

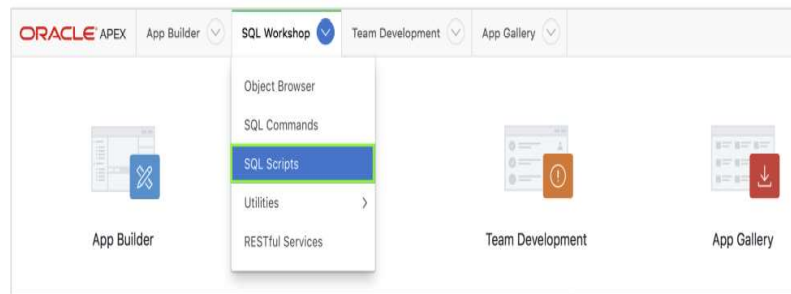
**Use APEX for all the lab activities and company schema you have created in the previous lab. The company schema is also provided on the Moodle. You need to create a database by running the script. Use the below steps to run the script.**

## Loading the Tables and Data (companySchema.SQL)

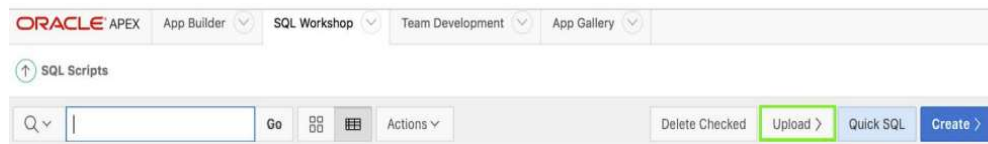
In this activity, you create the required database objects and populate the tables with sample data.

1. Use SQL Workshop to upload a script that creates the tables for company database. Perform the following steps:

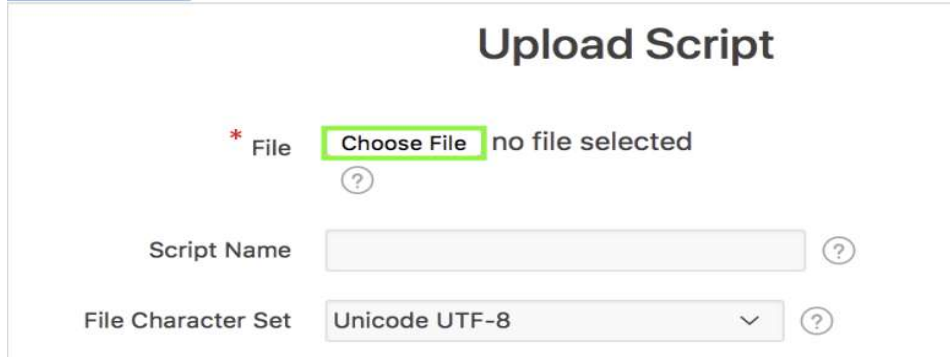
1. Navigate to SQL Workshop and select SQL Scripts



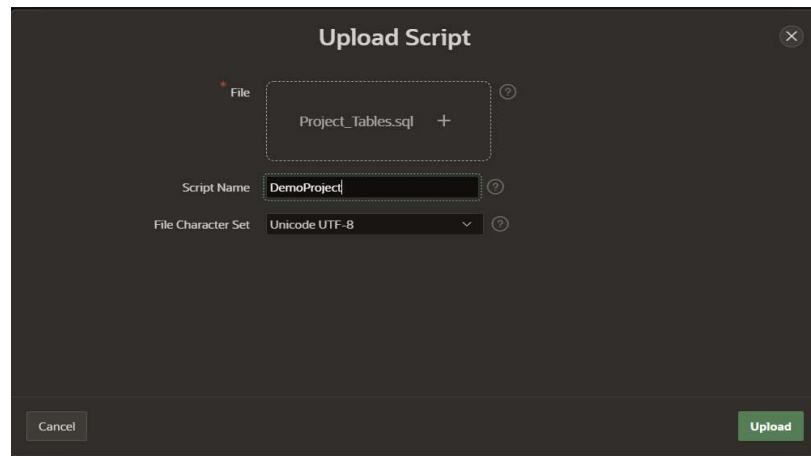
2. Click Upload





3. Click Choose File

The screenshot shows the 'Upload Script' form. At the top, there is a title 'Upload Script'. Below the title, there is a section for 'File' with a red asterisk. It contains a 'Choose File' button (highlighted with a green box) and the text 'no file selected'. Below this, there is a 'Script Name' input field with a question mark icon to its right. At the bottom, there is a 'File Character Set' dropdown menu with 'Unicode UTF-8' selected and a question mark icon to its right.

4. Navigate to the working directory where you downloaded the script. Click Upload.

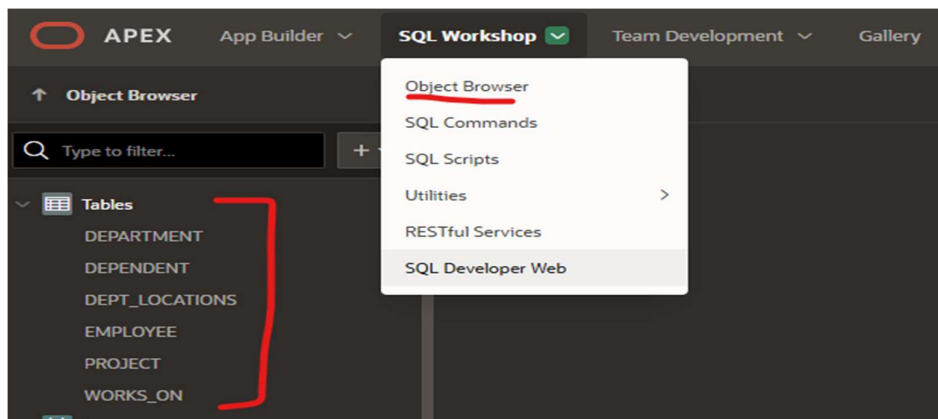


5. Review the uploaded script to see what tables will be created. In the SQL Scripts list, click the Edit icon (pencil), to the left of the script you just uploaded to explore.

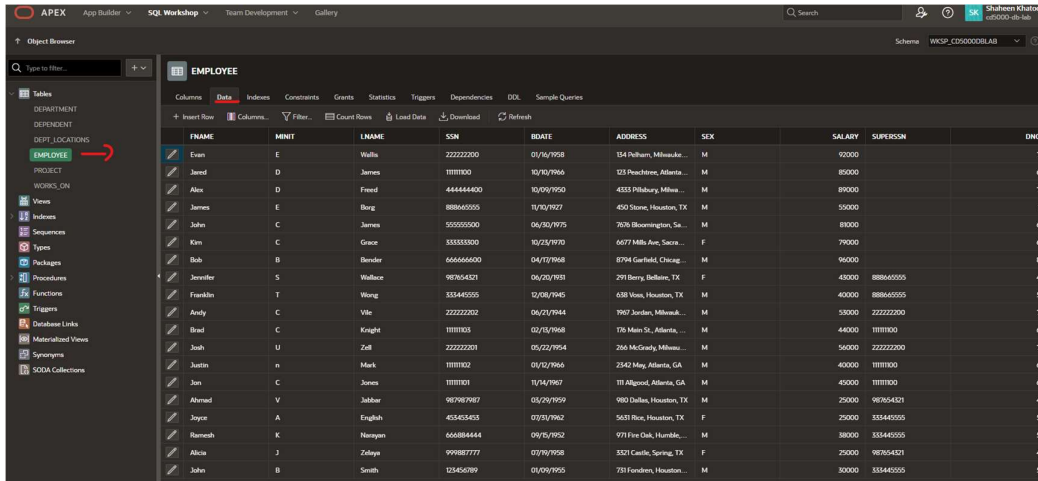
	Edit	Owner	Name	Created	Updated By	Updated	Bytes	Results	Run
		SSYEDSHK@GMAIL.COM	DemoProject	1 seconds ago	SSYEDSHK@GMAIL.COM	Now	15,367	0	

6. Click the Run icon to the right of the script you uploaded.

After running, go to 'Object Browser, and verify tables.



Check data in tables by clicking a table and Data tab as shown below:



The screenshot shows the Oracle APEX SQL Workshop interface. The 'EMPLOYEE' table is selected in the 'Tables' pane on the left. The main area displays the table's data with columns: FNAME, MINIT, LNAME, SSN, BDATE, ADDRESS, SEX, SALARY, SUPERVISOR, and DNO. A red arrow points to the 'EMPLOYEE' table in the left pane.

FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPERVISOR	DNO
Evan	E	Wallis	222222000	01/16/1958	154 Neilham, Milwaukee...	M	92000		7
Jared	D	James	181818000	10/10/1966	133 Peachtree, Atlanta...	M	89000		6
Alex	D	Freed	444444000	10/09/1950	4333 Pildbury, Milwa...	M	89000		7
James	E	Borg	888888000	11/02/1937	450 Stone, Houston, TX	M	55000		1
James	C	James	555555000	06/30/1975	7626 Bloomington, Sa...	M	81000		6
Ram	C	Grace	555555000	10/25/1970	6077 Mills Ave, Seac...	F	70000		6
Bob	B	Bender	666666000	04/17/1968	8794 Garfield, Chicag...	M	95000		8
Jennifer	S	Wallace	987654321	06/20/1931	291 Berry, Belmont, TX	F	43000	888645555	4
Franklin	T	Wong	333445555	12/08/1945	6188 View, Houston, TX	M	40000	888645555	5
Andy	C	Vile	222222002	06/21/1944	7907 Jordan, Milwaukee...	M	58000	222222000	7
Brad	C	Knight	181818003	02/15/1968	136 Main St, Atlanta...	M	44000	181818000	6
Joan	U	Zell	222222001	05/22/1954	266 McGandy, Milwa...	M	56000	222222000	7
Justin	n	Mark	181818002	01/02/1966	2342 May, Atlanta, GA	M	40000	181818000	6
Jon	C	Jones	181818001	11/14/1967	18 Algonqu, Atlanta, GA	M	40000	181818000	6
Alfred	V	Jabbar	987654321	05/29/1959	980 Dallas, Houston, TX	M	25000	987654321	4
Jayce	A	English	454545000	07/01/1962	5481 Ross, Houston, TX	F	23000	333445555	5
Ramesh	K	Narayan	666884444	09/15/1952	9717 Five Oak, Humble...	M	38000	333445555	5
Alicia	J	Zelaysa	999887777	07/19/1958	3321 Castle, Spring, TX	F	25000	987654321	4
John	B	Smith	123456789	01/09/1955	731 Fenderson, Houston...	M	30000	333445555	5

*After setting up the database, perform the following tasks.*

## Task 1: Queries

### Basic DMLs

1. Create a SQL statement that displays only the first\_name and salary of an employee whose salary is between 30,000 and 40000.
2. Create a SQL statement that displays the first\_name and last\_name of employees whose last\_name is either 'Smith', 'King', or 'Rogers'.
3. Create a SQL statement that displays the first\_name and last\_name of employees whose last\_name starts with 'S'.

### Grouping function

1. For each department, retrieve the department number, the number of employees in the department, and their average salary.
2. For each project, retrieve the project number, the project name, and the number of employees who work on that project.
3. For each project on which more than two employees work, retrieve the project number, the project name, and the number of employees who work on the project.

### JOIN and sub-queries

1. Retrieve the name and address of all employees who work for the 'Research' department without using join
2. Modify query 1 and observe results by using join
3. Modify query 1 and use subquery instead of join
4. Retrieve the last name of employees and their supervisors (using inner join)

5. Modify query 4 to display all employees with supervisor and also that employee where a supervisor is not assigned (left outer join)

*Note the difference in results by increasing row counts in the output*

6. Modify query 4 to display all the supervisors with and without employees assigned to them (Right outer join)
7. Modify query 4 to display all employees with and without supervisors and all supervisors with and without employees (Full outer join)

### Lab task 2: Creating Views

1. Create a view to display employee name and their salaries who work for the research department.
2. Create a view to display the employee name and the name of the project and project hour in which each employee works.

**Provide a screenshot of the code and results**

### Lab task 3: Creating and Executing Procedures

1. Download 1a - Raise SalaryProcedure, and run in APEX. Understand the procedure logic
2. Execute the procedure using 1b- Fire Raise Salary procedure, to test output.

*Provide different values in the test procedure to test each statement in the program logic. For each test statement provide a screenshot of the code and execution results*

### Lab task 4: Creating and Executing Functions

1. Download 2a - Salary Valid function, and run in APEX. Understand the function logic
2. Execute the function 2b - Test Salary\_Valid Function to test output.

*Provide different values in the test procedure to test each statement in the program logic. For each test statement provide a shot of the code and execution results.*