

# Oracle Application Express Student Guide

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## 1. Introduction

This document will help Oracle Academy students and instructors become familiar with how to use Oracle Application Express and each of its components from an end user's perspective. If you would like to learn more about the teacher capabilities of Oracle Application Express, please refer to the Oracle Application Express – Teacher Guide.

## 2. Logging in to Oracle Application Express

Oracle Academy students and instructors can log in to Oracle Application Express with the login credentials that are provided by the Oracle Academy to the instructor.

The screenshot shows the Oracle Application Express login interface. At the top is the Oracle logo (two crossed pencils). Below it is the text "Oracle Application Express". There are three input fields, each with a green checkmark to its right. The first field contains "US\_Z101\_SQL\_S01" and has a database icon on the left. The second field contains "US\_Z101\_SQL\_S01" and has a person icon on the left. The third field contains a masked password (represented by dots) and has a key icon on the left. To the right of each field is a red box containing a number (1, 2, or 3) with an arrow pointing to the field. Below the fields is a blue "Sign In" button and a "Reset Password" link.

Enter your

1. Workspace
2. Username
3. Password

You will be required to change your password the first time you access APEX.

### 3. Oracle Application Express Components

Once you log into Oracle Application Express you will see the Oracle Application Express home page. This page displays all of the components of Oracle Application Express: Application Builder, SQL Workshop Team Development and Packaged Apps.

- Application Builder: Allows you to create, view or monitor applications.
- SQL Workshop: You can create, manage, and view the database objects from a Web browser using SQL Workshop.
- Team development: facilitates the management of the application development process.
- Packaged applications: a suite of business productivity applications.

SQL Workshop is the main component that is used with the Database Programming with PL/SQL course curriculum. Note that the tabs at the top of the page provide quick access to these components.

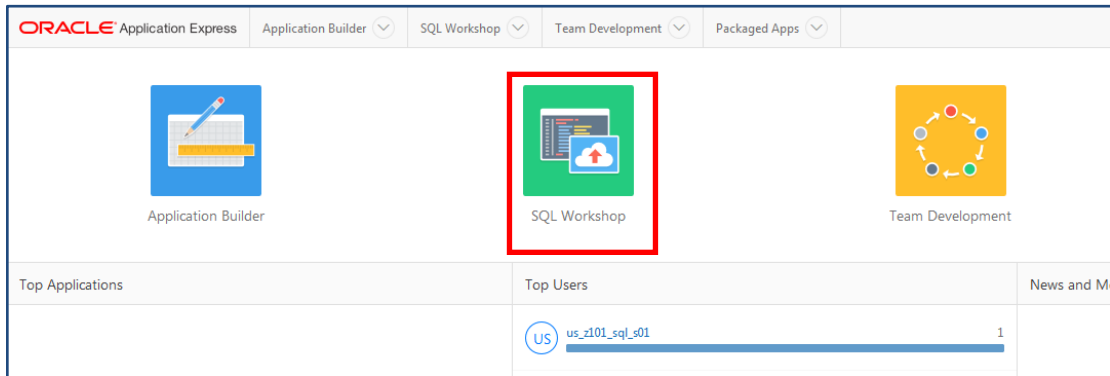
### 4. How to add tables and data to APEX accounts

In order to have access to the tables and data used throughout the course, a Script file that can be accessed from Oracle iLearning must be run in the teacher account and all student accounts.

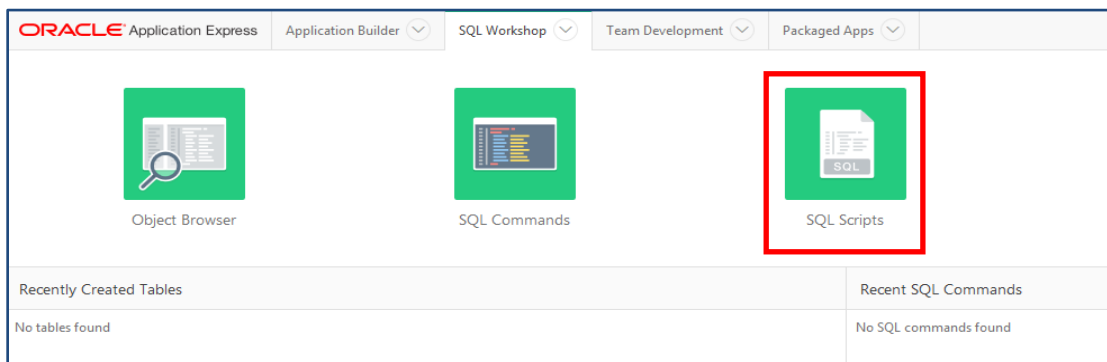
The teacher should do this as a “run-through” with the class following the instructions below. This method insures that students understand, and can download and run the scripts in their own schemas.

1. Download the script file from the Oracle iLearning Database Programming with SQL (or PL/SQL) course. Go to Section 0, Course Resources, click “APEX Scripts and User Guides”, click “Script to Create Tables and Data for This Course, UNZIP the ZIP file, and save the script file locally on your PC.

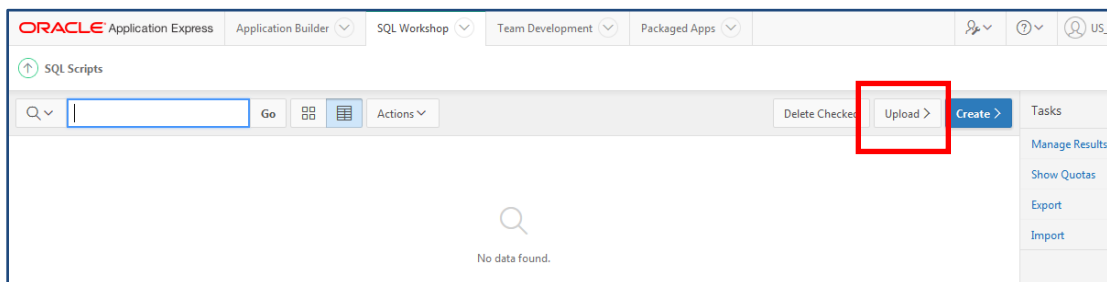
2. Open APEX in your browser and login.
3. Select "SQL Workshop"



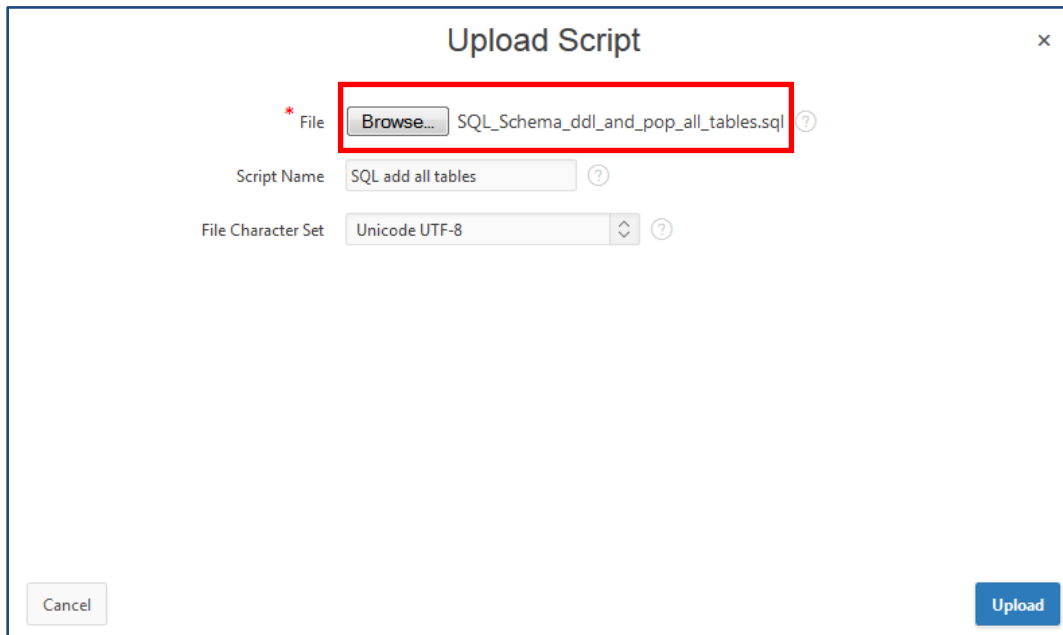
4. Select "SQL Scripts"



5. Click "Upload"

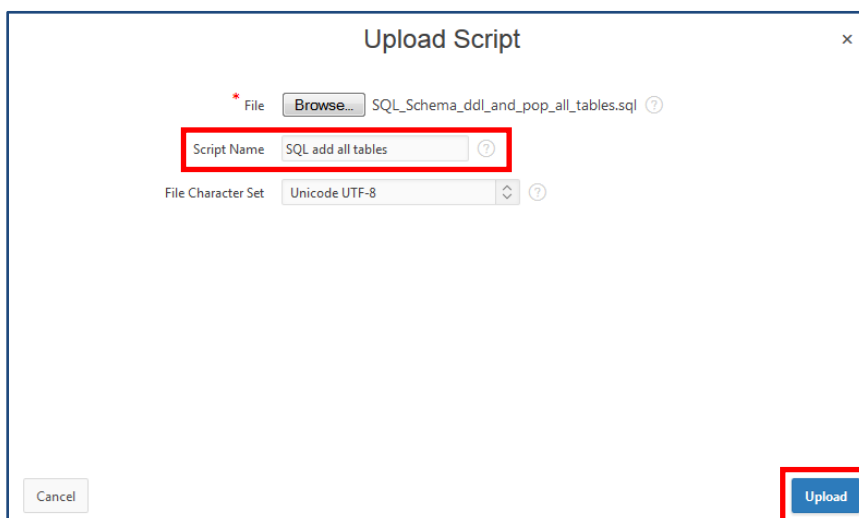


6. Click Browse and navigate to the file you downloaded from Oracle iLearning in Step 1.



The screenshot shows a dialog box titled "Upload Script" with a close button (X) in the top right corner. The dialog contains three input fields: "File", "Script Name", and "File Character Set". The "File" field is highlighted with a red box and contains a "Browse..." button and the text "SQL\_Schema\_ddl\_and\_pop\_all\_tables.sql". The "Script Name" field contains the text "SQL add all tables". The "File Character Set" field is a dropdown menu set to "Unicode UTF-8". At the bottom left is a "Cancel" button, and at the bottom right is a blue "Upload" button.

7. Add a Script Name - "SQL add all tables" or "PLSQL add all tables", leave "File Character Set" as default (Unicode UTF-8), and click "Upload".



The screenshot shows the same "Upload Script" dialog box. The "Script Name" field, which now contains "SQL add all tables", is highlighted with a red box. The "File" field remains highlighted with a red box. The "File Character Set" field is still set to "Unicode UTF-8". The "Upload" button at the bottom right is also highlighted with a red box. The "Cancel" button remains at the bottom left.

8. You will now see the Script listed. Click the Run icon.

ORACLE Application Express Application Builder SQL Workshop Team Development Packaged Apps

SQL Scripts

Search Go Actions Delete Checked Upload Create

	Edit	Owner	Name	Created	Updated By	Updated	Bytes	Results	Run
		US_Z101_SQL_S01	SQL add all tables	2 seconds ago	US_Z101_SQL_S01	1 seconds ago	308,397	0	

1 - 1

9. Click "Run Now"

Run Script

You have requested to run the following script. Please confirm your request.

Script Name	<b>SQL add all tables</b>
Created	<b>on 06/07/2016 09:21:56 AM by US_Z101_SQL_S01</b>
Updated	<b>on 06/07/2016 09:21:57 AM by US_Z101_SQL_S01</b>
Number of Statements	<b>1540</b>
Script Size in Bytes	<b>308,397</b>

Cancel **Run Now** Run in Background

This will take you to the Manage Script Results Page.

10. Click "View Results"

ORACLE Application Express Application Builder SQL Workshop Team Development Packaged Apps

SQL Scripts Manage Script Results

Search Go Actions Delete Checked

Selected File = 117341090955652327

Script	Run By	Started	Finished	Elapsed	Status	Security Group Id	Statements	Bytes	View Results
PLSQL_Schema_ddl_and_pop_all_tables.sql	US_Z201_PLSQL_S01	8 seconds ago	06/16/2016	8.11	Completed	7083820808135437	1607 of 1607	0	



## 5. Using SQL Commands from the SQL Workshop Component

Click on the SQL Workshop icon. On the SQL Workshop home page you will see the four tools available from SQL Workshop:

- Object Browser
- SQL Commands
- SQL Scripts
- Utilities
- Restful Services

The screenshot shows the Oracle Application Express SQL Workshop interface. The top navigation bar includes 'ORACLE Application Express', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Packaged Apps'. Below the navigation bar are five tool icons: Object Browser, SQL Commands (highlighted with a red box), SQL Scripts, Utilities, and RESTful Services. The main content area is divided into two columns: 'Recently Created Tables' and 'Recent SQL Commands'. The 'Recently Created Tables' column lists tables like DEPARTMENTS, JOBS, LOCATIONS, COUNTRIES, REGIONS, JOB\_HISTORY, and JOB\_GRADES, each with a timestamp of '3 days ago'. The 'Recent SQL Commands' column lists recent SQL queries and their execution times, such as 'SELECT \* FROM locations;' (44 hours ago) and 'select \* from employees;' (3 days ago). The right sidebar contains an 'About' section, a 'Schema' section with a dropdown menu set to 'US\_Z101\_SQL\_S01', and a 'Create Object' section with options for Table, View, Index, and Sequence.

The SQL Commands icon will link to where you will enter and practice SQL and PL/SQL coding in the Database Programming with SQL or PL/SQL course. You can use the SQL Command tool to run SQL or PL/SQL statements on any Oracle database schema to which you have access privileges.



## 6. General Overview SQL Command Window

Refer to the graphics below for information about the SQL Command window:

1. Schema: The drop down menu only displays the schemas to which you have been granted access.
2. Statement window: Type SQL or PL/SQL commands in this window.
3. Run SQL button: Click this button to execute the SQL or PL/SQL statement.
4. Save button: You have the ability to run your SQL or PL/SQL statement or save it for future use. To limit the number of times you enter a common SQL or PL/SQL statement, save the statement by clicking the Save button.

The screenshot shows the Oracle SQL Command Window interface. The top navigation bar includes 'ORACLE Application Express', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Packaged Apps'. The 'SQL Commands' section features a 'Rows' dropdown set to 10, 'Clear Command', and 'Find Tables' buttons. The main area contains the SQL statement 'SELECT \* FROM locations;'. To the right of the statement are 'Save' and 'Run' buttons. Below the command area is a 'Results' section with tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, displaying a table with 5 rows of location data. Red arrows and boxes with numbers 1 through 4 point to the Schema dropdown, the SQL statement, the Run button, and the Save button respectively.

LOCATION_ID	STREET_ADDRESS	POSTAL_CODE	CITY	STATE_PROVINCE	COUNTRY_ID
1800	460 Bloor St. W.	ON M5S 1X8	Toronto	Ontario	CA
2500	Magdalen Centre, The Oxford Science Park	OX9 9ZB	Oxford	Oxford	UK
1400	2014 Jaberwocky Rd	26192	Southlake	Texas	US
1500	2011 Interiors Blvd	99236	South San Francisco	California	US
1700	2004 Charade Rd	98199	Seattle	Washington	US

5 rows returned in 0.03 seconds [Download](#)

5. After a SQL or PL/SQL statement is executed, the results are displayed in the Results window. An error message displays if there is a problem with the SQL or PL/SQL command.
6. Rows: The Rows drop down menu lets you select the number of rows you would wish to display.
7. Tabs: The tabs can quickly take you back to any of the 4 main components of the Oracle Application Express.
8. Saved SQL: Click on this button to display your list of saved SQL and PL/SQL commands.
9. History: Displays a list of the recently executed SQL and PL/SQL commands.

The screenshot shows the Oracle Application Express SQL Workshop interface. The top navigation bar includes tabs for Application Builder, SQL Workshop, Team Development, and Packaged Apps. Below the navigation bar is a 'SQL Commands' section with a 'Rows' dropdown menu set to 10, and buttons for 'Clear Command' and 'Find Tables'. The main area contains a SQL statement: 'SELECT \* FROM locations;'. Below the statement is a 'Results' window with tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, displaying a table with 5 rows of location data. Red arrows and boxes highlight specific features: arrow 6 points to the 'Rows' dropdown, arrow 7 points to the 'Packaged Apps' tab, arrow 5 points to the 'Results' tab, arrow 8 points to the 'Saved SQL' tab, and arrow 9 points to the 'History' tab.

LOCATION_ID	STREET_ADDRESS	POSTAL_CODE	CITY	STATE_PROVINCE	COUNTRY_ID
1800	460 Bloor St. W.	ON M5S 1X8	Toronto	Ontario	CA
2500	Magdalen Centre, The Oxford Science Park	OX9 9ZB	Oxford	Oxford	UK
1400	2014 Jabberwocky Rd	26192	Southlake	Texas	US
1500	2011 Interiors Blvd	99236	South San Francisco	California	US
1700	2004 Charade Rd	98199	Seattle	Washington	US

5 rows returned in 0.03 seconds. [Download](#)

Additional features to note about the Results window (see Graphic below):

1. If you want to create a file of the output results:
  - a. Click on the "Download" link
  - b. A Pop-up window will appear. Select from "open or save this file"
  - c. If you select "open" then it will open the results in a Microsoft Excel spreadsheet. From Microsoft Excel you can then do a "save as" to save the file in this format.
  - d. If you select "save" then it will save it as a .csv (comma separated value) file. A pop-up will allow you to select the saved filename and location.
2. Click on the "Clear Command" button to clear the Statement Window.
3. Click on the "Find Tables" button to see a list of table names.

Oracle Application Express SQL Workshop interface. The SQL Commands window contains the query: `SELECT * FROM locations;`. The Results window displays a table with 5 rows:

LOCATION_ID	STREET_ADDRESS	POSTAL_CODE	CITY	STATE_PROVINCE	COUNTRY_ID
1800	460 Bloor St. W.	ON M5S 1X8	Toronto	Ontario	CA
2500	Magdalen Centre, The Oxford Science Park	OX9 9ZB	Oxford	Oxford	UK
1400	2014 Jabberwocky Rd	26192	Southlake	Texas	US
1500	2011 Interiors Blvd	99236	South San Francisco	California	US
1700	2004 Charade Rd	98199	Seattle	Washington	US

5 rows returned in 0.03 seconds. A 'Download' link is visible below the table.

## 7. Saving a SQL or PL/SQL Statement

To limit the number of times you enter a common SQL or PL/SQL statement, save the statement by clicking the Save button. To save the SQL commands:

1. Click on the 'Save' button in the SQL command window.
2. A pop-up window will appear where you can enter the name (mandatory) and description (optional) of the file.
3. Click the Save button when done.

Oracle Application Express SQL Workshop interface. The SQL Commands window contains the query: `SELECT * FROM locations;`. The Results window displays a table with 5 rows (same as above). A 'Save SQL' dialog box is open, prompting for a name and description. The 'Save' button in the dialog is highlighted with a red box and arrow labeled '3'. The 'Save' button in the SQL command window is highlighted with a red box and arrow labeled '1'. The 'Name' field in the dialog is highlighted with a red box and arrow labeled '2'.

## 8. Accessing a Saved SQL or PL/SQL Statement

The saved SQL or PL/SQL commands can be accessed, executed, modified and deleted (See Graphic Below).

1. To display the list of saved SQL or PL/SQL commands: click on the “Saved SQL” tab.
2. To execute a saved SQL or PL/SQL command: click on the “Name” of the saved SQL or PL/SQL command. You will see it displayed in the statement window. You can now click on the “Run” button to execute these commands.
3. To edit a saved SQL or PL/SQL command: click on the “Name” of the saved SQL or PL/SQL command. You will see it displayed in the statement window. Edit the command, as needed then click on the “Save” button. The pop-up window will contain the original information. You can either keep it or edit the information or save to a new filename.
4. To delete a saved SQL or PL/SQL command:
  - a. Click on the box in front of the name of the saved command you wish to delete,
  - b. Click on the “Delete Checked” button.
5. To search for a SQL or PL/SQL command: enter a key word in the “Find” box, then click on the “Go” Button.

The screenshot shows the Oracle SQL Developer interface with the 'Saved SQL' tab selected. The interface includes a top navigation bar, a 'Schema' dropdown set to 'US\_NLH1\_SQL\_T01', and a 'Rows' dropdown set to '10'. The main area displays a table of saved SQL commands. The table has columns for Owner, Name, Description, SQL, Updated By, and Updated. A single entry is visible: 'US\_NLH1\_SQL\_T01' with the name 'LOCATIONS' and the SQL text 'SELECT \* FROM locations;'. Annotations are placed as follows: '1' points to the 'Saved SQL' tab; '2' points to the 'LOCATIONS' link in the 'Name' column; '3' points to the 'Name' column header; '4a' points to the checkbox in the first column; '4b' points to the 'Delete Checked' button; and '5' points to the 'Find' box and 'Go' button.

Owner	Name	Description	SQL	Updated By	Updated
US_NLH1_SQL_T01	<a href="#">LOCATIONS</a>	Displays a list of locations.	SELECT * FROM locations;	US_NLH1_SQL_T01	Now

## 9. Using the History Option

A list of the latest run SQL or PL/SQL commands are kept in History. By default they are listed the most recently run commands. There are different options to note in the History window.

1. Click on the “History” option.
2. To search for a previously used command: Enter a key search word in the “Find” box then click on the “Go” button.
3. To re-execute the SQL or PL/SQL command: Click on the SQL or PL/SQL you wish to execute. You will see it displayed in the Statement Window. Click on the “Run” button to execute the SQL commands.

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'ORACLE Application Express', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Packaged Apps'. The main area is titled 'SQL Commands' and shows a 'Schema' dropdown set to 'US\_NLHI\_SQL\_T01'. Below this, there are controls for 'Rows' (set to 10), 'Clear Command', and 'Find Tables'. The SQL command window contains the text: `SELECT * FROM locations;`. The 'History' tab is selected, showing a table with columns 'Time' and 'SQL'. The first entry is '38 minutes ago' and 'SELECT \* FROM loc...'. A red box labeled '1' points to the 'History' tab. A red box labeled '2' points to the 'Find' input field, and a red box labeled '3' points to the 'Go' button.

## 10. Using the Explain Option

Either type in a SQL or PL/SQL command in the “Statement” window or select a command from “History” or “Saved SQL”, then click on the “Explain” option to see a graphic explanation of SQL or PL/SQL command in the “Results” window.

The screenshot shows the Oracle SQL Workshop interface with the 'Explain' option selected in the 'Results' tab. The SQL command window contains the text: `SELECT * FROM locations;`. The 'Query Plan' table is displayed below, showing the execution plan for the query. The 'Explain' button is highlighted with a red box.

Operation	Options	Object	Rows	Time	Cost	Bytes	Filter Predicates *	Access Predicates
SELECT STATEMENT			5	1	2	390		
TABLE ACCESS	FULL	LOCATIONS	5	1	2	390		

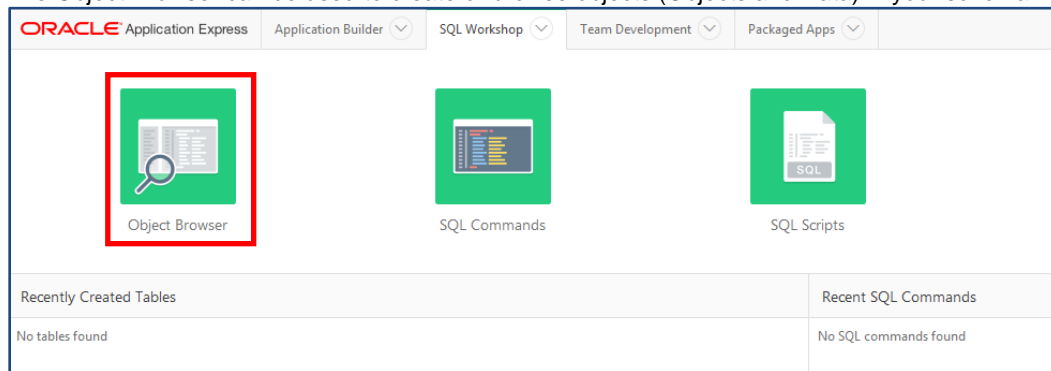
\* Unindexed columns are shown in red

Owner	Table Name	Index Name	Used in Plan	Columns	Uniqueness	Status	Index Type	Join Index
US_NLHI_SQL_T01	LOCATIONS	LOC_STATE_PROVINCE_IX		STATE_PROVINCE	NONUNIQUE	VALID	NORMAL	NO
		LOC_COUNTRY_IX		COUNTRY_ID	NONUNIQUE	VALID	NORMAL	NO
		LOC_CITY_IX		CITY	NONUNIQUE	VALID	NORMAL	NO
		LOC_ID_PK		LOCATION_ID	UNIQUE	VALID	NORMAL	NO

Table Columns

## 11. Using the Object Browser tool from the SQL Workshop Component

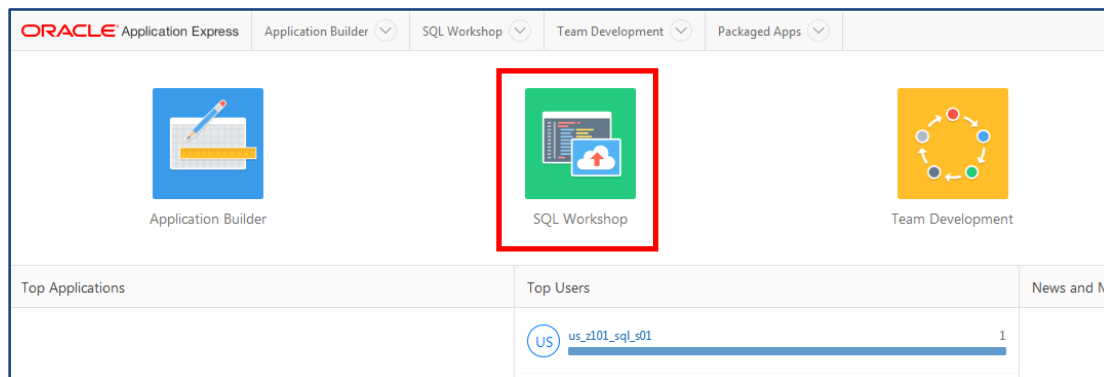
The Object Browser can be used to create or browse objects (Objects and Data) in your schema.



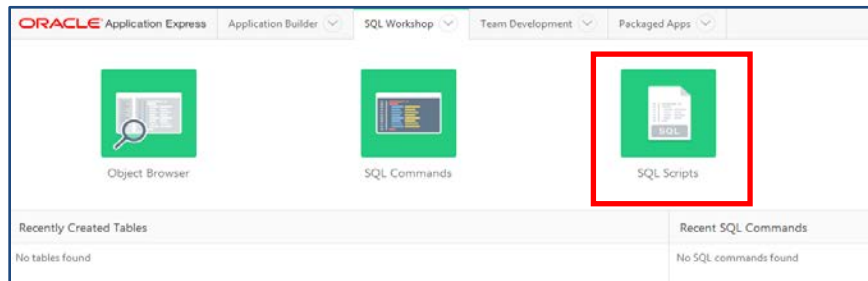
## 12. Using SQL Scripts tools from the SQL Workshop Component

The SQL Scripts tool can be used to view, create or upload SQL or PL/SQL scripts. A SQL or PL/SQL script is one or more SQL or PL/SQL statements that are executed sequentially. Each statement must have a semi-colon at the end of the statement.

To access the SQL Scripts page, click SQL workshop

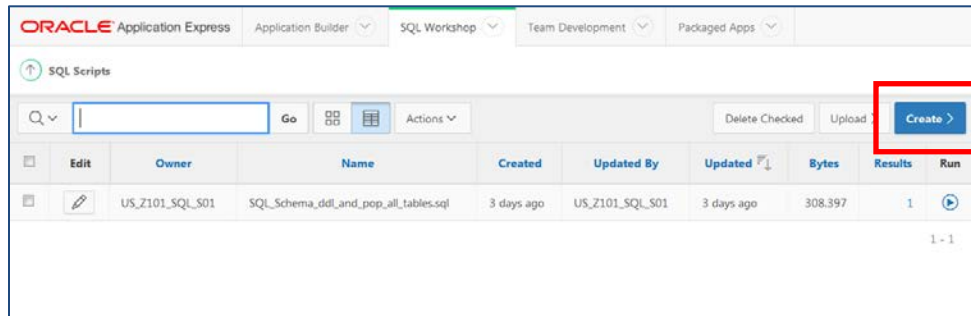


Click SQL Scripts



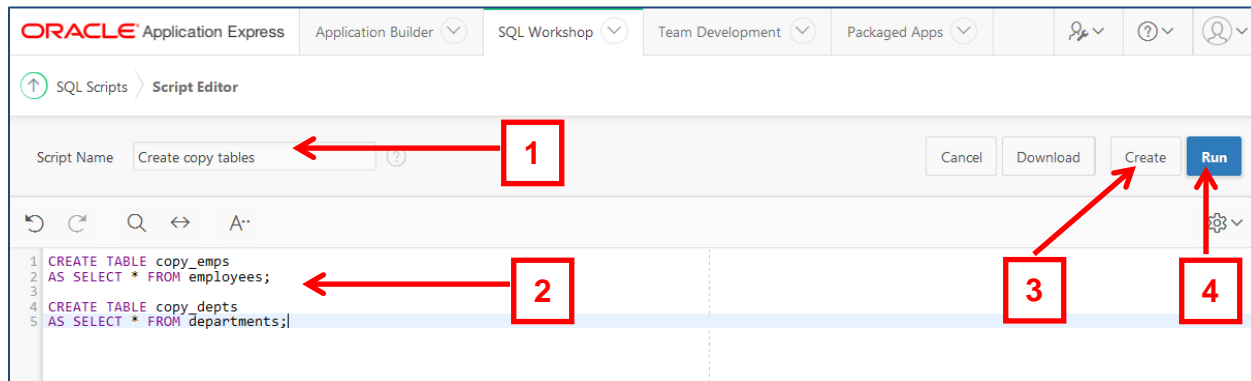
### 13. Creating Scripts

To access the script editor window you click the “Create” button from the SQL Scripts page.



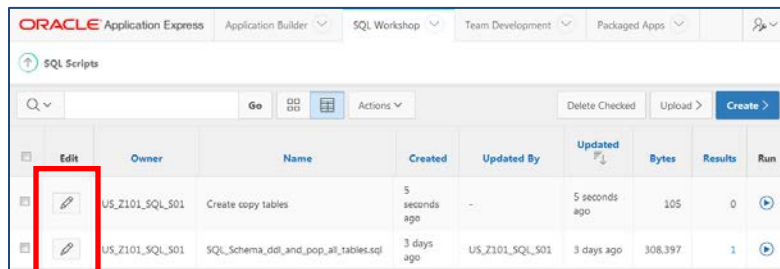
To create a new script:





1. Give your script a name
2. Enter in the SQL or PL/SQL commands
3. Click “Create” button to save your script
4. Or Click “Run” button to execute your script



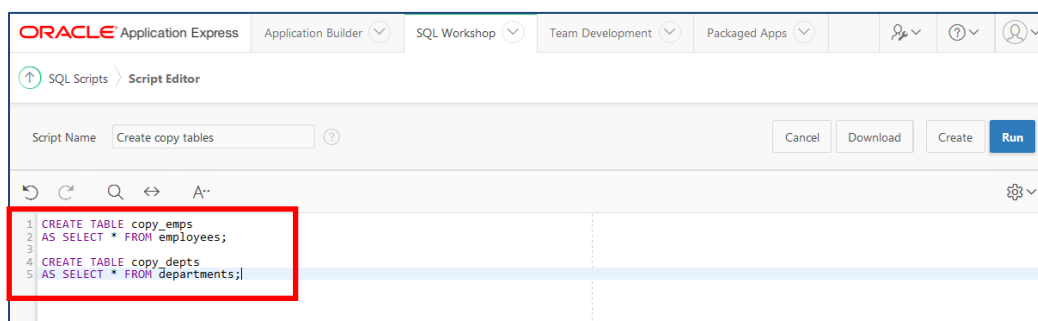
## 14. Viewing Scripts

To view scripts loaded into the SQL Script tool, select SQL Workshop SQL Scripts. (As shown in step 11) and click on the Edit icon (pencil).



	Edit	Owner	Name	Created	Updated By	Updated	Bytes	Results	Run
<input type="checkbox"/>		US_Z101_SQL_S01	Create copy tables	5 seconds ago	-	5 seconds ago	105	0	
<input type="checkbox"/>		US_Z101_SQL_S01	SQL_Schema_ddl_and_pop_all_tables.sql	3 days ago	US_Z101_SQL_S01	3 days ago	308,397	1	

The contents of the script is displayed in the Script Editor window



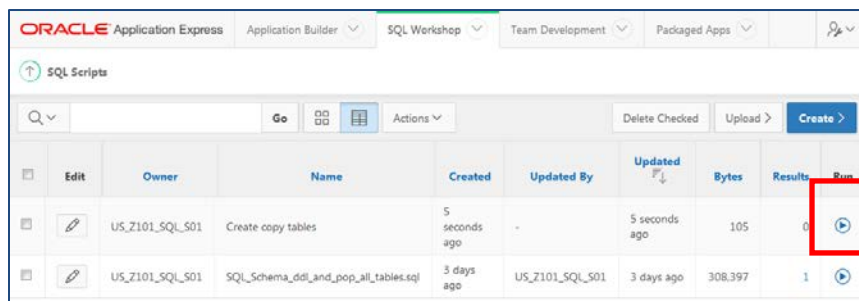
```





1 CREATE TABLE copy_emp;
2 AS SELECT * FROM employees;
3
4 CREATE TABLE copy_depts;
5 AS SELECT * FROM departments;

```

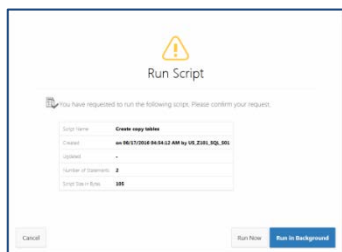
## 15. Running Scripts

To run a script, click the “Run” icon next to the script you wish to execute.



	Edit	Owner	Name	Created	Updated By	Updated	Bytes	Results	Run
<input type="checkbox"/>		US_Z101_SQL_S01	Create copy tables	5 seconds ago	-	5 seconds ago	105	0	
<input type="checkbox"/>		US_Z101_SQL_S01	SQL_Schema_ddl_and_pop_all_tables.sql	3 days ago	US_Z101_SQL_S01	3 days ago	308,397	1	

You will get a pop-up confirmation window to either cancel the request, Run Now, or Run in Background.



**Run Script**

You have requested to run the following script. Please confirm your request.

Script Name: **Create copy tables**

Owner: **US\_Z101\_SQL\_S01**

Number of Statements: **2**

Script Size in Bytes: **105**

Buttons: Cancel, Run Now, Run in Background



Click the “Run Now” button. You will be taken to the “Manage Script Results” page. To see the results, click the “View Results” icon.

Script	Run By	Started	Finished	Elapsed	Status	Security Group Id	Statements	Bytes	View Results
Create copy tables	US_Z101_SQL_S01	Now	06/17/2016	0.09	Completed	7076210502134169	2 of 2	0	
SQL_Schema_ddl_and_pop_all_tables.sql	US_Z101_SQL_S01	3 days ago	06/13/2016	7.22	Completed	7076210502134169	1540 of 1540	0	

The following is a sample of the type of detailed results information you might see.

Number	Elapsed	Statement	Feedback	Rows
1	0.06	CREATE TABLE copy_emp\$S SELECT * FROM employees	Table created.	0
2	0.03	CREATE TABLE copy_dept\$S SELECT * FROM departments	Table created.	0

## 16. Upload Scripts

Before you upload a script into the Script Repository, you must first create it in a text editor on your desktop. When saving your script, make sure to save it as a .sql file. Sometimes programs will add an extension to your .sql and cause problems. For example, cre\_dept.sql may sometimes be saved as cre\_dept.sql.doc. If this is a problem, place double quotes around the title of the script when saving – “cre\_dept.sql”.

You can access the upload window by selecting “Upload” from the SQL Scripts page.

Edit	Owner	Name	Created	Updated By	Updated	Bytes	Results	Run
	US_Z101_SQL_S01	Create copy tables	5 seconds ago	-	5 seconds ago	105	0	
	US_Z101_SQL_S01	SQL_Schema_ddl_and_pop_all_tables.sql	3 days ago	US_Z101_SQL_S01	3 days ago	308,397	1	

Click Browse and navigate to the file on your PC.

Upload Script

\* File **Browse...** SQL\_Schema\_ddl\_and\_pop\_all\_tables.sql

Script Name: SQL add all tables

File Character Set: Unicode UTF-8

Cancel Upload

Add a Script Name, leave “File Character Set” as default (Unicode UTF-8), and click “Upload”.

Upload Script

\* File **Browse...** SQL\_Schema\_ddl\_and\_pop\_all\_tables.sql

Script Name: SQL add all tables

File Character Set: Unicode UTF-8

Cancel Upload

You will see the uploaded Script listed on the “SQL Scripts” page in addition to any Scripts that you created in APEX using the Script Editor.

ORACLE Application Express									
Application Builder		SQL Workshop		Team Development		Packaged Apps		User	
SQL Scripts									
<input type="text"/> <input type="button" value="Go"/> <input type="button" value="Actions"/> <input type="button" value="Delete Checked"/> <input type="button" value="Upload"/> <input type="button" value="Create"/>									
	Edit	Owner	Name	Created	Updated By	Updated	Bytes	Results	Run
<input type="checkbox"/>		US_Z101_SQL_S01	Create copy tables	5 seconds ago	-	5 seconds ago	105	0	
<input type="checkbox"/>		US_Z101_SQL_S01	SQL_Schema_ddl_and_pop_all_tables.sql	3 days ago	US_Z101_SQL_S01	3 days ago	308,397	1	