of names.  
The ID\_NMR column populates with 2, 3, and 4.

	FIRST_NME	LAST_NME	ID_NMR
▶	Tim	Moore	4
	Margaret	Fletcher	3
	Elizabeth	Barnes	2
	John	Miller	1

- 9 Try to Insert data for a 5<sup>th</sup> record. An error message displays. “ORA-8004: sequence SEQA.NEXTVAL exceeds MAXVALUE and cannot be instantiated.” This is because you set the maximum records of the sequence to 4.

You can then delete the extra record.

### Fix Current Column

You can select and fix columns. Click in a column, right-click, and select **Fix Column** to fix the selected column. The column(s) you select will be anchored to the left. The fixed columns remain locked to the left in view during horizontal scrolling. Once a column is fixed, other columns can be dragged into the fixed area. To move a column out of the fixed area click and drag it to the right of the bold horizontal fixed column divider bar. When you display Row Numbers they automatically display as fixed columns.

### Preview Current Column

This displays a full row below each data row to show the value of the selected column. This is useful for viewing long varchar columns.

### Remove Preview Column

This removes the Preview Column.

**Allow Multi-Select**

When this is checked, you can select more than one row by pressing <CTRL> and the rows you want to select. If you accidentally select a row you want to deselect, press <CTRL> and click the row and it will be deselected.

When Multi-Select is not checked, you can only select one row at a time.

**Grid Options**

This invokes the Data Grids - Visual page which contains numerous display options including fonts and column sizing. This is discussed in detail later in this chapter. The Font option is on the Data Grids - Visual page.

**Size Columns**

You have a choice of

Apply Best Fit

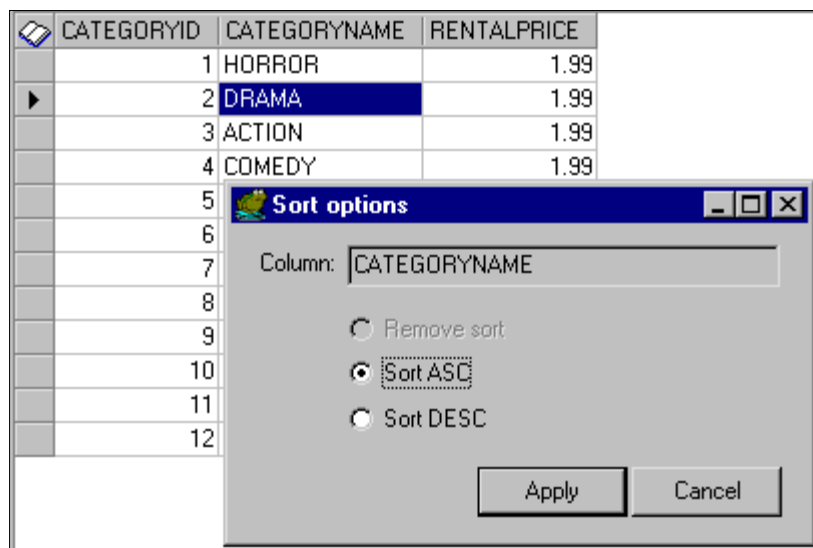
Size Columns to Headers

**About Row Height**

You can easily adjust the height of your rows by moving your mouse to the gutter (the left of the first column) and over a row divider line until you get the double arrow, then click-and-drag the row up or down to increase or decrease its height. The new height adjustment automatically applies to all rows in the table. Row height adjustment is useful for viewing varchar columns.

## Sort Options Window

The Sort Options window lets you sort columns in ascending or descending order. It also lets you remove sorts. It is invoked when you click on a grid column header under specific conditions in the Schema Browser and SQL Editor.





In the Schema Browser, if a sort filter has not been applied via the filter button, you can click on a column header and invoke a Sort Options window that contains 3 radio buttons: Remove Sort, Sort Ascending, Sort Descending. You have to click the apply button for your sort choice to apply. You cannot sort row numbers. Once you apply a sort via the filter window (which you can do in the Schema Browser), the column-click sorting is disabled until you clear the sort filter via the filter window.

In the SQL Editor, if the query does not contain an Order By, the grid is sortable via the Sort Options window.

The **View > Options > Data Grids – Visual > Confirm sorts when clicking on column header** option is checked by default.

## Calculator

Data	Explain Plan	Auto Trace	DBMS Output	Script Output	
	RENTALID	DUE DATE	TOTALCHARGE	CUSTOMERID	EMPLOYEEID
	1	10/09/2099	5.98	40	4
	2	10/09/2099	2.98	1	2
	3	10/09/2099	<div> <div>Back</div> <div>CE</div> <div>C</div> <div>MC</div> <div>7</div> <div>8</div> <div>9</div> <div>/</div> <div>sqrt</div> <div>MR</div> <div>4</div> <div>5</div> <div>6</div> <div>*</div> <div>%</div> <div>MS</div> <div>1</div> <div>2</div> <div>3</div> <div>-</div> <div>1/x</div> <div>M+</div> <div>0</div> <div>+/-</div> <div>.</div> <div>+</div> <div>=</div> </div>		1
	4	10/09/2099			1
	5	10/09/2099			3
	6	10/09/2099			5
	7	10/09/2099			1
	8	10/09/2099			2
	9	10/09/2099			5

You access the calculator by clicking on a number in an editable cell and pressing <Enter>. A dropdown arrow displays. Click the arrow and a calculator will display. You can use the calculator to perform calculations in the cell. When you get your final result press <Enter> or click outside of the calculator area, and the new number remains displayed in the cell.

## Data Grids – Data Options

You access the TOAD Options menu via the Configure TOAD Options toolbar button on the main menu or by selecting the **View > Options** menu item. The Data Grids Data options are on the **Options > Data Grids - Data** page.

### **Default to Read-Only Queries**

Default – Unchecked

This option controls the ability to fetch updatable result sets in the SQL Edit window. If checked, you cannot edit data in a SQL Edit window. Otherwise, you can edit a resultset by including the ROWID in the query, or using “edit table.”

### **Popup memo editor on double-click**

Default – Unchecked

If checked, when you double-click on any text column, a popup window will display with the contents. This option is useful for LONG columns.

### **Date format** dropdown

Default – Your Windows Control Panel, Regional Settings, Short Date Style Format

Normally, the data in TOAD for date columns will display in the format selected in the Window Control Panel. Selecting a different format will override the Windows Control Panel setting.

### **Time format** dropdown list

Default – h:mm:ss AMPM

This lets you select a different time format, if desired.



**Clone SQL cursor when exporting grid contents (faster exports and uses less memory)**

Default – Unchecked

For the Save As window, if you clone cursor (check this option), TOAD will reissue the statement from the SQL Editor which means that the statement processing time is doubled. But the cursor is unidirectional, which saves a lot of memory during the export.

If you do not clone the cursor (unchecked), TOAD will use the existing cursor from the SQL Editor Grid, which is a lot faster, but can potentially be a memory hog.

You must decide whether or not to clone the cursor on a case-by-case basis. You must take into consideration the processing time of the statement and the memory requirements of the data returned by the statement.

**Do not require NOT NULL columns in data grid entry (allow Oracle to enforce constraints)**

Default – Checked

If this option is checked, TOAD will not check for blank values during grid edits, and will instead rely on Oracle for the constraint checking. If unchecked, TOAD will stop editing if blank is entered in a NOT NULL required entry column.

**Trim string data before posting to Oracle**

Default – Unchecked

If checked, this will trim off trailing spaces from data before posting it to the database. This lets you post a single column with just spaces.

**Confirm data deletions from grids**

Default – Unchecked

If checked, this will confirm each record deletion before deleting the record. This also affects the data grids on the Schema Browser “Data” tabs.

**Check and warn of cascading constraints before deletions**

Default - Unchecked

If checked, you will be warned of cascading constraints before deletion.

**Show Row ID in data grids**

Default – Unchecked

If checked, the ROW IDs will display in the data grids.

**Sliding window for entering two digit years**

Default - 30

This is the number of years that will be subtracted from the current date (system date) to determine whether a two-digit year will be interpreted as a current century year or a previous century year. Click the **Up and Down** arrow to select the range. The range of choice is 0 to 49. Anything outside of the sliding window will be treated as a current century year, and any number that falls inside the sliding window will be treated as a previous century year.

For example, if your current system date is set for June 1, 2000 and you specify a 30 year window (which is the TOAD default) and enter 1/1/87; the date produced will be Jan. 1, 1987. If you enter 1/1/57, the date is outside of the 30 year window; so the date produced will be Jan. 1, 2057.

**Precision for float columns spinner**

This sets the precision for float data type values. Setting this option displays the number data in non-scientific notation format for users who do not like to view numbers in scientific notation.

The default is zero, which displays all available precision.

**Precision for integer columns spinner**

This sets the precision for integer data type values.

The default is zero, which displays all available precision.

**Allow Control-J to cancel data fetches (grid scrolls)**

Default – Unchecked

When checked, it lets you disable scrolling in a large data set by typing <CTRL><J>. No more data is fetched beyond the point where you stopped scrolling. If you attempt to continue scrolling a message box will appear asking “Do you want to cancel the Data Scroll?” If you click “Yes” you cannot scroll any further down and no more data will be fetched. If you click “No” you can continue scrolling.

## Data Grids – Visual Options

The Data Grids – Visual Options are accessed via the View > Options (or the Configure Options button) > Data Grids – Visual page.

### Show

#### **Focus Rectangle**

Default - Checked

If checked, when you select an item in the data grid and then click outside of the grid, the item you selected is marked with a black rectangle.

#### **Selection**

Default - Checked

If checked, when you select an item in the data grid and then click outside of the grid, the item and cell remain highlighted. If unchecked, when you click outside the grid the item and cell are no longer highlighted.

#### **Grid**

Default – Checked

When checked, the grid displays around the data (lines appear between the rows and the columns).

### Preview Column

#### **Lines spinner**

Default - 1

This lets you change the number of lines included in the preview column. You can select from 1 (the default) to 5. If you select 0 the preview is removed and you cannot preview columns.

**Font** button

Default – MS Sans Serif 8 point

This invokes the font selection window. Changing the font here only affects the font displayed in the preview column.

Row lines**Width** spinner

This controls the thickness of the lines between rows on the data grid. The measurement is in points.

Fonts**Grid** button

Default – MS Sands Serif 8 point

This invokes the font selection dialog. Changing the font here affects the entire data grid, with the exception of the preview column and headers. All data grids will have the same font.

**Header** button

Default – MS Sands Serif 8 point

This invokes the font selection dialog. Changing the font here only affects the font displayed in the headers of the data grids.

Options**Column Sizing**

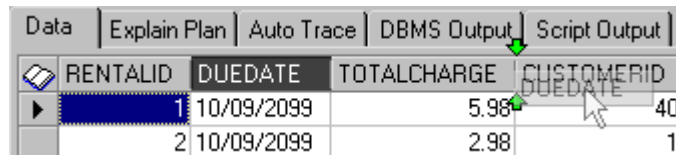
Default – Checked

If checked, you can click-and-drag between columns to resize them.

### Column Moving

Default – Checked

If checked, you can click-and-drag a column to another location in the grid.



	RENTALID	DUE DATE	TOTALCHARGE	CUSTOMERID
1		10/09/2099	5.98	40
2		10/09/2099	2.98	1

### Tabs

Default – Checked

If checked, lets you tab from column to column through one record. You cannot tab through multiple records unless Tab Through is also checked.

### Tab Through

Default – Unchecked

If checked, you can tab through more than one record. In order to tab through the records, you must also have Tabs checked.

### Row Select

Default – Unchecked

If checked, clicking in a cell in the data grid selects the entire row rather than only one cell.

### Multi Select

Default – Unchecked

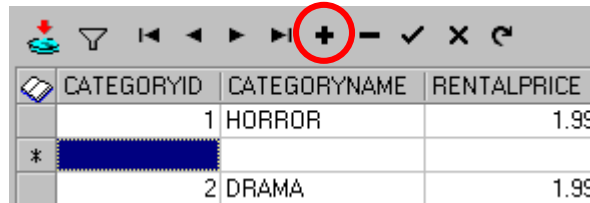
If checked, this automatically engages row select. Multi Select lets you select more than one row at a time by pressing either <SHIFT> or <CTRL> while clicking on the rows.

**Cancel on Exit**

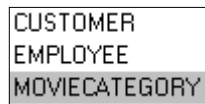
Default – Checked

This applies to the Schema Browser > Data Grid for a table. If checked, if you click

the Insert Record button and do not enter data...



then when you click back on the table name in the table list at the left...



the blank row will be deleted.

	CATEGORYID	CATEGORYNAME	RENTALPRICE
	1	HORROR	1.99
▶	2	DRAMA	1.99

If the option is unchecked, the blank row will remain.

**Immediate Edit**

Default – Unchecked

If this option is checked, as soon as you click on a data cell in the grid, the grid will enter edit mode. If unchecked, you must select the cell twice to place the grid in edit mode or just begin typing in the cell. If the data grid is not editable, and the option is checked, it will still appear to enter edit mode, but the data will not be editable.

### Column Sizing

#### **Size data to the width of column headings**

Default – Unchecked

If checked, columns are sized to the width of the headings, and data wider than the heading is truncated.

#### **Size grid columns to the width of the data**

Default – Unchecked

If checked, columns are sized to the width of the data contained in them.

#### **Display {null} for null columns**

Default – Unchecked

If checked, any data cells that are null will contain the words {null}. Unchecked, the null data cells will display as empty cells.

#### **Show row numbers**

Default – Checked

If checked, a column containing row numbers displays. It is automatically fixed and the first column in the data grid.

#### **Allow columns to be less than the header width**

Default – Unchecked

If checked, you can make columns narrower than the width of the column header.

#### **Confirm sorts when clicking on column header**

Default – Checked



If checked, the Sort Options window displays when you click on a column header. Unchecked, when you click on the column it is sorted in either ascending or descending order (whichever is the opposite of its current state).

**Color row numbers same as grid border**

Default – Unchecked

If checked, the row number background will be the same color as the border background. If unchecked, the row number background will be white.

## Report Link Designer

When you issue a print command for a grid (Grid > Print Grid or right-click on the grid and select Print), the Report Link Designer displays. This contains options for how your printout will display. The printout will print in spreadsheet fashion, i.e., printing will not truncate the output at the page width, columns are printed on subsequent pages.

### Options tab

#### **Bands**

Default – Unchecked

If checked, adds a blank band (bar) to the top of the grid.

#### **Header**

Default – Checked

If checked, the column headers are included in the printout. If unchecked, column headers are not included.

*Footers – Not applicable to data grids*

*Group Footers – Not applicable to data grids*

#### **Preview**

Default – Unchecked

If checked and if you have activated the Preview Current Column command, the preview columns will printout. If unchecked, or if checked and you have not activated the Preview Current Column command, the preview columns will not printout.

**Node Grid**

Default – Checked

If checked, will print the column lines in a data grid. If unchecked, the column lines will not print in the data grid.

**Grid**

Default – Checked

If checked, the grid lines (the lines between the rows and columns) will printout. If unchecked, the grid lines will not printout.

**Flat Checkmarks**

Default – Checked

If unchecked, checkmarks will be 3 dimensional.

**Transparent Graphics**

Default – Unchecked

Applicable to data grids that contain graphics (i.e. Instance Manager). If checked, graphics will print as transparent.

**Graphics as Text**

Default – Unchecked

Applicable to data grids that contain graphics (i.e. Instance Manager). If checked, the word “GRAPHIC” will replace each graphic.

**Expand Level (-1 to 10) Available on Explain Plan Report Link Designer**

This spinner lets you choose the number of levels of an Explain Plan to print. -1 will print all the levels. 0 will print the top level. 1 will print the top level plus the next sublevel. You can choose from -1 to 100.

Operation	Object Na...	Ro...	Byt...	C...	T..	In/...	PStart	PSt...
SELECT STATEMENT								
NESTED LOOPS								
TABLE ACCESS FULL	EMP							
TABLE ACCESS BY INDEX ROWID	DEPT							

Here, Expand Level 2 was selected.

### Colors tab

The Colors Tab lets you set colors. You can set colors for the grid background, the preview column, the band, the header, and the grid line. The Transparent checkboxes remove the colors and disable the associated color dropdowns. *Group Node and Group Footers (and their color choices) are not applicable to data grids.*

*Extended Management by Colors – Not implemented at this time*

### Fonts tab

The Change Font button lets you change fonts for the selected font. This includes band, font, header, and preview.

After you've made your selections, click OK and the Print window will display. The **Preview** button lets you preview the printout. The **Page Setup** button invokes the Page Set up window, which can also be accessed via File > Print Setup. This lets you set your paper size, source, orientation (portrait or landscape), and margins.



It is important to remember that the width of the screen is wider than the width of a portrait layout page.




# Procedure Editor

The Procedure Editor lets you create or modify procedures, functions, packages, triggers, types, and type bodies. It also has a PL/SQL debugging function and can show errors for objects if it encounters errors while compiling.

*See the PL/SQL Debugger chapter, page 197, for more information about debugging.*

By clicking the right mouse button or pressing F10 you access a context menu with numerous options such as Set Bookmark and Uncomment Block

## Ways to invoke the Procedure Editor window

- Click the button on TOAD's main toolbar. 
- Select menu item **Database > Procedure Editor**.
- Click the Procedure Editor button in the **Schema Browser > Procedure Editor** page
- Set the Procedure Editor to StartUp on new connection in the **View > Options > Startup** page.

## Toolbar Buttons



*The Procedure Editor toolbar*



Compile the current complete statement

*The next 3 buttons only display when the **Enable Compiling Multiple Objects From a Single File** option is checked in the Options dialog, Procedure Editor tab.*



Execute FROM the cursor position to the end of the editor



Execute TO the cursor position from the beginning of the editor



Execute the highlighted statement



Load a SQL file into the Procedure Editor

*The dropdown arrow lists the most recent files used while this editor window was open.*



Save the Procedure Editor contents to a new filename



Save the current editor contents to the file, only active if you've made changes to the script



Check file out of source control, lets you check files out of SourceSafe








Check file in to source control, lets you check files into SourceSafe











Load source from existing object in the database

*A dropdown arrow lists the most recent objects loaded from the database while this editor window was open. When the editor is closed, the list is reset.*

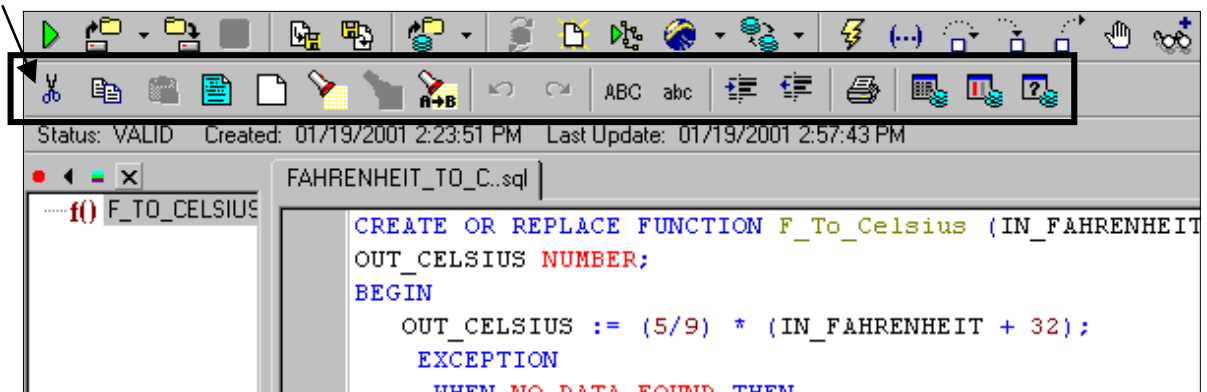
-  Reload the object from database or file
-  Create a new Procedure, Function, Package, or Trigger
-  Compile Dependent procedures (objects that call this procedure)
-  Tune current statement using SQLLab Xpert. Dropdown includes SQLLab Xpert/SQL Impact where used/SQL Impact Quality Audit.
-  Change active session for this window  
*This button includes a dropdown arrow that lists the available sessions.*

*If you have the PL/SQL Debugger option, these eight buttons display to the right of the Procedure Editor toolbar. Refer to the PL/SQL Debugger chapter, page 197, for more information.*

-  Run procedure using existing arguments
-  Set Parameters
-  Step Over
-  Trace Into
-  Trace Out
-  Halt
-  Add Watch
-  Compile Dependent Procedures with Debug information (procedures called by your procedure)

The second toolbar is the Common Edit toolbar, a standard TOAD editing/formatting toolbar which is also used in the SQL Edit window. To show or hide the Common Edit toolbar, right-click over the Procedure Edit toolbar and select **Show Edit Toolbar**. There is also a **View > Options > Editors > Show Editor toolbars on SQL Editor and Procedure Editor** checkbox option.

*Common Edit Toolbar*





## Shortcut Keys

Shortcut Key	Function
F1	Display Window Help File
F2	Show/Hide error panel
F3	Find Next Occurrence
F4	Describe Table, View, Procedure, Function, or Package in popup window
F7	Clear all text
F9	Compile
F10	Display Popup Menu
F12	Pass the SQL or Stored Procedure Editor contents to the specified External Editor
<CTRL>A	Select all text
<CTRL>C	Copy
<CTRL>D	Display procedure arguments, for functions tells you the return datatype
<CTRL>F	Find Text
<CTRL>G	GoTo Line
<CTRL>L	Convert Text to Lowercase
<CTRL>O	Open a text file
<CTRL>R	Find and Replace
<CTRL>S	Save file
<SHIFT> <CTRL> S	Save File As
<CTRL>T	Display columns dropdown
<CTRL>U	Convert text to Uppercase
<CTRL>V	Paste
<CTRL>X	Cut
<CTRL>Z	Undo last change
<SHIFT><CTRL>Z	Redo Last Undo

<CTRL><HOME>	Go to col. 1, row 1 of the editor
<CTRL><END>	Go to the last line of the buffer
<CTRL><SPACE>	Display code template (key combination + <CTRL> <SPACE>) displays the applicable template
<CTRL><TAB>	Cycle through the collection of MDI Child windows
<CTRL><ENTER>	Compile
<CTRL>. (period)	Autocomplete tablenameames

## Using the Procedure Editor

Navigating through the Procedure Edit window is similar to navigating through the SQL Edit window.

### Main ways to get code into the Procedure Editor

- Read from file
- Load from existing object from database
- Create new Procedure Editor dialog
- Type/Paste from scratch
- Drag and Drop from File Explorer
- Select procedure or trigger in Schema Browser and click Load In Procedure Editor button (the Procedure Editor Window button on the objects panel).

The **F9** key compiles and then stores the code in the database.



If you have the optional PL/SQL Debugger and click in the gutter of the Procedure Editor, a breakpoint is created. So, when selecting text with the mouse drag the selector within the text area.

### To Open a Procedure Using File > Open

- 1 While in the Proc Edit window, Go to **File > Open File**.
- 2 The **Select File for Edit** window will display.
- 3 Double-click on the selected file.
- 4 The file is opened in the Procedure Editor.

### To Load Source from an existing object

- 1 Click the Load Source from an existing object button.
- 2 The Select Database Object window will display.
- 3 Select the desired schema from the schema dropdown list.
- 4 You can filter using object types and a starts with, includes, excludes filter.
- 5 To preview the source for an object, select the object from the object list. Or, double-click on an object name to load it directly into the Procedure Editor.
- 6 The selected object's SQL script is displayed in the SQL script area of the Select Database Object window. *You can toggle the auto preview button that's at the top of the dialog to turn the auto preview on and off.*
- 7 Click OK.

The script is opened in the Procedure Editor, and the Select Database Object window closes automatically.

The filter button on the Select Database Object window shows and hides the four widgets for filtering. If you hide the widgets, you have more area for the grid.

### To Create an Object using the New Procedure button

- 1 Click the Create New Procedure toolbar button.
- 2 The New Procedure Create Options window displays.
- 3 Select an object type from the dropdown list.
- 4 Click in the Object Name textbox and type in an object name.
- 5 You can check or uncheck the **Include or REPLACE option?** checkbox. Checked produces “create or replace procedure procedure\_name...” which WILL overwrite an existing procedure with the same name. Unchecked produces “create procedure procedure\_name...” which will NOT overwrite an existing procedure with the same name.
- 6 Click OK.
- 7 The template script with your object name is pulled into the Procedure Editor.

The default templates are NEWFUNC.SQL for Functions, NEWPACK.SQL for Packages, NEWPROC.SQL for Procedures, and NEWTRIG.SQL for Triggers. You can edit the templates to create a common starting point for new stored procedures. If you are creating a trigger, the BEFORE/AFTER radio buttons and the INSERT/UPDATE/DELETE checkboxes become enabled.

There is also an option to load the templates from the network if you elected to install TOAD to a network server share. *See page 117 for details.*

You configure templates on the **View > Options > Proc Templates** page.

TOAD will automatically substitute values for keywords in the templates. TOAD will perform the following substitutions.

Object Name:    %YourObjectName% or \*YourObjectName\*

Sysdate:        %SYSDATE%

Date/Time:      %DATETIME%

Date:            %DATE%

Time:            %TIME%

Username:        %USERNAME% (set in TOAD Options, Procedure Editor)

Trigger Options: %TriggerOpts%

For example, this template:

```
/* Object Name: %YourObjectName% */
/* Date:        %DATE%           */
```

is translated into:

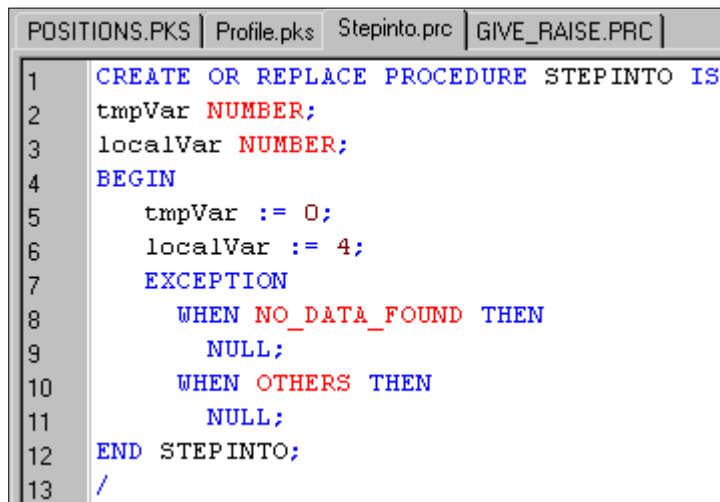
```
/* Object Name: My_Proc_Name    */
/* Date:        9/15/2001       */
```

TOAD can substitute variables in the code completion templates. If you have substitution variables in your code completion templates, then after you enter the code completion keystroke, TOAD prompts you for the substitution variable.

The Procedure Edit window is divided into two panels.

The left panel contains the Package Navigator List, a list of objects or package contents. Every package is composed of a Specification (SPEC) and Body, which is displayed in the hierarchy on the list. Functions in the list are indicated with an  $f()$  and Procedures in the list are indicated with a  $p()$ .

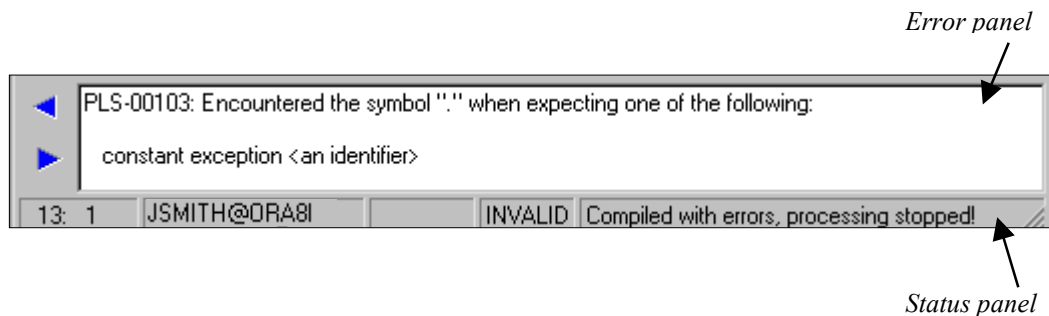
The right panel is the Procedure Editor and contains the code for the selected object.



The screenshot shows a multi-tabbed window with four tabs: 'POSITIONS.PKS', 'Profile.pks', 'Stepinto.prc', and 'GIVE\_RAISE.PRC'. The 'Stepinto.prc' tab is active. The code editor displays the following PL/SQL code:

```
1 CREATE OR REPLACE PROCEDURE STEPINTO IS
2   tmpVar NUMBER;
3   localVar NUMBER;
4 BEGIN
5     tmpVar := 0;
6     localVar := 4;
7 EXCEPTION
8     WHEN NO_DATA_FOUND THEN
9         NULL;
10    WHEN OTHERS THEN
11        NULL;
12 END STEPINTO;
13 /
```

*The multi-tabbed Procedure Editor panel*



The Error panel can only display one error at a time, so arrow buttons let you advance forward and backward through the errors. The displayed error is highlighted in the procedure script in the display.

The Status panel shows the Row number and Column number of the cursor position, whether or not the code has been Modified, VALID or INVALID status, and whether or not the code was compiled successfully or compiled with errors.

A vertical splitter between the package navigator list and the editor lets you resize the navigator list and the editor. A horizontal splitter between the editor and the error panel can be sized up or down.

	POSITIONS.PKS	Profile.pks	Stepinto.prc	GIVE_RAISE.PRC
1	CREATE OR REPLACE PROCEDURE give_raise (			
2	p_deptno IN number,			
3	p_raise_percent IN number )			
4	AS			
5	BEGIN			
6	UPDATE EMPLOYHEE SET salary = salary + (salary * p_r			
7	WHERE department_id = p_deptno;			

The Procedure Edit window allows multiple statements per file, only if the **View > Options > Procedure Editor tab > Enable Compiling Multiple Objects From a Single File** option is checked. Package Specifications and Bodies can coexist in the same file. If this option is checked the status bar will always display INVALID because there isn't just one procedure's status to report. The Debugger is not designed to work with this option activated.



**Run button**

The Run button is only enabled for the debugger. This button lets you can run the selected procedure with the Run button. If GIVE\_RAISE is the selected procedure, and if you click the **Run** button, it will run the GIVE\_RAISE procedure. You can also right-click and select **Execute without debugging**, regardless of whether or not you have the debugger.

If you select the **Load Object from Database** button you get a filter window. If your database contains many items, uncheck the **View > Options > Procedure Editor > Automatically show objects on Select Database Object Window** option and set up filters before clicking the Run button. This populates the list of existing objects more efficiently.

## Navigator List Buttons



### **Refresh Navigator**

This button refreshes the navigator list.



### **Sort/Do not sort navigator list alphabetically**

This button lets you sort the list of package functions and procedures alphabetically or in the order they appear in the package.

If the button is UP, the list appears in source code order.

If the button is DOWN (depressed), the SPEC and BODY lists are presented alphabetically.



*Here, the button is depressed so the SPEC and BODY lists are alphabetized.*



### **Close navigator list**

This button closes the navigator list. If you close the navigator and want to reopen it, you need to right-click and select **Show Navigator List**.

## Options for the Procedure Editor

You access the TOAD Options window via the Configure TOAD Options button or by selecting the **View > Options** menu item. The **Options > Procedure Editor** page contains numerous options.

### Reload files when activating TOAD if the file time stamp is changed

Default – Unchecked

If checked, this allows editing in an external editor. When a Procedure Edit window containing a file is reactivated (gets focus), TOAD will check the date stamp of the file to see if it was modified by the external program. If the file was modified, TOAD will display a prompt dialog that will say that the file date/time has changed and ask you if you want to reload it. Select Yes, and the file will reload.

### Highlight names of stored procedures

Default - Checked

*This option must be checked if you want the **Load Source** menu item enabled in the Procedure Editor Right-Click Menu.*

This option refers to syntax highlighting. If checked, TOAD will highlight functions and procedure names, in the Procedure Editor, SQL Editor, and the other read-only editors in TOAD. For example, if PROC\_B is a stored procedure, and you've designated stored procedures to be displayed in red, "PROC\_B" will display in red. NOTE: you must select a custom color in the Editor Options dialog, Highlighting tab, for **User Procedures**.

**Include Owner When Extracting Source From Database**

Default – Unchecked

If checked, this basically puts owner name in the first line when loading from the database. When exporting source, if this option is checked, source will be prefixed with the owner.

Example: CREATE OR REPLACE PROCEDURE **STHOMAS**.PROCEDURENAME IS

If unchecked, source is not prefixed with the owner.

**Enable compiling multiple objects from a single file**

Default – Unchecked

If checked, you can compile more than one object from a single source file. If not checked, you are limited to one object per file, but you can still create separate tabs or MDI windows for each object.

NOTE: this MUST be unchecked in order to use the PL/SQL Debugger, because the debugger can handle only one object at a time per file.

**Use “CREATE” instead of “CREATE OR REPLACE” when loading database objects**

Default – Unchecked

If this option is checked, the Create Procedure will not overwrite an existing object. When loading PL/SQL into the Procedure Editor, the Create clause will read, "Create Procedure/Function/Package ...". This is useful if when compiling a procedure, a different object of the same name already exists in the database, hence the compile will fail, instead of overwriting it.

If unchecked, the Create clause will read “Create or Replace Procedure/Function Package” and overwrite any existing objects that have the same name.

**Automatically show all objects on Select Object from Database Window**

Default – Unchecked

If checked, an object type will be selected, and all objects that are not filtered will be shown. If unchecked, no object type is selected (just a blank grid), and you must select before any objects are shown.

**Search for Dependent Objects following a compile**

Default – Checked

If checked, TOAD will search the database for dependent objects of the currently compiled PL/SQL object (those procedures that call this procedure), and if any are found, will enable the **Compile Dependencies** button.

If unchecked, the **Compile Dependencies** button is always enabled.

If PROC\_A calls PROC\_B and you are editing and recompiling PROC\_B, Oracle flags PROC\_A as INVALID, forcing a need to recompile PROC\_A. TOAD will check for this dependency, enable the **Compile Dependencies** button, which you can then click to compile PROC\_A, and therefore not leave any INVALID objects out there as a result of your changing PROC\_B.

**User Name for New Procedure Templates %USERNAME% textbox**

Default - Blank

The value you enter in the box will be substituted automatically for %USERNAME% when new procedure templates are read up into the Procedure Editor.

**Show Package Navigator Panel**

Default – Checked

If checked, displays the Package Navigator hierarchy of package procedures and functions in the panel that is to the left of the Stored Procedure Editor. This lets you click the procedure names in the navigator to advance the editor to that section of source.

**Sort Package Navigator Panel**

Default – Unchecked

If checked, this option displays the package procedures and functions in alphabetical order. If unchecked, it displays them in original package order.

**Notification when compile process is complete**

Default – Unchecked

When checked, this plays the TOADLOAD.WAV (croak sound) when the compile of a procedure has been completed.

**Only show one Procedure Editor per database connection**

Default – Unchecked

If checked, permits only one Procedure Edit window per database connection, to conserve Windows resources.

This is similar to the option that limits the number of SQL Edit windows and Schema Browser windows, per connection.

**Toggle Modified Flag after compiling source from database**

Default – Unchecked

If checked, after you compile source from the database, the Modified flag in the status panel will toggle to “Modified”.

**Allow compiling when source loaded from database.**

Default – Checked

If checked, TOAD will let you compile source that is loaded from a database. Unchecking this option enforces the practice of loading and altering source files instead of storing the only copy of the code in the database.

## Right-Click Menu

Right-click while you are in the Procedure Editor to access the Right-Click Menu. This provides a shortcut to the functions listed in the menu. You can also press **F10** to display the Right-Click Menu.

Many of these items are the same as the items found in the SQL Edit window Right-Click Menu. Some of the functions that the menu contains are:

### **Describe**

Displays popup window that describes the selected object. If the item is a procedure, it displays the procedure popup window.

### **Close File/Tab**

Closes the current File/Tab

### **New File/Tab**

Adds another tab and places the cursor on line 1 of your new tab

### **Comment Block**

Adds dashes before the selected line or lines

### **Format Statement**

TOAD's internal formatting mechanism only supports single DML statements (update, insert, delete). If you use the internal formatter on anything other than individual DML statements you will get errors.

If you have PL/Formatter or Formatter Plus installed, **Formatting Tools** will display in the menu instead of Format Statement.

**Find Closing Block**

Finds closing parenthesis, "END" for matching "BEGIN" or "END IF" for matching "IF"

**Show Navigator List**

Shows/hides the navigator panel

**Read Only**

Toggles a File's Read-Only status.



## DBMS Output

You get to this dialog via the **View > DBMS Output** menu item.

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.

Output only comes out 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.

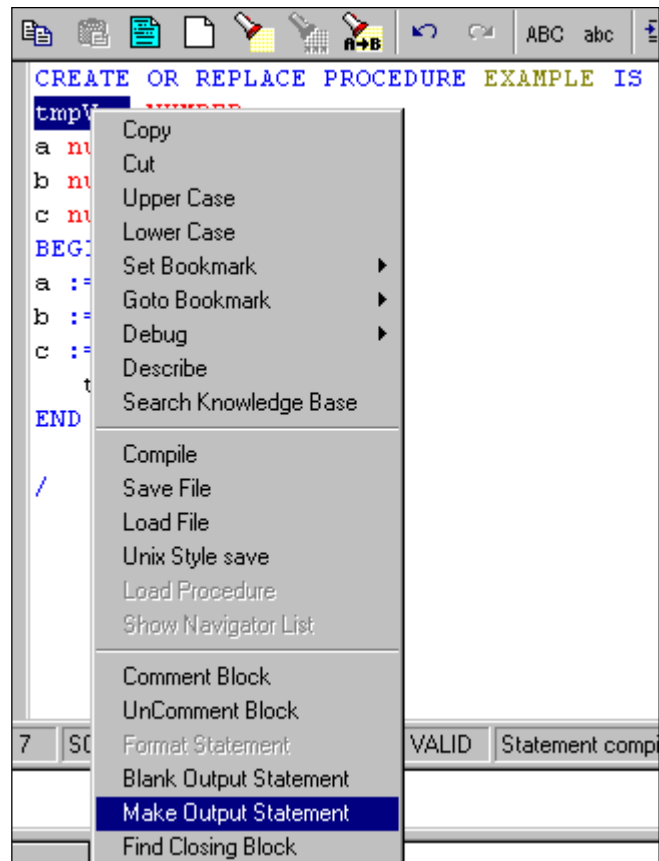
The Procedure Editor Right-Click Menu lists `DBMS_OUTPUT` specific commands.

You can edit `DBMS_OUTPUT` content, make comments, delete specific lines of output, etc. The standard copy, cut, and paste keys work in the `DBMS_OUTPUT` textbox.

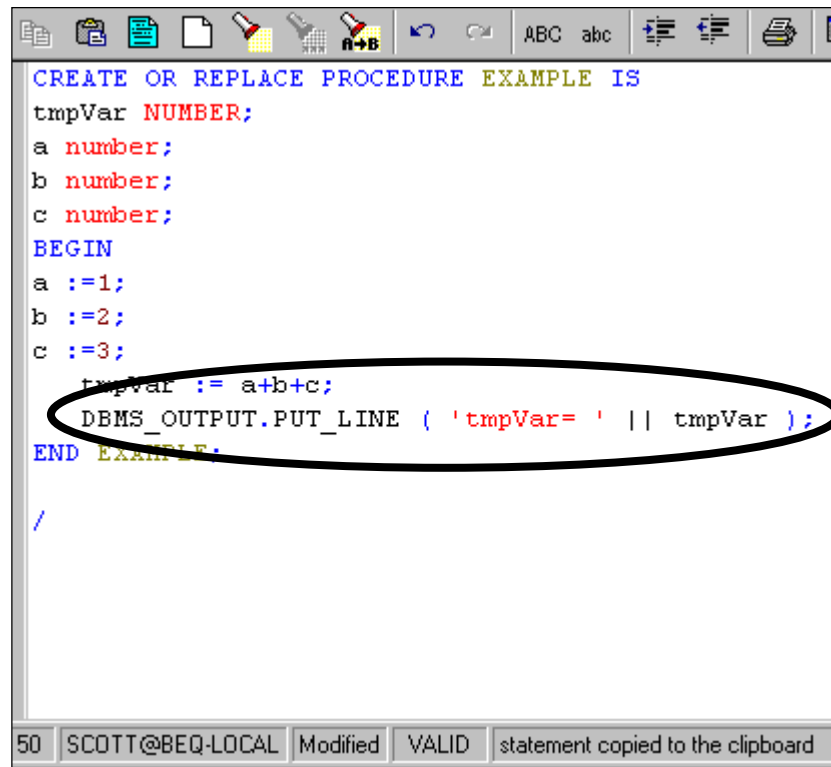
### To create a `DBMS_OUTPUT` statement

- 1 Highlight the desired selection from your SQL script.
- 2 Right-click to display the Right-Click Menu for the Procedure Editor.
- 3 Select the **Make Output Statement** item.
- 4 Click the place in your script where you want to paste the `DBMS_OUTPUT` statement.
- 5 Select **Paste** from the Right-Click Menu **OR** the **Edit** menu.

In this example....



tmpVar is highlighted, and **Make Output Statement** is selected from the Right-Click Menu..



```
CREATE OR REPLACE PROCEDURE EXAMPLE IS
tmpVar NUMBER;
a number;
b number;
c number;
BEGIN
a :=1;
b :=2;
c :=3;
tmpVar := a+b+c;
DBMS_OUTPUT.PUT_LINE ( 'tmpVar= ' || tmpVar );
END EXAMPLE;

/
```

50 SCOTT@BEQ-LOCAL Modified VALID statement copied to the clipboard

and pasted into the SQL script where the tmpvar is now part of the DBMS\_OUTPUT statement.

### Blank Output

You can also select Blank Output to get a DBMS\_OUTPUT template, which you paste into your script and fill in the blank sections yourself.

```
DBMS_OUTPUT.PUT_LINE ( ' ' );
```

### To create a Blank DBMS\_OUTPUT statement

- 1 Right-Click and select the **Blank Output Statement** item.
- 2 Click the place in your script where you want to paste the statement.
- 3 Select Paste from either the Right-Click Menu or the **Edit** menu, and the blank DBMS\_OUTPUT Statement is pasted into your script.

## Source Code Management

TOAD supports the Source Code Control (SCC), a Microsoft API. It defines a standard interface between development environments and source control products. The SCC API provides functions to perform the common source control operations such as Check-out, Check-in, and Add File.

The following vendors support SCC API and have been tested with TOAD:

- Microsoft Visual SourceSafe 6.0
- PVCS 6.7 (requires the VM Development Interface)
- StarBase StarTeam 4.2 (requires the Developer Studio Integration option)
- QVCS 3.5 (Quma) (use the QVCS client to add QVCS as a Source Control Provider)
- CS-RCS 2.5.140 (ComponentSoftware) Personal Version

NOTE: Earlier versions of these software products have not been tested with TOAD, and we cannot guarantee their compatibility. Other vendors may conform to the API, but have not been tested with TOAD; therefore, integration cannot be guaranteed at this time.

Each SCC compliant product will create an entry in the registry identifying it as an SCC provider and identifying the location of the DLL used to invoke the SCC functions.

NOTE: The client portion of the Source Control install must be run. You cannot run only the server piece of the Source Control install.

### Working Folder

You must have a working folder set in order to use the TOAD Source Control interface. For example if you are using Microsoft Visual SourceSafe, to set your working folder you would open Microsoft Visual SourceSafe, right-click on a folder, and select the Set Working Folder option.

### Source Control Options

You must also have the interface to the SCC configured by selecting the Source Control options in the **View > Options > Source Control** page.

### To set the Source Control Options

- 1 Select the **Source Control Provider** that you wish to use with TOAD from the dropdown. The Source Control Provider dropdown lists the SCC providers found in the registry. *If you switch providers, you should restart TOAD.*
- 2 The **Prompt for Comment** checkboxes let you determine whether or not a dialog will display that lets you store comments with the respective action.

Source Control is run through the Procedure Editor. The toolbar on the Procedure Editor contains the check-in and check-out buttons.



**Check file out of source control**



**Check file into source control**

All the other functions are on the Right-Click Menu.. The Right-Click Menu contains a **Source Control** menu item that has the following submenu items:

#### Check-out File

When a file is checked-out, the file is reloaded from disk (it could be different than the file that was loaded), and it is made writeable.

#### Check-in File

When a file is checked-in, it is set to read-only again.

**Undo-checkout**

This command throws away any changes and reverts to the read-only, original version. This is useful, for example, if you do not want any changes stored to the database.

**Get latest version**

This refreshes the file from the source control and reloads the file (still read-only).

**Add Project**

This adds the current file to source control and reloads it read-only.

**Select project**

This produces a dialog (provider-specific) to let you select a source control project to work with. The selected project is retained in the .ini file between TOAD sessions.

A file that is not checked out should have a read-only status. Read-only files cannot be edited. All the SCC functions act upon the currently loaded file.

Source Control functionality does not work with database objects; it only works with files.

**Steps for using Source Control from TOAD for the first time**

- 1 Install your client.
- 2 Confirm your client is configured to support SCC API. You confirm this by confirming that the client or the client install has created this registry key.
- 3 Go to **View > Options > Source Control**.
- 4 Select your SCC provider and check/uncheck options as desired.

- 5 Load the file that you want to work with into the Procedure Editor. Remember, Source Control is run through the Procedure Editor.
- 6 Right-click in the Procedure Editor and choose **Source Control > Select Project**.
- 7 Your SCC provider will display a dialog that will ask you to select a project. Depending on the provider and the configuration, it might also ask you to log in or browse for a database. It might provide a place for you to set a working folder. Refer to your provider's documentation if you need further details.

**NOTE: The working directory for the selected project must match the directory that you loaded the file from.**

- 8 If the file is already stored in Source Control, you can check it in or check it out. Otherwise, you can right-click and select **Source Control > Add File** to add it into Source Control. This assigns it a checked in status, and you will have to check it out to modify it



## Procedure Editor Tasks

This section demonstrates how to create a few simple functions using the Procedure Editor (converting temperatures from Fahrenheit to Celsius and from Celsius to Fahrenheit). It also shows how to use edit/replace with the functions, how to test the functions using the set parameters and execute buttons, how to grant public privileges, and, finally, how to create public synonyms.

### **The Conversion Formulas**

**Celsius = (Fahrenheit-32) \* 5/9**

**Fahrenheit = (Celsius \* 9/5) + 32**

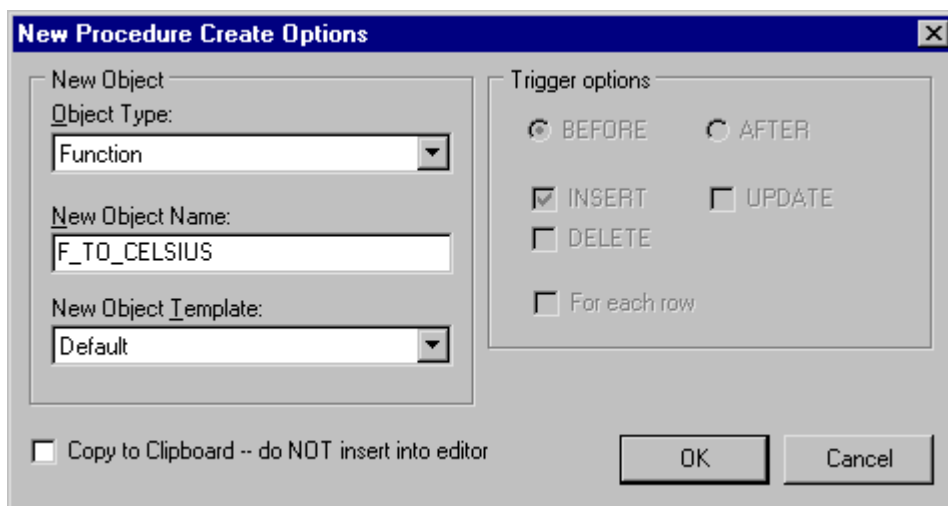
Stored procedures are useful for processes that will be repeated over and over again. In this example, the procedures are the temperature conversion functions.

## F\_TO\_CELSIUS

First, you need to create a new stored procedure function that will convert Fahrenheit to Celsius.

### To Create a New Procedure

- 1 Click the **Create a new procedure** button.
- 2 The **New Procedure Create Options** dialog window displays.
- 3 From the **Object Type** dropdown menu select function.
- 4 Type in the function name “F\_TO\_CELSIUS”.
- 5 Click **OK**.



- 6 A template script displays with F\_TO\_CELSIUS in the Create or Replace line.

(Now you need to edit the script with the input and return arguments.)

- 7 After F\_TO\_CELSIUS on the first line, type the following:  
(IN\_FAHRENHEIT NUMBER)

- 8 After RETURN NUMBER IS type the following:

OUT\_CELSIUS NUMBER

Your code should now look like this:

```
1 CREATE OR REPLACE FUNCTION F_TO_CELSIUS (IN_FAHRENHEIT NUMBER) RETURN
2 NUMBER IS
3 OUT_CELSIUS NUMBER;
/*****
```

- 9 Scroll past the comment section and after the BEGIN statement edit the next line (it contains a tmpvar holder) to match the following formula.

OUT\_CELSIUS := (5/9) \* (IN\_FAHRENHEIT - 32);

- 10 after RETURN type

OUT\_CELSIUS

Notice the END statement has been automatically filled in.

END F\_TO\_CELSIUS;

The final script should look similar to this. Here, all extra comments and spaces have been deleted.

```
F_TO_CELSIUS.FNC
1 CREATE OR REPLACE FUNCTION F_TO_CELSIUS (IN_FAHRENHEIT NUMBER) RETURN
2 NUMBER IS
3 OUT_CELSIUS NUMBER;
4 BEGIN
5     OUT_CELSIUS := (5/9) * (IN_FAHRENHEIT - 32);
6     RETURN OUT_CELSIUS;
7 END F_TO_CELSIUS;
8 /
```

*This function converts Fahrenheit to Celsius.*

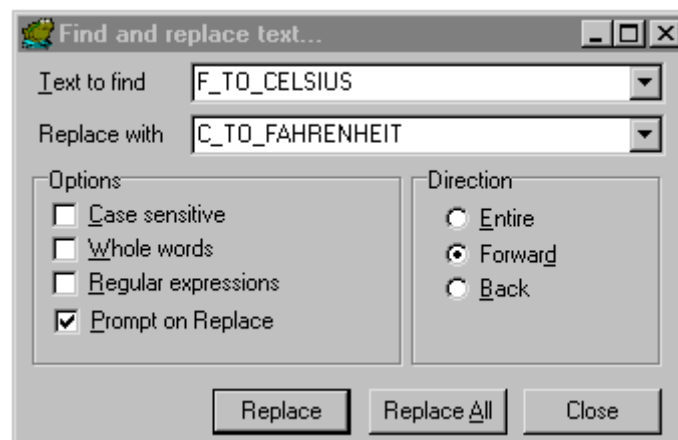
You can compile the script for a quick syntax check. If you get errors, they'll display in the error panel, and you can correct and recompile.

## C\_TO\_FAHRENHEIT

Now you can go to **Edit > Select All** and then **Edit > Copy**, copy the code you've just created, and paste it into a new tab in the Procedure Editor. (See the Right-Click Menu, option **New File/Tab**.) Then use the **Edit/Replace** function to change the copy of the Fahrenheit to Celsius script to a Celsius to Fahrenheit script.

### To Use Edit/Replace

- 1 Place the cursor on the text you want to replace, in this case F\_TO\_CELSIUS.
- 2 Type <CTRL>R or choose the **Edit > Replace** menu item.
- 3 The **Find and Replace** dialog displays with the selected item already in the Text to Find entry. The Prompt on Replace option is checked by default.



- 4 Type in what you want to replace the text with, in this case C\_TO\_FAHRENHEIT.
- 5 Click the **Replace All** button to replace all occurrences of the text. Confirmation dialogs will display.
- 6 When you have finished replacing all, press **ESC** to close the dialog window.
- 7 Select your next replacement item, which in this case would be IN\_FAHRENHEIT.

- 8 Press <CTRL>R to open the Find and Replace dialog.
- 9 The selection is already entered. Type in IN\_CELSIUS for the replacement.
- 10 Select the **Replace All** button.
- 11 Repeat the Find/Replace or manually edit to change the following:  
OUT\_CELSIUS to OUT\_FAHRENHEIT  
5/9 to 9/5  
– 32 to + 32  
(You'll need to manually edit line 5 so that the formula is in the correct order.)

The final script should look like the following:

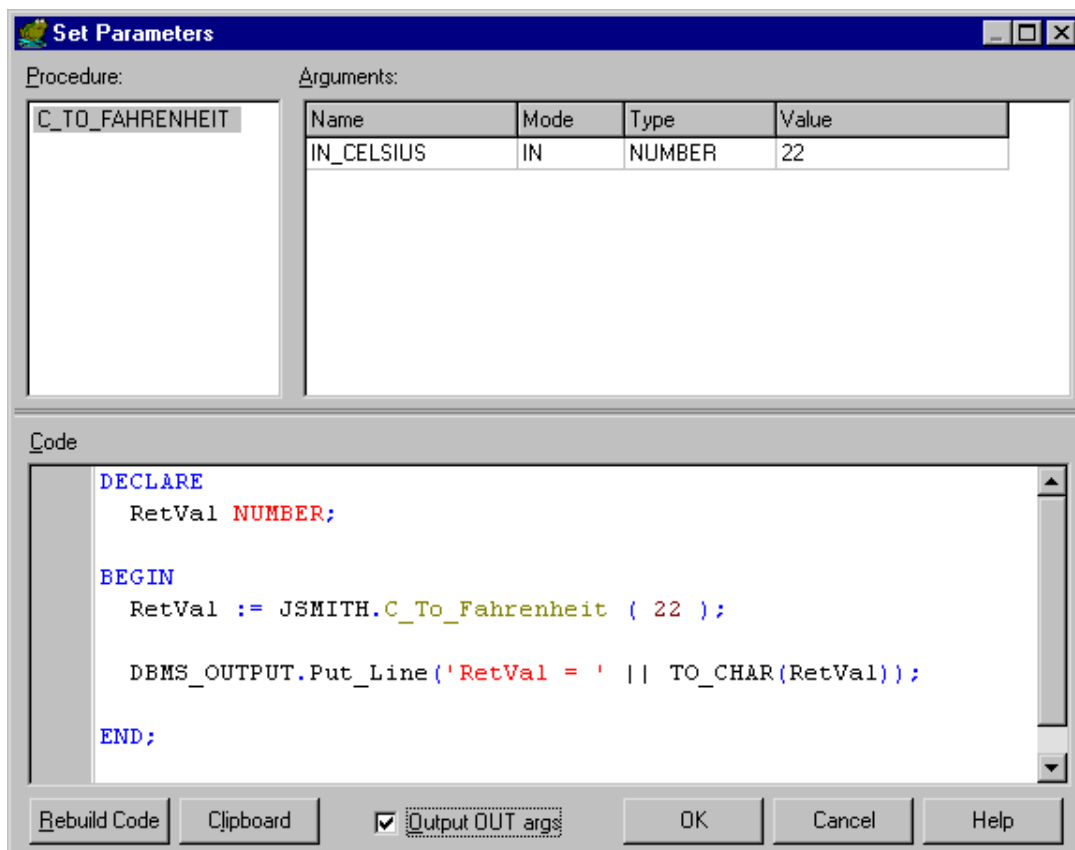
```
C_TO_FAHRENHEIT.FNC  
1 CREATE OR REPLACE FUNCTION C_TO_FAHRENHEIT (IN_CELSIUS NUMBER)  
2 RETURN NUMBER IS  
3 OUT_FAHRENHEIT NUMBER;  
4 BEGIN  
5     OUT_FAHRENHEIT := (IN_CELSIUS * 9/5) + 32;  
6     RETURN OUT_FAHRENHEIT;  
7 END C_TO_FAHRENHEIT;  
8 /
```

Next, compile the procedure.

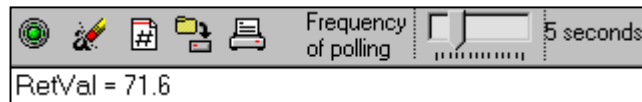
Using the just created Celsius to Fahrenheit script, you can test the function.

### To input and output values

- 1 Open a DBMS Output window via **View > DBMS Output**.
- 2 Return to your Procedure window, right-click, and select **Execute without debugging**.
- 3 The Set Parameters window opens.
- 4 A dialog displays with your argument filled in.
- 5 Type a value in the value cell, such as 22.
- 6 The value is automatically entered in the SQL Code panel.
- 7 Check the **Output OUT args** checkbox. This adds a DBMS\_OUTPUT statement.



- 8 Click OK in the Set Parameters window.
- 9 A Procedure Completed message displays. Click OK, and the dialog closes.
- 10 Go to the DBMS Output window that you opened, and the return value is displayed.

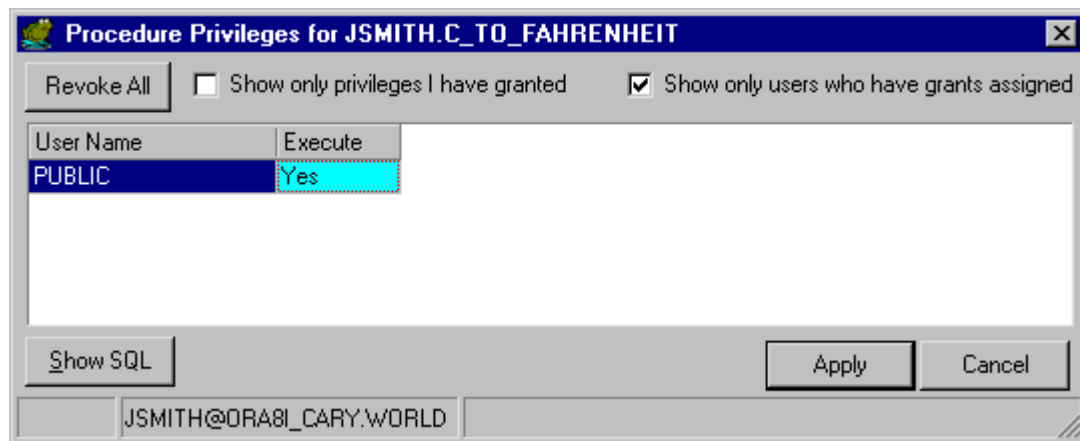


You can also test the functions in a SQL Edit window, but the Procedure Editor provides a shortcut to typing in your own anonymous PL/SQL block.

You can also grant public privileges for your procedures; so anyone on your database can use your stored procedure function. This involves the Schema Browser, which is discussed in detail in the Schema Browser chapter.

### To Grant Public Privileges

- 1 Click the Schema Browser button.
- 2 The Schema Browser window displays.
- 3 On the left panel, select the Procs (Procedures) tab.
- 4 Expand the functions list.
- 5 Select the C\_TO\_FAHRENHEIT function. Details for the selected function display in the right panel.
- 6 Click the Privileges button.
- 7 The Privileges window displays.



- 8 Click in the Execute column on the Public row and select Yes from the dropdown.
- 9 Click the Apply button.
- 10 A dialog will display telling you the changes have been applied.



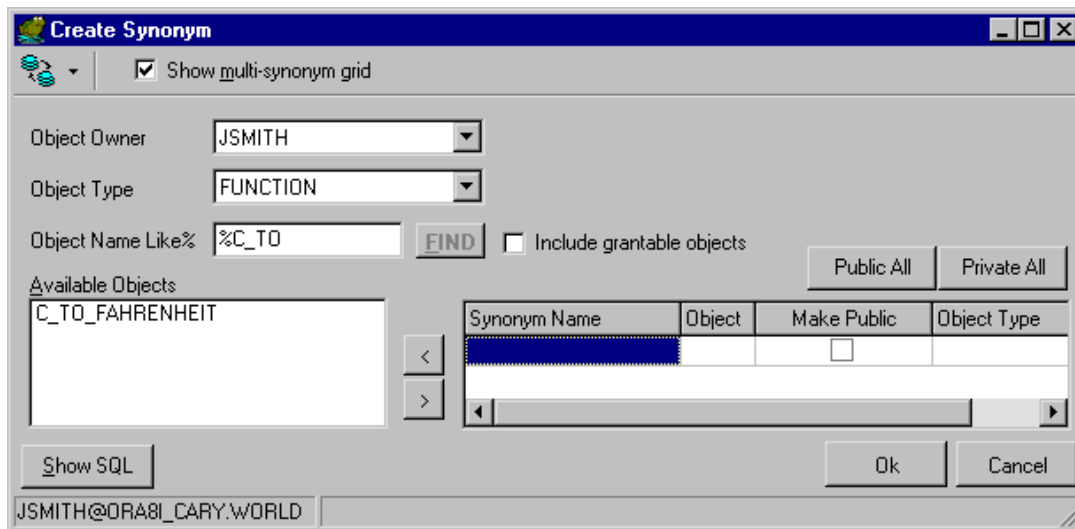
You can repeat these steps for the F\_TO\_CELSIUS function.

While you are still in the Schema Browser window, you can click the Grants tab and see the privileges that have been granted from your procedure to other users or roles.

You might want to create a public synonym for your procedure.

### To Create A Public Synonym

- 1 From the main menu select **Create > Synonym**.
- 2 From the dropdown menu select the object type. For our C\_TO\_FAHRENHEIT and F\_TO\_CELSIUS examples, the object type would be Function. This acts as a filter when you click the Find button. Nothing will appear in the list until you click the Find button.
- 3 If you want to filter even further, you can type the first letter or letters of your object in the Like% box. (Like% is the standard SQL command).

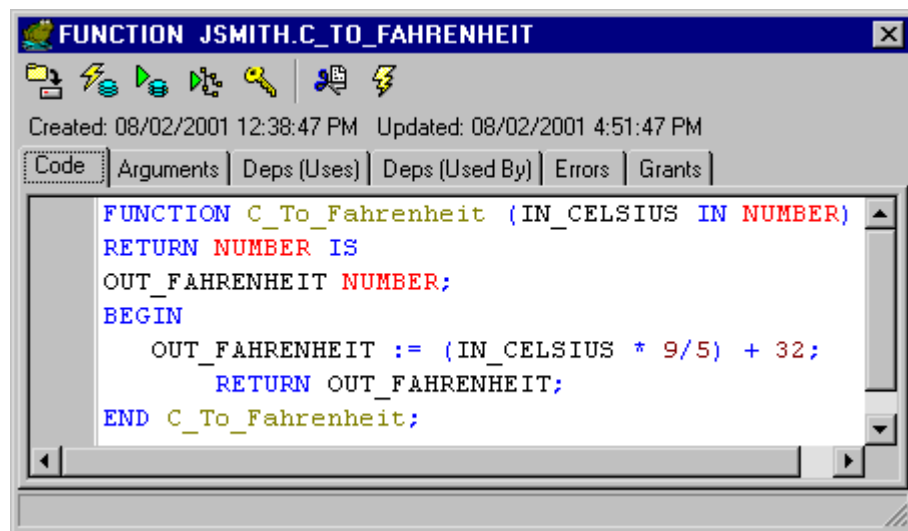


- 4 Then Click the **Find** button.
- 5 The filtered object(s) display in the Available Objects list.
- 6 Double-click on an item or click the right arrow to move it to the right panel.  
Or  
Multi-select several items and drag and drop them to the right panel.

- 7 A checkbox lets you choose whether or not you want to make this a public synonym. (In this example, we want a public synonym.) You could also rename the synonym by selecting it in the list (click, pause, click) and typing in a new name.
- 8 Click **OK** to execute the synonym script and a message window will confirm the synonym has been created.

Now that you've granted public privileges and even included public synonyms, anyone in a different schema can easily access your C\_TO\_FAHRENHEIT and F\_TO\_CELSIUS stored procedure functions.

While in the SQL Editor, after typing the procedure name you can press F4 to display a function popup Describe window that shows details including the type of argument it is, the code for the argument, and the grants. You could select and copy the code into your own script.



### Procedure Argument Display

Typing the procedure name and <CTRL>D would pull in a line of code that includes the IN and OUT arguments, which, for this example, is the IN\_CELSIUS statement. It will still need to be edited, but parts of the code are already filled in for you. In the case of functions, it includes the datatypes, return types, etc.

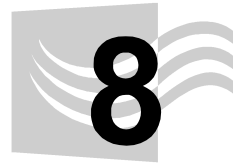
```
C_TO_FAHRENHEIT (RETURN TYPE number OUT, IN_CELSIUS number IN)
```

### Package List/Procedure Argument Display Combination

When you're in either a Procedure Edit window or a SQL Edit window, you can type the package name and a period, and a popup list displays a list of functions and procedures in that package. After you select the package function or procedure, <CTRL> D looks up the argument. This is basically two shortcuts for two steps.

### Using Source Control

It's always a good idea to save your code using Source Control. *See the Source Code Management section of this chapter, page 181, for more information about Source Control.*



# PL/SQL DEBUGGER

The PL/SQL Debugger is an optional feature for TOAD. The PL/SQL Debugger, which is run in the **Procedure Editor** window, lets you step through the code as it executes, line-by-line, statement-by-statement. The Debug menu is only enabled in a Procedure Edit window. You can run a debug session with or without argument values. With the click of the toolbar button, debugging begins and stops on breakpoints, as appropriate, or it runs to the end.

If you have the Debugger installed, the Debug toolbar (8 buttons) displays to the right of the Stored Procedure Edit/Compile toolbar in the Procedure Edit window. You can also access the Debug menu using the keyboard by pressing **<ALT>U**.

Unless you specify parameter values in the Set Parameters dialog, they will default to NULL values. So, for functions that depend on the argument values, you can still check the branching, logic, etc. You can also set argument values in the Set Parameters dialog, and it will use those values.

You can add, edit, and delete breakpoints. You can also set conditional breakpoints and apply pass counts.

After the procedure has executed, you can view the DBMS\_OUTPUT from the server.

## Dependencies

You can use the Debugger to check for dependencies.

If procedure A calls procedure B, and you are editing and debugging procedure B, and you click F9 to compile procedure B, procedure A is marked invalid (The Oracle dictionary gives procedure A an invalid status. This is not visually indicated, but when you try to execute procedure A, it won't execute; it'll be rejected).

TOAD's solution to this is an option that checks for upper dependencies following a compile. What is an upper dependency? If procedure A calls procedure B, and you are editing procedure B, procedure A is the upper dependency.

If the **Options > Procedure Editor > Search for dependent objects following a compile** is checked, TOAD runs an additional query to see if any procedures call the current procedure. If the option is checked and dependent objects are found, the Compile Dependencies button is enabled. If the option is unchecked, the Compile Dependencies button is always enabled. Notice the symbol on the Compile Dependencies button is a combination of the right arrow which is used in TOAD as a compile symbol, and a symbol that represents a hierarchy of procedures.



### *Compile Dependencies*

When you click the Compile Dependencies button, TOAD will recompile all procedures that call your procedure. Then, if the **Search for dependent objects following a compile** option is checked, the button becomes disabled. If you make any additional edits and compile the procedure, the button is enabled again.

If you want to visually view dependencies and their status, you can go to the Schema Browser and click the **Procedure** tab, then the **Deps(uses)** and **Deps (used by)** tabs. This visually shows anything that has an invalid status with a red X next to the object in the object list. *The Schema Browser is discussed in detail in the Schema Browser chapter, page 237.*

## Requirements

### Minimum Oracle Database Requirements

For all databases, you must have the Oracle Probe API installed in order to debug PL/SQL using TOAD. Check for the existence of a package named DBMS\_DEBUG in the SYS schema. Also make sure that your users have the Execute privilege on this package. They can have the privilege as users, through PUBLIC, or through a role.

### Here's how to check what Probe version you have:

Run this anonymous PL/SQL block in the SQL Editor with a DBMS Output window open to find out what version of the Probe API you have:

```
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.

Here are some notes about using the PL/SQL Debugger on different Oracle database versions.

Database Version	Notes
Oracle 7.3.4 on Unix, Oracle 7.3.4 on NT	<p>Inspect package variables by stepping into the package first, then adding the watch on the package variable.</p> <p>For the Call Stack to display, you must set the BLANK_TRIMMING value to TRUE in the init.ora Oracle Initialization parameters file and restart your database. Otherwise, the Call Stack menu will be disabled. Refer to your Oracle documentation regarding the effects of the BLANK_TRIMMING setting.</p> <p>On Oracle 7 databases, if you receive a “Debugger is not responding” message, comment out all DBMS_OUTPUT statements and then recompile, and use watches to display the values. Also, uncheck <b>Enable DBMS Output before every debugging session</b>.</p>
Oracle 8	<p>BLANK_TRIMMING requirement also refers to databases 8.0.4 and 8.0.5.</p> <p>The PL/SQL Debugger works fine on Oracle 8 databases.</p>
Oracle 8i	<p>No notes or issues.</p> <p>The PL/SQL Debugger works fine on Oracle 8i databases.</p>



## ADDITIONAL NOTES:

- You cannot use the Evaluate/Modify window to change argument values.
- Custom data types (like Oracle 8 objects and records) are supported by the debugger, but the Set Parameters dialog might not be able to generate a valid block when these types are used. You can manually edit the block to correctly declare and initialize these types for their use in the debug session.
- Procedures in a package must be in the package spec in order to be debugged.
- Lengthy server delays (such as when you open large cursors or have a slow database connection) might cause a timeout that results in the “Debugger is not responding” message. You can increase the timeout period in the View > Options > Debugging screen to correct this problem.
- Watches on package variables are only allowed for Probe v2.2, or higher.

## To run the PL/SQL Debugger

To run the PL/SQL Debugger, you must have a Quest Software license key with the PL/SQL Debugger option activated in the key. You can verify that the Debugger option is activated by checking the TOAD **Help > About** menu and seeing what options are listed.

If you have just purchased the Debugger, you need to install your new license key, also known as the registration key. The PL/SQL Debugger option is activated in the license key.









### To Activate the PL/SQL Debugger Registration Key

- 1 Go to **Help > Register TOAD**.
- 2 The **Product Authorization** window displays.
- 3 Click in the *Enter Authorization Key* textbox and enter the registration key.
- 4 Click **OK**.

Open a new **Procedure Edit** window. The items on the Debug menu should now be enabled.

## Debug Toolbar buttons

The Debug toolbar is contained on the right half of the **Procedure Edit** toolbar.

	Run
	Set Parameters
	Step Over
	Trace Into
	Trace Out
	Halt
	Add Watch
	Compile Dependent Procedures with Debug information (procedures called by your procedure)

If the **Enable compiling multiple objects from a single file** option is checked, the debug buttons (Run, Set Parameters, Step Over, Trace Into, Trace Out, Halt, and Add Watch) are disabled on the right side of the toolbar.

You must have the **Enable compiling multiple objects from a single file** option unchecked on the **View > Options > Procedure Editor** page in order to use the Debugger. (If the option is turned on (checked), and you attempt to debug multiple objects, TOAD automatically unchecks the option and begins to debug as if there were a single object in the file. A warning message box also displays.) You cannot debug a file containing multiple PL/SQL objects. There has to be one-to-one correspondence from the lines of source in the editor to the lines of source in the database.

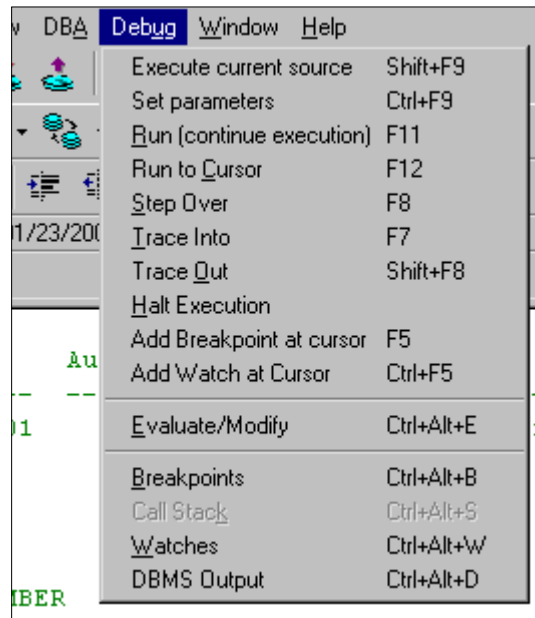
#### **Objects you can Debug**

- Top-level Functions
- Top-level Procedures
- Package Functions
- Package Procedures
- Triggers

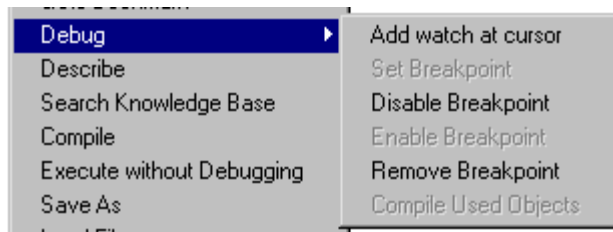
#### **Objects you cannot debug**

- Java classes
- Oracle 8 object methods
- Anonymous PL/SQL blocks

The Debug menu is enabled if you have the Debugger installed, and you are in the **Procedure Edit** window. The Debug menu is disabled for all other TOAD windows.



You can also access a smaller Debug menu in the **Procedure Edit** window. Right-click over the editor, select **Debug** from the menu, and several Debug functions will appear on the submenu.



*Right-click Debug menu*

## Debug Functions

Function	Description
Execute Current Source	Starts debugging and runs to the next breakpoint or end of procedure with the current argument settings.
Set Parameters	Displays a dialog to set the IN or IN/OUT argument values, and, in the case of a Package, lets you select which package procedure or package function to debug. It also lets you set up triggers.
Run (Continue Execution)	Once you are stepping through the code, this function runs to the end of the procedure or to the next breakpoint, whichever it encounters first.
Run to Cursor	Once debugging has begun, it runs to the cursor location as if it were a breakpoint, and stops.
Step Over	Executes one line of code at a time, bypassing a procedure or function call.
Trace Into	<p>Executes one line of code at a time, stepping into other procedures as they are called.</p> <p>NOTE: Only the top-level procedure will have debugging information available for it. If you step into another procedure and want to view debugging information, click the <b>Compile dependencies with debug</b> button (located on the end of the second row of buttons). Otherwise, the message “no debug information available” will appear in the Watch window.</p>
Trace Out	Executes to the bottom of the called procedure, returning to the caller to continue debugging the caller, stopping on the line following the call.
Halt Execution	Ends Debugging. Stops “stepping” through the code, retaining watch and breakpoint settings.
Add a Breakpoint at Cursor	Adds or removes a breakpoint at the cursor location.
Evaluate/Modify	Displays a window where you can (on the fly) inspect and/or change values of variables and continue execution with the new values.
Breakpoints	Displays a dockable window of the currently set breakpoints, allowing you to add, edit, delete, enable, or disable breakpoints.

Call Stack	<p>Displays a dockable window of the current procedure or function call stack (which procedures called which other procedures). This list is meaningful only during execution, as indicated by the “Running” light in the status panel. The Call Stack window is blank when the debugger is not running.</p> <p><i>Also see the Requirements section in this chapter, page 199, for enabling the Call Stack window.</i></p>
Watches	<p>Displays a dockable window of the current variables being watched, allowing you to add, edit, delete, enable, or disable watches.</p>
Add Watch at Cursor	<p>Adds a Watch at the cursor position.</p>
DBMS_OUTPUT	<p>Displays a dockable window for displaying DBMS_OUTPUT generated from the procedure code.</p> <p>NOTE: The DBMS_OUTPUT content is not released from the database (and therefore not displayed) until all procedures have finished, or you force it to stop via the <b>Halt</b> button or <b>Halt Execution</b> menu item.</p>

## Debug Shortcut Keys

Keyboard Shortcut	Function
F5	Set or Delete a Breakpoint on the current line
<CTRL>F5	Add Watch at Cursor
F7	Trace Into
F8	Step Over
<SHIFT>F8	Trace Out
F9	Compile without Debug information
<SHIFT>F9	Execute Current Source without Debugging
<CTRL>F9	Set Parameters
F10	Display right-click popup menu
F11	Run (continue execution)
F12	Run to Cursor
<CTRL><ALT>B	Display Breakpoints
<CTRL><ALT>D	Display DBMS_OUTPUT
<CTRL><ALT>E	Evaluate/Modify
<CTRL><ALT>S	Display Call Stack
<CTRL><ALT>W	Display Watches



## Using the Debugger

NOTE: “Procedure” refers to PL/SQL code including procedures, functions, package procedures, package functions, or triggers.

### To start the Debugger

- 1 Open the **Procedure Edit** window from either the **Database > Procedure Editor** menu item  
**OR**  
Click the **Open a New Procedure Edit window** button on the main toolbar.
- 2 Load a PL/SQL procedure into the editor or write a new procedure.  
You can  
Load a procedure from a file on disk  
**OR**  
Load a procedure from an existing object in the database  
**OR**  
Type a procedure from scratch  
**OR**  
Click the New Procedure button.
- 3 Compile the procedure by  
Pressing **F9**  
**OR**  
Clicking the **Compile** button on the Procedure Editor toolbar.
- 4 Press **F7** (Trace Into) to start stepping through the code. TOAD generates the symbol table required to obtain debug information for this procedure.

If you want to step into other procedures and view debug information, you’ll need to click the **Compile Dependencies with Debug** toolbar button before beginning the debug process.

When you begin debugging, you can set TOAD to

- Always compile dependent procedures
- Never compile dependent procedures
- Prompt you whether or not to compile dependent procedures

To set any of these options go to **View > Options > Debugging** tab.

Otherwise, watched variable values in the dependent procedures will have “no debug information” displayed in the watches window.

### To finish running the Debugger

Click the **Continue execution to breakpoint** button on the toolbar

**OR**

Select **Run (continue execution)** from the **Debug** menu.

### To stop the Debugger



*Halt button*

- 1 Click the **Halt** toolbar button

**OR**

Click the **Debug > Halt Execution** menu item.

- 2 The status does not display *Running*.

When you finish debugging your PL/SQL code, compile it once again by toggling the Debug button on the main toolbar to the off position and pressing F9 to discard the symbol table.

## Tooltip Feature for Variables

The Debugger has a handy tooltip feature. When you are running the debugger, if you move the pointer over a variable, a tooltip pops up that tells you what the value of that variable is at that point in the code.

## The Status Panel Indicators

When debugging PL/SQL code, the word “Running” displays in a segment of the **Procedure Edit** window status panel at the bottom of the window.

A screenshot of a status panel with a light gray background. It contains two segments: the first segment has the word "Running" in a bold, black, sans-serif font, and the second segment has the text "Statement compiled." in a regular, black, sans-serif font.

If you are not debugging a procedure, “Valid” or “Invalid” displays.

## Options menu for Debugging

**View > Options** (or the Configure Options button on the main toolbar) > **Debugging** tab displays the Debugging options page.

### Colors

To set breakpoint, current execution point, or disabled breakpoint colors

- 1 Select the item type (breakpoint, current execution point, or disabled breakpoint) from the list at the left.
- 2 Move the mouse pointer over the color selectors.
- 3 Click the left mouse button to select a foreground color (e.g., the code text color). The letters FG appear on the palette on your selected foreground color.
- 4 Click the right mouse button to select a background color. The letters BG appear on the palette on your selected background color.

### Allow watches on package variables

Default – Checked

This checkbox is provided because the Oracle Probe API call for watching package variables acts differently on Oracle 7 and Oracle 8 databases. On Oracle 8, you can set up the watch on the package variable before or after stepping into the procedure. If you do not want to inspect package variables, uncheck this option.

### Automatically show all debugging windows when debugging

Default – Checked

When checked, the docked window with all 4 windows: Breakpoints, Watches, Call Stack, and DBMS Output will open, if any of the four are opened. With this option unchecked, each window is activated separately, undocked.

**Default Debugging Windows to StayOnTop**

Default – Checked

When checked, this will create the Breakpoints, Watches, Call Stack, or DBMS Output window as a Stay-On-Top window when activated. Otherwise, they will be hidden underneath TOAD whenever the Procedure Editor window gets focus.

**Enable Trace Output while debugging**

Default – Unchecked

This checkbox creates trace information while the Debugger is running, which will help debug the Debugger interactions with the database. This is normally unchecked and is used for technical support or DBA. The trace files are written to the database server, folder specified by the USER\_DUMP\_DEST Oracle database initialization parameter.

**Enable DBMS Output before debug session**

Default – Checked

If this box is checked, after you run a procedure that contains DBMS\_OUTPUT statements, the DBMS Output window will display automatically.

**Break on exceptions**

Default – Checked

A check in this checkbox causes the Debugger to stop when it hits a procedure exception (such as zero divide) and display a message. You can then continue debugging the exception handler code or stop.



*Break on exceptions will cause TOAD to display a message like this whenever it hits an exception.*

**Default Debug toggle button to ON for each session**

Default – Checked

If checked, the Debug toggle button will toggle to ON for each session.

**Debug session timeout (in seconds) *textbox***

Default – 180 seconds

This limits the amount of time that the Debugger will wait for the database to respond with debug information. You can enter the number of seconds. For a slow database, poor network speeds, or connection via modem, increase the number of seconds.

**Date format for watches**

Default – DD-MON-YY

This dropdown menu lets you select a date format.

NOTE: Date format does not affect the NLS\_DATE\_FORMAT for the TOAD sessions/connections; it only affects the debugger session.

**Compile Dependencies Yes/No/Prompt**

Default – Prompt

This will conditionally compile procedures called by your procedure with debug information just before debugging begins.

**Step through package initialization**

Default – Unchecked

When you have a package spec that includes package variables, the first time you execute a procedure in the package the variables are initialized. If this option is checked, the debugger will step to the lines of code in the spec where the variables are declared and initialized. If the option is unchecked, the debugger will never step into the package spec.

**Step through SYS/SYSTEM procs**

Default – Unchecked

If checked, the debugger will step into PL/SQL objects owned by SYS or SYSTEM the same way it does for PL/SQL objects owned by any other schema. If unchecked, the debugger will always step over procedures, packages, and functions owned by SYS or SYSTEM.

NOTE: The Oracle 8i debugger will never step into a SYS or SYSTEM procedure unless it is the main procedure that you are debugging.

**Show debug window toolbars**

Default – Checked

If checked, the debug toolbar in the Debug windows will display. If unchecked, they will be hidden.

**Notify when debugging terminated**

Default – Checked

If checked, when debugging execution has terminated a message box with confirmation will display indicating **Execution has terminated**. If unchecked, no message will display at the end of debugging execution.

**Save proc parameters between sessions**

Default – Checked

If checked, the parameters you enter for PL/SQL objects get saved to your Toad.ini file when you set parameters for debugging, and they are restored from the Toad.ini file for your next debugging session.

All the Option settings are saved in TOAD.INI and restored the next time TOAD is invoked.

## The Dockable Windows

There are four stay-on-top windows in the Debug menu: Breakpoints, Call Stack, Watches, and DBMS Output.

Any of these four windows can be docked together into one window (or combinations of multiple docked windows) by dragging the window title bar of one window and dropping it on another window. This creates a tabbed interface to the separate panels. You can dock the whole group to the base of the window if you have the **View > Options > Debugging > Automatically show all debugging windows** option checked. This causes all four debugging windows to open when any one window is opened.

To see how this works, select **Debug > Breakpoints** from the main toolbar. Notice that the Breakpoints window displays over other tabs (the DBMS Output tab and the Watches tab). If the Call Stack information is not available, see the Requirements topic on page 199 to adjust your settings accordingly; then the Call Stack window will also display.

Click a tab to display its corresponding window. You can also click and drag the tabs to move the windows. You can display all the windows at once. To return the windows to their docked as one position, simply drag them by their tabs and place them on top of each other.



## Breakpoints

A breakpoint is a line in a program that you designate as a place where execution by the Debugger will stop. When the Debugger reaches a line with a breakpoint, it stops execution prior to executing any code that was on that line. Buttons on the Breakpoints window let you Edit, Add, Delete, Enable, or Disable Breakpoints, and View Source.

### Breakpoints Right-Click Menu

When you are in the Breakpoints window, you can right-click to access a menu for breakpoints. If you right-click while a breakpoint in the list is selected, or you right-click on a breakpoint in the list, additional items are enabled in the menu that apply to that specific breakpoint. This method provides a shortcut when performing various breakpoint functions.

### To set or reset breakpoints

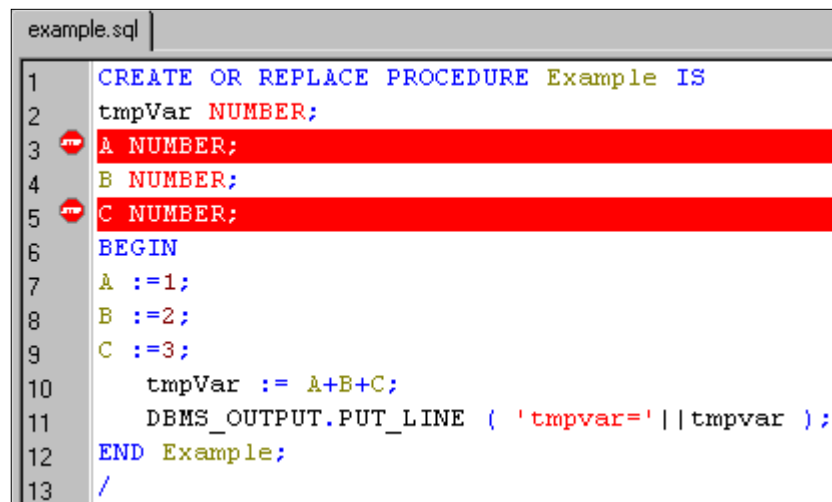
*You should set your gutter width to 35.*

*Access the **Edit > Editor Options** dialog to change the gutter width.*

### Different ways to set a Breakpoint

- Press **F5** while in the Procedure Editor.
- Click in the Procedure Editor gutter.
- Click the **Add Breakpoints** button in the Breakpoints window.
- Select **Debug > Add Breakpoint at Cursor**.
- From the Breakpoints menu (**Debug > Breakpoints**), right-click and select the **Add Breakpoint** menu item listed in the **Right-Click Menu**.
- From the Breakpoints menu (**Debug > Breakpoints**), press <CTRL>A.
- Press <INSERT> to add a breakpoint. Press <DELETE> to delete a breakpoint.

After you set a breakpoint, a stop sign displays in the gutter, and the line is highlighted in default red, or whatever color you selected from the View > Options > Debugging menu.



The screenshot shows a SQL editor window titled 'example.sql'. It contains a PL/SQL procedure named 'Example IS'. The code is as follows:

```
1 CREATE OR REPLACE PROCEDURE Example IS
2 tmpVar NUMBER;
3 A NUMBER;
4 B NUMBER;
5 C NUMBER;
6 BEGIN
7 A :=1;
8 B :=2;
9 C :=3;
10 tmpVar := A+B+C;
11 DBMS_OUTPUT.PUT_LINE ( 'tmpvar=' || tmpvar );
12 END Example;
13 /
```

Breakpoints are set on lines 3 and 5. Each breakpoint is indicated by a red stop sign icon in the gutter and the corresponding line of code is highlighted in red.

*Stop signs in the gutter and red highlighted lines indicate the breakpoints.*

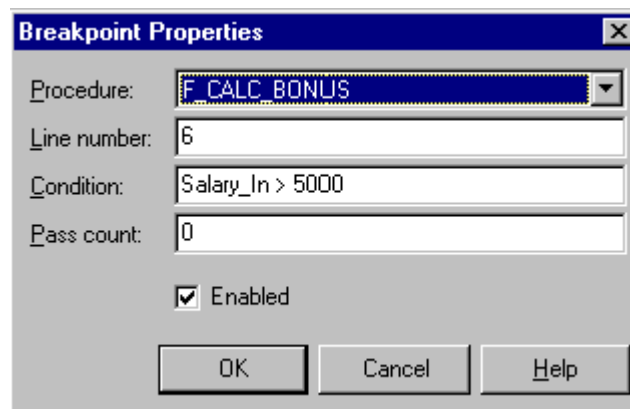
## To edit a breakpoint

- 1 Different ways to perform this step
  - Double-click the breakpoint in the **Debug > Breakpoints** window.
  - Click the **Edit Breakpoint** button on the Breakpoints window.
  - Single-click the breakpoint in the **Debug > Breakpoints** window and right-click to display the **Right-Click Menu**, Select the **Edit Breakpoint** menu item.
  - While in the **Debug > Breakpoints** window, click on a breakpoint from the list and press <CTRL>E.
- 2 The **Breakpoint Properties** dialog displays.
- 3 Edit the information.

4 Click **OK**.

### Conditional Breakpoints

A conditional breakpoint only breaks if a certain condition is met. To set a conditional breakpoint, enter the condition in the Breakpoints Properties window Condition box. For example, “Salary\_In>5000”. When you run the Debugger, it will stop on the breakpoint only if the condition is met.

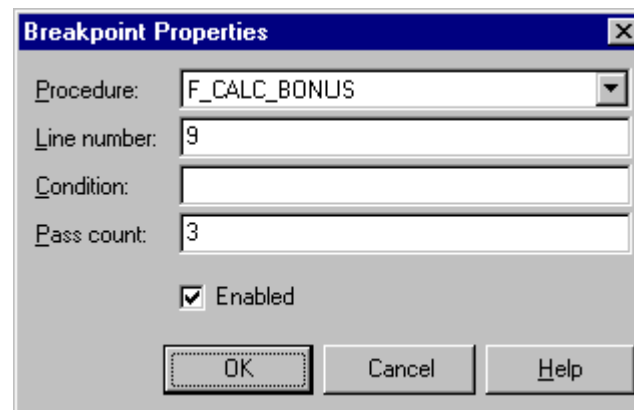


The format for **Condition** is: variable operator value. Supported operators are:

- <= Less than or equal to
- <> Does not equal
- >= Greater than or equal to
- < Less than
- > Greater than
- = Equal

### Pass Count Breakpoints

You can set breakpoints that break ONLY after a certain number of passes in a loop have occurred. These are known as pass count breakpoints.



To set a pass count breakpoint, enter the pass count number in the pass count textbox. This is the number of passes in a loop that will occur before the Debugger will stop on the breakpoint. The pass can be a FOR loop, DO WHILE loop, etc.

### Conditional Pass Count Breakpoints

You can specify both a condition and a pass count. Then, the break will occur after the  $n^{th}$  ( $n$  = pass count number) time the condition is met.

### Enabling or Disabling a Breakpoint

Once you set a breakpoint, you can temporarily disable it and later enable it again. You do this by checking or unchecking the Enabled checkbox in the Breakpoints Properties window. You can also enable/disable breakpoints through the Enable and Disable buttons on the Breakpoints window, and through the Right-Click Menu in the Procedure Editor.

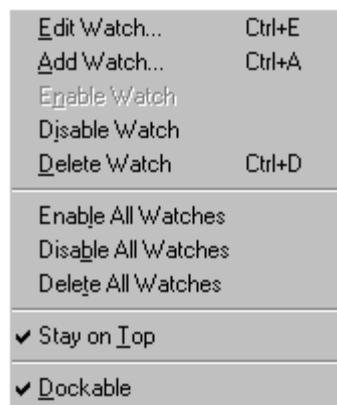
Disabled breakpoints will be grayed out in the Breakpoints window.

## Watches

A watch lets you designate a variable to be evaluated. A watched variable's value can only be displayed during procedure execution.

### Watches Right-Click Menu

While in the Watches window, right-click to access the Right-Click Menu list of watch specific commands.



## To add a watch



*Add Watch button*

### Different ways to add a Watch

- Double-click to select a variable in the editor.  
Click the **Add Watch** button in the toolbar, and the variable will be added to the list of watches.
- From the editor, click the right mouse button.  
The **Right-Click Menu** displays.  
Select the **Debug > Add Watch at Cursor** menu item, or **<CTRL>F5**.
- Click the **Add a Watch** button in the Watches window.
- From the **Watches** window Right-Click menu select the **Add Watch** menu item.
- From the **Watches** window, Press **<CTRL>A** to bring up the add watches dialog window.
- From the **Watches** window, press **<INSERT>** to add a watch and **<DELETE>** to delete a watch.

### NOTE:

- You cannot watch a trigger :new.column or :old.column value. The Oracle Probe API does not support it.
- **It is recommended that you do not explicitly declare implicitly defined variables, because the implicit variable will be created anyway.** So, you can just inspect the implicit variable directly.

Because of limitations in the Oracle Probe API, you cannot watch implicitly defined variables when they are also declared explicitly in the variables declaration section. For example, the following code is correct, but you cannot watch the `Counter_Var` variable as it loops. A work-around to this would be to explicitly declare a local variable, e.g., `Counter_Var_Watched`, and copy the contents as it is changed, then add the watch to the local variable, `Counter_Var_Watched`.

Here is an example of the workaround just described. From this:

```
CREATE OR REPLACE FUNCTION F_Calc_Bonus (Salary_In IN NUMBER)
RETURN NUMBER IS
    Counter_Var NUMBER;
    Bonus_Out NUMBER;
BEGIN
    /* Set Bonus earned equal to 10 percent of the employee's salary. */
    FOR Counter_Var IN 1..5 LOOP
        Bonus_Out := Salary_In * 0.10;
    END LOOP;
    RETURN Bonus_Out;
END F_Calc_Bonus;
/
```



To this:

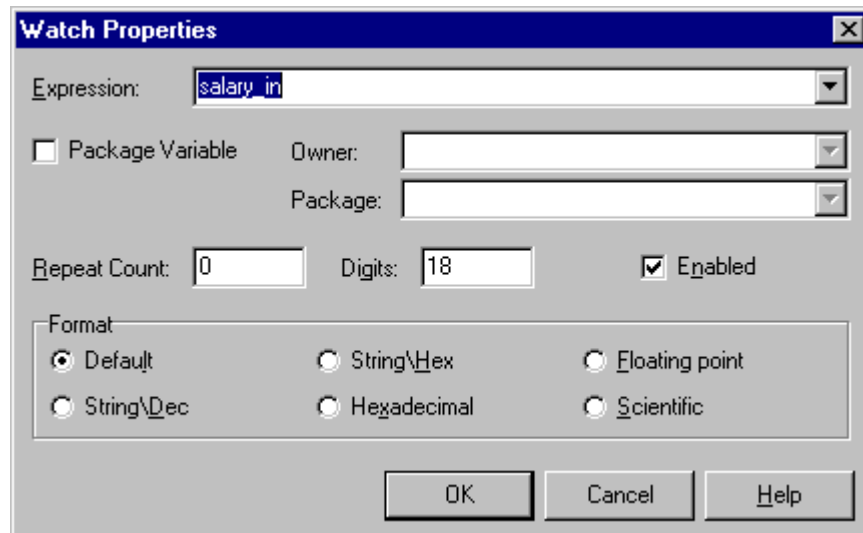
```
CREATE OR REPLACE FUNCTION F_Calc_Bonus (Salary_In IN NUMBER)
RETURN NUMBER IS
    Counter_Var NUMBER;
    Counter_Var_Watched NUMBER;
    Bonus_Out NUMBER;
BEGIN
    /* Set Bonus earned equal to 10 percent of the employee's salary. */
    FOR Counter_Var IN 1..5 LOOP
        Counter_Var_Watched := Counter_Var;
        Bonus_Out := Salary_In * 0.10;
    END LOOP;
    RETURN Bonus_Out;
END F_Calc_Bonus;
/
```





### The Watch Properties Window

The Watch Properties window lets you set a number of options.



### Package Variable

If the variable you want to watch is a package variable, check the package variable checkbox. Also select the owner and package name. Otherwise, a watch variable is assumed to be within the current scope of the package procedure or package function.

### Repeat Count

In addition to the usual data types that you watch such as date, number and varchar, you can also watch array values and record types. If you have an array, such as `MyArray(1..10)`, and set up a watch on `MyArray(1)`, then you can set up a Repeat Count setting of 3 to examine `MyArray(1)`, `MyArray(2)`, and `MyArray(3)`, all at the same time.

**Digits**

The digits box is for the number of significant digits you want displayed.

**Format**

If you want the watch value displayed in a different format than the default, select your format options. Non-printable characters (ASCII 0-31) embedded in strings can cause confusing errors and are difficult to debug because most fonts cannot render them in a meaningful way.

**String\Dec** displays non-printable characters, such as CR and LF, in decimal format. For example, “This is a test.\013\010”

**String\Hex** displays non-printable characters in hexadecimal format. For example, “This is a test.\\$D\\$A”

**Enabled**

You can temporarily disable a watch by double-clicking the watch and unchecking the Enabled checkbox.

**OR**

Select the watch.

Right-Click to display the Right-Click Menu.

Select **Disable Watch**.

You might want to disable some watches to improve the performance of the debugger. As each line of code is executed, each watch that was set has to be evaluated. The fewer watches the debugger has to evaluate, the faster it will run.

**To edit a watch**

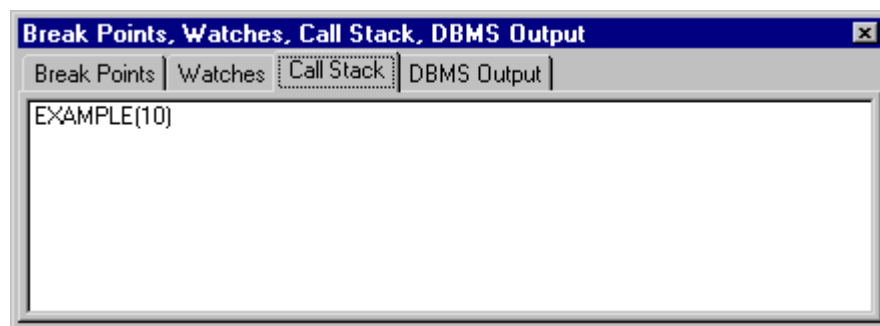
- 1 Double-click the watch in the Watches tab in the debug window (**Debug > Watches**)  
**OR**  
Use the Edit Watch toolbar button on the Watches tab in the debug window  
**OR**  
Double-click on the watch  
**OR**  
Right-click on the watch and select Edit Watch  
**OR**  
Select the watch and Press <CTRL>E
- 2 The Watch Properties dialog window displays.
- 3 Enter and edit information in the window and click OK.

**To delete a watch**

- 1 Display the **Watches** window (**Debug > Watches**).
- 2 Select the watch.
- 3 Press <Delete>  
**OR**  
Press <CTRL>D.

## Call Stack

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. If procedure A line 5 called procedure B, the call stack would look like this: “Procedure B(1)” followed by “Procedure A(5).”



*This Call Stack window shows that you are on line 10 in procedure "Example".*

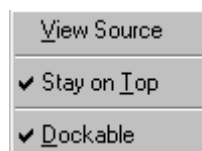
You can navigate among multiple procedures via the Call Stack window either by Double-clicking the procedure name in the **Call Stack** window

**OR**

Selecting the procedure.

Right-Click to display the Right-Click Menu.

Select **View Source**.



*See the Requirements section of this chapter, page 199, for information about enabling the Call Stack window feature.*

## DBMS Output

*DBMS Output is also discussed in the Procedure Editor chapter.*

### To view the DBMS\_OUTPUT

- 1 Select **Debug > DBMS Output**.
- 2 The DBMS Output dockable window displays with the variable value listed, after execution of the procedure has completed.

*Remember, if you have the Options > Debugging > Enable DBMS Output option on, the DBMS Output window opens automatically after completion of the procedure.*

## Debug Functions

This section shows different debug functions and procedures.

NOTE: When debugging a procedure, if no breakpoints have been set and no errors occur, the procedure will execute to completion, and it appears to have “done nothing.” This is a common cause of confusion when people first start using the debugger. To avoid this confusion, if you haven’t set any breakpoints you might want to use the Step function <F8> instead of the Execute function <F11>.

### To start a debug session with or without any argument values

- 1 Select **Debug > Execute Current Source**  
**OR**  
Click the **Run** button
- 2 Debugging starts and stops on the breakpoints, as appropriate, or runs to the end.
- 3 If your procedure contains IN or IN/OUT argument values, and those values have not been set (via the **Run Procedure** dialog), the values will be set to NULL.

### EXAMPLE:

```
FUNCTION F_CALC_BONUS (Salary_In IN Number) RETURN NUMBER IS
Bonus_Out NUMBER;
BEGIN
    /* Set Bonus earned equal to 10 percent of the employee's
    salary. */
    Bonus_Out := Salary_In * 0.10;
    DBMS_OUTPUT.PUT_LINE ( 'Bonus_Out = '
    || to_char(Bonus_Out));
    Return Bonus_Out;
END F_CALC_BONUS;
```


In this case, Salary\_In would be set to NULL. This would not be very useful for functions that depend on argument values, but it is useful for checking branching, logic, etc.

If you set any argument values in the **Set Parameters** dialog, those values and settings will be used.

When debugging a package, you must select which package procedure or package function to start debugging. You select this in the **Set Parameters** dialog. Once you have selected the package procedure or function to run, the Run toolbar button is enabled.

If you debug a trigger, you have to go through the Set Parameters dialog in order to set up the anonymous PL/SQL block that will invoke the trigger.

### To set IN or IN/OUT argument values

 *Select function/Set parameters button*

- 1 Open a package procedure to execute  
**OR**  
Set up a trigger for debugging.
- 2 Select menu item **Debug > Set Parameters**  
**OR**  
Click **Set Parameters** button on the Procedure Edit toolbar  
**OR**  
Press the shortcut keys <CTRL>F9
- 3 Set the desired parameters. If a package, select which procedure/function.

This does NOT execute the procedure or start debugging.

## Run Procedure

There are different uses for the Set Parameters dialog, depending on the type of PL/SQL object you wish to debug: Procedures, Functions, Package Procedures, Package Functions, or Triggers.

## Run Procedure or Function

This dialog lets you input values for the procedure or function arguments.

- 1 For each IN or IN/OUT argument, enter the desired values in the “Value” column.
- 2 When you finish entering argument values, click **OK**.

TOAD debugs the given PL/SQL procedure via an anonymous PL/SQL block. As you enter values, the anonymous PL/SQL block code updates.

You can also directly edit the anonymous PL/SQL code block. If you want to resynchronize the anonymous PL/SQL block with the values entered in the grid, click the **Rebuild Code** button. The Rebuild Code button becomes enabled when you make manual changes in the anonymous PL/SQL block.

## Run Package

When debugging packages, a list displays for you to select which package procedure or package function to execute. In the Procedure list, single-click to select a package procedure to debug; then enter your argument values in the “Value” column, if desired.

## Debugging 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. The values entered are for the column values, not the argument values.

You must go through the **Run Trigger** dialog to set up the proper anonymous PL/SQL block to invoke the trigger, at which point the **Run** button on the Debug toolbar becomes enabled.



### Run Trigger: INSERT

When debugging an INSERT trigger, the values will be used as the values to insert. The inserted record will be rolled back so that no changes are made to the database during debugging. The "INSERT INTO..." code is not valid until you enter column values.

### Run Trigger: UPDATE

When debugging an UPDATE trigger

- 1 Enter values for the "SET..." clause AND the "WHERE..." clause.
- 2 If the **Where Clause Values** checkbox is unchecked, enter the "SET..." values.  
If the **Where Clause Values** checkbox is checked, enter the "WHERE..." values.
- 3 The updated record will be rolled back so that no changes are made to the database during debugging. The "UPDATE TABLE..." code is not valid until you enter the column values.

### Run Trigger: DELETE

When debugging a DELETE trigger, you must enter values for the "Where..." clause.

With the "Where Clause Values" checkbox checked, enter the "WHERE..." values.

The deleted record will be rolled back so that no changes are made to the database during debugging. The "DELETE FROM..." code is not valid until you enter the column values.

Once a value is entered into the Value column of the grid, if you want to make it NULL again, type the word NULL. Otherwise, the value will be the empty string.

In the case of multiple BEFORE or AFTER actions, INSERT takes priority over UPDATE, and UPDATE takes priority over DELETE.

## Viewing OUT Argument Values

If you have OUT or IN/OUT arguments in your procedure, you can choose to view their values during debugging in the Debug DBMS Output window.

### To view OUT or IN/OUT argument values

- 1 From the **Set Parameters** dialog, check the **Output OUT Args** checkbox.
- 2 TOAD adds DBMS\_OUTPUT.Put\_Line statements at the end of the anonymous PL/SQL block used to invoke your procedure.
- 3 Turn on the **Debug DBMS\_OUTPUT** window from the **Debug** menu  
**OR**  
Press <CTRL><ALT>D.

### Evaluate Modify

The Evaluate/Modify window lets you view the value of a variable on the fly, without having to set a watch. It also lets you change the value of a variable and continue executing. This is useful for advancing a loop variable to the end of a “FOR COUNTER\_VAR IN 1..500 LOOP” loop statement. In this case, evaluate Counter\_Var and set its new value to 499. So, you don’t have to debug through the loop the extra 498 times.

### To display the Evaluate/Modify window

Select **Debug > Evaluate/Modify**  
**OR**  
Press <CTRL><ALT>E.

### Package Variable Checkbox

Check the **Package Variable** checkbox in the Evaluate/Modify window, if the variable to evaluate is a package level variable and not a local variable. Then select the package owner and package name from the dropdowns.

The **Evaluate/Modify** window is not dockable with the other debug windows.

## Preparing PL/SQL Code for Production

Once you have finished debugging your PL/SQL code, compile your procedure and any called procedures one last time with the debugger toggled off. This recompiles it without the debug symbol tables. This will make your code smaller; so it will run faster.






# Schema Browser

The Schema Browser separates database objects by type. Details for the objects are separated by tabs. For example, all tables appear in the left panel when the Tables type is selected, all views appear in the left panel when the Views type is selected, etc. When you select an object, details or the DDL structures for that object are displayed in the right panel. This eliminates having to drill down through hierarchical mountains to find the desired data. It also lets you compare details between objects of the same type with one click. Keyboard users can easily use the scroll keys to perform the same tasks.

For performance, TOAD delays fetching some schema lists until the dropdown or tab that requires that list is activated.

You can cancel certain long running list populating queries in the Schema Browser. The **Statement Processing** popup will display, which lets you cancel.

## 3 ways to invoke the Schema Browser window

- Click the second button in TOAD's main toolbar. 
- Select menu item **Database > Schema Browser**.
- Set the Schema Browser to open automatically when a new connection is made in the **View > Options > StartUp** dialog.

## Right-Click Menus

### Object Lists

The Right-Click Menu on any of the tabs in the objects panel (the left-hand side of the window) displays a menu to show/hide the object tabs. You can check or uncheck menu items to show or hide the tabs. However, you cannot hide the Tables tab. If you only want Views and Synonyms, deselect the rest for a cleaner interface. When you exit, TOAD saves your options. The next time you run TOAD, the window will hide the tabs that you unchecked in your previous session.

The Schema Browser panels contain Right-Click Menus.

The Schema Browser Tables - Data Grid Right-Click Menu is the same as the SQL Editor Data Grid Right-Click Menu. See the **Data Grids** chapter for more information.

## Using the Schema Browser

The object types that display in the left panel depend upon the database version. All the tabs that show in the details panel are details for the selected object.

The vertical splitter between the objects panel and the details panel can be moved left or right via click and drag.

The Schema Browser object types can be displayed in a tabbed interface or an alphabetized dropdown. The default is a tabbed interface. You can always show or hide tabs through the Right-Click Menu.

If you prefer a dropdown interface for the object types, go to the **View > Options > Schema Browser > Page 1** item and uncheck the item **Tabbed Schema Browser**. This will cause TOAD to display a dropdown list for the object types the next time you open the Schema Browser.

When viewing Packages and Procedures, you may see "wrapped" rather than the code of the object. This means that the procedure was compiled using the Oracle wrap utility and is not stored in readable format.

### Configure Browser Tabs window

The Schema Browser object types Right-Click Menu (for tabs) lets you show or hide tabs and contains a **Configure** menu item which invokes the **Configure Browser Tabs** window that lets you rename and rearrange tabs. This has no effect on the alphabetized dropdown list, which displays if you have chosen to display the categories in a dropdown by unchecking the **Tabbed Schema Browser** option.

The Configure Browser Tabs window has a **Tab** column that lists the actual category names and an editable **Caption** column that lists the captions TOAD is currently displaying for the tabs. You can rename these captions by simply clicking in a caption cell and typing.

In addition, you can rearrange the order of the tabs by clicking in the gray box on the far left of the row of the item you wish to move and dragging the row to its new position on the list. Or you can select a Tab or Caption cell and click the **Up Arrow** or **Down Arrow** in the window to move the whole row up or down in the list.

When you first open the Schema Browser, the Tables Tab is selected by default, and a list of all the tables in the selected schema displays.

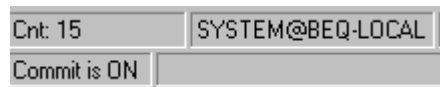
The dropdown box above the Object Tabs lets you select the desired schema.

If you want to narrow the list of schemas in the schema dropdown list you have two choices, **Only show users that own objects in dropdown lists** and **Oracle Users List**. For details about “Show only schemas that own objects” see the Schema Browser options. To set up a specific list of Oracle users (schemas) that you want to see, select menu item **View > Oracle Users List**. This opens the **Configure User Lists** dialog where you can multi-select any combination of users you want to see. This list is saved and restored in a file named `schema_databasealias.lst`, e.g., `SCOTT_ORA8I.LST`, in the `TOAD\TEMPS` folder. From that point forward, any dialog in TOAD that presents a schema dropdown list will be restricted to the schemas you select, e.g., the “Table Name Select” dialog or the “Column Name Select” dialog.

If an Object Tab doesn’t contain any objects, the Object Tab window will be empty for that tab.

The **Change Active Session** button has a dropdown button next to it. Its dropdown list displays all active sessions. You can click on a session from the list to change the active session. If you want to create another session, click the change active session button. It will bring up the “Select Session” dialog where you can then click the NEW button to create the new session.

The status panel shows what session you’re in. The CNT on the status panel shows how many objects are in the object list for the object tab you’ve selected.





**Refresh All**

The Refresh All button refreshes everything in the Schema Browser. If you create a table and you don't see it in your table list, click Refresh All which will requery, and the table name should display in the list, subject to any active table filters.

**Refresh Detail**

The Refresh Detail button refreshes, or requeries, only the details panel. If you dropped a column, you can click on the Refresh Detail button to see the refreshed list.

**Clear Data Grid Filters**

Clears all data grid filters.

### Filters

The following objects have object name and other filtering capability: Tables, Procs, Triggers, Views, Synonyms, and Constraints. Click the filter toolbar button and enter the filter criteria, e.g., starts with A, etc.



- When the filter is red, it's ON.
- When the filter funnel is gray, it's OFF.
- When there are no filters, the filter is gray, and it's OFF.



*Here, the data is sorted ascending/descending but not filtered.*

On the **Schema Browser** page **Tables > Data tab** and **Views > Data tab**, a four-way filter button displays a dialog where you can sort and/or filter. The filter can display four states: empty, filtered, ascending/descending filtered, ascending/descending empty.

## Options for the Schema Browser

You get to the Schema Browser Options menu through the **View > Options** (or the Configure Options button ) > **Schema Browser** item. The options are on 2 pages accessed via **Page 1** and **Page 2** tabs.

### Page 1

#### **Enable DROP-ALL Buttons**

Default - Unchecked

Most object list tabs in the Schema Browser have a Drop All button which allows fast dropping of database objects. **The Drop-All buttons are never enabled unless you check this option.** TOAD will not save this option and will revert to disabled Drop-All buttons. So, checking this option works for the current TOAD session only.

#### **Omit SYS objects from the Procedure Dependencies List**

Default - Checked

If checked, TOAD will omit SYS owned objects from the Procedure Dependencies lists (Deps tabs on the Procedure detail panel and the trees in the View Dependencies window), such as standard packages, DBMS\_STANDARD, DBMS\_UTILITY, etc.

#### **Show Table Stats for Table Details (on the Stats/Size tab)**

Default – Checked

If checked, TOAD will show the table stats information. You can also check this ON or OFF via checkboxes on the **Stats/Size** tab.

**Show Column Length Info with Column Data Type**

Default – Checked

If checked, columns will show in the columns tab in the format "VARCHAR2(20)" including max length, scale, and precision (if applicable). If unchecked, length, scale, and precision will display in separate columns in the grid.

**Limit data grids to X number of rows**

Default – Blank (all rows)

If a value is entered, the SQL results grids on the **Tables > Data** tab and the **Views > Data** tab are limited to that number of rows. It will fetch that number (*n*) of rows, then a prompt will ask you if you want to keep fetching rows. If you respond yes, it fetches *n* more rows and then prompts again. This option does not affect the SQL results grid on the SQL Edit window.

**Automatically show filter dialog for filtered lists on Browser**

Default – Unchecked

If checked, before the Schema Browser window is opened a Filter Dialog will display for the user to enter filter criteria for tables; then the Schema Browser will open with only those objects matching the filter.

**Add view columns to View text when creating scripts or showing view SQL**

Default – Checked

If checked, a list of columns displays that will result when the view is queried, after the "create or replace view" clause, e.g., "create or replace view view\_name (col1, col2, ..., coln) as ..."

**Only show users that own objects in dropdown lists**

Default – Unchecked

If checked, TOAD will only show the users who own objects. This is an alternative to the Oracle User List selection process. For example, if your environment includes only a few schemas that own objects granted to hundreds of schema names for security purposes, then checking this option will list only the few schemas that own objects instead of a long list of all the schemas. So, this filter makes the schema dropdown list more manageable.

NOTE: This option affects all windows in TOAD with Schema dropdown lists, e.g. "Table Name Select", "Column Name Select", etc.

**Only show one Schema Browser per database connection**

Default – Unchecked

If checked, TOAD will only permit one Schema Browser window to be opened per Oracle connection. This conserves operating system resources, because the Schema Browser is loaded with widgets, buttons, and bitmaps. If the user tries to create another Schema Browser window, and one is already open, TOAD will just switch to the existing Schema Browser window.

This option is similar to limiting the number of SQL Edit windows in the SQL Editor option (**Only show one SQL Editor per database connection**) and Procedure Edit windows in the Procedure Editor options menu.

**Cache cursors used for queries (faster Browser but uses 12 cursors)**

Default – Checked

If checked, TOAD will use cursors when retrieving detail information to display in the details panels to the right of the Schema Browser window. Usually, only the object name changes from query to query. So, the use of cursors, where only the bind variable values change, is much faster than forcing Oracle to repars and re-execute different queries each time.

**Show Primary Key Columns for tables**

Default – Checked

When checked, TOAD will display the list of Primary Key columns, on the Tables/Columns tab, to the right of the **Show Comments** dropdown list. For some tables with long column names and/or compound primary keys, this label may not be long enough.

**Auto-Expand dependencies Trees**

Default - Unchecked

If checked, when dependencies display, they are automatically expanded. If unchecked, each level is queried and displays as the user drills down.

**Auto-size list view columns**

Default – Unchecked

If checked, TOAD will automatically size the width of the listview columns in the details panel to the width of the text.

**Show table names following Triggers names**

Default – Unchecked

If checked, corresponding tablenames will display after trigger names on the triggers object list.

**Use multi-line tabs on the left side**

Default – Checked

If checked, once a line of object tabs is full the schema browser tabs will display on multiple lines. If unchecked, once a line of object tabs is full, the tabs will display with a horizontal scroll bar.

**Set focus to table data grid after selecting table**

Default – Unchecked

If checked, after you first pull up the **Schema Browser** page and select a **Table** on the objects panel and **> Data** on the details panel if you start typing you'll be automatically editing in the data grid section. Otherwise, the focus will remain on the list of tables.

**Tabbed Schema Browser**

Default – Checked

If checked, the Schema Browser object types will display in a tabbed interface. If unchecked, the Schema Browser object types will display in an alphabetized dropdown list.

**Save data grid layouts**

Default – Unchecked

When checked, TOAD will automatically save the Data tab grid layouts with respect to column order and custom column widths.

**Save Browser filters**

Default – Checked

If checked, TOAD will save the browser filters to disk, in files named SCHEMA.FLT in the \TOAD\TEMPS folder.

If you want to reset your Schema Browser filters each time you close and open TOAD, uncheck this option.

**Use same schema after changing sessions**

Default – Unchecked

If checked, when you change sessions within the Schema Browser the selected schema will be the same.

**Show Object Create/Update dates**

Default – Checked

If checked, will display the date and time objects were created and updated, on the details panel above the tabs.

**Page 2****Auto refresh details after selecting object on left hand side**

Default – Checked

If checked, when you select an object from the objects panel TOAD will auto refresh the details panel.



## Objects

### Object Scripts

TOAD can create DDL Scripts -- Oracle Statements to recreate the object -- for most of the objects displayed on the Schema Browser. The **Create Script** button on the objects panel is used to generate a script. The scripts are always copied to the clipboard by default.

Note: Table Create Scripts can be viewed while on the Browser window on the “Scripts” detail tabs for Tables.

### Dropping Objects

Many objects can be dropped directly from the Schema Browser. When an object has a drop button, the button is enabled whenever an object is selected in the list.

The Drop All buttons are not enabled by default. If you want to enable the Drop All buttons, you must manually enable them on the **View > Options > Schema Browser > Page 1** window. This makes a potentially destructive operation a little more complex. The Drop All setting is NOT saved and must be reselected each time TOAD is started. Notice the “drop a single item” scissors icon is cutting a white piece of paper and the Drop All icon has scissors cutting a red piece of paper. This is a visual alert, to stop you from accidentally selecting Drop All instead of Drop.



TOAD will confirm any DROP operation on the Browser, but after you respond <Yes> to the confirmation, NO DROPS CAN BE REVERSED.

### Copying From the Browser

Any of the Object Names shown in the Object Lists on the left of the Browser can be copied to the clipboard by pressing **<CTRL>C** for the highlighted object name.

Any column of data shown in the detail grids on the right of the Browser can be copied to the clipboard by pressing **<CTRL>C** for the highlighted grid cell.

Note that the listview displays for Table Information work differently. The grids that display Table Detail Information support multi-row selection and always copy the first column to the clipboard. For example, if you are viewing a grid display of a list of columns for a table, you can **<CTRL> Click** to select more than one column and then press **<CTRL>C**. This will copy your selected columns to the clipboard, with commas in-between (a comma-delimited list). Then you can paste the list into a SQL Editor or another application.

### Filters

Most of the primary lists of objects on the Browser can be filtered to show a subset of all the like objects in the schema. For example, you may have hundreds of tables in a schema but only want to see those where the table name begins with "GEO".

Browser Filters are specific to a schema/owner name. This means you can define a filter for the schema DEMO and a different filter for PRODUCTION, and the appropriate filters will be loaded when you view that schema in the Schema Browser.

Table Filters allow filtering on table names as well as column names. For example, you can find all tables that have columns with FND\_NO anywhere in the column name. The table name may also be searched.

Constraints can be searched by constraint name or constraint column name.

Synonyms can be filtered by Synonym scope: owned by schema only, owned by schema plus Public synonyms, exclude SYS and SYSTEM synonyms, etc.

Note: for performance reasons, TOAD caches the list of tablenamees for the current schema once the list has been queried from any window. The browser filter, although primarily intended to filter the Schema Browser window, also affects the table lists throughout TOAD. For example, if your filter is set to display only tables that begin with GEO, every table list will display a filtered list until the filter is changed.

Also note that the filters not only reduce the amount of data displayed, they also modify the query used to fetch the data. Not only is the display refreshed faster, the query fetches fewer rows for faster response from the database.

If no filters are defined, the Browser displays the following:

- Table list shows all tables
- Constraints show primary keys only
- Synonyms show all but exclude those for objects owned by SYS & SYSTEM
- Views display all Views
- Triggers display all Triggers
- Procedures display all Procedures

The filters for all Browser objects can be viewed in a single window under the **View > Browser Filters** menu.

To apply the filters, you must click the Filter toolbar button on the desired object tab, e.g., Constraints, to bring up the Browser Filters dialog where you can select constraint options, click the OK button, and the browser filters are applied.

## Tables

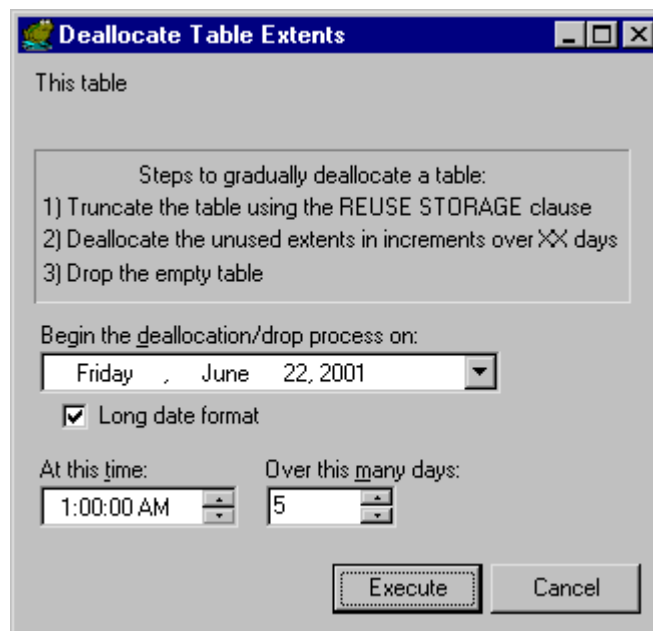
The Tables page Right-Click Menu includes basic functions and an Incrementally Drop Table menu item which is only accessed via this menu.

### Incrementally drop table

This lets you drop a large table, in steps, over a selected number of days so that server performance is not hindered. You can only incrementally drop tables with greater than 200 MB and greater than 1000 extents. If the table is not large enough to drop incrementally, a warning dialog displays.

The steps include a job to truncate the table, jobs to deallocate the unused extents in increments over a number of days, and a job to drop the empty table on the last day.

The Incrementally drop table menu item invokes the **Deallocate Table Extents** window.



**To incrementally drop a table:**

1. In the Schema Browser > Tables page, right-click on the table you want to drop.
2. Select the Incrementally Drop Table menu item.
3. A confirmation dialog displays. Click Yes. (If the table is not large enough to drop incrementally, a warning dialog will display.)
4. The Deallocate Table Extents window displays. Select the **Begin the deallocation/drop process on** date from the calendar dropdown.

The **Long date format** checkbox is checked by default. If you prefer the short date format, uncheck the box.

5. Use the **At this time** spinner to set the time of day that you want to start the deallocation process.
6. Use the **Over this many days** spinner to set the number of days you want the deallocation process to take. The spinner lets you select from 5 to 14 days.
7. Click **Execute**. The process is scheduled.

To confirm that the procedure has been scheduled, or to delete the procedure, check the Jobs tab. The last several jobs on the jobs list will be deallocating and dropping the selected table. You can delete the incremental drop by deleting all related jobs in the list.

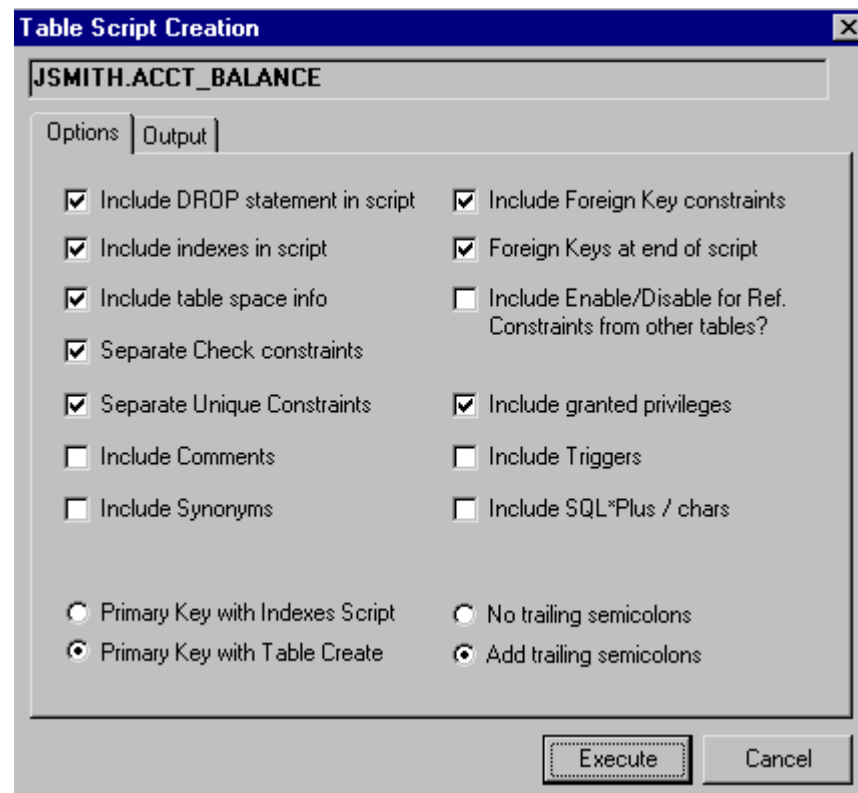
## Objects Panel



### Create Script

The Create Script button displays a Table Script Creation window.

When the Table Script Creation window displays, the Options Tab is selected by default.



When you select the Execute button, a script is created for your table that you can then paste into the SQL Editor or elsewhere.

For creating multiple table scripts, see the **Database > Export > Table Scripts** menu item.

### **Options Tab**

#### **Include DROP statement in script**

If checked, this will include a DROP statement at the top of the table script.

```
DROP TABLE SALGRADE CASCADE CONSTRAINTS ;  
CREATE TABLE SALGRADE (  
    GRADE    NUMBER,  
    LOSAL    NUMBER,  
    HISAL    NUMBER)
```

#### **Include indexes in script**

If checked, TOAD will include CREATE statements for each index on the table.

```
CREATE INDEX JUNK ON ACCT_BALANCE(OPBAL_CR) ;
```

#### **Include tablespace info**

If checked, TOAD will place TABLESPACE and STORAGE clauses after the CREATE TABLE and CREATE INDEX commands.

```
TABLESPACE USER_DATA  
    PCTFREE 10    PCTUSED 40  
    INITRANS 1    MAXTRANS 255  
STORAGE (  
    INITIAL 10K NEXT 10K PCTINCREASE 50  
    MINEXTENTS 1 MAXEXTENTS 121 )  
NOCACHE;
```

#### **Separate Check constraints**

If checked, TOAD will place check constraints in ALTER TABLE statements after the CREATE TABLE command.

If unchecked, it will place the check constraints inside the CREATE TABLE command.

```
CONSTRAINT ACCT_BAL_CHECK_CONSTRAINT  
CHECK (compcode >= 'AA' and compcode <= 'ZZ')
```

### **Separate Unique Constraints**

If checked, TOAD will place unique constraints after the CREATE TABLE command.

If unchecked, it will place the unique constraints inside the CREATE TABLE command.

```
ALTER TABLE UNIQUE_TEST ADD CONSTRAINT UNIQUE_TEST_UK  
UNIQUE (NAME);
```

### **Include Comments**

If checked, TOAD will include table and column comments.

```
COMMENT ON TABLE ACCT_BALANCE IS 'This is a test.';  
COMMENT ON COLUMN ACCT_BALANCE.COMPCODE IS 'Only compcodes AA-ZZ  
are valid.';
```

### **Include Synonyms**

If checked, TOAD will include a PUBLIC synonym to the table.

```
CREATE PUBLIC SYNONYM ACCT_BALANCE FOR ACCT_BALANCE;
```

### **Include Foreign Key constraints**

If checked, TOAD will include the foreign key constraint clauses for the table.

```
ALTER TABLE DIS ADD  
FOREIGN KEY (PLANT_ID)  
REFERENCES TSMITH.PLANTS (PLANT_ID) DISABLE;
```



**Foreign Keys at end of script**

If checked, TOAD will place the foreign keys in ALTER TABLE statements at the end of the script.

If unchecked, TOAD will place the foreign key clauses inside the CREATE TABLE statement.

**Include Enable/Disable for Ref constraints from other tables**

If checked, TOAD will include statements to disable and enable referential constraints from other tables to the table for which you are creating a script.

**Include granted privileges**

If checked, GRANT statements will be included at the end of the script.

```
GRANT SELECT ON PLANTS TO DEMO;
```

**Include Triggers**

If checked, TOAD will include the trigger code for the table at the end of the script.

```
CREATE OR REPLACE TRIGGER JSMITH.TABLE_TO_VALIDATE_IU
  BEFORE INSERT OR UPDATE ON table_to_validate
  FOR EACH ROW
  BEGIN
    /* Call the proc to validate the incoming value. */
    check_validated_value(:new.value_to_validate);
  END TABLE_TO_VALIDATE_IU;
```

**Include SQL \* Plus / chars.**

If checked, TOAD will include "/" characters after every command in the script.

```
DROP TABLE ...  
/  
CREATE TABLE ...  
/
```

**Primary Key with Indexes Script**

If selected, TOAD will place the Table Primary Key with the indexes portion of the script.

NOTE: This option is mutually exclusive with the **Primary Key with Table Create** radio button.

```
ALTER TABLE ACCT_BALANCE  
ADD CONSTRAINT ACCT_BALANCE_PK  
PRIMARY KEY (COMPCODE, FISCALYEAR, ACCTCODE, OFFCODE)  
USING INDEX  
TABLESPACE USERS PCTFREE 10  
STORAGE(INITIAL 10240 NEXT 10240 PCTINCREASE 50 ) ;
```

**Primary Key with Table Create**

If selected, TOAD will place the Table Primary Key inside the CREATE TABLE statement.

NOTE: This option is mutually exclusive with the **Primary Key with Indexes Script** radio button.

```
RUN_CR_13    NUMBER(13,2),  
CONSTRAINT ACCT_BALANCE_PK  
PRIMARY KEY ( COMPCODE, FISCALYEAR, ACCTCODE, OFFCODE )  
USING INDEX  PCTFREE 10  
STORAGE(INITIAL 10240 NEXT 10240 PCTINCREASE 50 )  
TABLESPACE USERS)
```

**No trailing semicolons**

If selected, TOAD will not place semicolons at the end of each statement.

NOTE: This option is mutually exclusive with the **Add trailing semicolons** radio button.

**Add trailing semicolons**

If selected, TOAD will place semicolons at the end of each statement.

NOTE: This option is mutually exclusive with the **No trailing semicolons** radio option button.

```
DROP TABLE ACCT_BALANCE CASCADE CONSTRAINTS ;
```

### **Output Tab**

#### **To Clipboard**

If selected, TOAD will output the table script to the Windows Clipboard.

#### **To File**

If selected, TOAD will output the table script or scripts to a single file, as selected in the **Filename** textbox.

#### **Filename textbox**

Enter a drive, path, and filename, or click the drill down (ellipses) button for the standard file picker dialog.

#### **To Separate Files**

This saves multiple table scripts as separate files (instead of as one file) using the tablename.sql for the filenames.

#### **Path box**

Enter a path or select a directory via the drilldown button.

Click the **Execute** button to generate the table script, or click the **Cancel** button to close the Table Script Creation dialog.

The options selected in the Table Script Creation dialog are saved and restored the next time you create a table script.



### Create Table

The Create Table button invokes the Create Table window. You can also access this window from the **Create > Table** menu item.

This window lets you create a new Oracle table.

Use the dialog to enter the table information, then click the Execute button to create the Table. This is easier than remembering the Oracle syntax for this command.



### Alter Table

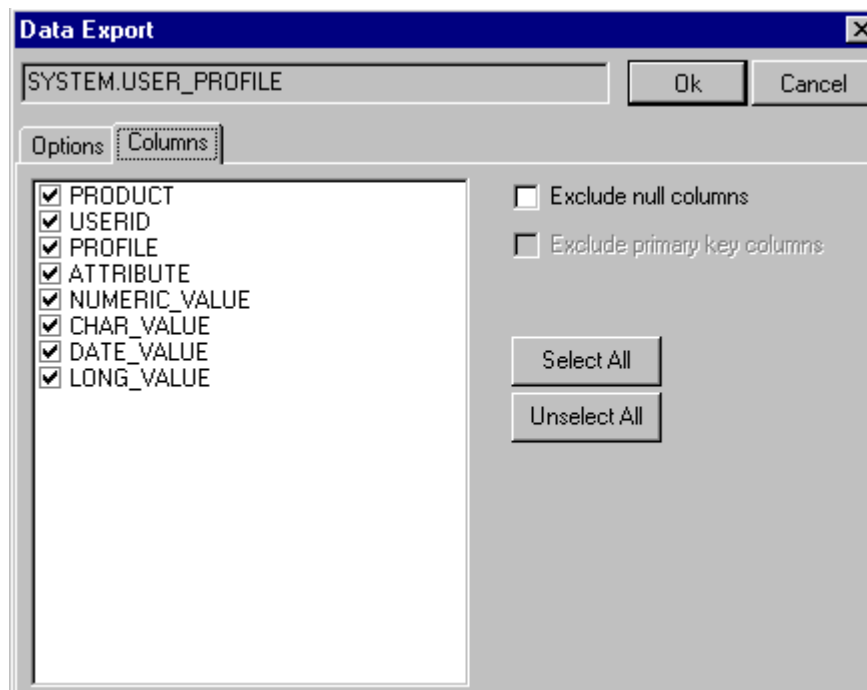
The Alter Table button invokes the Tables window. This window lets you drop, modify, and add columns; change storage parameters and data type sizes; add not null constraints; and set unused columns. It is the same window as the **Create > Table** window, but you are using it to make modifications.

To alter a table, select a table from the objects list and click the Alter Table button. The Table window will automatically display the Schema and the Name for the table you selected.



## Export Data

The Export Data function creates “INSERT INTO” SQL statements for the data in the selected table. The **Export Data** button displays the **Data Export window** for whatever table is selected from the left panel of the Tables page.



*Here, the User Profile object was selected, the Export Data button was clicked, and this was the resulting Data Export window.*

The Data Export window supports NUMBER, FLOAT, CHAR, DATE, and VARCHAR2 object types.

### **Columns Tab**

You can check/uncheck columns you wish to include/exclude. TOAD checks all the columns by default.

### **Exclude Null Columns**

If checked, TOAD will exclude null columns from the columns clause and the values clause of the “INSERT INTO” SQL statement.

E.g.,

```
INSERT INTO Foo ( ID ) VALUES (5);  
INSERT INTO Foo ( ID, NULL_COL_TEST2 ) VALUES (6, 2);  
INSERT INTO Foo ( ID, NULL_COL_TEST ) VALUES (7, 1);  
INSERT INTO Foo ( ID ) VALUES (8);  
INSERT INTO Foo ( ID ) VALUES (9);  
INSERT INTO Foo ( ID ) VALUES (9);
```

### **Exclude Primary Key Columns**

If checked, your primary key columns will be unchecked. If you then check a primary key column, this box gets unchecked. If you do not have any primary key columns, this choice will not be enabled.

### **Select All /Unselect All**

The **Select All** and **Unselect All** buttons let you quickly Select or Unselect all the columns. You can then selectively check/uncheck the columns you want to include/exclude.

### **Options Tab**

#### **Where... clause**

The Where clause is optional. You do not have to include a Where clause.

If you include a Where clause, you must include the word “Where” in your statement. Example:

```
WHERE INVENTORY_NUMBER = 943
```

#### **Destination**

Default – To File

The Destination radio buttons let you choose between **To Clipboard** or **To File**.

#### **Filename**

The filename area has a drill down button where you can drill down to the desired file. You must supply a file name.

#### **Include Schema/Owner Name in Insert Statements**

When this radio button is selected, the Schema or Owner Name will be included in insert statements.

E.g.,

```
INSERT INTO Schema.Foo ( ID ) VALUES (5);
```

#### **Insert COMMIT statements every \_\_ rows spinner**

This spinner lets you designate how many insert statement to generate before generating a commit statement.





### Load table in SQL Modeler

This loads the selected table into the SQL Modeler. This function can also be accessed via the Tables Objects Panel Right-Click Menu **Model Table** menu item. An **Enter Number** dialog will ask how many levels of referential tables to load.



### Table Privileges

The Table Privileges button activates the **Privileges window**.

This window lets you view, grant, and revoke privileges for the selected table. You can view all users and their privileges. If you are not the object owner, you cannot grant privileges that you don't have the grant option for. If you do not have sufficient privileges to alter an object, you will get a warning message, but you will still be able to view everyone's privileges for that object and you will also be able to rearrange columns.

The **Revoke All** button will revoke all privileges from everyone but you.

You can multi-select users using the <CTRL> key. This is useful when applying changes to multiple users. You can multi-select the users, right-click in the column, and grant or revoke from the Right-Click Menu..

The **Show SQL** button lets you preview the SQL before applying changes.

You can rearrange columns by clicking and dragging on the column headers.

If the **Do not colorize columns** box is unchecked grants will be highlighted in blue and admin grants will be highlighted in yellow.

If you only want to see the rows of users who have grants you can check the **Show only users who have grants assigned** checkbox.

*The Privileges window is also discussed in the Grants Section of this Tables Tab Section, page 283.*



### Create Constraint

The Create Constraint button activates the Create Constraint window.

Use this dialog to create additional table constraints.

You can also get to this dialog via the **Create > Constraint** menu item.

You can create:

- Primary Key constraints
- Check constraints
- Unique constraints
- Foreign Key constraints

### To Create Primary Key Constraints

- 1 Type the constraint name in the **Constraint Name** box.
- 2 If desired, select the **Create Constraint Disabled** checkbox.
- 3 Select the schema and table from the dropdown lists. This will query and populate the columns into the **Table Columns** list.
- 4 Click the **Primary Key** option button.
- 5 From the **Table Columns** list, select the column or columns you want to designate as the primary key. (To select more than one item press the <CTRL> key while clicking on the item(s).)  
Optionally select the storage parameters. If you select storage parameters, you must choose a tablespace.
- 6 Click the **right arrow** button to move your selected item(s) to the **Constrained Columns** panel.

If you want to move records that do not meet the new constraint criteria into another table, click the **Exceptions** tab, pick a schema and existing table; or enter a new table name and click the **Create a New Exceptions Table** button.

- 7 You can review the SQL prior to execution by clicking the **SQL tab**.
- 8 Click the **Execute** button to create the Primary Key constraint.

If a Primary Key constraint already exists for the selected table, then the Primary Key radio button option will be disabled.

### To Create Check Constraints

- 1 Type the constraint name in the **Constraint Name** box.
- 2 If desired, select the **Create Constraint Disabled** checkbox.
- 3 Select the schema and table from the dropdown lists. If you opened the Create Constraint window from the Schema Browser, the schema and table will already be selected.
- 4 Click the **Check** option button.
- 5 Enter the check constraint text, in the **Check Constraint Condition** textbox, e.g., "SALARY < 100000 and COMMISSION > 5000."

If you want to move records that do not meet the new constraint criteria into another table, click the **Exceptions** tab, pick a schema and existing table, or enter a new table name and click the **Create a New Exceptions Table** button.

- 6 You can review the SQL prior to execution by clicking the **SQL** tab.
- 7 Click the **Execute** button to run the SQL and add the **Check Constraint**.

### To Create Unique Constraints

- 1 Enter the **Constraint Name**.
- 2 If desired, select the **Create Constraint Disabled** checkbox.
- 3 Pick the schema and the table from the dropdown list. That will populate the **Table Columns** list.
- 4 Click the **Unique** radio button.
- 5 From the **Table Columns** list, select the column(s) that you want to be the **Constrained Column(s)**. Optionally select the storage parameters.
- 6 Click the **right arrow** button to move your selection(s) to the **Constrained Columns** window.

If you want to dump records that do not meet the new constraint criteria into another table, click the **Exceptions** tab, pick a schema and existing table, or enter a new table name.

- 7 You can review the SQL prior to execution by clicking the **SQL tab**.
- 8 Click the **Execute** button to run the SQL and add the Unique Key constraint.

### To Create Foreign Key Constraints

- 1 Enter the **Constraint Name**.
- 2 If desired, select the **Create Constraint Disabled** checkbox.
- 3 Pick the schema and the table from the dropdown list. That will populate the **Available Table Columns** list.
- 4 Click the **Foreign Key** option button, and optionally select the **Cascade Deletes** dropdown.
- 5 On the **This Table** tab, select the column(s) that you want to be the **Constrained Column(s)**.
- 6 Click the **right arrow** button to move your selection(s) to the Constrained Columns window.
- 7 Click the **Referenced Table** tab.
- 8 Select the **Referenced Table schema, table, and column(s)**. (To select more than one item press the <CTRL> key while clicking on the item(s).)

If you want to dump records that do not meet the new constraint criteria into another table, click the **Exceptions** tab, pick a schema and existing table, or enter a new table name and click the **Create a New Exceptions Table** button.

- 9 You can review the SQL prior to execution by clicking the **SQL tab**.
- 10 Click the **Execute** button to run the SQL and add the Foreign Key constraint.



### Analyze Table

Click the **Analyze Table** button to display the **Analyze Tables window**.

Use this dialog to analyze the selected table from the tables object list. This collects statistics so that COST based query optimization can be used. So, the optimizer can run better queries.

You can either estimate statistics (faster than compute), compute statistics, or delete current statistics.

To analyze all tables in the current schema or other selected schema, go to the **Tools > Analyze All Tables** menu item. This displays the same dialog as above, but with the Schema dropdown list enabled so that you can select which schema tables to analyze all at once.



### Add Public Synonym for Table

Click the **Add Public Synonym for this Table** button, and a confirmation window will appear asking if you want to create a public synonym for the table.

Click **Yes** to create the synonym or **No** to Cancel.



### Table Filter

The Table Filter button displays the Browser Filters window for the Tables.

The Browser Filters button can be found on the tabs for Tables, Procedures, Triggers, Views, Synonyms, and Constraints. All the Browser Filter windows have a similar interface.

Browser Filters for: SCOTT@ORA734

☒ Show current schema filters ☐ Show Default filters

Ok Cancel

Tables

Table Name

Filter how: Starts With

Filter: EMP

Table Column Names

Filter how: (none)

Filter:

Table Space

(none)

☐ Search in all Schemas

☐ Omit tables created by Snapshots

☐ Omit tables created for IOT Overflow

*Here, all tables in the SCOTT schema will be filtered out, except those with Tablenames that begin with EMP.*

Browser filters are helpful for schemas that contain a lot of objects—the fewer objects that TOAD needs to load, the faster it will execute. For example, you can narrow the focus to only tables whose names begin with EMP and temporarily ignore all other objects in the schema.

Dropdown filter lists include the following choices:

- Starts with
- Includes
- Ends with
- Not like

After you set your filters, select OK and the browser displays the resulting objects.

To view all the objects again, simply select the filter button, clear the filters by selecting Clear where you have filters, and select OK.

The filter is stored in a file named SCHEMA.FLT in the TOAD\TEMPS folder, where SCHEMA is the schema name. Do NOT attempt to edit this file!

You can also use this dialog to set up the default filter, which is in force for every new schema.

To set up a default filter, go to **View > Browser Filters**, and click the **Show Default Filter** button. Set up your default filters and press **OK** to close the window. These filters will be set up by default each time the Schema Browser window is opened.

You can set defaults for Tables, Constraints, Synonyms, Views, Triggers, and Procedures, such as *starts with*, *contains* or *ends with* a keyword.

If you select multiple filters, e.g., table name and tablespace name, then they are joined together with an AND statement in the SQL, as opposed to an OR statement in SQL.

**Not Like** sets up the tablename query like this: [not like KEYWORD%].



### Rebuild Table

This button invokes the Rebuild Table window which only works if you are browsing in your own schema. *Rebuild Table* is discussed on page 457.



### Compile Dependencies

If your table is called by a Procedure or View this button will compile those dependencies.



### Drop Table

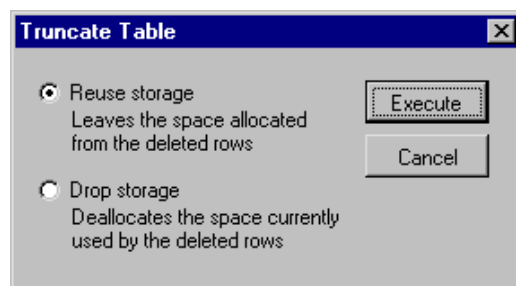
The Drop Table button lets you drop the selected table directly from the Schema Browser. A confirmation window will ask you if you are sure you want to drop the table. Once you select **Yes** the table is dropped and cannot be retrieved.



### Truncate Table

Lets you truncate a table (delete all the data but maintain the table structure) and either reuse the storage or drop it. The following dialog will display when you select the button.

Once you click the **Execute** button you can't rollback or undo your choice.





## Details Panel

The Tables details panel has tabs for displaying different details about the selected table.

### Table - Columns

The Columns tab lists all the columns for the selected table. It also displays each column **Data Type**, whether or not the column accepts **Null** values, column attributes (such as length, precision, scale), **Default** value, and column comments, if any. You can change the length, precision, scale display to “NUMBER(10,5)” through the TOAD **Option > Schema Browser > Show Column Length Info with Column Data Type** setting.

The dropdown default is **Show no comments**. The other choices in the dropdown are **Column Comments** and **Table Comments**, which show the comments in an overlay panel at the bottom of the details panel. You can type directly into this panel to edit the various comments. To save the comment edits, just select a different column or table.

Primary Key columns are indicated by PK column numbers in the PK column. A label to the right of the Add and Drop column buttons in the details panel displays the Primary Key column name(s).

You can multi-select columns, press <CTRL>C to create a comma-delimited list of columns to the windows clipboard, and paste the selection into an editor.

**Table - Columns Details Panel Buttons**

Add Column



Drop Column

Click the **Add Column** button to display the **Column Definition window**. This dialog lets you add a column to the selected table. You must enter the Column Name, the Type, and the Size. The Nullable radio button is selected by default.

If you want to see the resulting SQL script of your command, select the SQL tab.

**To Add a Column**

- 1 Enter the column name, data type, and other appropriate information.
- 2 Click the **Execute** button to add the column.

Character Default Values have to be wrapped within single quotes, in order to make a valid "ALTER TABLE..." statement.

Additional columns are always appended to the end of the table definition.








*The Drop Column button and the Drop Column from Table Right-Click Menu item are enabled only if you have Oracle 8.1.5 or later.*

The panel also contains a Clear Filter button. If it is red, a filter is active for the data grid, and you can click the Clear Filter button to clear the filter.

**Table - Indexes**

The Indexes tab lists the indexes for the selected table. The list includes the **Index Name**, whether or not the index is **Unique**, the **Column(s)**, and the **Position**. It also lists the **Parameters** and **Values** for each index.

**Indexes Details Panel Buttons**







	Create script for selected index
	Create new index
	Modify index
	Rebuild index
	Analyze index
	Drop index
	Drop all indexes

**Table - Constraints**

The Constraints tab lists any constraints for the selected table. It lists the **Constraint Name**, the **Constraint Type**, the corresponding **Column**, and the **Position**.

For foreign key referential integrity constraints, the panel at the bottom lists the owner, table, and column names that the foreign key constraint is pointing to.

**Table - Constraints Detail Panel Buttons**









	Enable ALL Constraints for this table
	Disable ALL Constraints for this table
	Enable the current Constraint
	Disable the current Constraint
	Drop ALL Constraints, not enabled by default
	Drop Constraint

### Table - Triggers

The Triggers tab lists any triggers for the selected table. It includes the **Type**, **Status**, whether or not it's **Enabled**, the **Trigger Event**, the **Trigger Owner**, and the **When Clause**.

The editor at the bottom of the details panel lists the source code for the selected trigger.

### Table - Triggers Detail Panel Buttons

	Enable ALL Triggers for this table
	Disable ALL Triggers for this table
	Enable the current Trigger
	Disable the current Trigger
	Drop ALL Triggers, not enabled by default
	Drop Trigger
	Open Procedure Edit window for selected trigger
	Compile

### Table - Data

The Data tab displays the selected table, with data, in grid format. This is similar to the SQL Results Grid on the SQL Edit window. The data in this grid is directly editable, because the query to populate the grid includes the ROWID column. The right mouse menus are slightly different. Grid configurations on this data tab are saved and restored from the TOAD\TEMPS folder structure.

You can easily rearrange columns by clicking and dragging on the column titles.

Double-click any data item to bring up a memo editor for that item.



*Single record view button*

Click on the book in the top left corner of the table to show single record views of the selected row.

### Table - Data Details Panel Buttons

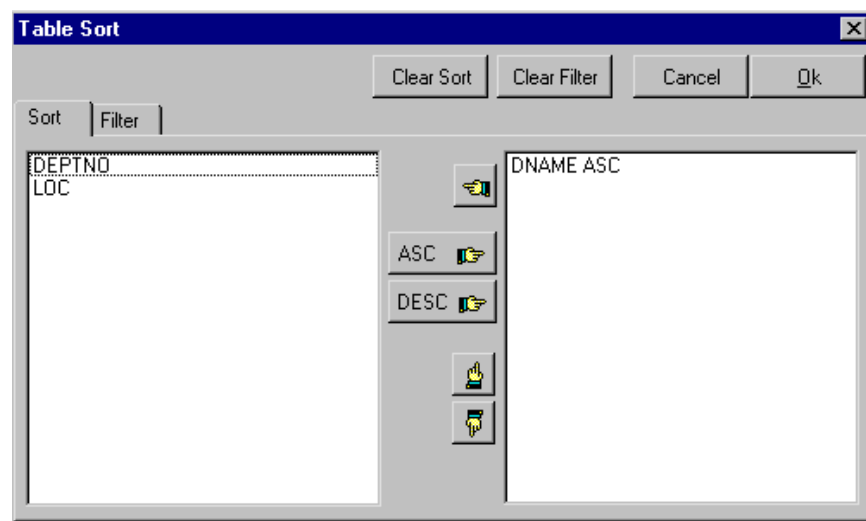


Commit the grid edits to the database



Filter the data grid, set sort criteria

The **Filter Data** toolbar button opens the **Table Sort** dialog, where you can select the columns to sort and/or filter.



## Table Sort Window

### Sort Tab

To Sort, select the column(s) you want to sort and click on the pointing hand. Notice you can sort in ascending or descending order. You can also move items up and down the list. If you want to clear the sort column(s) for this table, click the **Clear Sort** button. If you want to clear the entire filter for this table, click the **Clear Filter** button on the **Table Sort** dialog.

### Filter Tab

You enter the filter criteria in the lower text panel.

The filter tab provides dropdowns with additional filter choices. On the filter tab, select the Column, Operator, and Value to filter upon. You can further edit the resulting SQL right in the memo editor widget.

When finished, click **OK** and the data in the grid will be sorted and/or filtered as specified.

The sort and filter criteria are saved in temporary files in the TOAD\TEMPS folder hierarchy.

If a table filter is in effect, the funnel icon on the Data tab will be red.

The **Clear Filters** toolbar button clears the filter criteria and the sort criteria.

**Data Detail Buttons *Continued***

The forward and backward buttons let you quickly move around from row to row in the recordset. The First Record button takes you to the top of the grid (the first record in the recordset). The Next Record button takes you to the next record in the recordset, and so on.

*See the **Data Grids** chapter for information on the Data Grids Right-Click menu.*



### Table - Scripts

The scripts tab displays the SQL script for the table you've selected.

The scripts tab also includes several buttons and options.



#### Copy Text to Clipboard

The Copy Text to Clipboard button (or <CTRL> C) copies selected text from the SQL script to the clipboard so that you can paste it into another application or text editor.



#### Select All Text

The Select All Text button selects all the text in the SQL script. You can then use the Copy Text to Clipboard button to copy the whole script.



#### Copy Script to SQL Edit window

The Copy Script to a SQL Edit window button opens a SQL Edit window and pastes a copy of the script into the SQL Edit window.

The options you can check or uncheck are:

- FKeys
- Indexes
- Synonym
- Grants
- Storage
- Triggers
- Comments

When you change an option by either checking or unchecking it, the checkbox text turns red. At the same time, the GO button turns red. This indicates that a change has taken place, but is not yet reflected in the SQL script. Once you Click GO, the script refreshes, implementing the options you've changed. The option text returns to its original black color, and GO returns to its original gray color.

**GO Refresh the Table Script**

The GO button refreshes the script, updating any changes. If you've changed options, the GO button turns red until you click it, refreshing the screen. Your new script is displayed, and the GO button returns to its original gray color.

### Table - Grants

The Grants Tab lets you view existing table grants and assign or replace existing privileges.

#### Grants Details Buttons



**Revoke All**



**Revoke Privilege**



**Privileges**

The Privileges button opens the Privileges window.

If you cannot see any roles, have your DBA **Grant select on dba\_roles to schema.**

### To Add or Replace Privileges

- 1 Select the table from the object list.
- 2 Click the **Privileges** button. The privileges window for the selected table displays.
- 3 Click in the cell of the privilege you wish to change. A dropdown displays.
- 4 Select an item from the dropdown.
- 5 Click **Apply**.
- 6 A confirmation dialog will appear. Confirm by clicking **OK**.

**Table - Partitions**

This lets you see partitioned columns and partitions for the selected table. The **Drop Partition** button lets you drop partitions. The **Truncate Partition** button lets you truncate a selected partition.

**Table - Stats/Size**

The Stats/Size tab displays numerous statistics and size information about the selected table.

The two display options

**Show Stats**

**Show Size/Extents**

are checked by default.

The Stats, such as TABLESPACE NAME and NUM ROWS, are displayed in the upper window of the details panel, and the Size/Extents information, such as SIZE IN BYTES and INITIAL EXTENTS, are displayed in the lower window of the details panel.

The panel window columns are click and drag resizable, and a horizontal splitter is between them.

### Table - Referential

The Referential tab displays a hierarchy of tables and how the selected table is referenced by other tables and references other tables. This display is based on the existing foreign key constraints from table to table.

Remember, “+” on the keyboard expands one branch of the hierarchy, and <CTRL><SPACE> expands the whole tree. Pressing the asterisk key, “\*”, will fully expand the current node.

On each node of the hierarchy, there is a chain symbol for standard referential and a scissors symbol if the reference is *Cascade on Delete*.



Circular references, such as EMPLOYEE.MANAGER\_ID referencing EMPLOYEE.EMPLOYEE\_ID, are captured; so you cannot drill down in the hierarchy endlessly (for example, emp\_id is referenced by manager\_id, which references emp\_id, which references manager\_id, and so on).

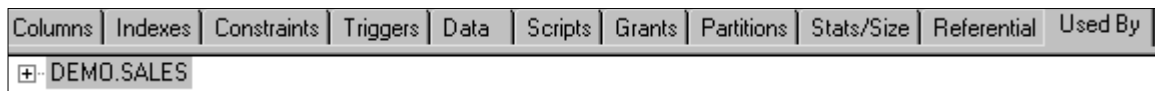
You can select an item in the list, press <F4> and get a popup window describing the object in detail.

**Table -Used by**

The Used By tab shows the objects that reference the selected table such as views, triggers, functions, procedures, and packages.



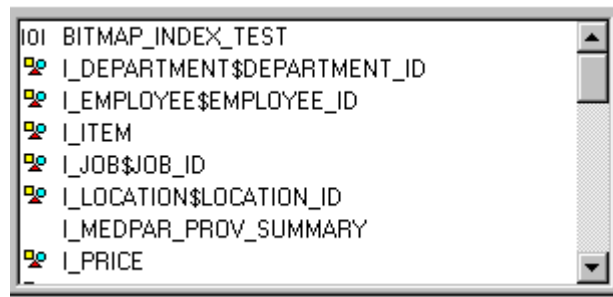
Here, the *CUSTOMER* table is selected in the objects panel. The *Used By* tab in the details panel shows that the *CUSTOMER* table is used by the *Demo.Sales* view.



## Indexes

### Objects panel

In the list of indexes, "101" icons are BITMAP indexes, and "Yellow Square + Red Triangle + Blue Circle" icons indicate UNIQUE indexes (vs. non unique), "f()" indicates function-based indexes.



#### Create Script

This copies the Create Index script of the selected index to the clipboard.



#### Create Index

This invokes the Create Index window.



#### Modify Index

This invokes an Alter Index window for the selected index.





## Rebuild Index

Use this function to rebuild a table index.

Indexes need to be periodically rebuilt in order to improve query performance. Over time, records are added to the end of tables and indexes, and other records are deleted from the middle of tables and indexes. When you read the tables and indexes, the disk device has to traverse the chain up and back until your record is found. Rebuilding an index reorganizes the chain sequentially, substantially improving query performance.

A screenshot of the 'Rebuild Index' dialog box. The title bar says 'Rebuild Index'. There are 'Execute' and 'Cancel' buttons at the top right. Below the title bar are two tabs: 'Options' (selected) and 'Sql'. The main area is titled 'Rebuild Index DEMO.I\_CUSTOMER\$CUSTOMER\_ID'. It contains several groups of options: 'Parallel' with a radio button and a text box containing '1'; 'Not Parallel' with a radio button; 'Recoverable' with a radio button; and 'Not Recoverable' with a radio button. To the right of these is a 'Storage' section with three text boxes: 'Initial extent:' containing '10240', 'Next extent:' containing '10240', and 'Percent Increase:' containing '50'. At the bottom is a 'TableSpace' dropdown menu showing 'USER\_DATA'. The status bar at the very bottom says 'SCOTT@BEQ-LOCAL'.

The Rebuild Index window lets you change storage parameters, select a Parallel option, and select a Recoverable option. You can click the SQL tab to see the resulting SQL syntax.

**Analyze Index**

This collects statistics on the selected index so that COST based query optimization can be used. So, the optimizer can run better queries. A confirmation popup window will appear, select Yes, and the selected index will be analyzed.

**Filter Indexes List**

This invokes the Browser Filters window that lets you filter Index Names and Table Names.

**Drop All Indexes**

This is disabled by default. This will drop all indexes in the list. This will not drop indexes that have been filtered out of the list.

*Refer to the Dropping Objects section, page 249, for more information about Drop All buttons.*

**Drop Index**

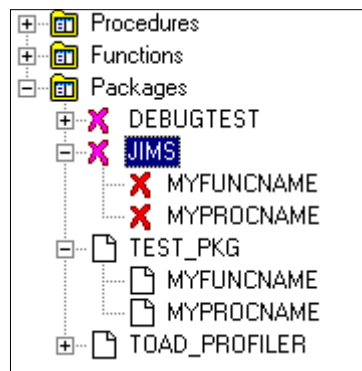
This will drop the selected index.

## Details Panel

The details panel displays information about the selected index. The details **Column** tab includes the column, table name, and table owner. The **Stats** tab includes the parameters and values. The **Partitions** tab shows the partitioned columns and the partitions. A **Drop Partition** button lets you drop partitions. The **Script** tab shows the Create Index script for the selected index.

## Procedures

In the list of PL/SQL Procedures, Functions, and Packages, a "Pink X" is for a Package that contains one or more invalid (Red X) functions or procedures.



## Objects Panel



### Save to File

This button lets you save the selected procedure to a file on your hard drive.



### Proc Edit

The Proc Edit button is enabled after you select a procedure. It opens a Procedure Edit window for the procedure that you've selected in the objects panel.



### Compile

The Compile button compiles the selected procedure, function, or package.



### Compile All

The Compile All button compiles all procedures, functions, packages, and triggers for the current schema. On databases prior to 8.1.7, it compiles only INVALID objects.



### Procs Filter

The Procs Filter button displays a Browser Filter dialog for procedures.

*Refer to the Filters discussion, page 250, for more about Filters.*



### **Compile Dependencies**

The Compile Dependencies button will compile dependencies for the selected procedure. For example, if procedure A calls your procedure B, select procedure B, click the Compile Dependencies button, and TOAD will recompile procedure A. A dialog asks if you want to compile the dependencies on the selected procedure. Select **Yes** or **No**.



### **Execute Procedure**

The Execute Procedure button brings up the Set Parameters window where you can enter your arguments, and click OK to execute the procedure.



### **Privileges**

Use this window to view or modify the privileges of the selected procedure to other user schema accounts or roles.



### **Create Public Synonym**

This creates a Public Synonym for the selected procedure, function, or package.

**Drop All Procedures**

This drops all the procedures in the list. This will not drop procedures that have been filtered out of the list. The button is disabled by default.

*Refer to the Dropping Objects section, page 249, for more information about Drop All buttons.*

**Drop Procedure**

This drops the selected procedure.

## Details Panel

The details panel includes tabs for Code, Arguments, Deps (Uses), Deps (Used by), Errors, and Grants.

### Code

This displays the code for the selected procedure, function, or package.

### Arguments

The Arguments tab displays information about the procedure arguments (if any) in the upper part of the panel.

### Deps (Uses) and Deps (Used By)

The Dependencies tabs (Uses and Used By) displays the dependencies in the upper part of the panel. If there is a hierarchy of dependencies, the dependencies tree will display. The Deps right-click menu lets you compile, describe, and copy the outline of a selected object.

You can select an item in the Deps list, press <F4> and get a popup window describing the object in detail.

### Errors

The Errors tab displays the last errors that occurred when you tried to compile the selected procedure. If you click on an error, its location is highlighted in the script displayed in the lower part of the details panel.

### Grants

The Grants tab lists the Grants and shows the associated Privileges, whether or not there is a "With Grant Option", and the Grantor. The tab contains two buttons.



**Revoke All**

This revokes all privileges that are in the list.

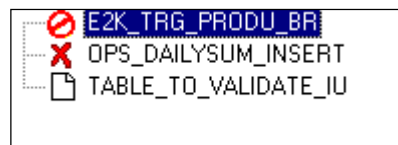
**Revoke Privilege**

This revokes the selected privilege.

## Triggers

In the Triggers list, the icons to the left of the items represent the following:

- **Red Circle with a slash**  
indicates that the trigger is DISABLED
- **Red X**  
indicates that the trigger is INVALID and needs recompiling
- **White page**  
indicates that the trigger is VALID and ENABLED



## Objects Panel



### Save to File

This button lets you save the selected trigger to a file on your hard drive.



### Proc Edit (Trigger to Proc Editor)

This button places the selected Trigger in a Procedure Editor ready for editing.



### Compile the Selected Trigger

This button compiles the trigger that is selected in the objects panel.



### Compile all

This button compiles all the triggers in the objects panel.



### Enable all Triggers

This button enables all triggers in the current schema.



### Disable all Triggers

This button disables all triggers that are in the current schema.



### Enable the current Trigger

This button enables the currently selected trigger.



### Disable the current Trigger

This button disables the trigger that is currently selected.

**Trigger Filter**

This button activates the Browser Filters for the Triggers window.

**Drop all Triggers**

This button drops all triggers in the list. This is a Drop All button and has to be manually enabled on the Options window.

*Refer to the Dropping Objects section, page 249, for more information about Drop All buttons.*

**Drop Trigger**

This button drops the selected trigger.

### Details Panel

The details panel displays information about the selected trigger. The **Columns** tab displays the column, table, table owner, and usage. The **Source** tab displays the SQL script for the selected trigger.

The trigger text is selectable via <CTRL>A and can be copied to the clipboard via <CTRL>C.

## Sequences

Sequences are basically counters that Oracle maintains. They have designated starting and stopping points.

A sequence can either be ascending or descending. Oracle computes and caches the specified number of sequence values in memory before they are requested. This lets TOAD and Oracle run faster.

If you are caching sequences, and the database crashes, you lose from whatever the sequence started with to wherever the sequence stopped. This might or might not matter to you depending on why you are using the sequence. For example, if the sequence is for printed invoices where every number on the invoice is printed on a sheet, it is important for you to have every number in the sequence, and you don't want to cache anything.

An example of a situation where you might want to cache sequences, so that TOAD can run faster, is if you are using the sequences to generate unique id numbers for primary keys, and you don't need all the sequences.

## Objects Panel



### Create Script

This creates the Create Sequence script and copies it to a clipboard so it can be pasted into a SQL Editor or another application.



### Create New Sequence

This button opens the Create Sequence window, where you can create a new sequence.



### Alter Sequence

This button opens the Alter Sequence window for the selected sequence.

You can modify the min value, max value, the increment value, whether or not to cycle, and the number to cache settings.



### Sequence Privileges

This button opens the privileges window for the selected sequence.



### Add Public Synonym for this Sequence

This creates a public synonym for the selected sequence.

**Drop all Sequences**

When enabled, this drops all sequences in the current schema.

*Refer to the Dropping Objects section, page 249, for more information about Drop All buttons.*

**Drop Sequence**

This drops the selected sequence.



### Details Panel

The **Info** tab lets you view the start value, the max value, the increment value, and the number to cache settings. The **Grants** tab lets you view grants, and the buttons on the Grants tab let you revoke privileges for the selected sequence or all sequences.

## Views

### Objects Panel



#### Create Script

Generates the Create View script syntax and places it on the clipboard so it can be pasted into the SQL Editor or another application.



#### Create View

This opens the Create View window which lets you create a view.



#### Edit View

This opens up a window that lets you modify the selected view.



#### Show view in a SQL Editor

This opens the SQL Editor and pulls in the SQL script of the selected view.



#### Save to File

This invokes the Save As window so you can save to a file.



#### Compile

This button compiles the selected view.



#### Compile All

This button compiles all the views in the current schema.

**View privileges**

This button displays the Privileges window for the selected view.

**View Filter**

This button displays the Filter window for the selected view.

**Create Public Synonym**

This creates a Public Synonym for the selected view.

**Compile Dependencies**

If your table is called by a procedure or view, this button will compile those dependencies.

**Drop all Views**

This button, when enabled, drops all views in the current schema.

*Refer to the Dropping Objects section, page 249, for more information about Drop All buttons.*

**Drop View**

This drops the selected view.

## Details Panel

The details panel includes tabs for Columns, Source, Data, Grants, Source, Deps (uses) and Deps (Used by).

### Columns

The Columns tab includes an **Include Updateable** checkbox that lets you either display or not display which columns of the view are updateable. This requires an extra query step; so it is an option. The Columns panel populates information about the selected view: Column, Data Type, Null (Y/N), and Updateable (if the checkbox is checked). The Comments dropdown box has choices for **Show no comments**, **Column comments**, **View comments**.

The view code (Source tab) is selectable via <CTRL>A and can be copied to the clipboard via <CTRL>C.

### Source

Displays the source for the selected view.

### Data

The Data tab displays the data for the selected view, in table format. It includes a filter button, which pulls up the Table Sort window containing the Sort and Filter tabs. *For more information on the Table Sort dialog, see page 278.* It has the single record view button, which pulls up the Single Record View window. It also includes the standard TOAD table navigation buttons for quick navigation through the rows (or records).

### Grants

The Grants tab displays Grant information for the selected view: granted to, type of privilege, whether or not there is a **with grant option**, and the grantor.

It includes buttons for revoking all privileges or for revoking just the selected privilege. It also includes a Privileges button that invokes a View Privileges window.

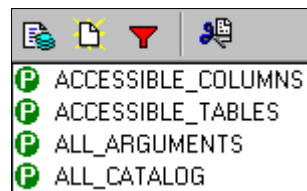
**Deps (Uses) and Deps (Used By)**


The Dependencies tabs (Uses and Used By) displays the dependencies. If there is a hierarchy of dependencies, the dependencies tree will display. The Deps right-click menu lets you compile, describe, and copy the outline of a selected object.

You can also get a popup describe window by selecting an object in the Deps list and pressing <F4>.

## Synonyms

You can create synonyms for the following objects: tables, procedures, packages, functions, sequences, views and synonyms. Synonyms are useful for things like security and ease of maintenance. Remember, synonyms basically point to the original object.



The  symbol indicates a public synonym.

### Objects Panel

t onto the clipboard so you can paste it into the SQL Editor or another application.



This opens the Create Synonym window which lets you create a synonym.



### Filters

Filters let you filter out different types of synonyms.

Because the SYS/SYSTEM schemas contain a lot of synonyms, users like to filter them out for easier navigation. So, the **Show Public synonyms except those for objects owned by SYS/SYSTEM** is selected by default.

In addition to the basic filter choices, the window also has radio buttons where you can choose the type of synonyms you want displayed. The checkboxes let you show synonyms for tables, views, and/or stored procedures. A dropdown box is provided for Object Owner choices.



### Drop Synonym

This drops the selected synonym.

## **Details Panel**

The details panel displays details of the object the synonym is pointing to. When you click on a synonym from the object list, the details of the object the synonym is pointing to displays in the details panel. So, you can see details about synonyms pointing to tables, views, and stored procedures. Unknown Objects are listed as UNKNOWN.

The details panel will also display tabs and details associated with the object. For example, if the object is a view, the details panel will contain the same tabs the Object View Tab displays in the details panel (Columns, Source, Data, Grants, Deps) and the same associated details, options, and dialogs.



## Constraints

The Constraints tab displays the constraints in the objects panel and details about the constraints, including the type of constraint and the columns involved, in the details panel.

### Objects Panel



#### **Enable all constraints**

This enables all constraints that are in the current schema.



#### **Disable all constraints**

This disables all constraints that are in the current schema.



#### **Enable the current constraint**

This enables the selected constraint.



#### **Disable the current constraint**

This disables the current constraint.

**Constraints filter**

This pulls up a Browser Filter dialog window for constraints.

**Browser Filters for: JSMITH@ORA8I\_CARY.WORLD**

☒ Show current schema filters ☐ Show Default filters Ok Cancel

**Constraints**

☒ Show Check Constraints ☒ Show Primary Key Constraints  
☐ Show Referential Integrity Constraints ☐ Show Unique Key Constraints  
☒ Show Check Option Constraints (on views) ☒ Show ALL  
☐ Show table name following constraint name ☐ Show Enabled only  
☐ Exclude SYS\_\*\*\*\* constraints ☐ Show Disabled only  
☐ Sort Constraints by Name? (otherwise, grouped by Table)

**Constraint Name**  
Filter how:  
Starts With  
Filter:  
EMP

**Constraint Column Names**  
Filter how:  
(none)  
Filter:



### Drop Constraint

This drops the selected constraint.

When you disable constraints (either disable current or all), if any of the constraints you have selected to disable have dependencies, an Oracle error message will display stating that you cannot disable constraints that have dependencies. If the constraint was disabled, a red X will also appear next to your constraint in the objects list. If you then enable the constraint, the red X will disappear.

## Details Panel

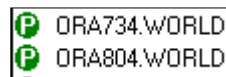
The details panel provides information about the selected constraint, including its type, status, table and owner.


Type	<b>Primary Key</b>								
Status	<b>ENABLED</b>								
Table	<b>XDBA_MON_INDEX_SIZE</b>								
Owner	<b>DEMO</b>								
Delete Rule									
Constraint Columns	<table><thead><tr><th>Column</th><th>Position</th></tr></thead><tbody><tr><td>OWNER</td><td>1</td></tr><tr><td>INDEX_NAME</td><td>2</td></tr><tr><td>TABLE_OWNER</td><td>3</td></tr></tbody></table>	Column	Position	OWNER	1	INDEX_NAME	2	TABLE_OWNER	3
Column	Position								
OWNER	1								
INDEX_NAME	2								
TABLE_OWNER	3								
Constraint Text									
Referential									
Owner									
Table Name									
	<table><thead><tr><th>Column</th><th>Position</th></tr></thead><tbody></tbody></table>	Column	Position						
Column	Position								

## DB Links

The DB Links lists all possible links from the database you are using. Links can be public (used by all schemas) or private (used only by the schema that created it).

DB Links are used in queries at the end of each table or view name.



*Public links in the list have the  symbol next to them.*

### Objects Panel



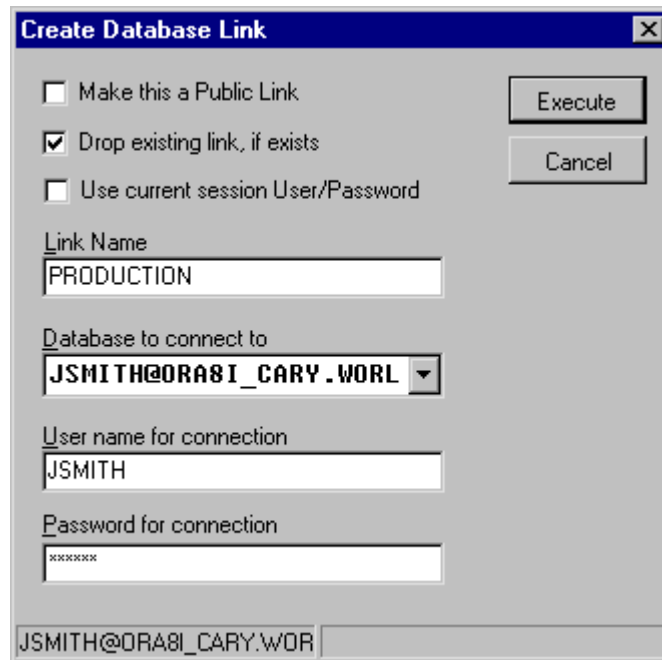
#### Copy script to clipboard

This copies a Create Public DB link script to the clipboard, which you can then paste.



#### Create new database link

This displays the **Create Database Link** window where you can fill in the information to create a database link. The dropdown menu lets you select from the list of databases to connect to. After the information boxes are filled in, select the **Execute** button to create the database link.



The image shows a 'Create Database Link' dialog box with a blue title bar and a close button. It contains several options and input fields. The 'Drop existing link, if exists' option is checked. The 'Link Name' field contains 'PRODUCTION'. The 'Database to connect to' dropdown menu is set to 'JSMITH@ORA8I\_CARY.WORL'. The 'User name for connection' field contains 'JSMITH'. The 'Password for connection' field is masked with 'xxxxxx'. There are 'Execute' and 'Cancel' buttons on the right. At the bottom, there is a text field containing 'JSMITH@ORA8I\_CARY.WOR'.

**Create Database Link**

☐ Make this a Public Link

☒ Drop existing link, if exists

☐ Use current session User/Password

Execute

Cancel

Link Name

PRODUCTION

Database to connect to

JSMITH@ORA8I\_CARY.WORL

User name for connection

JSMITH

Password for connection

xxxxxx

JSMITH@ORA8I\_CARY.WOR



### Drop DB link

This drops the selected database link.

### Details Panel

The details panel lists the owner, host, user name, and the date and time the link was created for the selected DB link from the object list.

Info	
Parameter	Value
Owner	PUBLIC
Host	ORA805
User Name	SCOTT
Date	02/28/2000 9:25:48 AM

## Jobs

You can create, alter, execute, and drop jobs. You can also place jobs online or offline and view job details.

### Objects Panel



#### Create New Job

This displays the job definition window, which includes a job number box, entry boxes for next date of execution and interval, and a box for what to execute.



#### Alter Jobs

This displays a job definition window for the selected job, which you can then alter.



#### Place Online

This button is only enabled when the selected job is Offline. This places the selected job Online, available for transactions.



#### Place Offline

This button is only enabled when the selected job is Online. This places the selected job Offline, unavailable for transactions.



#### Execute Job Immediately

This executes the selected job.



#### Drop Job

This drops the selected job.



### **Details Panel**

The details panel shows various parameters for the selected job, such as LOG USER, NEXT DATE, and INTERVALS. Source for the selected job displays in the lower pane of the details panel.

## Users

You can create, modify, and drop users. You can also create and copy the SQL script to the clipboard. You can view details for roles and privileges. The objects list right-click menu includes an Expire User feature.



### Create Script

This creates and copies the SQL script to the clipboard.



### Create New User

This invokes the Create user window.



### Modify User

This invokes the Modify User window for the selected user.



### Copy This User

This invokes the New User Info window, where you choose the user name for the copy and the password.



### Lock this account

This locks the selected account. Locked accounts display in the objects list with a lock to the left of the name. When someone tries to access a locked account, a message will display that says the account is locked. The locked status displays in the Info tab on the details panel.



### Unlock this account

This unlocks the selected account.



### Drop User

This drops the selected user.

### Details Panel

The details panel contains tabs for **Info**, **Roles**, and **Privileges**.

A checkbox lets you **Exclude privileges granted by Role**.

The Roles and Privileges tabs contain Revoke and Revoke all buttons, which revokes the selected Role or Privilege (Revoke) or revokes all the Roles or Privileges (Revoke all).

## Types

This page lets you create, browse, and edit user-defined datatypes.

*This feature is only available for Oracle 8 and higher databases.*

You can set options via the **View > Options > Types Tab** page.

### Objects Panel

The Objects Panel lists user-defined datatypes in a hierarchical display.

**Icons for the objects in the hierarchy:**



**Object**



**Attribute**



**Method**



### Create User Type

This invokes the New Object Type window that lets you create a new object, adding it to the **Object Types** hierarchy list. The name of the new object is adjustable in the **View > Options > Types Tab** dialog. The default name in the options menu is NEWOBJECTX (*X* being an integer that starts at 1 and increments by 1 with each new object name). An attribute is also automatically created because object types must have at least one attribute.

The dropdown button lets you choose New Object or New Collection.

*Refer to TOAD Help for more information about the New Object Type window.*



### Edit User Type

This invokes either the Edit Object Type window or Edit Collection Type window, depending on the item you select.

**Save to File**

This creates a script for the selected object.

**Load in Procedure Edit window**

This loads the selected object into a Procedure Editor window. The dropdown lets you load spec, body, or both.

**Compile**

This compiles the selected object. The dropdown button lets you select the spec, body, or both.

**Privileges**

This lets you grant EXECUTE privileges to other users or roles for this type.

**Create Object Table**

This lets you create an object table based on the Object Type you select.

**Drop**

This drops the selected object.

**Details Panel**

The details panel tabs include **Object types**, **Collections**, **Attributes**, **Methods**, **Specification**, **Body**, and **Dependencies**.

*Refer to TOAD Help for more information about the Types page.*

## Queue Tables

This page lets you create, alter, and drop queue tables using Oracle's built-in DBMS\_AQADM package.

*This feature is only available for Oracle 8 and higher databases.*

### Objects Panel



#### Create Script

This creates and copies the SQL script to the clipboard.



#### Create queue table

This displays the Create Table window with the Advanced Queuing radio button selected.



#### Alter queue table

This displays an alter queue table window for the selected table. *Alter queue table is not supported in Oracle 8.0.*



#### Drop queue table

This drops the selected queue table.

### Details Panel

The details panel includes tabs for **General**, **Queues** (lets you start and stop enqueues and dequeues), **Scripts**, **Statistics**, and **Schedules**.

*Refer to TOAD Help for more information about Queue Tables.*

## Queues

This page lets you create, alter, and drop queues and enable or disable enqueueing or dequeuing on those queues, using Oracle's built-in DBMS\_AQADM package.

*This feature is only available for Oracle 8 and higher databases.*

### Objects Panel



#### Create Script

This creates and copies the SQL script to the clipboard.



#### Create queue

This displays the Create Queue window which lets you create a new queue.



#### Alter queue

This displays an Alter Queue window for the selected queue.



#### Start enqueue

This enables enqueueing on selected queues.



#### Stop enqueue

This disables enqueueing on selected queues.



#### Start dequeue

This enables dequeuing on selected queues.

**Stop dequeue**

This disables dequeuing on selected queues.

**Drop queue**

This drops the selected queue.

**Details Panel**

The details panel includes tabs for **General**, **Statistics**, and **Schedules**.

*Refer to TOAD Help for more information about Queues.*



## JAVA

TOAD includes a JAVA tab for Oracle 8i databases. It lets you view the list of Java objects. The details panel has a Code tab.

## Schema Browser Tasks

This section will take you step-by-step through various tasks that you might want to perform with the Schema Browser.

### To copy table or view column names to the clipboard

You can copy the column names from the list on the Tables/Columns tab or the Views/Columns tab via multi-select list and copy <CTRL>C.

From **Tables > Columns**

- 1 Click the Column you want to copy. To select more than one column, press <CTRL> while clicking the columns you wish to select. To select a continuous block of columns, select the starting point, press <SHIFT>, and click on the ending part of the blocked selection.

Columns	Indexes	Constraints	Triggers	Data	Scripts	Grants	Partiti
Show no comments							CUSTOMER_ID
Column	Pk	Data Type	Null?	Default			
CUSTOMER_ID	1	NUMBER (6)	N				
NAME		VARCHAR2 (45)	Y				
ADDRESS		VARCHAR2 (40)	Y				
CITY		VARCHAR2 (30)	Y				
STATE		VARCHAR2 (2)	Y				
ZIP_CODE		VARCHAR2 (9)	Y				
AREA_CODE		NUMBER (3)	Y				
PHONE_NUMBER		NUMBER (7)	Y				
SALESPERSON_ID		NUMBER (4)	Y				
CREDIT_LIMIT		NUMBER (9,2)	Y				
COMMENTS		LONG	Y				

- 2 Press <CTRL>C or select **Edit > Copy** from the menu.

The selection is copied to the clipboard.

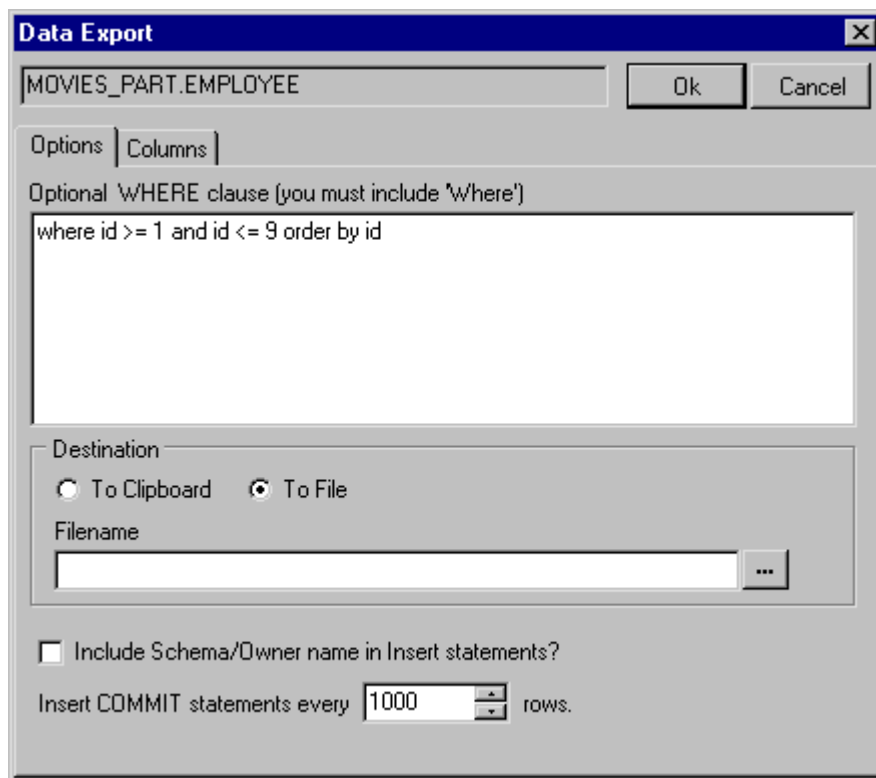
In this example, the following selection is copied to the clipboard:

CUSTOMER\_ID, CITY, ZIP\_CODE,

### To export table data in a certain order

In the **Data Export window**, which is accessible from the **Schema Browser window > Tables page > Export Data button**, you can export table data to either a file or the clipboard. If you want to filter out only certain records, enter the WHERE clause in the where textbox on the **Options tab**.

If you want to sort the data further, add an “ORDER BY” clause after the “WHERE” clause. TOAD adds the entire string onto the end of the SQL and executes it.



**To filter out schemas that do not contain objects from the schema dropdown list**

If you have a database where only a few schemas contain objects, e.g. tables, views, etc., and all other schemas are used as end-user logins, go to the **View > Options > Schema Browser > Page 1** tab, and check **Only show users that own objects in dropdown lists**.

# Create/Alter Table

This chapter discusses the Create Table and Alter Table functions.

## Create Table

*NOTE: TOAD does not support the following functionality at this time: foreign key references, composite partitions, subpartitions, LOB storage, Varrays.*

You get to this dialog via the **Create > Table** menu item or from the **Schema Browser** window > **Tables** page > **Create Table** button.

This window lets you create a new Oracle table.

Use this dialog to enter the table information; then click the **Execute** button to create the Table. This is easier than remembering the Oracle syntax for this command.

The **Schema** box has a dropdown. Enter the name of the table in the **Name** textbox. The Table window is divided into tabs: Columns, Organization, Partitions, and Comments. The **Show SQL** button displays a SQL Statement window that contains the associated SQL statement.

**Standard Table** radio button

Select Standard Table if you want a normal relational table.

**Global Temporary Table** radio button

Select this if you want a table whose data is only visible for the current session.

**Index-Organized Table** radio button

Select this if you want a table whose data rows are stored in the primary key index.

**Clustered Table** radio button

Select this if you want a table that is part of a cluster.

**Advanced Queuing** radio button

Select this if you want to create an advanced queuing table.

**Columns Tab****State**

The first column is the state column. This displays the state of the table column by using bitmaps: + (plus) for an add column, - (minus) for a drop column, triangle for a changed column, cobweb for a set unused column.

**Name**

This displays the name of the table column. For new tables, this is where you type in the name of your table.

**Data Type**

This is the data type for the table column. The data type dropdown lists the native Oracle data types first, followed by the ANSI data types, and then (if using Oracle 8) the user-defined object types. A dashed line separates the different groups of data types. For new tables you would select a data type from the dropdown. *Also see the Data Types Options section of this chapter, page 350.*

**Size**

This displays the size of the data type when applicable. This is sometimes automatically generated based on the data type you select from the dropdown. If you want to change the size, click in the box and either type a value or use the Up/Down arrows to scroll through the numbers.

**Precision**

This displays the precision of the data type when applicable.

**Scale**

This displays the scale of the data type when applicable.

**Nullable**

Click in the box to check/uncheck. If checked, the column can accept a null value.

**Primary Key**

Click in the box to check/uncheck. If checked, the column is a primary key.

**Unique**

Click in the box to check/uncheck. If checked, a unique constraint exists for the column.

**Ref**

Click in the box to check/uncheck. If checked, the data type is a ref object. This is for object data types only.

**Default**

This is the default column value for new rows. Click in the box to enter a default column value.

**Constraint**

This is the column constraint expression. Click in the box to enter a constraint expression.

**Comment**

This is the column comment. Click in the box to enter a comment.

Editing buttons**Add** button

This adds a new blank row into the columns grid.

**Drop** button

This deletes the selected column. (In the Alter function, this marks a column for a drop.) This function is only enabled if you have Oracle 8.1.5, or later, because that is when this function was introduced.



**Unused** button

This sets the selected column to unused. This is for the **Alter** function only and is disabled in the Create Table function. This function is only enabled if you have Oracle 8.1.5, or later, because that is when this function was introduced.

Hot Keys

<Ins>	Add
<Ctrl><Del>	Drop
<Home>	Go to first column in grid
<End>	Go to last column in grid
<Ctrl><Home>	Go to first row in grid
<Ctrl><End>	Go to last row in grid

**Organization Tab**

## Table Type

The Table Type frame contains radio buttons that, when selected, enable or disable the associated parameter options.

Segment Attributes

These options are enabled when you select either the Standard Table radio button or the Index-Organized table radio button.

**Percent Free** entry box

This is the percentage of space in the data block that is reserved for updates.

**Percent Used** entry box

This is the minimum percentage of used space that Oracle maintains for each data block of the table.

**Initial Trans** entry box

This specifies the initial number of transaction entries allocated within each data block that is allocated to the table.

**Max Trans** entry box

This specifies the maximum number of concurrent transactions that can update a data block allocated to the table.

Storage

Dropdowns let you specify the storage characteristics for the table.

**Tablespace** textbox/dropdown

This specifies the tablespace in which Oracle will create the table.

**Logging** checkbox

If checked, the creation of the table will be recorded in the redo logs.

### Index-Organized Parameters

These options are enabled if you select the Index-Organized radio button.

#### **Threshold Pct** box

This is the percentage of space reserved in the index for the data row.

#### **Key Compression** checkbox

If checked, this enables key compression, which eliminates repeated occurrences of primary key column values. This function is only enabled if you have Oracle 8 or later.

#### **Columns** box

This is the number of prefix primary key columns to compress.

#### **Overflow** checkbox

If checked, data rows that exceed the threshold pct will be placed in an overflow data segment.

#### **Overflow Column** dropdown

This lets you specify a column at which to divide a table into index and overflow portions. You can select a column from the dropdown list.

### Cluster Parameters

These options are enabled if you select the Clustered Table radio button.

#### **Cluster** textbox/dropdown

Enter or select the name of the cluster to which the table will belong.

#### **Columns** checkboxes list

Check the columns that will correspond to the cluster columns.

### Partitions Tab

*The Partitions tab is not present if you are creating an Index-Organized table.*

You select columns from the **Available Columns** list to determine which columns the partition will be based upon. Double-click on the column name (or click on the column and click the single right arrow) to move the selected columns into the **Partitions Columns** list.

#### **Add a Partition**

Once you select columns for the partitions to be based upon, you can add a partition.

For **range partitions**, you do this by clicking the **Add** button. The Add Partition dialog displays, and you can provide a partition name. You must enter the upper range for each column within the partition or select **Maxvalue** from the dropdown list on that dialog. (NOTE: String value upperbounds must be enclosed in single quotes within the grid, e.g. for a Last Name column with a datatype of varchar2, an upper bound could be 'Smith'. The single quotes must be entered into the grid.)

To add a **hash partition**, select the tablespaces to use for the hash partition by checking the appropriate checkboxes next to the tablespaces.

**Comments Tab**

This is where you can type in a description for the table.

**Queue Tab**

This tab displays if you are creating an Advanced Queuing table.

*Refer to TOAD Help for more information about Advanced Queuing tables.*

## Alter Table

*NOTE: TOAD does not support hash partitions at this time.*

You get to this window from the **Schema Browser > Tables** page > **Alter Table** button. This window lets you drop, modify, and add columns; change storage parameters; change data type; add not null constraints; and set unused columns. It is the same window as the Create Table window, but you are using it to make modifications to an existing table.

To alter a table, select a table from the objects list, and click the Alter Table button. The Table window will automatically display the **Schema** and the **Name** for the table you selected.

The Table Type radio buttons are disabled, because you can't alter the table type.

**Standard** radio button

This is a normal relational table.

**Global Temporary** radio button

This is a table whose data is only visible for the current session.

**Index-Organized** radio button

This is a table whose data rows are stored in the primary key index.

**Clustered** radio button

This is a table that is part of a cluster.

**Advanced Queuing** radio button

A queue table is a database tables that stores one or more queues.

### **Columns Tab**

#### **State**

The first column is the state column. This displays the state of the table column by using bitmaps: + (plus) for an add column, - (minus) for a drop column, triangle for a changed column, cobweb for a set unused column.

#### **Name**

This function is disabled because you cannot change the tablename. This displays the name of the table column. For new tables, this is where you type in the name of your column.

#### **Data Type**

This is the data type for the table column. The data type dropdown lists the native Oracle data types first, followed by the ANSI data types, and (if using Oracle 8) the user-defined object types. A dashed line separates the different groups of data types. For new tables, you would select a data type from the dropdown.

In the Alter window, you can change the data types. If there is no data in the table, you can change the datatype to any datatype as long as there are no rows in the table. *Also see the Data Types Options section of this chapter, page 350.*

#### **Size**

This displays the size of the data type when applicable. This is sometimes automatically generated based on the data type you select from the dropdown. If you want to change the size, click in the box and either type a value or use the Up/Down arrows to scroll through the numbers.

#### **Precision**

This displays the precision of the data type when applicable.

**Scale**

This displays the scale of the data type when applicable.

**Nullable**

Click in the box to check/uncheck. If checked, the column can accept a null value.

**Primary Key**

You cannot check/uncheck the Primary Key checkbox in the Alter window. The Primary Key designations cannot be altered. (If checked, the column is a Primary Key.)

**Unique**

You cannot check/uncheck the Unique checkbox on an existing column in the Alter window. The Unique designations cannot be altered. (If checked, a unique constraint exists for the column.)

**Ref**

Click in the box to check/uncheck. If checked, the data type is a ref object. This is for object data types only.

**Default**

This is the default column value for new rows. Click in the box to enter a default column value.

**Constraint**

This is the column constraint expression. Click in the box to enter a constraint expression.



**Comment**

This is the column comment. Click in the box to enter a comment.

Editing buttons**Add** button

This adds a new blank row into the columns grid.

**Drop** button

This marks a column for a drop. This function is only enabled if you have Oracle 8.1.5, or later, because that is when this function was introduced.

**Unused** button

This sets the selected column to unused. This is for the **Alter** function only and is disabled in the Create Table function. This function is only enabled if you have Oracle 8.1.5 or later, because that is when this function was introduced.

Hot Keys

<Ins>	Add
<Ctrl><Del>	Drop
<Home>	Go to first column in grid
<End>	Go to last column in grid
<Ctrl><Home>	Go to first row in grid
<Ctrl><End>	Go to last row in grid

**Organization Tab****Segment Attributes**

These options are enabled when you have either a Standard Table or an Index-Organized table.

**Percent Free** entry box

This is the percentage of space in the data block that is reserved for updates.

**Percent Used** entry box

This is the minimum percentage of used space that Oracle maintains for each data block of the table.

**Initial Trans** entry box

This specifies the initial number of transaction entries allocated within each data block that is allocated to the table.

**Max Trans** entry box

This specifies the maximum number of concurrent transactions that can update a data block allocated to the table.

**Storage**

Dropdowns let you change the storage characteristics for the table.

**Tablespace** textbox/dropdown

The tablespace cannot be altered. The tablespace textbox specifies the tablespace in which Oracle will create the table.

**Logging** checkbox

If checked, it indicates the creation of the table will be recorded in the redo logs.

Index-Organized Parameters

These options are enabled if you have an Index-Organized Table.

**Threshold Pct** box

This is the percentage of space reserved in the index for the data row.

**Key Compression** checkbox

If checked, this enables key compression which eliminates repeated occurrences of primary key column values. This function is only enabled if you have Oracle 8 or later.

**Columns** box

This is the number of prefix primary key columns to compress.

**Overflow** checkbox

If checked, data rows that exceed the threshold pct will be placed in an overflow data segment.

**Overflow Column** dropdown

This lets you specify a column at which to divide a table into index and overflow portions. You can select a column from the dropdown list.

### Cluster Parameters

These options are enabled if you have a Clustered Table.

#### **Cluster** textbox/dropdown

Enter or select the name of the cluster to which the table will belong.

#### **Columns** checkboxes list

Check the columns that will correspond to the cluster columns.

### Partitions Tab

If the partitions tab displays, you select columns from the **Available Columns** list to determine which columns the partition will be based upon. Double-click on the column name (or click on the column and click the single right arrow) to move the selected columns into the **Partitions Columns** list.

#### **Add a Partition**

Once you select columns for the partitions to be based upon, you can add a partition.

For **range partitions**, you do this by clicking the Add button. The Add Partition dialog displays, and you can provide a partition name. You must enter the upper range for each column within the partition, or select **Maxvalue** from the dropdown list on that dialog. (NOTE: String value upperbounds must be enclosed in single quotes within the grid, e.g. for a Last Name column with a datatype of varchar2, an upper bound could be 'Smith'. The single quotes must be entered into the grid.)

To add a **hash partition**, select the tablespaces to use for the hash partition by checking the appropriate checkboxes next to the tablespaces.

**Comments tab**

This is where you can type in a description for the table.

## Data Types Options

The Data Types Options page is accessed through the **View > Options > Data Types** item. The options that are checked will appear as items in the Data Types dropdown in the Create Table and Alter Table windows.

The screenshot shows the 'Data Types Options' dialog box. It is divided into two main sections: 'Native Oracle Types' on the left and 'ANSI Types' on the right. Each section contains a list of data types with checkboxes next to them. Below each list are 'Select All' and 'Select None' buttons. At the bottom of the dialog, there is a checkbox labeled 'Include Object Types (Oracle 8)' which is currently checked.

Native Oracle Types	ANSI Types
<input checked="" type="checkbox"/> BFILE	<input checked="" type="checkbox"/> CHAR VARYING
<input checked="" type="checkbox"/> BLOB	<input checked="" type="checkbox"/> CHARACTER
<input checked="" type="checkbox"/> CHAR	<input checked="" type="checkbox"/> CHARACTER VARYING
<input checked="" type="checkbox"/> CLOB	<input checked="" type="checkbox"/> DECIMAL
<input checked="" type="checkbox"/> DATE	<input checked="" type="checkbox"/> DOUBLE PRECISION
<input checked="" type="checkbox"/> FLOAT	<input checked="" type="checkbox"/> INT
<input checked="" type="checkbox"/> LONG	<input checked="" type="checkbox"/> INTEGER
<input checked="" type="checkbox"/> LONG RAW	<input checked="" type="checkbox"/> NATIONAL CHAR
<input checked="" type="checkbox"/> MLSLABEL	<input checked="" type="checkbox"/> NATIONAL CHAR VARYING
<input checked="" type="checkbox"/> NCHAR	<input checked="" type="checkbox"/> NATIONAL CHARACTER
<input checked="" type="checkbox"/> NCLOB	<input checked="" type="checkbox"/> NATIONAL CHARACTER VARYING
<input checked="" type="checkbox"/> NUMBER	<input checked="" type="checkbox"/> NCHAR VARYING
<input checked="" type="checkbox"/> NVARCHAR2	<input checked="" type="checkbox"/> NUMERIC
<input checked="" type="checkbox"/> RAW	<input checked="" type="checkbox"/> REAL
<input checked="" type="checkbox"/> ROWID	<input checked="" type="checkbox"/> SMALLINT
<input checked="" type="checkbox"/> UROWID	<input checked="" type="checkbox"/> VARCHAR
<input checked="" type="checkbox"/> VARCHAR2	

☒ Include Object Types (Oracle 8)

Types are listed in the Native Oracle Types panel and the ANSI Types panel. **Select All** and **Select None** buttons are in each panel. You can check and uncheck the individual types. The types checked are the only ones that will be included in the Table Data Types dropdown. You can also check or uncheck the **Include Object Types (Oracle 8)** checkbox.

# Create/Alter Index

This chapter discusses the Create and Alter Index functionality.

## Create Index

*NOTE: TOAD does not support the following functionality at this time: domain indexes, composite partitions, some features of hash partitioning (ability to name individual partitions, currently they are system generated), and subpartitions.*

You get to this dialog via the **Create > Index** menu item or from the **Schema Browser** window > **Indexes** page > **Create New Index** button. Indexes can speed up execution by providing a faster path to access table data.

Use this dialog to select a schema owner and tablename. Then, on the **Create Index** tab, select whether you want to create a Primary Key index, Unique index, Non-Unique Index, or a Bitmap index. Select the index columns and optional storage parameters.

### Schema dropdown

The top Schema dropdown lets you select the schema in which the index will reside.

### Name textbox

The Name textbox lets you designate the name of the new index.

### Index tab

**Create Index**

Schema: JSMITH  
Name: EMP

Index | Physical Attributes | Partitions

☒ Table Index ☐ Cluster Index

Schema: JSMITH  
Table: EMPLOYEE  
Type: GLOBAL

Table columns  
COMMISSION  
DEPARTMENT\_ID  
EMPLOYEE\_ID  
FIRST\_NAME  
HIRE\_DATE  
JOB\_ID  
LAST\_NAME  
MANAGER\_ID  
MIDDLE\_INITIAL  
SALARY

Index columns  
asc column

☒ Non-unique ☐ Unique ☐ Primary Key ☐ Bitmap ☐ Function ... ☐ Not sorted ☐ Reverse

Options  
Logging: Default Tablespace:   
☐ Parallel:   
☐ Compute Statistics ☐ Online  
Key compression  
☐ Compress ☐ No Compress columns

Show SQL OK Cancel



**Table Index** radio button

Select the Table Index button if you want an index based on a table. This button is already selected by default.

**Cluster Index** radio button

Select the Cluster Index button if you want an index based on a cluster.

**Schema** dropdown

Select the schema where the table or cluster to be indexed resides. This loads either the tables or the clusters for that schema into the Table/Cluster dropdown box that is under the schema dropdown.

**Table/Cluster** dropdown

This dropdown is where you select the table or cluster on which to create the index. If you select the Table Index radio button, the dropdown is a Table dropdown. If you select the Cluster Index radio button, the dropdown is a cluster dropdown. When you select a table, the columns display in the Table Columns list box.

**Type** dropdown

This is only enabled if the table on which the index is to be based is partitioned. When enabled, the dropdown choices are **Global** and **Local**.

**Table Columns** list box

This panel displays the columns for the tables you've selected.

You move items from the Table Columns list to the Index Columns list with a double-click or a drag-and-drop. If you move a column from the Table Columns list box to the Index Columns list box, and you specify that the index will be comprised of this column, the ASC checkbox is automatically checked for the item indicating the default sort order for the column.

**Index Columns**

This panel displays the table columns that you selected for the index, as well as the order ASC or DESC (ascending or descending) for the column within the index. The default order is ascending unless the item is unchecked.

**Unique** radio button

Select this to specify that the values of the column(s) upon which the index is based must be unique. (This is usually not recommended. Oracle recommends using UNIQUE integrity constraints when the table is created.)

**Non-unique** radio button

If you select this, unique constraints will not be enforced.

**Bitmap** radio button

This specifies that the index is to be created as a bitmap rather than as a B-tree. This is most appropriate for applications that have low levels of concurrent transactions, like warehousing. This function is only enabled if you have Oracle 8 or later.

**Primary Key** radio button

This creates a primary key constraint on the specified table, with the same name as the provided index name, and based on the selected columns.

**Not Sorted** checkbox

A check in this checkbox indicates to Oracle that the rows are stored in the database in ascending order. So, Oracle does not have to sort the rows when creating the index. The Not Sorted checkbox is mutually exclusive with the Reverse checkbox. You cannot choose both. This function is only enabled if you have Oracle 8 or later.

**Reverse checkbox**

If this box is checked, the bytes of the index block are stored in reverse order. The Reverse checkbox is mutually exclusive with the Not Sorted checkbox. You cannot choose both. This function is only enabled if you have Oracle 8 or later.

Options**Compute Statistics checkbox**

A check in this box lets you collect statistics during the creation of the index. These statistics are stored in the data dictionary for ongoing use by the optimizer in choosing a plan of execution for SQL statements. This function is enabled if you have Oracle 8.1 or later.

**Online checkbox**

If this option is checked, TOAD will allow DML operations on the table during creation of the index. This function is only enabled if you have Oracle 8 or later.

**Parallel checkbox**

This option enables or disables the Parallel edit field. If this option is checked, it causes Oracle to select a degree of parallelism equal to the number of CPUs available on all participating instances times the value of the `PARALLEL_THREADS_PER_CPU` initialization parameter. If a value is specified, it represents the degree of parallelism, which is the number of parallel threads used in the parallel operation. Each parallel thread may use one or two parallel execution servers. Oracle usually calculates the optimum degree of parallelism; so it's not necessary to specify a value. This option is unchecked (no parallel) by default.

**Logging** dropdown (Default, Logging, No Logging) *for Oracle 8 and later*  
**Recoverable** dropdown (Default, Recoverable, Unrecoverable) *for prior to Oracle 8*

This dropdown lets you specify whether the creation of the index will be logged (Logging) or not logged (No Logging) in the redo log file. It also specifies that subsequent Direct Loader (SQL\*Loader) and direct-load INSERT operations against the index are logged or not logged, depending on your choice. The default is "Default" which means the statement will not be included in the DDL script creation.

Versions prior to Oracle 8 refer to this concept as **Recoverable**. For versions before Oracle 8, instead of Logging, the option will display as Recoverable, and the dropdown choices will be Default, Recoverable, and Unrecoverable.

#### **Tablespace** dropdown

This is where you specify the name of the tablespace to hold the partition. If you do not specify a tablespace name, Oracle will create the index in the default tablespace of the owner of the schema containing the index.

#### Key Compression radio buttons

*The Key Compression radio buttons are only enabled if you have Oracle 8 or later.*

#### **Compress** radio button

The Compress radio button enables or disables the Compress columns input field. If you select Compress, you'll need to enter the number of columns to compress. If you select Compress, you enable key compression, which eliminates repeated occurrences of key column values and might substantially reduce storage.

**Value box**

The Value box lets you specify the prefix length (the number of prefix columns to compress). You'll need to fill in this box if you select the Compress option.

For Unique indexes, the valid range of prefix length values is from 1 to the number of key columns minus 1. The default prefix length is the number of key columns minus 1.

For nonunique indexes, the valid range of prefix length values is from 1 to the number of key columns. The default prefix length is the number of key columns.

Oracle compresses only nonpartitioned indexes that are nonunique or unique indexes of at least two columns.

**No Compress radio button**

If you select No Compress, you disable key compression.

**Show SQL button**

This displays the SQL statement for the Index Create DDL.

**OK button**

This gives the command to Create the index.

**Cancel**

This displays a confirmation dialog, and if you answer **OK** to the confirmation, TOAD will discard the changes and close the Index window.

**Physical Attributes tab**

The **Percent Used** field is irrelevant for Create Index; so it is disabled.

**Partitions tab**

The **Available Columns** are the same columns that you selected as the columns for the index (except for columns with certain datatypes: BLOB, CLOB, NCLOB, BFILE, ROWID, UROWID, MLSLABEL). You select columns from the Available Columns list to determine which columns the partition will be based upon. Every partition created for the index is based on the same column list. Once partitions are created on this screen and columns are removed, the created partitions should be removed.

**Add a Partition**

Once you select columns for the partitions to be based upon, you can add a partition.

For **range partitions**, you do this by clicking the **Add** button. The **Add Partition** dialog displays, and you can provide a partition name. You must enter the upper range for each column within the partition or select **Maxvalue** from the dropdown list on that dialog. (NOTE: String value upperbounds must be enclosed in single quotes within the grid, e.g. for a Last Name column with a datatype of varchar2, an upper bound could be 'Smith'. The single quotes must be entered into the grid.)

To add a **hash partition**, select the tablespaces to use for the hash partition. Quantity is irrelevant for hash partitions based on Indexes; so quantity is disabled.

You can alter indexes through the **Schema Browser > Indexes tab > Modify** button.

## Alter Index

This is accessed through the **Schema Browser > Indexes** tab (select an index) > **Modify** button.

This window lets you modify (or alter) the selected index.

### **Schema** dropdown

This is the schema in which the index resides. It cannot be altered; so the dropdown is disabled.

### **Name** textbox

This defines the name of the index. You can alter it.

### **Index** tab

#### **Deallocate Unused Space** checkbox

If checked, this tells Oracle to explicitly deallocate unused space at the end of the index. This makes the freed space available for other segments in the tablespace. Only unused space above the high water mark can be freed. If checked, the **Keep** box is enabled.

#### **Keep** box

This specifies the number of bytes above the high water mark that the index will have after deallocation.

#### **Bytes** dropdown

You can choose **Kilobytes** or **Megabytes**. The default is Kilobytes.

Deallocate Unused Space is mutually exclusive with Allocate New Extent. If one is checked, the other gets unchecked automatically. You cannot choose both.

**Allocate New Extent** checkbox

If checked, this explicitly allocates a new extent for the index. For a local index on a hash-partitioned table, Oracle allocates a new extent for each partition of the index. If checked, the **Size** box is enabled.

**Size**

This specifies the size of the extent in bytes. If Size is omitted, Oracle determines the size based on the values of the index's storage parameters.

**Bytes** dropdown

You can choose **Kilobytes** or **Megabytes**. The default is Kilobytes.

Allocate New Extent is mutually exclusive with Deallocate Unused Space. If one is checked, the other gets unchecked automatically. You cannot choose both.

**Options****Mark Unusable** checkbox

If checked, this marks the index as unusable. If an index is marked as unusable, it must be rebuilt or dropped and recreated before it can be used.

**Coalesce** checkbox

If checked, this tells Oracle to merge the contents of index blocks wherever possible to free blocks for reuse.

**Parallel** checkbox

If checked, this alters the parallel value used during the create process.



**Logging** radio button and **No Logging** radio button

These radio buttons change the logging value used during create.

**Storage** tab

This is where you specify the storage parameters.

For the **Buffer Pool**, a dropdown lets you choose **Default**, **Keep**, and **Recycle**. This function is enabled only if you have Oracle 8.1 or later.

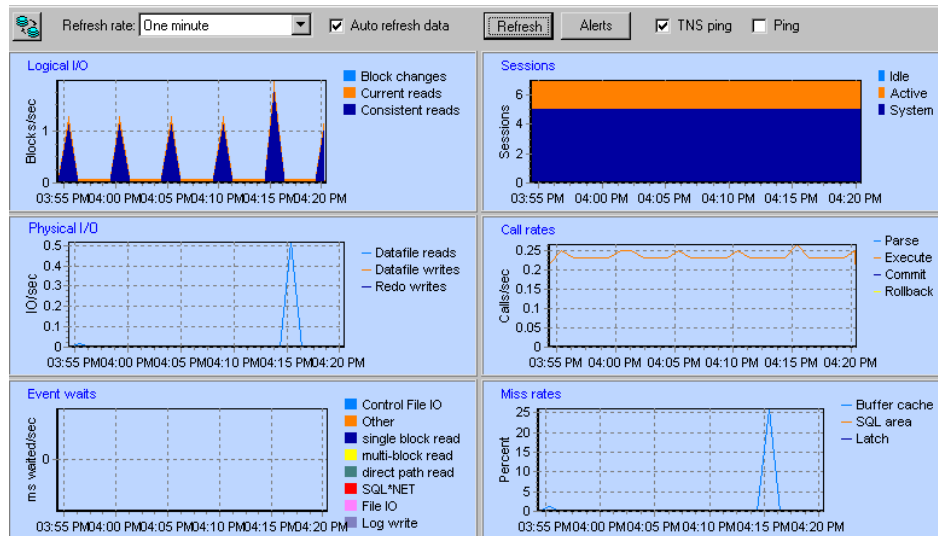


# DBA

TOAD DBA adds database administration functionality for common database management tasks throughout base TOAD.

Most of the DBA menu items are enabled only if you have the optional TOAD DBA Module.

## Database Monitor



Database Monitor lets you monitor database performance with the following charts: Logical I/O, Physical I/O, Event Waits, Sessions, Call Rates, Miss Rates, SGA Memory, Shared Pool, and Indexed Queries Percent. A horizontal scrollbar lets you scroll and see the last three graphs listed.

Database Monitor must be launched in order to work. You can launch it manually, or you can set Monitor to launch automatically by checking the **Open a monitor window for each connection** checkbox on the **View > Options > DBA** page.

### TNS Ping checkbox

If checked, TOAD will ping the Oracle server (using TNS ping) before it runs the query to refresh the data on the charts.

**Ping checkbox**

If checked, TOAD will perform a TCP/IP ping to the Oracle server before it runs the query.

Right-click on a graph to access a Right-Click Menu that contains the menu items **Zoom** (displays the enlarged graph in its own window) and **Print**.

You can set up numerous thresholds and alerts in the **View > Options > Monitors – Database** page.

Series	Minimum	Maximum
Block changes		
Current reads		
Consistent reads		
Idle		
Active		
System		
Datafile reads		
Datafile writes		
Redo writes		
Parse		
Execute		
Commit		
Rollback		
Control File IO		
Other event waits		
Single block read		
Multi-block read		
Direct path read		
SQL*NET		
File IO		
...		

Clear

Email...

☒ Enable alerts

☒ Use Tray Icon

Each item in the series list corresponds to one line on the graph. You can enter the minimum and maximum threshold values.

Checkboxes let you **Enable alerts** and **Use Tray Icon**. If Enable alerts is checked, TOAD alerts you when a threshold has been exceeded. Use Tray Icon will display a blinking TOAD icon in your system tray if you have an alert, and you have enabled alerts. A non-blinking TOAD icon indicates that you don't have alerts. The Database Monitor window must be open for alerts to be enabled. (In Windows NT you can click on the blinking TOAD, and the Database Monitor window will display in the foreground). You can also have alerts emailed to you.

The **Email** button invokes the **Email Alerts** window which is where you set up the sender and receiver information.

*You should consult your email administrator to determine the proper settings.*

#### **From box**

Enter your email address. When the alerts are sent they will be treated as coming from this address.

#### **To, Cc, Bcc boxes**

Enter the recipients' email addresses.

#### **From Name box**

This is the name that the email recipient will see for the sender.

#### **Subject**

This is the subject of the email. The default entry is TOAD Database Monitor Alert, but you can edit this if you wish.

The body of the email will contain the alert message.

**NOTE: The SMTP Server must be specified and might not be the same as the exchange server.**

**Port**

This is the port number on the machine where the SMTP server is listening. The default is 25.

If you click the **Alerts** button, a history of alerts will display. Alerts are stored in memory until you close Database Monitor or press **Clear** in the Alerts window.

## Instance Manager

You access this window via the DBA > Instance Manager menu item.

This window monitors the state of servers and listeners on the network, and provides DBAs with a way to start up and shut down servers from within TOAD.

**NOTE: You cannot start up/shut down an Oracle 7 server from an 8i client.**

### Instance Manager Options

Access Instance Manager options via the View > Options > Instance Manager page.

#### **Servers to Poll**

This lets you select the list of servers that you want to poll.

#### **Alert when down on**

This lets you select which servers you want to be emailed about when they are determined to be down. If Enable Alerts is not checked, no alert will be sent regardless of which servers are checked in the Alert when down on panel.

#### **Email**

The Email button invokes the Email Alerts window which lets you configure how and where TOAD will send the email alerts.

The email is sent via SMTP (Simple Mail Transfer Protocol). You must have a server that will let you send SMTP email through it.

Enter the **To** and **From** addresses. **CCs** (Carbon Copies) and **BCCs** (Blind Carbon Copies) are optional.



You can change the **From name** and the **Subject** line. The default from is TOAD and the default subject is TOAD Instance Manager Alert.

If necessary, enter the **SMTP server**, **User ID**, and **Port** where you send your email. If you do not know this information, contact your network administrator for help.

#### **Enable email alerts**

Default - Checked

If checked, alerts are sent to you when one of the servers goes down. Unchecked, no alerts will be sent.

Alerts are sent whenever TOAD polls a server (node), listener, or database and finds it down or inaccessible.

#### **Use Tray Icon**

Default – Checked

If checked, a TOAD icon displays in your system tray whenever alerts are enabled. When there is an alert, if the Enable email alerts checkbox is checked and if Instance Manager is in the background (not in focus), the toad will blink alerting you to the server, database, or listener failure, until you look at Instance Manager. If you are in Windows NT or 2000, then double-clicking on the blinking TOAD will bring Instance Manager into the foreground.

#### **Poll upon Opening**

Default – Checked

If checked, TOAD will immediately poll the selected servers when Instance Manager is first opened.

## **Instance Manager Window**

### **Refresh Rate** dropdown

Select the appropriate time frame to automatically refresh your data. If the Auto refresh data checkbox is unchecked, the data will not be refreshed regardless of the refresh rate checkbox selection.

### **Auto refresh data**

Checked, this option automatically refreshes the data according to the rate you have set in the Refresh Rate dropdown. Unchecked, you will have to refresh the data manually.

### **Polling Priority** dropdown

The thread that is cycling through the database will be assigned an operating system priority that you select from the dropdown. If you select Idle, the thread will only execute when the system is idle.

### **Refresh** button






Click this button to refresh the info about your databases. You can also set the Instance Manager to refresh itself automatically and set how often it refreshes.



### **Status** tab

Displays the status of the Node, Listener, and Database.

The Instance Manager uses TNS Ping to determine whether a listener is available. The location of TNS Ping is configured under View > Options > Executables. If TNS Ping returns the IP address of the host, Instance Manager uses Ping to determine whether the server (Node) is available. The Instance Manager pings the Database and displays the result.

Status	Status change history	Detail Log				
Server	Node	Listener	Database	Version	Logon info for database test	
Beq-Local.world	?	✓	?			
ORA734.world	✓	✓	?			
ORA805.world	✓	✓	?			
ORA81_CARY.world	✓	✓	?			
Tcp-loopback.world	✓	✗	?			

-  Unknown. The status is unknown (can't be determined).
-  Node red x – unable to ping the server
  - Listener red x – tns ping did not return a response
  - Database red x – an Oracle test connection failed
-  Node green check – able to ping the server
  - Listener green check – tns ping returned a response
  - Database green check - database is started, mounted, and open
-  Started - The red check displays in the Database column when the database has been started, but not mounted or opened.
-  Mounted - The yellow check displays in the Database column when the database has been started and mounted but is not open.

Status	Status change history	Detail Log			
Server	Node	Listener	Database	Version	Logon info for database test
SOLO2000.world				8.1.6.0.0	KSCOTT@SOLO2000.world

You can select a database and **Startup**, **Shutdown**, or **Alter** the status of the selected database.

### Startup window

This window requires a **User** and **Password**. For the User name you'll need to enter a user who has SYSDBA or SYSOPER privileges.

The **Connect as** dropdown lets you choose **SYSDBA** or **SYSOPER**.

Startup options let you Open, Mount, or Nomount.

**Open** – Open opens the database so anyone can use it.

**Mount** – Mount lets you connect as SYSDBA. This is useful, if for instance you want to change parameters through an Oracle Utility, and they are parameters you can't change when the Database is open, such as Archive Log Mode.

**Nomount** – Nomount puts the database into the started mode.

### **Force**

If you try to Startup an instance of a database that is already running, the command will result in an error. The Force checkbox lets you restart a database, which you might want to do during debugging or under other conditions. If checked, it will shut down the current Oracle instance using the Shutdown mode Abort. Then TOAD will continue with its startup procedures.

### **Exclusive**

If checked, the database can only be mounted and opened by the current instance. It cannot be opened simultaneously by multiple instances. Exclusive cannot be used with SHARED, PARALLEL, or NOMOUNT.

If no mounting option is specified, EXCLUSIVE will be assigned by default.

Unchecked, the database can be opened simultaneously by multiple instances, making SHARED, PARALLEL, and NOMOUNT possible.

### Shutdown window

**NOTE: On 7.3.4 clients, you cannot shut down 7.3.4 databases that are not open. So, for databases that are unmounted or mounted, you must use Server Manager (svrmgr23) to shut them down.**

This window requires a **User** and **Password**. For the User name you'll need to enter a user who has SYSDBA or SYSOPER privileges.

The **Connect as** dropdown lets you choose **SYSDBA** or **SYSOPER**.

Shutdown mode lets you choose **Normal**, **Immediate**, or **Abort**.

After shut down, an X displays in the database column, and the shut down action displays in the Status history and the Details log.

When TOAD shuts down a database, it creates a folder called DBA and in the folder it creates an init.ora file. This file contains the parameters information, so that if you restart the database, by default, the parameter file window will point to this file.

### Alter window

This window lets you alter the state of the database to Mount or Open. You have to mount the database before you can open it.

Error messages from these windows go to  
<TOAD directory>\DBA\StartupShutdownLog.txt.

The contents of this file are displayed on the Detail Log tab.

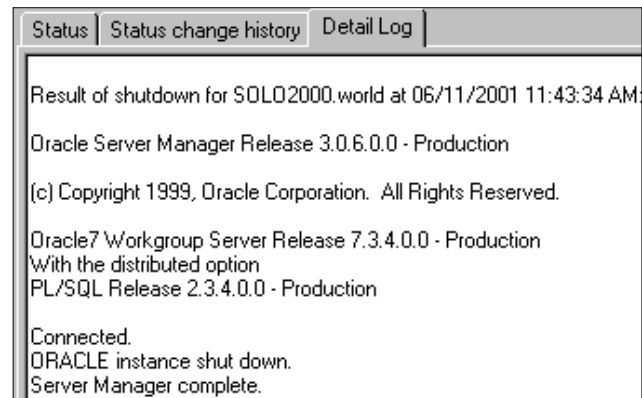
### **Status change history tab**

This shows each time TOAD found a different result from its previous round of polling.

Status	Status change history	Detail Log			
Server	Item	From	To	Date	Time
SOLO2000.world	Database	unknown	up	06/11/2001	11:37:47 AM
SOLO2000.world	Database	up	down	06/11/2001	11:43:34 AM
SOLO2000.world	Database	down	unmounted	06/11/2001	11:55:10 AM
SOLO2000.world	Database	unmounted	down	06/11/2001	11:57:12 AM
SOLO2000.world	Database	down	up	06/11/2001	12:02:08 PM
SOLO2000.world	Database	up	down	06/11/2001	12:02:37 PM
SOLO2000.world	Database	down	mounted	06/11/2001	12:02:49 PM
SOLO2000.world	Database	mounted	down	06/11/2001	12:03:19 PM

### Detail Log tab

Displays the details, such as shutdown. It contains a **Clear** button that you can click to clear the information.



### Logon info for database test dropdown

Click in the cell of the row you want to select to activate the dropdown. The items are **Do not test** and **New**.

If you click **New**, a New connection window opens. You'll need to enter your **User Name** and **Password** and click **OK**. That information is then populated into the Logon info column. Then press **Refresh** to connect and test the database. If the connection is successful, the server version will automatically display in the **Version** column.

The file TOADMotors.ini contains the information configured under View > Options > Instance Manager, as well as the login/password info for the database tests and startup/shutdown actions.

Passwords for Instance Manager will only be saved if **View > Options > Oracle > Save passwords for Oracle Connections** is checked.

### Database Wizard

Databases created with the Database Wizard can be started up and shut down with the Instance Manager. The .bat/.sh script which the wizard creates calls orapwd, the Password File creation utility. This creates a password file to permit the use of a client connection using a SYSDBA privileged account. This, in conjunction with remote\_password\_login = EXCLUSIVE in the pfile (INIT.ORA) is required for starting up and shutting down from the client with a SYSDBA privileged connection (OS authentication alone will not work). The INIT.ORA which the wizard creates sets remote\_password\_login to exclusive to support this. The SYSDBA privilege is also granted to both SYS and SYSTEM.

#### NOTE:

The database to be shut down/started doesn't have to have been created with the Wizard, but a password file is required and remote\_password\_login=EXCLUSIVE must be set in the pfile, typically INIT.ORA or INIT<sid>.ORA.

## Unix Monitor

The Unix Monitor shows performance statistics for Unix machines. You can zoom and print graphs, sort columns, and print the grid (via Grid > Print Grid). It supports Linux, Sun OS 5.7 and 5.8, and HP-UX 11.0. *See the note at the end of this section about support for AIX.*

RExec is the Unix command used to drive the monitor, so it must be installed and enabled. Iostat is the command used to get the Disk IO information, so it must be installed. The other commands Unix Monitor uses are vmstat and ps to obtain CPU information and process queues and lists.

Click the **Connect** button.

The **Connection Information** window displays.

In the **Host/IP** box enter your Host name or IP address.

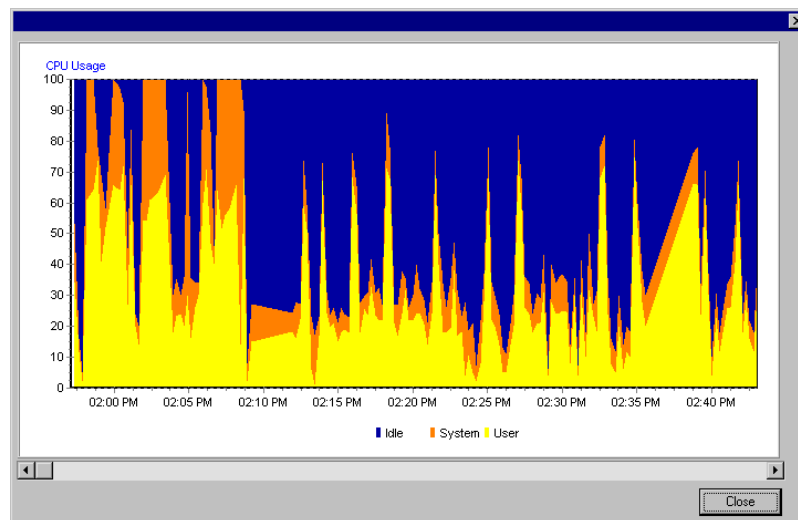
In the **User** box enter the User name.

In the **Password** box enter the password.

The **Refresh Rate** dropdown lets you select the auto refresh rate.

The **Auto Refresh** checkbox activates the auto refresh.

After the graphs initialize, they quickly fill in. When the graphs are full (one hour), the data scrolls offscreen but is not cleared. You can see a two hour history via **right-click > Zoom**. (This is also true for the Database Monitor.)



*Zoom displays a selected graph in a large window with a horizontal scrollbar that lets you scroll through the history of the graph.*



You can print the graphs via **right-click > Print**.

The process list displays the top 20 CPU usage processes, sorted by %CPU as a default. Click on a column header to sort by that column.

The Disk IO graph displays device IO sorted by total IO for the drive.

## AIX

There are potential connection issues with AIX that are beyond our control.

On AIX, the rexecd daemon performs a "reverse name lookup" as part of the connection process by default. That means the server verifies the rexec source machine's IP address against its own /etc/hosts file, and denies the connection if the source IP address is not found. For server to server rexecs, this makes sense because the servers often have hard coded and well known IP addresses. For network clients this is often not the case. Few companies want to place the IP addresses of every PC in each server's /etc/hosts file. And many companies use DHCP for their network clients -- so the IP addresses are not well known and not constant. **The solution is to turn off the "reverse name lookup" by editing the /etc/inetd.conf file on the server and adding the -c parameter to the rexecd command. Then either reboot the server or refresh -s inetd.**

## Options

The **View > Options > Monitors - Unix** page contains the following options for saving the layout of the Unix Monitor window: **Save window size**, **Save process list column sizes**, **Save process list column positions**. All are unchecked by default.

The View > Options > DBA page includes an **Open a Unix Monitor at Start up** option.

## Kill/Trace Session

This window lets you view session information, trace sessions, and selectively kill sessions.

If you display the background processes by unchecking the **Exclude Null and System OS Users** checkbox, they will display in light blue. The selected session is highlighted in yellow. The current session is highlighted in red.



*Refresh this screen*



*Kill the Selected Session*



*Start trace for this session*



*Stop trace for this session*

The **Kill the Selected Session** button will be disabled if you don't have the Alter System privilege for the selected session, if the current session is selected, or if a background process is selected.

A toggle bar between the upper and lower panels lets you toggle between the top panel and a split panel.

The upper panel contains tabs for **Processes**, **All Locks**, **Blocking Locks**, **Access**, and **RBS Usage** (Rollback Segments Usage).

The lower panel contains tabs that let you see the **Current Statement**, **Open Cursors**, and **Explain Plan**. You can run an explain plan for another user's query if you have the privilege to Alter Session.

The **View > Options > Startup** page has an option to open a Kill/Trace window at Startup.

The **View > Options > DBA** page has an option to **Save grid layouts on Kill/Trace**.

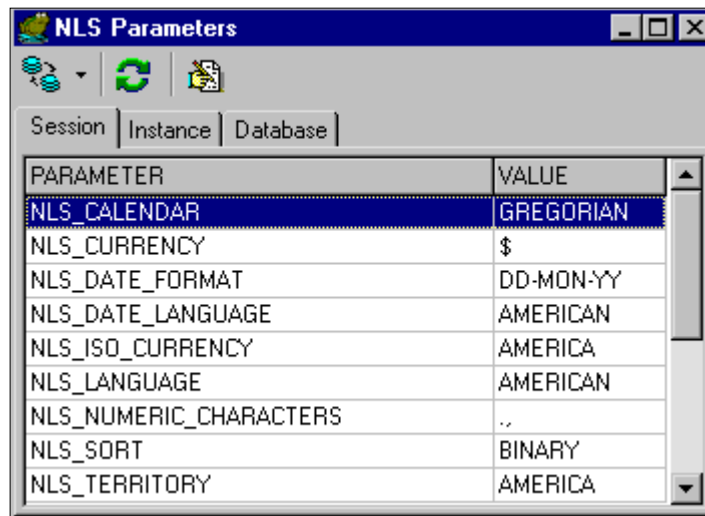
## Orainit Parameters

The DBA Module lets you modify or edit the System Modifiable and Session Modifiable options.

If the option is modifiable (as indicated by a YES), the Edit button will let you edit the setting. Double-clicking on modifiable options also lets you change the setting.

NOTE: If a parameter is both session modifiable and system modifiable, TOAD modifies at the system level.

## NLS Parameters



The screenshot shows a window titled "NLS Parameters" with three tabs: "Session", "Instance", and "Database". The "Session" tab is selected. Below the tabs is a table with two columns: "PARAMETER" and "VALUE". The table contains the following data:

PARAMETER	VALUE
NLS_CALENDAR	GREGORIAN
NLS_CURRENCY	\$
NLS_DATE_FORMAT	DD-MON-YY
NLS_DATE_LANGUAGE	AMERICAN
NLS_ISO_CURRENCY	AMERICA
NLS_LANGUAGE	AMERICAN
NLS_NUMERIC_CHARACTERS	.,
NLS_SORT	BINARY
NLS_TERRITORY	AMERICA

This window is used to view the Session, Instance, and Database parameter settings and to change Session and/or Instance parameters.

The window includes tabs for **Session**, **Instance**, and **Database**.

To change a NLS (National Language Support) setting, double-click on a parameter and enter the new setting in the popup window OR single-click on the parameter line, click the **Edit** button, and enter the new setting in the popup window.

If a parameter cannot be edited, the edit button will be disabled. Session parameters are editable; the others are not.

Notice that changing a value in one cell can cause a change in other cells. For example, if you change the NLS\_TERRITORY from America to Japan, notice the NLS\_CURRENCY symbol changes from the dollar to the yen.

## Extents

This window lets you view the datafile extents information.

Select the desired Object Type from the dropdown: All Objects, Tables, Indexes, Rollback, or Cluster.

Click the **GO** button to fetch the results.

Click the column headers to sort in ascending or descending order: Object Name, Object Type, Tablespace, Size (MB), Initial Extent, Next Extent, Num Extents, or Total Size.

If you have access to the DBA\_views, make sure the View > Options > Startup > Check for DBA Views checkbox is checked. If so, the Owner dropdown list will become active, and a DBA type user can select a specific schema owner.

## Tablespaces

The View Tablespace window lets you view tablespace usage and free space. The window has tabs for **Space**, **Data Files**, **Free Space**, **Objects**, **Fragmentation**, **Space History**, and **IO History**.

*Some tabs are only visible in the DBA Module.*

You can double-click on a tablespace from the Space tab or Data Files tab and get a description window. You can print via the Print button above the tabs.

## Space Manager

Space Manager is part of the View Tablespace window. The **Space History** and **IO History** tabs access Space Manager.

### Setup

You must have SELECT access on:

DBA\_TABLESPACES  
DBA\_DATA\_FILES  
DBA\_FREE\_SPACE  
V\_\$FILESTAT

Before you can use Space Manager, you must set up specific objects in the TOAD schema. You must first log in under the TOAD schema.

From the Space Manager window, click the Create/Recreate TOAD Space Manager Tables button.

If there are already Space Manager tables present, a confirmation dialog will ask if you are sure you wish to recreate the Space Manager tables and lose all existing data.

Click Yes. The Space Manager setup dialog displays.

In the Collection Status frame, check the **Activate** checkbox. TOAD creates a job to perform data collection for Space Manager. You can deactivate this job to suspend data gathering by unchecking this box.

Set the Collection schedule Info which includes a start date to **Execute** the job (the dropdown displays a calendar) and an **At this time** field (the time you want the data collection performed). To choose when to collect information select a choice from the dropdown menu below the At this time: field, or enter a formula in the field beneath the Execute this job on: field. (Regardless of the formula you enter, Space Manager can't collect information more frequently than once daily.)

Set the **History Retention** information using the sliding scale to select how long you want to retain the information. Radio buttons let you select **Days**, **Weeks**, or **Months**.

Set the Data Initialization information. The **Start with empty tables** radio button presents data from the first collection only. The **Back fill tables with generated values indicating positive growth** radio button presents the data with a generated history by TOAD indicating positive growth.

TOAD creates the necessary tables to maintain the Space Manager history. The information in these tables provides the basis for the graphs displayed on the Space Manager tabs.

### Editing Space Manager Settings

When editing the setup information, you must be logged into the TOAD schema. From the Space History or IO History tab, you can click the Edit Space Manager Settings button and the **Space Manager Setup** window will display which lets you modify the settings.

You can change the Collection Status by checking **Activate** and **Deactivate**. If the collection job has been dropped, then Collection Status will say that the job is Not Present, and altering the Space Manager settings will recreate the job.

### Using Space Manager

Space Manager tracks and forecasts database usage over time, displaying the results in an easy to read graph.

**Space History tab**

The Space History tab lets you graph space usage, print graphs, and forecast space usage.

The graph on the Space History tab displays the tablespace usage. You can display the graphs of tablespaces in the following configurations:

**View All the Tablespaces** – Uncheck the By datafile and select <All> from the Tablespaces dropdown

**Select a specific tablespace** – Uncheck the By datafile box and select a tablespace from the dropdown Tablespaces dropdown

**View tablespaces by Datafile** – Check the By datafile box and select a datafile from the Datafiles dropdown menu

**View all Datafiles** – Check the By datafile box, check Select <All> from the Tablespaces dropdown, and select <All> from the Datafiles dropdown

**Forecast Usage**

The Forecasting tool lets you forecast space usage of tablespaces and datafiles. You set the number of days in the future that you want to forecast, and TOAD uses linear regression (continuation of a line based on its slope or trend) to extrapolate the tablespace and datafile usage at the specified time.

Select which tablespace or datafile that you want to view and select the Forecast button that is on the Space Manager toolbar. The forecast window displays. At the bottom of the forecast window, you can select the number of days in the future for which to calculate the forecast (default is 30).

**IO History tab**

The IO History portion of the Space Manager tracks datafile IO history. It graphs Physical Reads, Physical Writes, Block Reads, Block Writes, Read Time, Write Time.



## Tablespace Map

The Tablespace Map provides a graphical view of how space is allocated to objects in the tablespaces in your database. A dropdown lets you select the tablespace, and the buttons perform various functions.



**Analyze**



**Coalesce**



**Clear Highlights**



**Restore form size**



**Legend**



**Segments & Extents**



**Filters**

### To View Tablespaces graphically

- 1 Select a **tablespace** from the dropdown list.
- 2 Click the **Analyze** button to fetch the data for the map. The cells representing occupied blocks are highlighted in green. Areas that equal or exceed the fragmentation percentage (set in View > Options > DBA) are displayed in red. In addition, you may have set other fragmentation limits and colors from the View > Options > DBA window.

### To Coalesce a fragmented chart

- 1 Select a tablespace from the dropdown menu.
- 2 Click the **Coalesce** button to coalesce the tablespace. The tablespace map disappears.

After coalescing, an analysis is performed, and the map is displayed.

### To View segments of the tablespace

- 1 Run your mouse slowly over the tablespace map. The segments display beside the pointer.
- 2 Click in a cell, and all other cells containing the same segments as those in the cell you clicked display in yellow.

### To get detailed Segment information

- 1 Select a tablespace from the dropdown menu.
- 2 Click the **Analyze** button to fetch the data for the map. The cells representing occupied blocks are highlighted in green.
- 3 Click the **Segments & Extents** button. The Segments & Extents dialog displays. Now, when you run your mouse over the tablespace map, segments for each cell display in the Segments dialog. In addition, the percentage of fragmentation for those segments displays at the bottom of the dialog.

### To filter the tablespace

- 1 Select a **tablespace** from the dropdown menu.
- 2 Click the **Analyze** button to fetch the data for the map. The cells representing occupied blocks are highlighted in green.
- 3 Click the **Filters** button. The Filters dialog displays. It contains tabs for **Datafiles**, **Object Types**, **Owners**, and **Objects**.
- 4 Select the filters you want to see. You can select filters on multiple tabs and multi-select (<Ctrl>click) in each tab. The spaces covered by the filters you choose are highlighted in yellow on the Tablespace map.

The **Clear Highlighting** button clears the highlighting. The **Restore Form Size** button restores your window to its optimal viewing size, which is its original size.

## Tablespace Map Options

You set the options for the Tablespace Map in the **View > Options > DBA** page. You can modify colors and set fragmentation levels used on the tablespace map.

### To Add a new Fragmentation level

- 1 Click the **Add** button. The Add Level dialog displays.
- 2 Enter the Fragmentation Percentage or use the spinner to select a percentage. The cells that have segments that equal or exceed this percentage will display in the color that you will select in the next step.
- 3 Click the Color drilldown button and select the color you want the cells to be for segments that equal or exceed the set fragmentation level in Step 2.
- 4 Click OK to add the level and close the Add Level dialog.

Notice you can add as many fragmentation levels as you want to. TOAD labels them Fragmentation Level 1, Fragmentation Level 2, etc.

### To Edit Fragmentation Levels

- 1 Click on the Fragmentation Level from the list.
- 2 Edit the color or percentage as desired.

### To Delete Fragmentation Levels

- 1 Select the Fragmentation Level from the list.
- 2 Click **Delete**.

The Level is removed from the list.

You cannot delete the last remaining Fragmentation Level.

**Show segment names on grid hint** is checked by default.

The following options let you save window states individually. They are checked by default.

**Remember Legend window state** checkbox

**Remember Segments window state** checkbox

**Remember Filters window state** checkbox

The state saved includes window size and position. For the filters window it also includes the column widths on the Objects tab and the current tab.

## Server Statistics

This window helps database administrators tune their databases. Use this dialog to view information about how the Oracle instance is performing.

On the Analysis tab, the upper and lower warning and error thresholds and messages can be configured in the TOADSTATS.INI file in the TOAD\TEMPS folder.

Since this dialog is intended for DBAs, access to certain SYS views is required to query and display the information. If you want to give a TOAD user access to the **Server Stats** window without granting them the DBA role, see the TOAD Help file, TOAD.HLP, topic **DBA Menu > Windows: TOAD Server Statistics** for a complete list of SYS views to grant select access to the destination user.

The dialog is composed of the following tabs: Analysis, Waits, Latches, Sessions, and Instance Summary. The Monitor tab will display for users without the DBA module option. DBA users already have access to Database Monitor.

### Analysis

To set the warning light threshold values, see the TOAD Help file topic **Installation Notes** which contains a **How to create your TOAD\temps\toadstats.ini file** topic.

Analysis shows high level database information such as gets, misses, and cache hits. This information comes from the SYS.V\$SYSSTAT view, and other views.

### Waits

Shows detailed information about database waits from the SYS.V\$SYSTEM\_EVENT view

### Latches

Shows detailed information about database latches from the SYS.V\$LATCH view

**Sessions**

Shows a master/detail presentation of the current sessions from the SYS.V\$SESSION view, and other views. The top grid lists the sessions, whereas the bottom grid lists the detailed information about the selected session from the SYS.V\$SESSTAT view.

**Instance Summary**

Shows overall instance statistics from the SYS.V\$SYSSTAT view.

**Monitor**

Shows five graphs of database performance information: Sessions, Cache Hit Percent, SGA Memory Usage (Oracle 8, or higher), Shared Pool (Oracle 8, or higher), and Indexed Queries Percent

NOTE: The TOADSTATS.INI file contains default values that are decimal values that use the American "." (period) as a decimal character. If your locale settings require a different decimal character, you should either edit TOADSTATS.INI or delete the file entirely.

## Control Files

The Control Files window displays information about the control files records section. If you need to allocate more records, for example, the Control Files statistics information will be helpful.

Control Files					
Control filename					
C:\ORANT\DATABASE\CTL10RCL.ORA					
Control file statistics					
Type	Record Size	Records Total	Records Used	Used Size	Free Size
Archived Log	584	1,601	0	0	934,984
Backup Corruption	44	46	0	0	2,024
Backup Datafile	116	69	0	0	8,004
Backup Piece	736	66	0	0	48,576
Backup Redolog	76	79	0	0	6,004
Backup Set	40	50	0	0	2,000
Ckpt Progress	1,012	16	0	0	16,192
Copy Corruption	40	50	0	0	2,000
Database	192	1	1	192	0
Datafile	180	49	48	8,640	180



## Pinned Code

When the Oracle SGA fills, Oracle overwrites parts of the buffer with new data. Pinning a PL/SQL object in the SGA will keep Oracle from overwriting it.

If you frequently use a particular PL/SQL object you have loaded from your database, pinning it to the SGA will improve Oracle performance.

The Pinned Code window lists each PL/SQL object, its owner, and whether or not the object is pinned.

You can sort data in a column by clicking on the column header, and you can rearrange columns via click-and-drag.

To Pin or Unpin an object, click in the row of the package you want to pin or unpin, and click the Pin or Unpin buttons as appropriate.

## DB Wizard

The TOAD Database Wizard (New Database...) provides a rapid way for DBAs to create Oracle databases. Screens prompt you to select parameter values for the construction of the database parameter file (INIT.ORA), as well as values used in the construction of a SQL file that can later be executed by either a batch file (Windows) or a script (UNIX) which the wizard generates. It can automatically assign tablespaces across available hard drives (or volumes), optimized according to either a drive performance rating which it assigns, or available volume space. It is OFA-compliant (Optimal Flexible Architecture) in the directories which it creates for 8.1.x and 9.0.x databases.

The wizard is presented in an intuitive step-by-step process.

*For more information, refer to TOAD Help.*

## Repair Chained Rows

This window shows tables that have chained rows.

When data for a row in a table cannot fit into a single data block, it is stored in a chain of data blocks (more than one data block). The original row of data points to the new block or blocks of data. A result of chained rows is that Oracle must scan more than one block of data to retrieve information.

NOTE: The Chained Rows table is where TOAD tells Oracle to store the row ids of the chained rows that are found. It is NOT the table that you are supposed to analyze. Remember, TOAD will truncate the chained rows table before it analyzes the tables in the list.

### Analyze tab

Click the **ADD** button to bring up a **Select Tables to Analyze** menu where you can select the schema (from a dropdown list) and table(s) from a list of tables in the schema to analyze. Click in the checkbox preceding the table(s) to select or unselect the table(s). **Select All** and **Select None** buttons help with quick selection.

### Repair tab

Check the boxes for which tables to repair.

#### **Repair Button**

This creates an intermediate table, copies chained rows to it, deletes the chained rows from the existing table(s), and then copies the rows back into the existing table(s). You might need to increase the existing table(s)' data block size to completely eliminate chaining.

You can also select a rollback segment from the dropdown.

Results appear beneath each repaired table.

The Results list the tables that were not repaired and the reasons.

The default Chained Rows table to use is configured in **View > Options > DBA**.

## Identify Space Deficits

This displays tables that do not have enough free disk space to allocate their next extent.

The **Alter Tablespace** button invokes the Alter Tablespace window for the selected tablespace which you can then modify.

## Redo Log Manager window

The Oracle background process log writer (LGWR) stores information about database changes in redo log files. The files can be used to recover the database in case of failure by reapplying the changes. The redo records are stored in the redo log buffer in the SGA and then written to the redo log files when either the buffer is full or the associated transaction is committed.

The DBA defines “groups” of identical (same size) redo logs, so that LGWR simultaneously writes identical information in parallel to each member of a group and switches between groups in a circular fashion. An Oracle database must have at least two groups, so that one group can be active while the other group can be archived (if in ARCHIVELOG mode).

### Last Switch frame

This shows the date and the time that the last redo log file switch occurred.

### Members frame

This shows the redo log groups and the members of the groups. Radio buttons let you select your choice of display: **Icon**, **File size**, or **File name**. **Add** and **Drop** buttons let you add and drop members.

### Groups frame

**Log switch** button – lets you switch groups

**Add** button – lets you add a group

**Drop** button – lets you remove a group

### Archive Mode frame

This frame shows the current archive mode of the database.

### Archive Process

This frame lets you control the archive process by starting and stopping it and specifying which files to archive and where to place the archive logs.

## Export Utility Wizard

You get to this window from the **DBA > Export Utility Wizard** menu item.

This is a wizard that lets you easily transfer data objects between Oracle databases using Oracle's export utility configured under **View > Options > Executables**. The intuitive wizard includes microhelp for many of the input fields.

You can export:

**Tables** - exports selected tables and all dependent objects

**Users** - exports all objects from the users that you select

**Database** - exports an entire database

**Tablespaces** – generates a transportable tablespace set

**Use parameter file** – performs export with an existing parameter file

The export action choices are:

**Execute Now** – saves parameter file, launches export utility

**Schedule to run later** – refers to Windows scheduled task

**Simply close after building the parameter file**

*For step-by-step details refer to TOAD Help.*

## Import Utility Wizard

You get to this window from the **DBA > Import Utility Wizard** item. This wizard lets you easily transfer data objects between Oracle databases using Oracle's Import utility configured under **View > Options > Executables**. The intuitive wizard includes microhelp for many of the input fields.

You can import:

**Tables** – imports tables and their associated objects

**Users** – imports schemas

**Database** – imports the entire export file

**Tablespaces** – imports transportable tablespace metadata

**Use parameter file** – performs import with existing parameter file

The import action choices are:

**Execute Now** – saves parameter file, launches export utility

**Schedule to run later** – refers to Windows scheduled task

**Just build the parameter file**

*For step-by-step details refer to TOAD Help.*



## SQL\*Loader Wizard

**NOTE:** If you have difficulty running SQL\*Loader, make sure that you have the correct version installed. You can do this by running the executable with no parameters in a command prompt window. Note that the executable on the server can only be run from the server.

The TOAD SQL\*Loader Wizard is a utility that lets you graphically build a control file for use with the SQL\*Loader, a database server application. The location of the utility is configured under **View > Options > Executables**.

The first window has radio buttons that let you choose to either **Build a control file** (create a new control file) or **Use a control file** (use an existing control file).

### **Build a control file**

#### Specify Input File(s)

If you choose to build a control file, the next window lets you enter the list of the data files that you want to load into one or more tables. You must have at least one input file.

#### **Input File**

This is the data file, which can be in stream, fixed, or variable format. The default format is stream.

#### **Bad File**

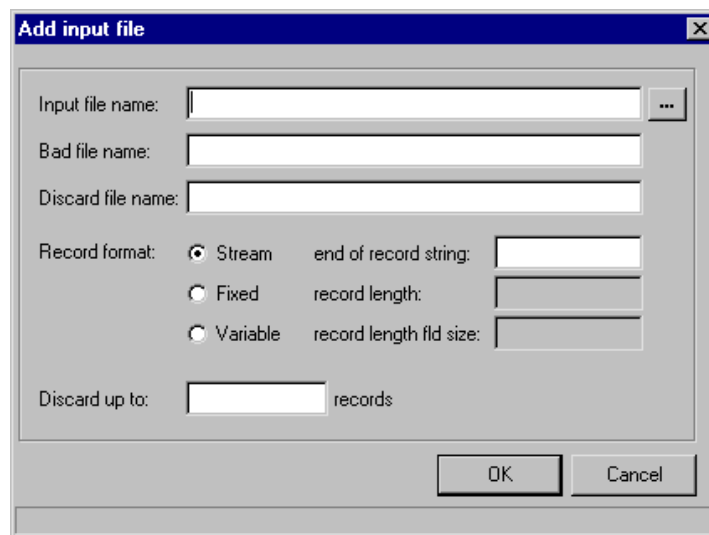
This file will contain rejected records. It's named the same as the input file by default, with a .BAD extension.

**Discard File**

This contains the records that were not inserted during the load because they did not match any of the selection criteria.

**Add button**

Click **Add** to add your data file. The **Add input file** dialog will display.

The image shows a Windows-style dialog box titled "Add input file" with a close button (X) in the top right corner. The dialog contains several input fields and options. At the top, there are three text boxes labeled "Input file name:", "Bad file name:", and "Discard file name:". The "Input file name:" box has a small "..." button to its right. Below these are three radio buttons under the label "Record format:". The first radio button is selected and is labeled "Stream". The other two are labeled "Fixed" and "Variable". To the right of the "Stream" radio button are three text boxes: "end of record string:", "record length:", and "record length fld size:". At the bottom left, there is a text box labeled "Discard up to:" followed by a text box and the word "records". At the bottom right, there are two buttons: "OK" and "Cancel".

Click the drill down next to the **Input file name** entry box to choose the data file.

The **Bad file** and **Discard file** textboxes are automatically entered with their default extensions.

**Record Format radio buttons****Stream Format**

This is the default. Lines are read until an end-of-record marker is found (end-of-line character, by default).

**Fixed Record Format**

Each record must be a fixed number of bytes in length.

**Variable Record Format**

Each record may be a different length, as specified by a special field – the first field in each record. (You must specify the length of this field.)

**End of record string box**

If you leave this field empty, the end-of-line character will be the end-of-record by default.

**Discard up to \_\_\_\_\_ records box**

This field indicates the maximum number of records to put into the discard file. If you leave this box empty, it indicates that you want all records.

Once you have entered all the data, click **OK**.

You can select many different input files, if desired, but they must all have the same record layout. (They could have a different record format.)

**Select Destination Tables**

The next window is where you select the destination table(s).

Click the **Add** button, and the **Table Name Select** window will display.

Double-click on a table, or click on a table and click OK to select a table from the list.

The **Tables Parameters** tab and the **Columns Parameters** tab let you enter the parameters for your destination table(s).

### Specify Global Options and Default Values

The next window lets you specify options and default values. Move your mouse over a field to display microhelp.

### Specify Control File and Log File

The next window lets you name the Control File. You can name the control file whatever you wish, including the extension.

### Finish

The next window lets you select an action.

#### **Execute Now**

This executes your control file and displays the **SQL\*Loader Status** window.

#### **Schedule to run later**

#### **Just build the control file**

#### **Preview Control File** button

This displays a preview of the contents of the control file. Simply click on this tab at any time to preview your control file.

#### **Save Settings** button

Click **Save Settings** at any time to save the information that you have entered into this wizard. You can load this information back into the wizard via the **Load Settings** button.

### Use Control file

If you choose to use an existing control file, the next window asks you to specify the control and log files. The Finish window lets you execute the file or schedule it to run later.

**NT Job Scheduler**

The SQL\*Loader has a scheduler that lets you schedule the load as a windows task. Clicking the **Schedule** button opens the NT Job Scheduler window. It lets you set the time for it to run and the frequency. Once you click OK, your job is added.

In Windows Explorer if you then click on the Scheduled Tasks folder, you'll see your job and its schedule information.

## Generate Schema Script

This window takes the current schema and builds DDL for all objects you select.

This is useful, for example, if your database crashes, because you'll have a script to recreate all your objects.

If you choose the radio button **Extract from Schema**, it produces a schema script.

If you choose the radio button **Extract from Schema Definition File**, it produces a .def file.

You can check or uncheck the desired Objects and Options checkboxes.

## Compare Schemas

This window lets you compare two schemas, display the differences between the original reference source and the comparison source, and display the migration SQL.

You access the Compare Schemas window via the **DBA > Compare Schemas** menu item.

*Some of the features of Compare Schemas are only available in the TOAD DBA module. Refer to TOAD Help for more details.*

### Schema tab

The Schema tab lets you select your reference and comparison schemas.

### Options tab

The Options tab lets you include/exclude different object types and includes additional comparison options. After you've selected the schemas and options, click the **Compare** button.

### Results (Interactive) tab

The Results (Interactive) tab lists the differences between the schemas in an interactive format. Each type of item has an icon assigned to it. The right-click menu lets you Group by Object. Click the **Show SQL** button to display the SQL required to migrate the selected object or objects. You can multi-select by holding down either the <Ctrl> or <Shift> key.

You can select object(s) and either click on the **Show SQL** button or right-click and select the **Show Migration SQL for selected Items** menu item, and the Sql Statement window will display the SQL required to migrate the selected items.

**Results (RTF) tab**

The Results (RTF) tab shows the comparison in list form. The toolbar buttons let you Save as an RTF, Save as a text file, and Print the file.

**Results (Summary)**

This displays comparison totals for individual elements in a table format. The toolbar buttons let you Save as RTF, Save as Text, and Print.

**Sync Script**

This displays a script that will change the comparison source schema so that it will match the reference source schema. So, if the reference schema contains one table and the comparison schema contains the same table and three additional tables, then the sync script, when run in the comparison schema, will drop the three extra tables.

The toolbar buttons let you Save script as RTF, Save script as text file, Print, Move script to SQL Editor window, and Move script to SQL Editor window and run it immediately.



## DBA Options

You access the DBA Options page through the **View > Options > DBA** menu item.

### Chained row schema tablename

This is where you enter the name of your chained row table. If you don't have a chained row table, you can go to `\rdbmsxx\admin\utlchains.sql`, which is the location of Oracle's sample standard chained row script.

### Tablespace Map panel

This lets you set options for the Tablespace Map window. *See the Tablespace Map Options section in the DBA chapter, page 388, for more details.*

### Open a Database Monitor window for each connection checkbox

Default – Unchecked

If checked, the Database Monitor will automatically open for each connection. Remember, the Database Monitor must be launched in order to work. This box is unchecked by default.

### Open a Unix Monitor at start up

Default – Unchecked

If checked, the Unix Monitor window will automatically open at start up.

### Open an Instance Manager at start up

Default – Unchecked

If checked, the Instance Manager window will automatically open at start up.

**Confirm before overwriting export files checkbox**

Default – Checked

If checked, TOAD will display a confirmation window before overwriting export files.

**Confirm before overwriting import files checkbox**

Default – Checked

If checked, TOAD will display a confirmation window before overwriting import files.

**Save grid layouts on Kill/Trace**

Default – Checked

If checked, Kill/Trace grid layouts will be saved.

# Create Menu for DBA

The DBA Module adds the following menu items to the Create Menu: Directory, Library, Policy, Profile, Role, Rollback Segment, Snapshot/M-View, and Tablespace. For more details about these windows refer to TOAD Help.

## Directory

You get to this window from the **Create > Directory** menu item or from the **Schema Browser > Directory** page > **Create Directory** button.

This window is used to create a new directory object. A directory object is an alias to a directory on the server's file system where external binary large objects (BFILEs) are stored.

## Library

You get to this window from the **Create > Library** menu item or from the **Schema Browser** window > **Libraries** page > **Create new Library** button.

This window lets you create a new library object. A library object is an alias to an operating system shared library (like a .DLL) that can be used in SQL or PL/SQL to allow calls to external functions.

## Policy

You get to this window from the **Create > Policy** menu item or from the **Schema Browser** window > **Policies** page > **Create new policy** toolbar button.

This window lets you create a new policy through the DBMS\_RLS package. If you do not have DBMS\_RLS, you cannot use this function in TOAD. Refer to the Oracle documentation for more information.

## Profile

You get to this window from the **Create > Profile** menu item or from the **Schema Browser** window > **Profiles** page > **Create New Profile** button.

This window lets you create a new profile. A profile is a set of limits on database resources. If you assign the profile to a user, that user cannot exceed those limits.

## Role

You get to this window from the **Create > Role** menu item or from the **Schema Browser** window > **Roles** page > **Create new Role** button. This lets you create a role.

## Rollback Segment

You get to this window from the **Create > Rollback Segment** menu item or from the **Schema Browser** window > **Rollback Segments** page > **Create new Rollback Segment** button.

This window lets you create a new rollback segment. A rollback segment is an object that Oracle uses to store data necessary to reverse (undo) changes made by non-completed transactions.

## Snapshot/M-View

You get to this window from the **Create > Snapshot/M-View** menu item or from the **Schema Browser** window > **Snapshots** page > **Create New Snapshot** button.

The Snapshot/MView window lets you create a snapshot (also referred to as a materialized view).

A snapshot is basically a partial (subset) or complete copy of a table. You can set your TOAD snapshots to be read-only or updateable (which allows users to insert, modify, or delete rows).

The window has 4 tabs: Snapshot Info, Physical Attributes, Snapshot SubQuery, and Partitions.

## Tablespace

You get to this window from the **Create > Tablespace** menu item or from the **Schema Browser** window, **Tablespaces** page, **Create New Tablespace** button.

Textboxes let you enter names. Dropdowns let you specify extents. Radio buttons let you specify **Temporary** or **Permanent** objects.

With **Extent Management** checked, you can choose **Dictionary**, if you want the tablespaces to use the SQL dictionary tables to track space usage. If you choose **Local**, then bit maps will track space usage.



# Schema Browser DBA functions

This chapter discusses additional Schema Browser functions that are included in the DBA module. For more details about these windows refer to TOAD Help.

## Directories

You can create a new directory, alter an existing directory, and drop a selected directory.

The Details panel shows the directory path.

## Libraries

You can create, alter, or drop libraries.

The Details Panel lists the File Spec, Status, and Dynamic for the selected library.

## Policies

You can create, enable, disable, edit and drop policies. You can edit a selected policy's predicate package source via the Edit Policy Predicate Package Source button.

The details panel displays various parameters for the selected policy, such as the Name, the Predicate Package, and the Predicate Function.

## Profiles

You can create, modify, and drop profiles. You can create and copy SQL scripts. You can also view resource details.

The details panel lists the resource names, resource types, and limits.

## Roles

You can create, alter, and drop roles. You can create and copy SQL scripts. You can also view roles and privileges details.

The Details Panel contains tabs for Roles details and Privileges details.

## Rollback Segments

You can create, alter, and drop rollback segments. You can place rollback segments online or offline.

The Details Panel has Info and Stats tabs that list parameters and their values



## Snapshots

You can create and drop snapshots.

The details panel contains tabs for Info, Snapshot Query (generates the SQL query for the selected snapshot), and Script.

## Tablespaces

You can create, alter, and drop tablespaces. You can place tablespaces online or offline.

The details panel has tabs for Datafiles, Free Space, Fragmentation, Objects, Quotas, and Extents.



# Network Utilities

You access the Network Utilities window via the **File > Network Utilities** menu item.

You access the Network Utilities options via the **View > Options > Network Utilities** page.

## Telnet

Telnet (Telecommunications Network) is a protocol for connecting to another computer and establishing a session there, where you can issue commands. The protocol is specified in Internet RFC 854.

The Telnet tab is used to communicate with servers implementing the Telnet protocol. It provides Telnet capability through a simple interface. It functions like a terminal emulator, although at this time only displayable characters and the <Enter> key are supported (i.e., control characters, including backspace, are not currently supported).

Type in the **Host Name/IP** (Host Name or the IP address) in the dropdown box.

Type in the **Port** number.

Click the **Connect** button.

In the window your cursor will appear after “login:”

Type in your **login name**, press <Enter>, type in your **password**, and press <Enter>.

The top panel is a console that displays messages from the server and the commands that you type in. The lower panel shows the Telnet commands sent and received as part of the protocol.

Right-click in the terminal window to access the context menu. The menu lets you **Clear** the screen or copy information to the **Clipboard**.

The **Save Output** button lets you save through the Save As window.

## RExec

The RExec tab lets you execute a Unix command. The server must be running Rexecd in order for this function to work. It provides controls for specifying the host, user name, and password for the connection. It also provides a location to enter the command to be executed and an **Execute** button to submit the command.

The output of the command is displayed in the panel below the connection information. If it is a command to run a program (such as “bc”), then you can enter the information to send, press <Enter>, and see the results of the program. The connection continues until you exit the remote program.

Type in the **Host Name/IP** (Host Name or the IP address).

In the **User** box type in the User name.

In the **Password** box type in the password.

In the **Command** box type in a Unix command such as “who” or “ls”.

Press the **Execute** button to execute the command.

The right-click menu lets you **Clear** or copy to **Clipboard**.

## Ping

This uses ICMP to contact other machines on the network and let you know whether it was successful or not.

Type in the **Host name/IP** (Host name or IP address) that you want to ping.

You can set a different **Interval** (which is in milliseconds), if desired.

Click **Start**.

TOAD will ping the selected host and display the results in the bottom panel.

The sending bytes and received bytes results will display in the window. It will continue to ping the host at the interval selected until you click **Stop**.

You can right-click in the results panel to access the context menu which lets you copy the results to **Clipboard** or **Clear** the results window.

## TNS Ping

TNS Ping is an Oracle utility that tries to determine whether a TNS Listener is running for one of the connection strings in the `tnsnames.ora` file. Given a connection string, TNS Ping looks in the `tnsnames.ora` file to determine the name or IP address of the machine running Oracle. TNS Ping then connects to that machine to determine whether a TNS Listener is running.

The TNS Ping tab has a **Server** dropdown with the connection strings from the `tnsnames.ora` file and a **TNS Ping** button to submit the TNS Ping request. The results of TNS Ping display in the panel at the bottom of the window.

TNS Ping is configured under View > Options > Executables.

Select a **Server** from the dropdown.

Click **TNS Ping**.

An “Attempting...” message and “Ok...” message will display indicating that the server was successfully pinged.

If there is no listener a “No Listener” message will display.

The right-click menu lets you **Clear** or copy to **Clipboard**

## IP Addresses

The IP Addresses tab lets you enter a Host name or URL and get the IP address, or enter an IP address and get the Host name or URL.

The top of the window displays the local Host and the local IP address.

In the **Host/IP/URL** box, type in the Host or URL.

Press the **Find** button or press <Enter>.

Both the Host/URL and its IP address will display.

This also works in the other direction. Type in an IP address, Press the **Find** button or press <Enter>, and both the Host/URL and the IP address will display.

The results panel displays all of the results since you opened the window.

The right-click menu in the results panel lets you **Clear** or Copy to **Clipboard**.

The **Save** button lets you save the results to a comma-delimited file via the Save As window.



## Other TOAD Options and Features

The major windows covered in the previous chapters of this manual include: Server Login, SQL Editor, Procedure Editor, PL/SQL Debugger, and Schema Browser. This section will highlight some selected options and features found in other TOAD windows.

## FTP File(s)

### **TOAD FTP Window**

You get to the FTP Window from the **File > FTP File(s)** menu item. This window lets you transfer files using FTP.

FTP (File Transfer Protocol) is the most common means of file transfer on the Internet. TOAD includes FTP support primarily so that Oracle scripts can be sent over TCP/IP connections.

### **FTP Logon Window**

The **Connect** button displays the FTP Logon screen which is used to make a connection to an FTP Server.

### **Host dropdown**

This is for the address of the FTP server that you'll connect to. Multiple connections are saved and recalled through the dropdown control.

### **User box**

This is the User ID for the FTP connection.

### **Password box**

This is the password for the FTP connection.

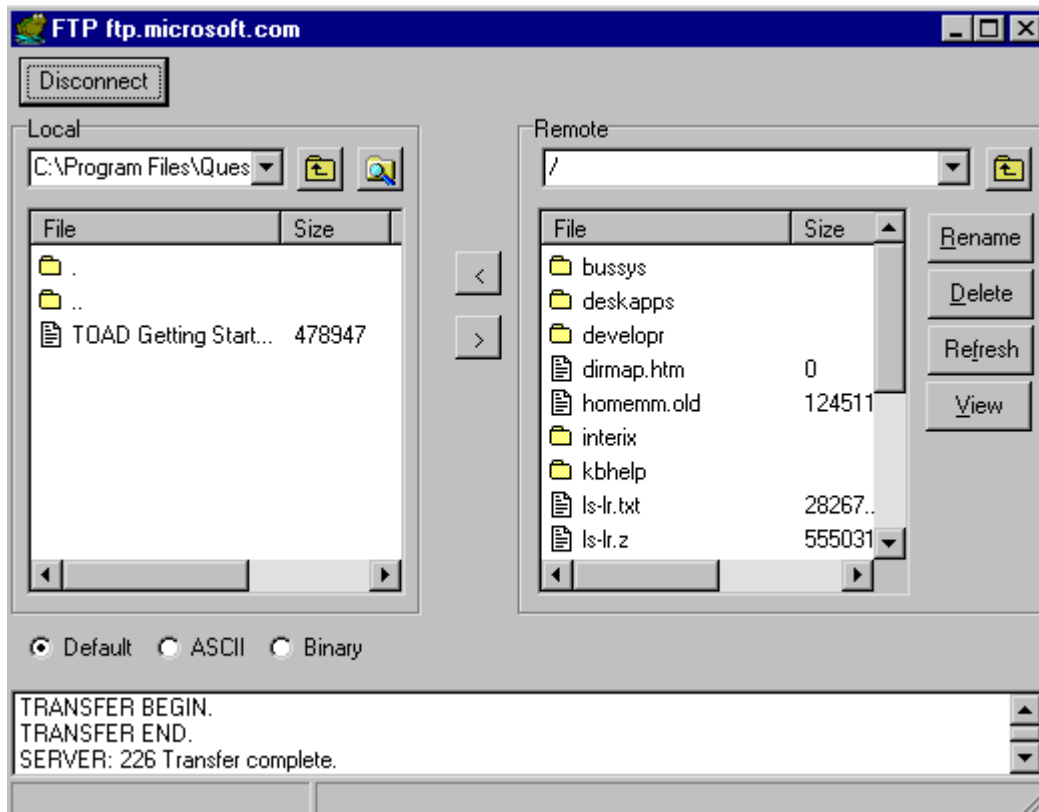
**Passive (for firewalls) checkbox**

If checked, this directs the server into passive mode. This is especially useful if the server is behind a firewall. Many firewalls don't let the FTP server open a connection from outside to the higher ports where the FTP client control expects them. If this box is checked, TOAD will use the PASV command instead of the PORT command, which directs the server into passive mode – connections are initiated only by the client.

If this box is unchecked, the PORT command is used.

If TOAD can't connect because it can't find the host, a Host Not Found message will display.

Once you are connected, the Connect button changes to a **Disconnect** button to allow the current connection to be terminated.



### Local Panel

The left panel contains a file browser for the local computer. The **dropdown** lets you type in a file path. The folder button lets you move up one level in the directory hierarchy.

The **Explore** button invokes a Windows Explorer-style dialog that lets you select a local or network directory. The list view control lists the folder and files of the current directory.

### Remote Panel

The right panel displays a file browser for the remote FTP server. The dropdown lets you type in a file path. The folder button lets you move up one level in the directory hierarchy. The list view control lists the folder and files of the current directory.

#### **Rename** button

This button opens the **Rename Window**, which lets you rename the selected file in the FTP interface.

#### **Delete** button

This button deletes the selected file.

#### **Refresh** button

This button refreshes the file list.

### Bottom Panel

File Transfer Mode radio buttons

**Default** – If selected, the default mode for the FTP server is used

**ASCII** – ASCII file transfer (faster transfer for text-only files)

**Binary** – Used to transfer binary files

### Messages Panel

Connections and FTP server messages are displayed in the messages panel.

### Transferring Files

You can transfer files between the local and remote computers. You can select files in either the local or remote panels and transfer them to the other machine by pressing the appropriate directional button located between the two panes ([<] or [>]). You can also use drag-and-drop to transfer files between the two panes. If you double-click a file, it will be transferred to the other side of the connection.

## SQL Modeler

The SQL Modeler lets you quickly create 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.



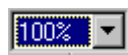
### Open a new SQL Modeler

#### Two ways to invoke the SQL Modeler

- Click the **Database > SQL Modeler** menu item.
- Click the **Open a new SQL Modeler** button on the main toolbar.

The SQL Modeler uses floating list boxes for tables which include checkboxes for selecting column(s) and allow for scrollbars and resizing.

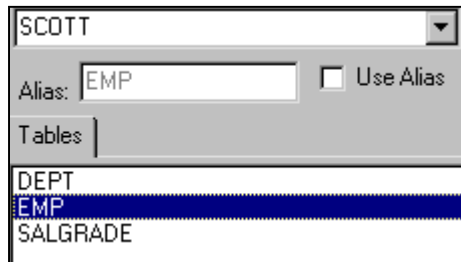
The modeler allows for keyboard interaction with the tables. Press the Up Arrow and Down Arrow keys to move up and down, and press the Space Bar to check or uncheck a box.

**Toolbar Buttons****Create New Model****Open Model from****Save Model to Disk As...****Save to Disk****Edit Current Model Info****Add Calculated Fields****Generate a Select Statement** (has dropdown to create different types of queries)**Execute SQL Statement****Show Explain Plan****View SQL in SQL Edit Window****Hide Table List****Save Subquery and return to master query****Cancel Subquery and return to master query****Print model****Zoom**



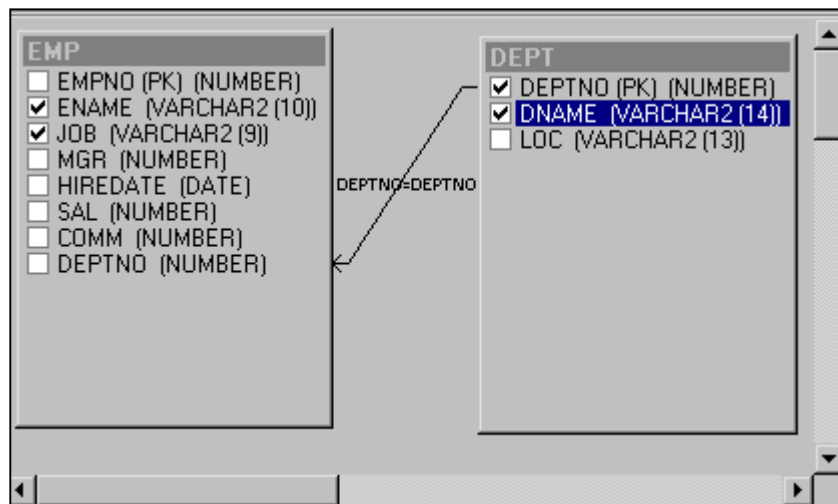
### Table Selector Area

This is where the tables are listed for the selected schema. A dropdown list lets you select a schema.



### Table Model Area

The Table Model Area lets you graphically lay out a query. Double-click (or drag-and-drop) an item from the Table Selector list, and a floating list box for the table displays in the Table Model Area. Checkboxes let you select columns.



To maximize the model viewing area, press **F2** or right-click in the model and select **Full Screen Model** from the Right-Click Menu.

You can visually join or manipulate the Tables, Views, or Synonyms. You can establish your own joins by dragging and dropping a column from one table to another table column. Once the line is drawn, you can double-click the line to adjust its properties, such as Inner Join vs. Outer Join, or Join Test, e.g., equal (=), less than (<), greater than (>), etc.

If no table columns are selected, all columns will be included in the query. The selected column information will appear in the Criteria grid below.

#### **Model Area Right-Click Menu**

Right-clicking over the model area displays the following menu items.

#### **Copy Model Image to Clipboard**

Copies a bitmap image of the model to the Windows Clipboard

#### **Tables > Visibility**

Displays a Tables Visibility window with checkboxes next to a list of tables that are in the model. Check/uncheck the individual tables to show/hide them.

#### **Tables > Calculated Fields**

Adds calculated fields based on other table columns

#### **Show > Join Text**

Displays the column names that comprise the joins

#### **Show > Adjust Model Origin**

Adjusts the upper left object to the upper left of the window

**Show > Virtual Space Size**

Brings up a **Model Virtual Space** dialog that displays the horizontal and vertical model space, which you can alter

**Show > Primary Key**

Shows or hides the Table Primary Keys as "(PK)" next to each PK col

**Show > Show Field Type**

Shows or hides the data type of each table column

**SQL > Run Query in Thread**

Lets you cancel a query while it is running, if necessary

**SQL > Distinct Mode**

Adds "DISTINCT" to the query to return only unique rows

**SQL > Global Where**

Adds a WHERE clause to the query in addition to the column conditions from the **Criteria** tab

**SQL > Query Variables**

Displays the **Variables and Constants** window where you can add and edit variables

**Auto Join All**

Automatically joins all tables based on existing DDL Foreign Key Constraints

**Full Screen Model**

Temporarily hides the Table Select list and Results tab

**Zoom to Table**

Pulls up a **Choose a table to focus** menu. Double-click on the table you wish to focus on, and the model scrolls until the table comes into center view.

**Object Menu Right-Click Menu**

Right-clicking over a Table object in the model displays the following menu items.

**Alias Field Names**

Sets logical column names

**Show Schema Name in SQL**

Shows or Hides the schema name before each table in the generated query

**Set Table Alias**

Sets the Table alias

**Auto Join**

Automatically joins this table to others based on existing DDL Foreign Key Constraints

**Remove Table**

Permanently removes this table from the model.

**Select All**

Selects all Columns in the Table

**Unselect All**

Unselects all Columns in the Table

**Invert Selection**

Selects columns that were unselected and vice versa

**Optimize Size**

Restores the size of the tables to their defaults

**Hide**

Temporarily hides this Table from the model. To unhide the table, right-click over the empty model space and select the **Tables > Visibility** menu item

### **Results Grid**

After you lay out your query, click the Generated Query tab, and the resulting query will display. Other tabs in the window are Criteria, Query Results, and Explain Plan.

The alias comes from ALIASES.TXT. *See page 66 for details about setting up table aliases.* If the selected table does not have an entry in ALIASES.TXT, the first three characters of the table name are used to generate the alias, which might not always be unique. For example, the aliases for ALL\_OBJECTS and ALL\_TABLES are both going to be ALL. You can edit the alias as desired to make it unique or change it to something more meaningful. If the table name is eight characters or less in length, the entire table name is used as the table alias.

The Results Grid contains four tabs: Criteria, Generated Query, Query Results, and Explain Plan.

### **Criteria tab**

If individual columns are selected, they will be displayed in the Criteria grid.

You can edit many of the column properties in the Criteria grid. "Table" and "Schema" are not editable here. Double-clicking on the following Criteria columns has the following effects:

Double-click on:

**Sort** in a column to select Ascending, Descending, or No sort for that column.

**Condition** to bring up the **Input the WHERE Definition** dialog, where you can set a column equal to a constant value or another column value. To remove the WHERE definition, bring up the dialog and click the **Clear** button.

**Or** to enter another WHERE criteria, which will be OR'd together with the above WHERE criteria. If you want to AND multiple column criteria together, go to the expert mode from the **Input the WHERE Definition** dialog.

**Aggregate Function** to select an aggregate column function, such as Average, Count, Max, Min, or Sum.

**Field Name** to enter a different logical column name.

**Visible** to toggle whether or not this column is returned in the column list (Show or Not Show).

**Group** to select this as a GROUP BY column. A number within parentheses indicates the order of the columns in the GROUP BY clause.

**Group Condition** to bring up the "Input the GROUP BY Definition" window to enter a GROUP BY condition.

If you want to change the table alias, right-click over the table in the model and select the **Set Alias** menu item.

To rearrange the order of the columns, click the column headers and drag and drop them left or right.

### **Criteria Tab Right-Click Menu**

Right-clicking over the Criteria grid will display the following menu items.

#### **Suppress Current Column**

Removes this column from the query, which also removes the plus “+” from the column in the model

#### **Best Fit (All Columns)**

Sets the column width of the Criteria grid to show all text

#### **Default Width (All Columns)**

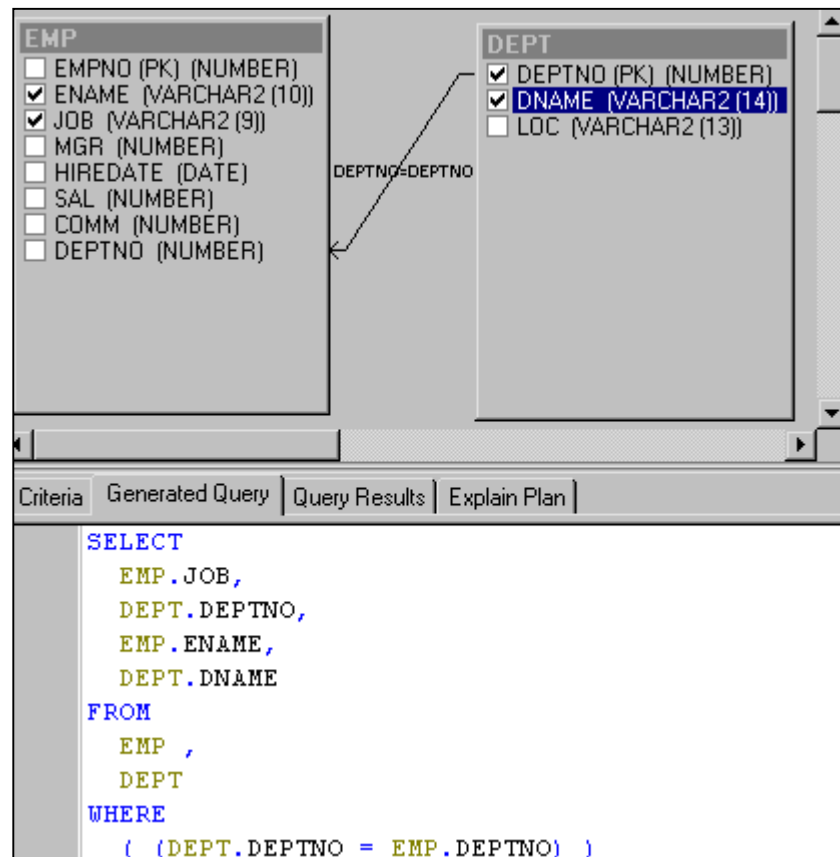
Sets the column width of the Criteria grid to the default width

#### **Copy Query Grid Image to Clipboard**

Copies the Criteria grid to the clipboard. A dialog gives you the options of rotating the image 90 degrees and/or a gray shaded image.

### Generated Query tab

This tab lists the automatically generated SQL statement. Any changes made to the model or column criteria will automatically regenerate this SQL statement.



You can copy the query to the clipboard by selecting it and pressing <CTRL>C or right-clicking and selecting **Copy** from the popup menu.

You can also copy the query directly to the SQL Edit window by clicking the SQL button in the SQL Modeler toolbar.

You cannot directly edit the SQL on the **Generated Query** tab dialog.

The query is syntax highlighted using the same editor settings from the SQL Edit or Stored Procedure Edit window.



**Query Results tab**

This grid displays the results of executing the generated query. Insert, Update, and Delete queries can only be executed in the SQL Edit window.

Criteria	Generated Query	Query Results	Explain Plan	
	JOB	DEPTNO	ENAME	DNAME
►	CLERK	20	SMITH	RESEARCH
	SALESMAN	30	ALLEN	SALES
	SALESMAN	30	WARD	SALES
	MANAGER	20	JONES	RESEARCH
	SALESMAN	30	MARTIN	SALES

**Query Results Right-Click Menu**

Right-clicking over the Query Results grid displays the following menu items.

**Print Grid**

Invokes the Report Link Designer so you can print a hardcopy of the data

**Save As**

Invokes the Save Grid Contents window which lets you save data to Clipboard or File.

**Export to Flat File**

Invokes the Flat File Export from Query window which lets you save the data as a Flat File.

**Find Data**

Invokes the Grid Data Find window.

**Record Count**

Displays the number of records in the grid.

**Explain Plan tab**

If you click the Explain Plan button for a generated SQL statement in the modeler, the Explain Plan output will display on the Explain Plan tab.

Criteria   Generated Query   Query Results   Explain Plan								
Operation	Object Name	Rows	Bytes	Cost	TQ	In/Out	PStart	PStop
SELECT STATEMENT								
NESTED LOOPS								
TABLE ACCESS FULL	EMP							
TABLE ACCESS BY INDEX ROWID	DEPT							
INDEX UNIQUE SCAN	PK_DEPT							

**Explain Tab Right-Click Menu**

Right-clicking over the Explain Plan window displays the following menu items.

**Copy to Clipboard**

Copies the Explain Plan statement (in text mode) to the Clipboard

**Optimizer Mode**

Allows you to select the query optimizer mode for subsequent statements from Choose, Default, Rule, First Rows, or All Rows.

### **SQL Modeler Options**

SQL Modeler options can be set via View > Options > SQL Modeler.

Select an element from the list which includes: **Inner Joins**, **Outer Joins**, and **Auto Joins**.

Click over a color box to select a color for the element. Right-click over the color box to select a background color for the selected item. A preview of the Table object with its new colors displays in the preview window below.

### **Automatic AutoJoin**

Default – Checked

When checked, this feature will automatically check foreign key constraints and join tables that are dropped into a model with other tables. If the option is unchecked, then you can manually join tables with the table popup menu.

### **Use Schema Name in Generated SQL**

Default - Unchecked

If checked, the schema name will be included in the tablename (i.e., myschema.mytable) in the generated SQL. Regardless of whether or not this option is checked, schema names are automatically included if the table belongs to a schema that is different than your login schema.

### **Automatically Select All Columns**

When checked, all columns are automatically selected when you add a table to the SQL Modeler. If unchecked, no columns are selected.

### **Revert to Default button**

Click this button to discard your customized options and revert to the default settings for the options.

## Script Manager



The Script Manager window is a centralized location in TOAD where you can manage your frequently used scripts. You access the window from the **File > Script Manager** menu item or from the main toolbar button (Run Script).

You can set TOAD to open Script Manager at startup via the **View > Options > Startup > Script Manager** checkbox.

Buttons on the top toolbar are: **Run**, **Options** (opens Options dialog), **Load Datafile**, **Add Category**, **Rename Category**, **Remove Category**, **Connections to execute against**, **Change active session**.

The Load datafile button lets you load the data of a Script Manager category. The file selection dialog opens with a default .sdf extension, which is the only extension Script Manager can work with.

### Script Manager Options Page

The **Script Manager Options** page is where you can set options prior to running the scripts that you have checked in the grid.

#### Suppress Errors checkbox

Default - Unchecked

If checked, TOAD will not notify you of any errors it encounters.

#### Show output in editor options

#### Show output in editor checkbox

Default - Checked

If checked, script output will display in the Script Output tab, and the Show output in Editor options will be enabled.

**Use single editor** radio button

Default - Selected

If checked, TOAD appends all scripts into one SQL Editor.

**Use separate editor for each script** radio button

Default – Not Selected

If checked, opens a new SQL Editor for each script that you execute.

**Place script in editor** checkbox

Default - Checked

If checked, the script will be placed in the editor. Otherwise an empty editor will display.

Spool output to file options**Spool output to file** checkbox

Default - Unchecked

If checked, the output will be spooled from the script to a file and the Spool output to file options will be enabled.

**Use single file** radio button

Default – Not Enabled/Selected

If checked, all of the output will be sent to one file that you name in the **Filename** box.

### Use separate file for each script radio button

Default – Not Enabled/Not Selected

If checked TOAD will automatically name the files for you (one file for each script), and you will need to specify the directory where you want the files saved.

**NOTE: If the files are automatically saved, they are saved as the original script name, with a .txt extension. If your original scripts have a .txt extension and you choose the directory where they are located, they will be overwritten by the new files.**

Remember, you can quickly execute a script (without choosing additional options) via the right-click Run menu item while in the Script Manager grid.

### Scripts tab

The **Category** dropdown window lists categories in alphabetical order.

After you have created categories, you can add scripts to the categories with the **Add** button at the bottom of the panel which invokes the **Add Script Entry** window. The Add Script Entry window includes a **Use** field which is where you enter or select what the script will be used for and an **Add** button which opens a Save As window where you can browse for scripts you want to add to that Use and Category.

Other buttons on the bottom of the panel let you **Edit** script entries, **Remove** checked items, **Move** (change all script directories), and **View** checked script(s) through Notepad(s).

The plus (+) and minus (-) buttons above the Include and QuickScript columns let you quickly check all or uncheck all boxes for each column. You can print the grid via the Grid > Print Grid menu item.

You can click on a column header to sort a column. The up/down arrows lets you change the order of the entry within the grid permanently. The arrows let you control the order in which the scripts will execute.

### QuickScript

Any script that you check in the QuickScript column checkbox will display in the QuickScript dropdown list. You access the QuickScript list by selecting the dropdown button on the Script Manager toolbar button.

The QuickScript dropdown list lets you select a script that is then run in a new SQL Edit window. The scripts are listed by categories and then scripts.

### Status tab

The status tab shows scripts as they run. The grid right-click menu lets you **Edit**, **View**, and **Run** a script. When you select Run, the SQL Editor opens the script that is listed in the row you have selected and executes the script.

*For more information about Script Manager, refer to TOAD Help.*

## TOAD Reports

TOAD Reports lets you print out various preformatted reports. You access the window from the **View > Reports** menu item. Or you can click on the Reports button on the toolbar.

The reports list is displayed in the **Reports** panel in tree views that are divided by major categories. You select a report from the list.

The **Report Description** panel displays a description of the selected report.

The right panel contains a dropdown of **Parameters** that you need to set. The parameters that are displayed depend upon the type of report you select. The wildcard symbol “%” is a choice in each parameters list.

The **Run** button will run the report and invoke a Print Preview window where you can select your printer settings.

### To run a report

- 1 Select the report.
- 2 Enter the parameters.
- 3 Click the **Run** button. The **Print Preview** button will display. The Print Preview window displays the preformatted report and lets you set your printer options.

The **Close** button closes the window. The window does not close automatically when you close TOAD.

TOAD Reports runs as a separate program. If you have a long running report process you can close TOAD and leave the reports program open. TOAD Reports enhances TOAD performance, because it can run in the background without tying up TOAD.



## Create View

You get to this window through the **Create > View** menu item or from the **Schema Browser** window > **Views** page > **New View** button.

This window is used to create a new view. A view is a customized display of data from a table or tables or from another view or views. A view does not get any storage space (except for the stored query). It is basically displaying the output of a query in the form of a table.

Choose the **Schema** from the dropdown and enter a **Name** in the textbox.

### View Info tab

Aliases section

#### **Add** button

This displays the add alias window where you enter the name for the alias. The defaults are Alias1, Alias2, etc.

#### **Edit** button

This displays an Edit Alias window for the selected alias. You can then change the name of the alias and click OK to implement the change.

#### **Delete** button

This deletes the selected alias.

#### **Clear** button

This clears the Alias list.

**Force checkbox**

If checked, this forces the creation of the view even if the user does not have access to the table.

**With checkbox**

If checked, the following checkboxes are enabled.

**Read Only**

If checked, the alias will be read only.

**Check Option**

The Check Option specifies that inserts and updates performed through the view must result in rows that the view query can select. The check option cannot make this guarantee if there is a subquery in the query of this view or any view on which this view is based or INSERT, UPDATE, or DELETE operations are performed using INSTEAD OF triggers.

**View SubQuery** tab

You can type in your subquery in this section.

**Show SQL** button

The **Show SQL** statement button will display the **SQL statement** window, which will show the create view SQL statement for your new view. The **Clipboard** button lets you copy the statement to the Clipboard. The **Save to File** button lets you save the statement as a file.

## Object Search



*The Object Search button is on the main toolbar.*

You can open the **Object Search** window by either clicking the toolbar button or by selecting the **Tools > Object Search** menu item.



*This button, on the Object Search window, lets you change the active session for the window.*

Object Search searches all database object names, table column names, index column names, constraint column names, trigger column names, and procedure source code for a keyword or phrase. Each of these items can be searched or excluded from the search via checkbox options.

Many capabilities of the Object Search window can be found on the Schema Browser Filters allowing results of the search to be viewed in a browser.

You can search across All Users, including or excluding SYS and SYSTEM schemas, or you can search just one schema by selecting the schema in the **Schemas/Owners** dropdown list. To search across all schemas, pick the first entry in the Schemas/Owners dropdown list, entitled, “\* ALL USERS.”

### To use the Object Search window

- 1 Select the **Schema/Owner** from the dropdown.
- 2 Check or uncheck the **Exclude Sys and System** checkbox, as appropriate.
- 3 Type the search word(s) in the **Search for** box.
- 4 Check the appropriate Object Search checkboxes and choose the type of filter from the dropdown box. You have a choice of: **Text occurs anywhere**, **Starts with**, or **Exact match**.
- 5 Check the appropriate **Source Search** checkboxes. You can specify case sensitive if you want to filter your search even further.
- 6 Click the **Search** button to begin the search.

- 7 The results will display in the results grid. If no matches are found, the results grid will be empty.
- 8 In the results grid you can double-click on a TABLE, VIEW, or PROCEDURE, and a popup details window displays about the object.

## Master/Detail record browser

The Master/Detail record browser is based on foreign key constraints. It lets you browse or edit table data in a database, where the tables are linked by foreign keys. This is like a database setup from an Entity/Relationship diagram, where one table's objects are related to another table's objects by a linking field or fields.

For example, you could start with the DEPARTMENT table, pick "EMPLOYEE" from the related tables dropdown list, select a department record, and the employee records display only for that particular department.

You could further drill down in the EMPLOYEE table to show employees managed by the current manager employee, by selecting "EMPLOYEE" again from the Employee's related tables dropdown list. Selecting a manager employee record will now automatically display the employees managed by that manager. This is known as a circular table reference, where `employee.manager_id` is related to `employee.employee_id`.

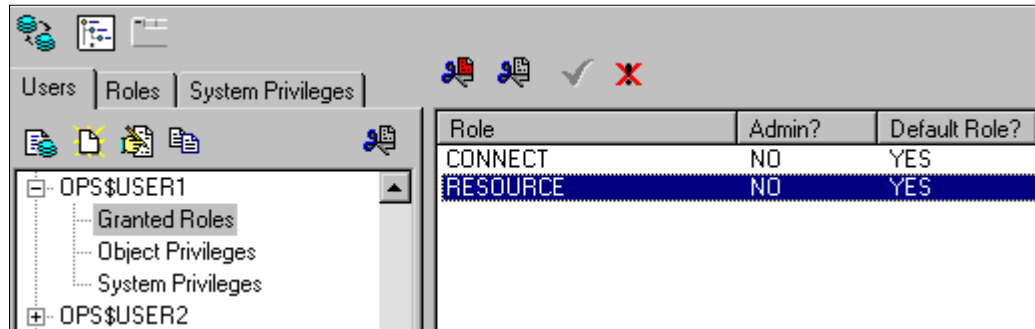
There is currently a static limit of five related tables.

There is also a right-click mouse menu (over the grids) for Print Grid, Save As, Copy Row, and Record Count.



## Privileges

The Privileges window is where users are created, and role and user privileges can be viewed or altered. You get to this dialog via the **Database > Privileges** menu item.



If you do not have DBA privileges, you cannot access this window, and you will get a "ORA-00942 Table or View does not exist" error if you try to open this dialog.

**With the Privileges window, Database Administrators can view:**

### 1 Users

- (a). When the user account was created, their tablespace and profile settings
- (b). Which Roles they have granted to them
- (c). What Object Privileges they have granted to them
- (d). What System Privileges they have (e.g., SELECT ANY TABLE)

### 2 Roles

- (a). System Privileges
- (b). Users with the Role
- (c). Object Privileges
- (d). Granted Roles

### 3 System Privileges

- (a). Roles with the Privilege
- (b). Users with the Privilege

#### **From the Users tab you can:**

- 1 Create a script to recreate the selected user, which includes the "Create User" command, and all the necessary "Grant" commands to recreate the user. The script is copied to the clipboard.
- 2 Create a new user, which will open the Create User window, where you can select the username, password, tablespace, profile settings, system privileges, and roles.
- 3 Modify the selected user by changing user settings or adding more system privileges and/or roles.
- 4 Create a new user as an exact copy of the selected user.
- 5 Drop an existing user.
- 6 Revoke a single or multiple Role, Object Privilege, or System Privilege from a user.
- 7 Change a user's role from DEFAULT to no DEFAULT or vice versa.

#### **From the Roles tab you can:**

- 1 Drop a role.
- 2 Revoke a single or multiple System Privileges from a role.
- 3 Revoke a user from the selected role.
- 4 Revoke a single or multiple object privilege from a role.
- 5 Revoke a role from a role.



## Rebuild Table

Use this function to rebuild a table, optionally dropping column(s), and/or renaming column(s). This will also coalesce the space occupied by the table. You get to this window via the **Tools > Rebuild Table** menu item.

This window will create a complete script to rebuild a table, after which you can further edit to customize, if desired.

### To Rebuild a Table

- 1 Logon as the table owner, because you cannot change owners in the **Rebuild Table** window.
- 2 Click the **Tools > Rebuild Table** menu item.
- 3 Select a table to rebuild from the **Tables** dropdown list.
- 4 On the **Options** tab, select the options.
- 5 On the **Storage** tab, select the storage parameters. You can either use the original storage parameters or use the current table size as the initial extent, which will combine all extents together into one extent, resulting in faster disk performance.
- 6 On the **Columns** tab, double-click a column on the upper list to exclude it (drop it) from the table. To rename a column, click to select it (from the upper list), wait until after the mouse double-click time, and click it again. Enter the new name for the column.
- 7 Click the **SQL** tab. The rebuild table script will be constructed and displayed. Now you can either save the script to a file or copy it to the clipboard. To execute the script, copy it, paste it into the SQL Edit window, and execute it.

Indexes owned by different schemas are not rebuilt in the Rebuild Table process.

## TOAD Security

TOAD includes a security feature. You can restrict TOAD users from having access to specific TOAD features.

### To set up security

- 1 Load the \TEMPS\TOADSECURITY.SQL script to create two tables in the TOAD schema: TOAD\_FEATURES and TOAD\_SECURITY. These are REQUIRED to be in the TOAD schema—they can't simply be in another schema with synonyms pointing back.

TOAD\_FEATURES is a two column table. NAME is the keyword that TOAD responds to in order to enable or disable functionality. DO NOT change the data in the NAME column. DESCR is the description of the specific TOAD feature to enable or disable. Feel free to edit the descriptions of the features, if you wish. If there is some ambiguity about a function, the description should indicate where that function exists in TOAD. "SB" is for Schema Browser.

TOAD\_SECURITY is a two column table of USER and FEATURE, from TOAD\_FEATURES.NAME. If there is not a record in TOAD\_SECURITY for the given user and function, the user cannot run that function.

- 2 Run TOAD, login as the TOAD schema, and select the **Tools > TOAD Security** menu item to bring up the **TOAD Features Security** window. Select the user or role, then select the features you want to grant to that user. All other features will be disabled from this user. You can also delete records from the TOAD\_SECURITY table directly, in order to remove functions from certain users. Since other non-DBA users only have SELECT privileges to the TOAD\_SECURITY table, they cannot make changes to the security.

- 3 Click the **Grant SELECT** button so the user or role can see the TOAD.TOAD\_SECURITY table.

If the user cannot "see" the TOAD\_SECURITY table (i.e., they do not have SELECT access granted to them), they have FULL access to all TOAD features.

If the user has SELECT privileges on the TOAD\_SECURITY table, then the security is in effect.

Menus are disabled and enabled from top down. For example, if the entire Create menu is disabled for a user by a CREATE MENU record in the security table, then all items on the Create menu will be disabled. Even if you have CREATE INDEX it will be disabled, because the whole Create menu will be disabled.

Not all buttons, menus, or functions in TOAD are contained within this security scheme. If you need to restrict other functionality, please let us know.

You can also create collections of TOAD features using existing Oracle roles. Grant the features to a role, e.g., DEVELOPER\_ROLE, grant the role to the end user(s), then those TOAD users will get the collections of TOAD functionality without having to set up the same list of TOAD features for multiple users.

**Disable saving Oracle passwords by TOAD** is one option that is in the Available Features List. This lets you disable the ability to save passwords. Once this feature is read in, it applies to the whole TOAD session, even if other users on the same session have the rights to save passwords.

#### **Read-only and the Copy All function**

If you choose to grant a Schema/User all the available features by selecting Copy All, it will also copy the **Place TOAD in READONLY mode for this schema** function. So, TOAD will be read-only to the user. If you want to grant the user all the privileges you would need to select the Copy All button and move the Place TOAD in READONLY mode...item back to the Available Features list.

NOTE: TOAD security is not enforced if the user has the DBA role.

### Example

#### To set up a list of different kinds of TOAD features and then grant the list to select groups of users

- 1 Start TOAD, login as user TOAD or a user with the DBA role, go to the **Tools > TOAD Security** window.
- 2 Select **DEVELOPER\_ROLE** from the **Schema/Users** dropdown list. These are standard Oracle roles. Have your DBA create the roles, if necessary. DO NOT use the DBA role. When TOAD starts, if the user has the DBA role, that overrides everything else, including security.
- 3 Confirm that DEVELOPER\_ROLE has Select priv to the TOAD.TOAD\_SECURITY table. If the **SELECT** button caption is "Grant SELECT" click it to execute the grant. If the button caption is "Revoke SELECT" the grant already exists.
- 4 Copy the desired features to the "Granted Features" list.
- 5 Click the **EXECUTE** button. TOAD will "grant select on toad.toad\_security to developer\_role" and write the selected records into the TOAD\_SECURITY table.
- 6 Confirm that the Oracle Role has been granted to the user: [grant developer\_role to scott].
- 7 Have user SCOTT logoff/logon to TOAD. Their TOAD features should be limited as specified.
- 8 Repeat these steps for setting up features for the other desired roles, e.g., TUNER\_ROLE, MAINTENANCE\_ROLE, etc.

## Options Menu

The Options menu (View > Options or Options button on main toolbar) contains the following options:

- General
- Oracle
- SQL Editor
- Data Grids
- Procedure Editor
- Editors
- StartUp
- Schema Browser
- Files
- Debugging
- Types Tab
- Source Control
- Printing
- DBA
- Data Types
- Parser Scripts
- Proc Templates
- Executables
- Instance Manager
- Monitors
- SQL Modeler
- Network Utilities

Many of these options have already been discussed. This section briefly covers General, Oracle, Startup, Files, Parser Scripts, and Proc Templates.

## General Options

### **Show USER@DATABASE in window captions**

Default – Checked

If checked, TOAD will show the schema username, the "@" symbol, and the database alias in the window caption on the applicable windows. If unchecked, TOAD will only show the schema username.

### **Show details following Oracle connection (and Oracle DLL load) features**

Default – Checked

If checked, this option displays a message box with details about the TOAD to Oracle connection handshaking.

### **Confirm before closing TOAD**

Default – Unchecked

If checked, TOAD will prompt you with YES or NO buttons when you either click the control box, close the TOAD application button, or select the menu item **File > Exit**.

### **Allow multiple copies of TOAD to be loaded**

Default – Unchecked

If checked, will permit multiple instances of the TOAD application to be loaded.

### **Display dropdown menus on ChangeSession buttons**

Default – Checked

If checked, will display the dropdown arrow on the **Load from File** or **Load Source from Database** toolbar buttons so that you can pick the last 10 items, and will display the dropdown arrow on the change session buttons.

**Show Splash Screen at startup**

Default – Checked

If checked, the splash screen will display when you start TOAD.

**Use the old style clipboard keys in the Edit menu**

Default – Unchecked

If checked, will use the old style clipboard command (cut, copy, paste) shortcut key combinations, which are displayed in the right-column of the Edit menu.

Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V

*Default clipboard shortcut keys*

Cut	Shift+Del
Copy	Ctrl+Ins
Paste	Shift+Ins

*Old style clipboard shortcut keys*

**Use locale settings (date format, decimal, char, etc.)**

This is an older option and is no longer applicable.

**Use drag bar for splitter sizing**

Default – Unchecked

If checked, when you click on the splitter in a window, a bar displays that you can then drag for repositioning the splitter. If unchecked, when you click and drag on the splitter, the whole splitter moves.

**Prompt to close all windows when closing Oracle sessions**

Default – Unchecked

If checked, when you close a session TOAD will prompt you if you want to close all windows associated with the session.



**Show task bar at bottom of main window**

Default – Unchecked

If checked, a task bar containing a button for each connection will display at the bottom of the main TOAD window. The connection buttons contain right-click menu items for End Connection, Commit, Rollback, and a list of currently open windows for the session from which you can select to view.

## Oracle Options

### **Commit automatically after every statement**

Default – Unchecked

This is a session level setting that, when checked, forces an automatic COMMIT to be sent following every statement.

### **Prompt for Commit when closing TOAD if AutoCommit is disabled**

Default – Checked

When Auto Commit is disabled, TOAD asks whether to perform a commit when the program is terminating. If this option is unchecked, TOAD will NOT prompt, and any uncommitted statements will be unsaved.

*Oracle will perform a commit following any DDL modifications.*

### **Save passwords for Oracle connections**

Default – Unchecked

Normally, only the schema and database are saved to the TOAD.INI file for each new Oracle connection. When checked, this option saves the passwords as well. Be sure you work in a secure environment where your TOAD.INI file will not fall into the wrong hands.

### **Encrypt saved passwords**

Default – Unchecked

If checked, will encrypt the saved passwords so that editing TOAD.INI will not reveal what the passwords actually are.

### **Default passwords to User name**

Default - Checked

If checked, will default passwords to the User name.

**Save previous Explain Plan results (requires TOAD tables)**

Default – Unchecked

If checked, will save the explain plan outputs in the TOAD tables, viewable in the **View > Explain Plan** window.

**Use \TEMPPS\EXPLAN.SQL to fetch Explain Plan results**

Default – Unchecked

If checked, TOAD will read the file EXPLAIN.SQL, which you can customize via a text editor, and TOAD will use that query to fetch and display the Explain Plan results.

**Explain Plan Table Name** textbox

Default – TOAD\_PLAN\_TABLE

This is the table name that you want TOAD to use when saving explain plan results. Use TOADPREP.SQL or NOTOAD.SQL to set this up. *Refer to the Installation Notes topic in TOAD Help for more information on installation.*

**User name for Explain Plan** textbox

Default – the windows logon name

This is the username that will be used when writing out and fetching explain plan data.

**Full path of SQL\*Plus** textbox

Default- Blank

This is the drive letter, path, and folder location of the SQL\*Plus executable. If blank, TOAD will use the ORACLE\_HOME\bin folder to find the SQL\*Plus executable.

**Use a separate connection when TOAD itself is generating transactions**

Default – Unchecked

If checked, when TOAD is putting data into the TOAD temp tables or explain plan function, this setting will force TOAD to use a separate connection.

**Refresh tablenames list on every display**

Default – Unchecked

Throughout TOAD there are lists that display the tablenames for the current schema. Usually, once TOAD reads the list, the list is cached to speed all future displays. If checked, this option forces a refresh before every display. Note that table name lists are affected by the Browser Filters.

**Display size of extents dropdown list**

Default – Kilobytes (KB)

This lets you select the table storage extent size in either Bytes, Kilobytes (KB), or Megabytes (MB).

**OCI Array Buffer size number box**

Default – 25

This lets you enter a number for the OCI Array Buffer size.

**Optimizer mode for DDL queries**

Default – "Default"

This lets you select the best optimizer hint for the DDL queries that TOAD executes. You can choose from the following:

- Default
- /\* + CHOOSE \*/
- /\* + RULE \*/
- /\* + FIRST\_ROWS \*/

**Wrap insert statement when exporting table data**

Default – Unchecked

If checked, TOAD will wrap the insert statements when you export table data.

**Autoconnect to *user@database***

Default – Unchecked

If checked, the next time you start TOAD, it will automatically connect to the *user@database* that is in the checkbox. The *user@database* is the same as your current connection.

**DBMS Output Font** button

This invokes the Font window where you can set the font for the DBMS Output. A sample of the selected font displays next to the button.

## Startup Options

### **Play TOAD wave file at startup**

Default – Checked

If checked, will croak when TOAD is starting. If you are having sound card problems, uncheck this option.

### **Use a 3D Main Form (MDI parent inner client area)**

This is an older option and is no longer applicable.

### **Decimal Character (affects printing and number conversion) textbox**

Default – "." (period)

This will be the character that is used as a decimal.

### **Start Up Windows**

Default – "SQL Editor"

You can select which MDI child window(s) comes up when TOAD starts: SQL Editor, Procedure Editor, Schema Browser., Kill/Trace, Script Manager.

### **File to AutoLoad on startup** textbox

Default – Blank (display no file)

This file will automatically be loaded into the first SQL Edit Window that displays following a database Login.

### **Check for access to DBA Views**

Default - Unchecked

If you have access to the DBA views, such as DBA\_TAB\_COLUMNS, check this option. At session startup, TOAD will see if DBA views are available to that particular user schema. If so, TOAD will query the Oracle Dictionary using the DBA views instead of the ALL views such as ALL\_TAB\_COLUMNS. DBA views do not have security checks; so they're faster than ALL views.

**Check for Access to DBMS\_Transaction to Prevent Unnecessary Commit Reminders** checkbox

Default – Unchecked

If you have access to the DBMS\_Transaction package, check this option. TOAD will check for it and use it instead of prompting for commit reminders.

## Files Options

### **Save files in Unix format**

Default – Unchecked

If checked, files are saved without CR/LF pairs. Tabs are converted to spaces.

### **Export File Extensions**

#### **Procedures**

Enter the desired file extension for exporting procedures. The default is PRC.

#### **Functions**

Enter the desired file extension for exporting functions. The default is FNC.

#### **Package Specifications**

Enter the desired file extension for exporting package specifications. The default is PKS.

#### **Package Bodies**

Enter the desired file extension for exporting package bodies. The default is PKB.

#### **Triggers**

Enter the desired file extension for exporting triggers. The default is TRG.

#### **Views**

Enter the desired file extension for exporting views. The default is VW.



**File Load/Save Dialog Filters**

Nearly all of the File Open and File Save dialog windows displayed through TOAD are for the purpose of manipulating SQL files. The grid dialog allows you to customize the file extensions that display in the system dialog windows. To add another filter, begin typing in a blank row. To delete a filter, highlight the text and press the <DELETE> key.

These are the default filters:

FILE TYPE	FILTER
SQL	*.sql
Text Files	*.txt
Query Files	*.qry
All Files	*.*

**File Association dialog**

This will create a windows file association for the specified file extensions. If you were to double-click in the file explorer on a \*.SQL file, for example, TOAD would startup automatically.

## Parser Scripts

The Parser Scripts options let you set up parsers and select the associated languages.

To add a language, click the **ADD** button and pick a *languagenamescr.txt* from your files (double-click). Then, click in the Extension cell in the lower panel and type in the desired extensions.

## Proc Templates

This option lets you add new templates. You can add as many as you like.

You must include the CREATE OR REPLACE statement. The macro %TriggerOpts% will receive the trigger options you select when creating a new trigger.

## SGA Trace Optimization

You access this window via the **Tools > SGA Trace Optimization** menu item. This is a DBA (Database Administrator) function.

Oracle's SGA (System Global Area Oracle Shared Memory) is a pool of the most recently used SQL statements. Not all SQL statements can be retained in the SGA forever, because it is a limited size. The least frequently used statements are discarded in favor of new ones.

The dropdowns let you select the sort order of the results, the type of statement, and the user (or all users).

You can further filter by showing only statements with a specific number of executions (more than one) and/or only those statements containing a specific keyword.

Once your filters are set, click the **Refresh the List of Statements** toolbar button.

If you want to work with a particular SQL statement in more detail, click the **Load selected statement into the SQL Editor** toolbar button.

A toolbar button lets you **Flush the SGA**. Remember, the SGA is a shared SQL pool where Oracle caches the most recently executed statements. This results in faster reprocessing. The Flush the SGA button removes everything from that pool.

The SQL Text and the tabs in the bottom window (SQL, Execution Stats, and Explain Plan) are the details for the selected SQL.

### Execution Stats

Shows information about the selected SQL statement.

### SQL

Shows the entire SQL for the selected SQL statement.

If you get the "SQL Body Unavailable" message when clicking on the SQL tab, the SQL is not present in Oracle's SGA, which is a pool of the most recently used SQL statements. Not all SQL statements can be retained in the SGA forever, because it is a limited size. The least frequently used statements are discarded in favor of new ones.

### Explain Plan

Shows the Explain Plan for the selected SQL statement in the SQL Shared Pool. The total cost of the statement is displayed in the **Total cost for statement** label. If the cost information is not available because of rule based optimization, this label will be blank.

You can only view the execution plan for a statement if you have rights to access the referenced objects in the statement.

## Estimate Table Size

You get to this dialog via the **Tools > Estimate Table Size** menu item. Use this dialog to estimate how much disk space a table might require given an estimated number of rows.

### To Estimate the Table Size

- 1 Select a Table Owner from the **Owners** dropdown list.
- 2 Select a Table from the **Tables** dropdown list.
- 3 The Block Size is retrieved from the database and populated in the **Block Size** textbox.
- 4 Enter the number of estimated rows of table data in the **Estimated number of rows** textbox.
- 5 Select an estimation option:
  - (a) **Calculate based on average row size of existing data.** Caution: this may take a while because the virtual storage size for all data must be summed and averaged. The more data you have in the table, the longer this will take. If there are no rows of data in the table, an error will result. Select a different estimation option. Once the row size calculation has completed, the average row size value will be populated into the Row Size textbox.
  - (b). **Calculate row/data size from table structure (DDL).** The row size is determined by adding together the DATA\_LENGTH from the Oracle Dictionary for every column in the table. Once the row size calculation has completed, the row size value will be populated into the Row Size textbox.
  - (c). **Use row/data size from analyzed table info.** The table must be analyzed before selecting this option. If the table was previously analyzed, the row size will be populated in the **Row Size** textbox, and the number of rows will be populated into the **Estimated Number of Rows** textbox. If the table was NOT previously analyzed, the Row Size textbox will be empty.

- 6 Click the **CALC** button. The estimated table size will now be calculated and displayed in the **Estimated Table Size** textbox. This value is in bytes.

NOTE: These estimation values are based on how much disk space the table data occupies. These values differ from the EXTENTS values displayed on the **Schema Browser > Tables** page > **Stats/Size** tab, because EXTENTS are containers that store data. Extents are created with a certain container size, e.g., 1MB. Each extent could be empty, half full, three quarters full, or full. In all of these cases, the EXTENT size remains the same, 1MB, but the amount of disk space occupied by data changes.

## Estimate Index Size

You get to this dialog via the **Tools > Estimate Index Size** menu item.

Use this dialog to estimate how much disk space an index might require given an estimated number of rows. This dialog is almost identical to the Estimate Table Size dialog.

### To Estimate Index Size

- 1 Select an **Owner, Table, and Index**.
- 2 Enter the **Estimated number of rows** of data in the table.
- 3 Select an estimation option:
  - (a). **Calculate based on average row size of existing data.**
  - (b). **Calculate row/data size from table structure (DDL).**
- 4 Click the **CALC** button to calculate and display the **Estimated Index Size**.

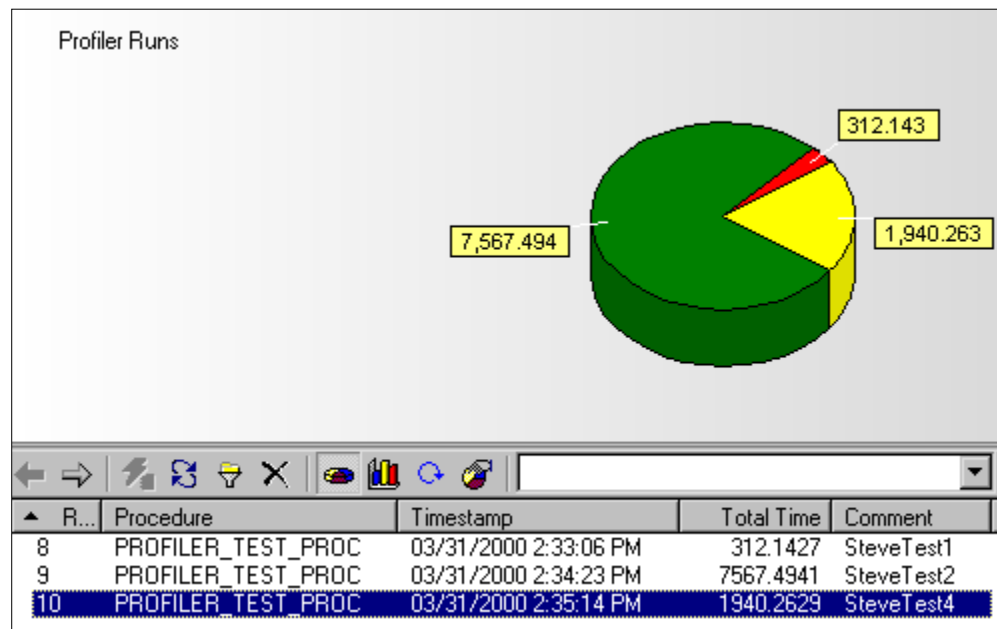


## Profiler Analysis (Oracle 8i only)

Oracle8i provides a Probe Profiler API to profile existing PL/SQL applications and to identify performance bottlenecks. The collected profiler (performance) data can be used for performance improvement efforts or for determining code coverage for PL/SQL applications. Code coverage data can be used by application developers 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.

The Profiler reviews previously collected statistics. It's a two step process. Collect the statistics. Analyze the statistics. To collect the statistics, you have to turn the Profiler on by depressing the **Toggle PL/SQL Profiling** button (the stopwatch icon) or selecting the **Database > PL/SQL Profiling** menu item.



## Using DBMS\_PROFILER

Improving application performance is an iterative process. Each iteration involves the following:

- 1 Exercising the application with one or more benchmark tests, with profiler data collection enabled.
- 2 Analyzing the profiler data and identifying performance problems.
- 3 Fixing the problems.

To support this process, the PL/SQL profiler supports the notion of a run. A run involves running the application through benchmark tests with profiler data collection enabled. You can control the beginning and the end of the run by clicking the **Toggle PL/SQL Profiling** button in the main TOAD toolbar.

### A typical session involves:

- 1 Starting profiler data collection in session.
- 2 Executing PL/SQL code for which profiler/code coverage data is required.
- 3 Stopping profiler data collection.

Some PL/SQL operations, such as the first execution of a PL/SQL unit, might involve I/O to catalog tables to load the byte code for the PL/SQL unit being executed. It could take some time executing package initialization code the first time a package procedure or function is called. To avoid timing this overhead, you should warm up the database before collecting profile data. Warming up involves running the application once without gathering profiler data.

### 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 spent executing that line, and the minimum and maximum times 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, etc.) and analysis capabilities.

With Oracle8i, a sample textual report writer is provided with the PL/SQL demo scripts.

### To set up the Profiler

NOTE: The minimum Oracle database version required for the PL/SQL Profiler is Oracle 8i.

- 1 Make sure you have the SYS.DBMS\_PROFILE package or load the ORA8I\RDBMS\ADMIN\PROFLOAD.SQL script if you do not already have it. Make sure that GRANT EXECUTE on the DBMS\_PROFILE package has been granted to PUBLIC or the users that will use the profiling feature. DBMS\_PROFILER must be installed as SYS.
- 2 Run the TOADProfiler.SQL script. You can find a copy of the script in the TOAD\TEMPS folder. This script will create the tables, packages, synonyms, and grants required to do profiling. It is recommended that you install these objects in the TOAD schema, but you can select whatever schema is appropriate to your environment.

### To use the Profiler



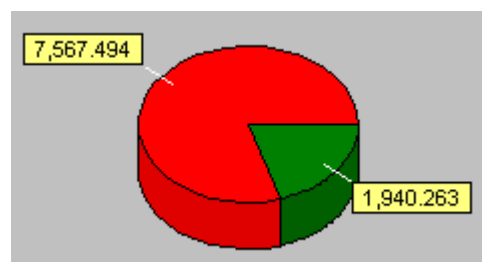
*This stopwatch button is in the depressed position indicating that the Profiler is ON.*

- 1 Select the **Database > PL/SQL Profiling** menu option to turn on the profiler, or click the **Toggle PL/SQL Profiling** button in the main TOAD toolbar.

- 2 Execute a procedure from the Schema Browser OR the Stored Procedure Editor using the Execute button. You will be prompted to enter a description of the procedure being executed. This will show up in the **Profile Analysis** window when you are analyzing the results. Run the procedure several times to get some data into the profiling tables. You can turn off profiling if you want to. Be careful not to leave the profiler toggled on when you switch to other TOAD windows. Otherwise, profiler data will be collected from the queries TOAD performs to populate those windows.
- 3 Select the **Database > Profiler Analysis** menu item. The Profiler Analysis window will display. There are three levels to the data. The top level contains the individual Runs of each procedure executed while profiling was enabled. Double-click on one item for the execution stats for that individual run. At this level, you can double-click to see the line-by-line performance times for individual procedures called during profiling.

The top half of the window is a pie chart (or bar chart, depending on your selection) showing the percent of time required to run each component of the procedure.

The labels on the chart show actual execution time in milliseconds, whereas the values in the legend are the percent of execution time. There are labels for fastest, slowest, and average unit or line of code.



*The legend shows the percent of execution time.*

*Chart labels show execution time.*

The bottom half of the window lists the runs, including Run Number, Procedure, Timestamp, Total Time to execute, and Comment. To sort in ascending or descending order, click the column header of the column you want to sort. A black triangle pointing up (in the column header) indicates order – up is ascending, down is descending.

Run	▲ Procedure	Timestamp	Total Time	Comment
9	PROFILER_TEST_PROC	03/31/2000 2:34:23 PM	7567.4941	SteveTest2
10	PROFILER_TEST_PROC	03/31/2000 2:35:14 PM	1940.2629	SteveTest4

Drilling down on a run will list the details of the run, including Unit Type, Owner, Unit Name, and Total Time to execute.

▲ Unit Type	Owner	Name	Total Time
ANONYMOUS BLOCK	<anonymous>	<anonymous>	0.0143
ANONYMOUS BLOCK	<anonymous>	<anonymous>	0.0263
ANONYMOUS BLOCK	<anonymous>	<anonymous>	0.0149
PACKAGE BODY	SYS	DBMS_PROFILER	0.0417
PROCEDURE	SCHAPMAN	PROFILER_TEST_PROC	1940.1655

When drilling down you see the lines of code executed and profiled. The column headers change to 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.

▲ Line	Passes	Total Time	Min Time	Max Time	Code
13	1	1446.5438	1446.5438	1446.5438	SELECT COUNT(*) INTO tmpVar FROM ALL_ARGUMENTS;
15	15,164	3.1966	0.0002	0.0059	FOR X IN 1 .. tmpVar LOOP
16	15,163	9.1746	0.0006	0.0533	Y := Y + X;
18	1	481.2505	481.2505	481.2505	SELECT COUNT(*) INTO tmpVar FROM ALL_OBJECTS;

Above the Profiler toolbar is a horizontal splitter that divides the top half of the window and the bottom half. Drag it up or down to show more or less detail.

## Profiler Toolbar Buttons



### More Detail/Less Detail

Select a wedge of the pie and double-click to drill down, showing the amount of time required to execute each statement in the procedure. To drill back up, click the **Less Detail** Left Arrow button in the Profiler Analysis toolbar. The **More Detail** Right Arrow button can also be used to drill down. You can also double-click on a procedure name in the list to drill down.



### Procedure Editor

Select a procedure in the list, and click the **Procedure Editor** button to load the selected procedure into a Procedure Edit window.



### Refresh Profiler

If you switch to other windows to execute procedures for profile analysis and switch back to the Profiler Analysis window, click the **Refresh Profiler** button to requery the profiler tables.



### Profiler Filters

If you want to filter OUT certain profiler analysis data, such as all calls of SYS.DBMS\_OUTPUT, click the **Profiler Filters** button on the Profiler Analysis toolbar to display the Profiler Filters window. Select the schemas that you want to filter out.

**Delete Run**

To remove a set of profiler analysis data for a particular run, select the run and click the **Delete Run** button on the Profiler Analysis toolbar. The data will be deleted from the profiler tables. The Delete Run button is only enabled when a run is selected. Drill back up to show less detail in order to select a run.

**Pie Chart****Bar chart**

You can change the graph from a pie chart to a bar chart, or vice versa, by clicking the **Pie Chart** or **Bar Chart** buttons on the Profiler Analysis toolbar. The selected button will be depressed.

When you click each pie chart wedge or bar chart bar, the list at the bottom will select the corresponding item.

**Rotate Graph**

When viewing the pie chart, if the labels overlap, try using the **Rotate Graph** button, or maximize the Profiler Analysis window to give it more client space.

**Graph Properties**

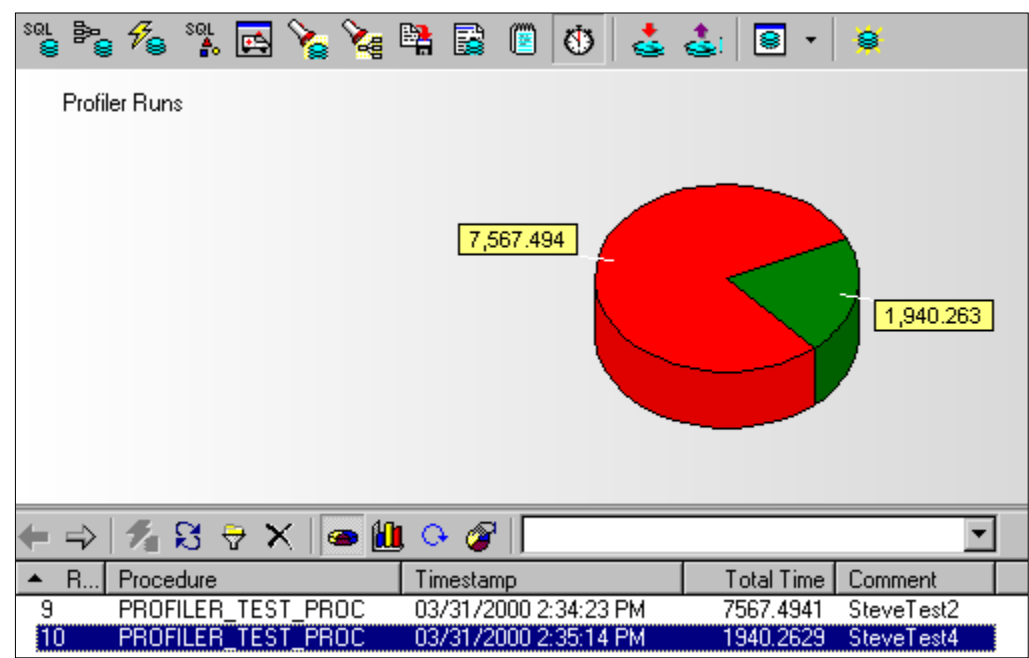
If you click the **Graph Properties** button, a dialog displays that lets you change the visual display of the graph and/or group together values below a certain percentage or value. This is useful when you have several small pie wedges or bars.



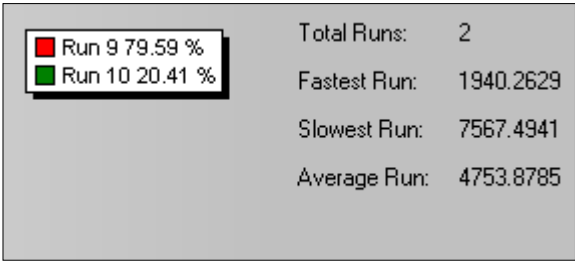
If you can see the pie chart labels but you can't see the pie chart, resize the window horizontally to allow more drawing space.

**Hiding Profiler Data**

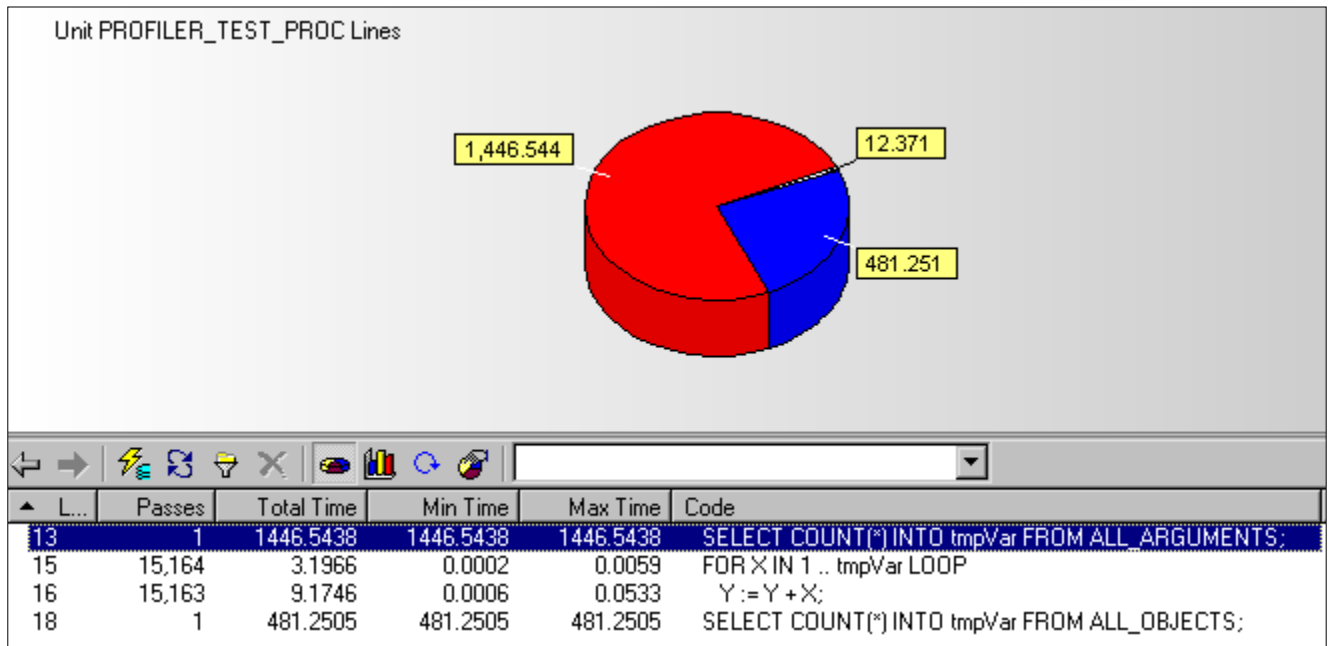
If you right-click on the list, you can temporarily hide some data to better analyze the remaining data. For example, if a statement takes 95% of the overall execution time, hide it, and the remaining statements, which were under 1% each, will blow up to a larger relative percentage on the graph.



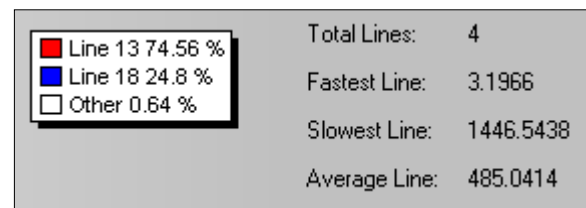
*In this example, the Profiler shows that PROFILER\_TEST\_PROC took 1940.2629 milliseconds to run (or 1.94 seconds). The legend shows the total number of runs the user profiled, which in this case was 2, the fastest run, the slowest run, and the average run. The legend also shows the percentage of total time (of all runs profiled) for each procedure.*







Drilling down from the previous example, the Profiler shows line 15 looped 15,164 times in 3.1966 milliseconds. It also reveals total times and code for the other lines. You can click on the different parts of the pie to see the corresponding code. The legend shows the total lines of code for the selected procedure, and the fastest, slowest and average lines. The legend also shows the percentage of the total execution time for each line.



TOAD Help has other examples and more information about the Profiler.



# Frequently Asked Questions/Troubleshooting

## **What is the current version of TOAD?**

See [www.quest.com](http://www.quest.com) for the latest version information.

## **Can TOAD connect using 16 bit Oracle SQL\*Net?**

TOAD is a 32 bit application and therefore requires 32 bit SQL\*Net.

## **Is TOAD compatible with WinSock v2?**

TOAD is neither compatible nor incompatible with WinSock. Any compatibility issues are between SQL\*Net and WinSock.

## **Something causes TOAD to hang during the splash screen. What can I do?**

If TOAD hangs during the splash screen, there could be a problem with the sound card or sound devices. Edit TOAD.INI, set "PLAY\_WAVE=0", and try to run TOAD again. You can also rename TOADLOAD.WAV to something else, so that TOAD will not find it or attempt to play it.

## **Where can I get upgrades?**

Upgrades can be obtained from the Quest web site, [www.quest.com](http://www.quest.com).

## SQL\*Net/Net8 Installation Problems

**For SQL\*Net/Net8 installation problems, follow these steps**

**1 Determine your Oracle\_Home value.**

Check the Registry under  
HKEY\_LOCAL\_MACHINE\SOFTWARE\ORACLE

**2 Check to see if you have access to ORACLE\_HOME\BIN.**

The most common cause of problems involves the PATH environment variable.

ORACLE\_HOME\BIN must be in your PATH environment variable.

Confirm you have access to the drive and make sure the Oracle Home folder exists.

Your PATH should look similar to this:

PATH=C:\PROGRA~1\MSOFFICE\OFFICE;C:\WINDOWS;C:\ORAWIN95\BIN;

**3 Confirm that the Oracle interface DLL is in the BIN folder under your Oracle home.**

TOAD must have an Oracle interface DLL to connect. It would be ORAxxy.DLL, where xy is the database version you are connecting to. So, for 7.1 it is ORA71.DLL. For Net8/Oracle8i, the DLL is called ORAClient8.DLL. Remember, if this DLL file is not in the bin folder, then TOAD cannot connect.

**4 Look for TNS Admin value.**

The TNS Admin value would be a folder name in the Windows registry.

This is an optional folder. If it is not present the default is

ORACLE\_HOME\NETWORK\ADMIN

Open up the TNSNAMES.ORA file. It should be in the Admin folder. Make sure the database alias name you are using is in the TNSNAMES.ORA file.

You can click the **SQL\*Net Help** button on the Login window to display the **SQL\*Net Configuration Help** window. It lists Oracle Home(s), whether or not TOAD can find the interface DLL, whether or not your ORACLE\_HOME\BIN folder is in your PATH, etc. You can click the **Clipboard** button to copy the information for pasting into an email for technical support.

To access **TOAD Help** while in TOAD, press the **F1** key. TOAD Help includes contents, a searchable index, and details on TOAD's features. It also contains details for troubleshooting problems.



You can get help from the Quest Software Web site at  
[www.quest.com/support/index.html](http://www.quest.com/support/index.html)



## Products Available

This chapter lists optional products that work with and enhance TOAD.

**Quest Software** offers the following products. For more information on any of these products go to [www.quest.com](http://www.quest.com) or contact Quest sales at 1-800-306-9329. You can also send email to [info@quest.com](mailto:info@quest.com).

- TOAD PL/SQL Debugger (see the **PL/SQL Debugger** chapter of this manual)
- TOAD DBA (see the **DBA** chapter of this manual)
- SQLab Xpert™
- SQL Impact™
- Formatter Plus™
- Knowledge Xpert for Active PL/SQL Development™
- Knowledge Xpert for Oracle Administration™







## About Quest Software, Inc.

Quest Software, Inc. is a leading provider of performance management solutions designed to maintain the integrity of mission-critical business transactions and maximize the performance of enterprise applications. Our solutions address the needs of today's 24x7x365 businesses where demands on the information technology infrastructure are high and tolerance for downtime is low.

The Internet has propagated the expectation of instant access to information, and Quest delivers *nonstop software for nonstop business*<sup>™</sup> to meet this demand.

Founded in 1987, Quest Software now helps more than 100,000 users achieve the best possible performance from their enterprise systems so the end user experience is a positive one. Based in Irvine, California, Quest Software has offices worldwide and over 1,000 employees. For more information, visit [www.quest.com](http://www.quest.com).

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## Technical Support

If you have questions about using a Quest Software product, please contact the technical support staff. Please include the version number. You can find your version number in the **Help > About** menu. If your question is about an error message, include the error text as well. You can email support by going to **Help > Support > Email**.

Email: [support@quest.com](mailto:support@quest.com)

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