

Creating and Managing Tables

EX_NO:1

DATE:

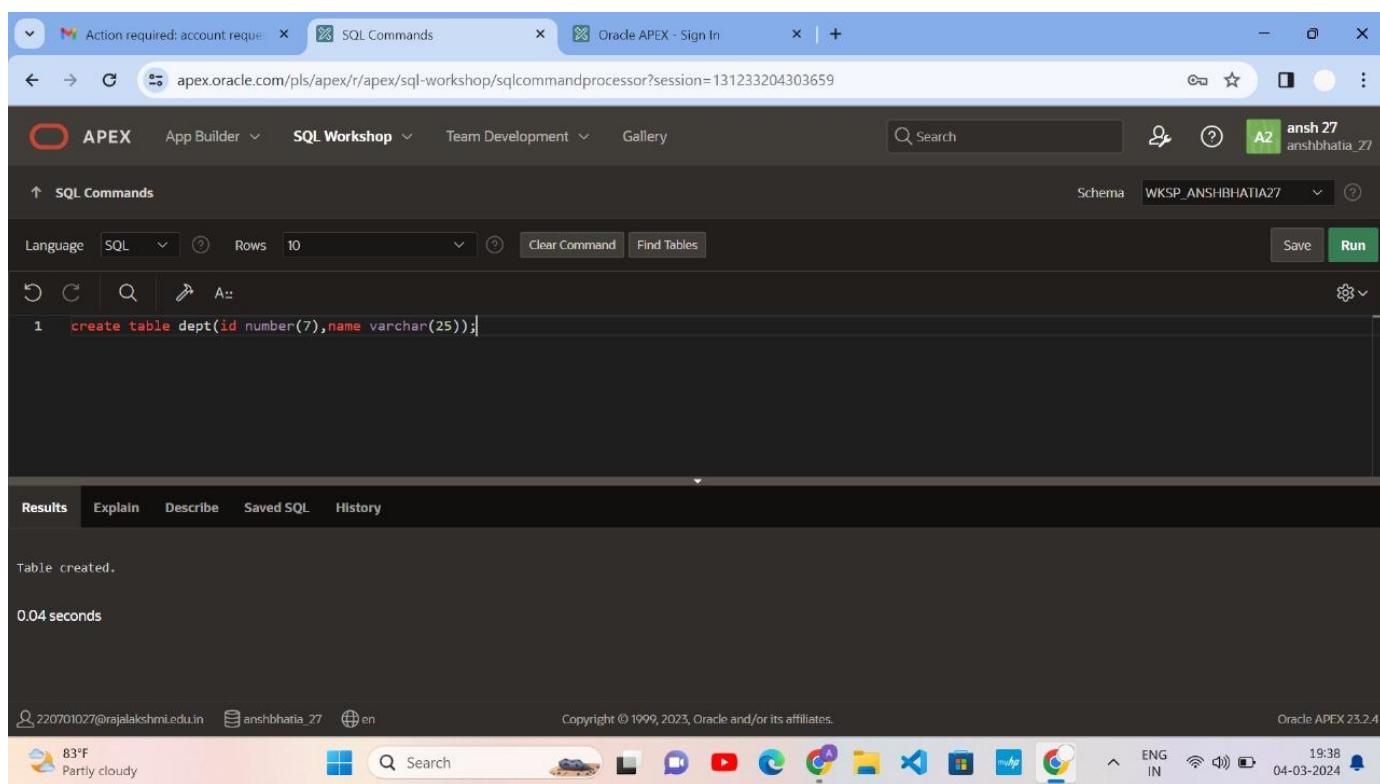
- Create the DEPT table based on the DEPARTMENT following the table instance chart below. Confirm that the table is created.

Column name	ID	NAME
Key Type		
Nulls/Unique		
FK table		
FK column		
Data Type	Number	Varchar2
Length	7	25

QUERY:

Create table dept (id number(7),name varchar2(25));

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. In the SQL Commands tab, a single line of SQL code is entered: "create table dept(id number(7),name varchar2(25));". The "Run" button is highlighted in green. Below the editor, the results show "Table created." and a execution time of "0.04 seconds". The status bar at the bottom indicates the user's email as 220701027@rajalakshmi.edu.in, the session ID as anshbhatia_27, the language as en, and the version as Oracle APEX 23.2.4. The system tray shows a weather icon for 83°F and partly cloudy, along with other standard icons.

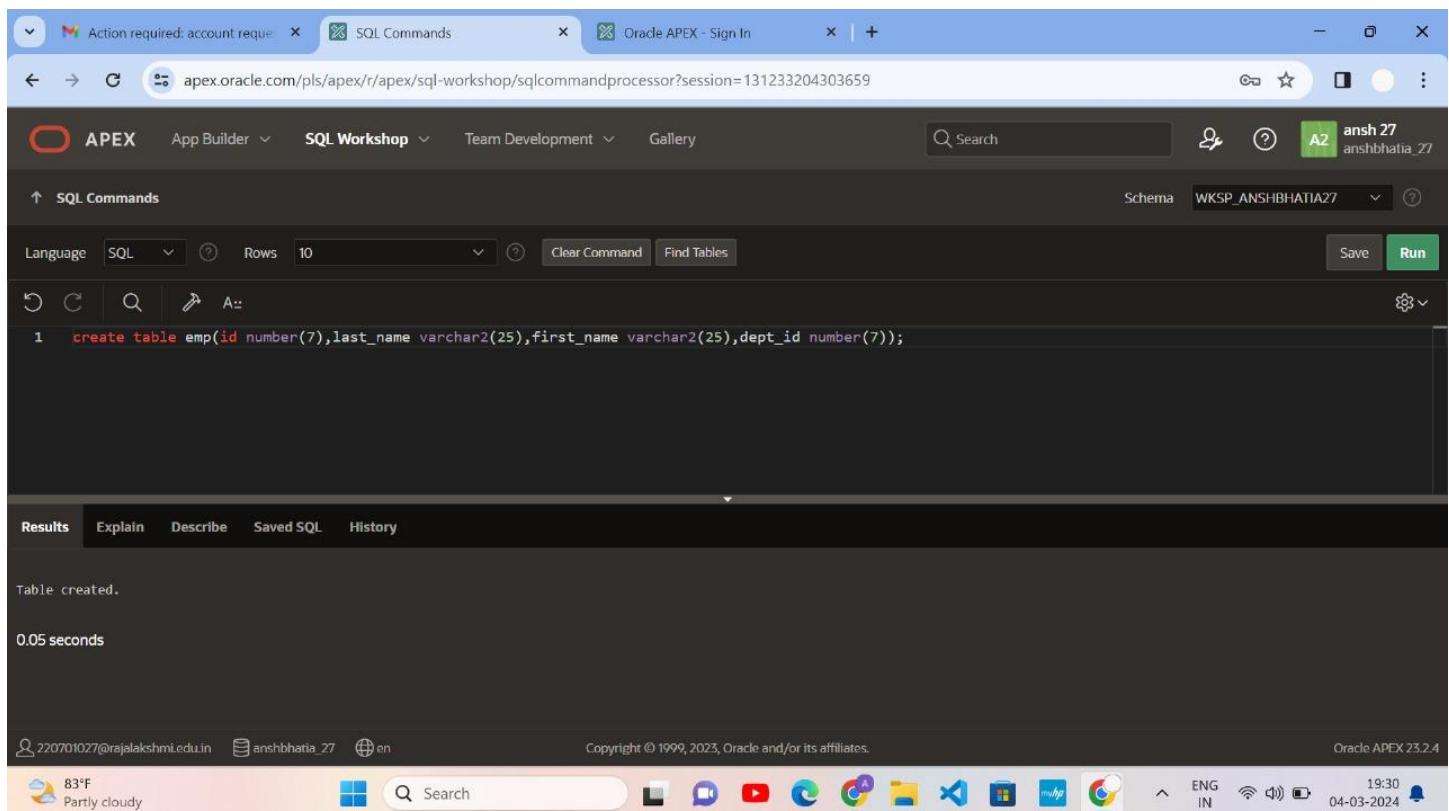
2.Create the EMP table based on the following instance chart. Confirm that the table is created.

Column name	ID	LAST_NAME	FIRST_NAME	DEPT_ID
Key Type				
Nulls/Unique				
FK table				
FK column				
Data Type	Number	Varchar2	Varchar2	Number
Length	7	25	25	7

QUERY:

```
Create table emp(id number(7),Last_Name varchar(25),First_Name varchar(25),Dept_id number(7));
```

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes tabs for APEX, App Builder, SQL Workshop (which is selected), Team Development, and Gallery. The right side of the header shows the user 'anshb27' and the schema 'WKSP_ANSHBHATIA27'. The main workspace is titled 'SQL Commands' and contains a single command: 'create table emp(id number(7),last_name varchar2(25),first_name varchar2(25),dept_id number(7));'. Below the command, the results section displays the message 'Table created.' and a execution time of '0.05 seconds'. The bottom status bar shows the user's email '220701027@rajalakshmi.edu.in', the session ID 'anshb27', the language 'en', copyright information 'Copyright © 1999, 2023, Oracle and/or its affiliates.', and the system time '04-03-2024 19:30'. It also includes icons for weather (83°F Partly cloudy), search, and various application tools.

3.Modify the EMP table to allow for longer employee last names. Confirm the modification.(Hint: Increase the size to 50)

QUERY:

```
Alter table emp modify Last_Name varchar2(25);
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. A search bar and user information (A2 anshbhatisa_27) are also present. The main workspace is titled 'SQL Commands' and contains a SQL editor with the following content:

```
1 alter table emp modify(last_name varchar2(25));
```

Below the editor, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab displays the output of the query:

```
Table altered.
```

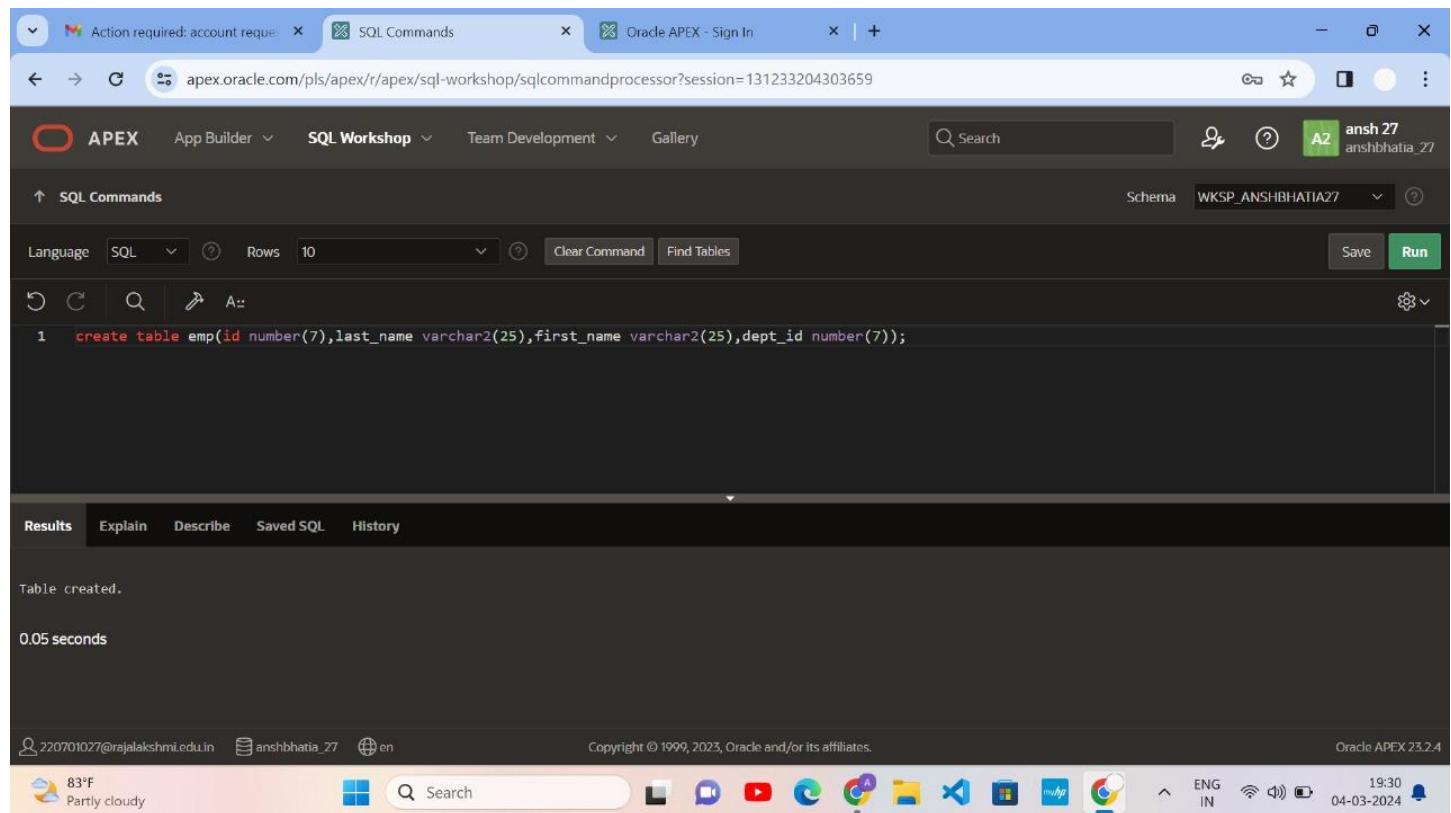
Execution details are shown as 0.05 seconds. At the bottom, footer information includes the user's email (220701027@rajalakshmi.edu.in), session ID (anshbhatia_27), language (en), copyright notice (Copyright © 1999, 2023, Oracle and/or its affiliates.), and the software version (Oracle APEX 23.2.4).

4.Create the EMPLOYEES2 table based on the structure of EMPLOYEES table. Include Only the Employee_id, First_name, Last_name, Salary and Dept_id columns. Name the columns Id, First_name, Last_name, salary and Dept_id respectively.

QUERY:

```
Create table emp(id number(10),first_name varchar(25),Last_name varchar(25), Dept_id number(7));
```

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. In the top navigation bar, the 'SQL Commands' tab is selected. The main area contains the following SQL command:

```
1 create table emp(id number(7),last_name varchar2(25),first_name varchar2(25),dept_id number(7));
```

Below the command, the 'Results' tab is active, displaying the output:

```
Table created.
```

Execution time is listed as 0.05 seconds. The bottom status bar shows system information including weather (83°F, Partly cloudy), date (04-03-2024), and time (19:30).

5.Drop the EMP table.

QUERY:

```
Drop table emp;
```

OUTPUT:

The screenshot shows a browser window for Oracle APEX. The URL is `apex.oracle.com/pls/apex/r/apex/sql-workshop/sqlcommandprocessor/session=131223204203659`. The page title is "SQL Commands". The top navigation bar includes "APEX", "App Builder", "SQL Workshop", "Team Development", and "Gallery". On the right, there is a user profile for "ansh 27" and a workspace selection for "WKSP_ANSHBHATIA27". The main content area is titled "SQL Commands" and contains a SQL editor. The SQL command entered is "drop table emp;". Below the editor, there are tabs for "Results", "Explain", "Describe", "Saved SQL", and "History". The "Results" tab is selected, showing the output "Table dropped." and a time of "0.07 seconds". At the bottom of the page, there is a footer with various system icons and information: "220701027@rajalakshmi.edu.in", "anshbhatia_27", "en", "Copyright © 1999, 2023, Oracle and/or its affiliates.", "Oracle APEX 23.2.4", "83°F Partly cloudy", "Search", "YouTube", "Google Chrome", "Windows Taskbar", "19:37", "ENG IN", "04-03-2024", and a bell icon.

```
drop table emp;
```

Table dropped.
0.07 seconds

6.Rename the EMPLOYEES2 table as EMP.

QUERY:

Rename emp_2 to dept2;

OUTPUT:

The screenshot shows a SQL query editor interface. The top bar includes 'Language: SQL', 'Rows: 10', 'Clear Command', 'Find Tables', 'Save', and 'Run' buttons. The main area contains a numbered script:

```
1 CREATE TABLE DEPT2(
2     ID NUMBER(7),
3     FIRST_NAME VARCHAR(25),
4     LAST_NAME VARCHAR(25),
5     DEPT_ID NUMBER(7)
6 );
7 ALTER TABLE DEPT2
8     MODIFY LAST_NAME VARCHAR(50);
9 CREATE TABLE EMP_2(
10     ID NUMBER(18),
11     FIRST_NAME VARCHAR(25),
12     LAST_NAME VARCHAR(25),
13     SALARY NUMBER(18),
14     DEPT_ID NUMBER(25)
15 );
16 )
17 DROP TABLE DEPT2;
18 RENAME EMP_2 TO DEPT2;
19
20
```

The 'Results' tab is selected at the bottom, showing the output:

Statement processed.
0.05 seconds

7.Add a comment on DEPT and EMP tables. Confirm the modification by describing the table.

QUERY:

```
comment on table dept is 'Department info';
comment on table emp is Employee info';
```

OUTPUT:

7.Add a comment on DEPT and EMP tables. Confirm the modification by describing the table.

QUERY:

```
Describe Dept2;
```

OUTPUT:

```
Language SQL Rows 10 Clear Command Find Tables Save Run
CREATE TABLE DEPT2(
    ID NUMBER(7),
    FIRST_NAME VARCHAR(25),
    LAST_NAME VARCHAR(25),
    DEPT_ID NUMBER(7)
);
ALTER TABLE DEPT2
MODIFY LAST_NAME VARCHAR(50);
CREATE TABLE EMP_2(
    ID NUMBER(10),
    FIRST_NAME VARCHAR(25),
    LAST_NAME VARCHAR(25),
    SALARY NUMBER(10),
    DEPT_ID NUMBER(25)
);
DROP TABLE DEPT;
RENAME EMP_2 TO DEPT2;
ALTER TABLE DEPT2
DROP COLUMN FIRST_NAME;
DESCRIBE DEPT2;
```

NAME	COLUMN	DATA_TYPE	LENGTH	Precision	Scale	PRIMARY KEY	NULLABLE	DEFAULT	COMMENT
DEPT2	ID	NUMBER	-	10	0	-	✓	-	-
	LAST_NAME	VARCHAR2	25	-	-	-	✓	-	-
	SALARY	NUMBER	-	10	0	-	✓	-	-
	DEPT_ID	NUMBER	-	25	0	-	✓	-	-

8.Drop the First_name column from the EMP table and confirm it.

QUERY:

Alter table emp drop column first_name;

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows a user profile for 'ansh 27' (anshbhatia_27). The main area is titled 'SQL Commands'. The language is set to SQL, and the results show 10 rows. The command entered is 'alter table emp drop column first_name;'. Below the command, the results tab displays the output: 'Table created.' and '0.04 seconds'. Other tabs available include Explain, Describe, Saved SQL, and History.

```
1 alter table emp drop column first_name;
```

Table created.
0.04 seconds

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

RESULT:

MANIPULATING DATA

EX_NO:2

DATE:

1.Create MY_EMPLOYEE table with the following structure

NAME	NULL?	TYPE
ID	Not null	Number(4)
Last_name		Varchar(25)
First_name		Varchar(25)
Userid		Varchar(25)
Salary		Number(9,2)

QUERY:

```
Create table my_employee( ID number(4),First_name varchar(25),Last_name varchar(25),salary Number(9,2), userid varchar(25));
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. The right side shows a user profile for 'ansh 27 anshbhatia_27'. The main area is titled 'SQL Commands' with a 'Schema' dropdown set to 'WKSP_ANSHBHATIA27'. The command input field contains the SQL code for creating the 'my_employee' table. The results tab at the bottom shows the output: 'table created.' and '.04 seconds'. The footer includes copyright information for Oracle and the APEX version.

```
1 create table my_employee(id number(4),last_name varchar2(25),first_name varchar2(25),userid varchar2(25),salary number(9,2));
```

Results Explain Describe Saved SQL History

table created.
.04 seconds

Copyright © 1999, 2023, Oracle and/or its affiliates. Oracle APEX 23.2.4

2. Add the first and second rows data to MY_EMPLOYEE table from the following sample data.

ID	Last_name	First_name	Userid	salary
1	Patel	Ralph	rpatel	895
2	Dancs	Betty	bdancs	860
3	Biri	Ben	bbiri	1100
4	Newman	Chad	Cnewman	750
5	Ropebur	Audrey	aropebur	1550

QUERY:

```
INSERT INTO MY_employee (id,last_name,first_name,userid,salary) VALUES('2','DANCS', 'BETTY', 'BDANCS', '860');
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery. The user is logged in as 'ansh 27 anshbhatia_27'. The SQL Commands tab is active, showing the following SQL code:

```
1 insert into my_employee(id,last_name,first_name,userid,salary)
2 values
3 (2,'dancs','betty','bdancs',860);
```

The Results tab is selected, displaying the output of the query:

```
1 row(s) inserted.
```

Execution time: 0.02 seconds.

At the bottom, the footer includes copyright information: Copyright © 1999, 2023, Oracle and/or its affiliates. and Oracle APEX 23.2.4.

3. Display the table with values.

QUERY:

Select * from My_employee;

OUTPUT:

The screenshot shows the Oracle APEX interface with the SQL Workshop module selected. The query `select * from my_employee;` is entered in the command editor. The results section displays a single row of data from the table:

ID	LAST_NAME	FIRST_NAME	USERID	SALARY
2	dancs	betty	bdancs	860

Below the table, it says "1 rows returned in 0.01 seconds".

4. Populate the next two rows of data from the sample data. Concatenate the first letter of the first_name with the first seven characters of the last_name to produce Userid.

QUERY:

```
Insert into my_employee values('4','newan','chad','cewman',750);
```

OUTPUT:

The screenshot shows the Oracle APEX interface with the SQL Workshop module selected. In the SQL Commands section, a single line of SQL code is entered:

```
1 insert into my_employee values(4,'newan','chad','cewman',750);
```

The Results section displays the output of the query:

ID	LAST_NAME	FIRST_NAME	USERID	SALARY
2	dancs	betty	bdancs	860

Below the table, it says "1 rows returned in 0.01 seconds".

5. Make the data additions permanent.

QUERY:

```
Select * from My_employee;
```

OUTPUT:

The screenshot shows a SQL query editor interface. At the top, there are tabs for Language (SQL), Rows (10), Clear Command, and Find Tables. On the right, there are Save and Run buttons. Below the toolbar, there is a search bar and a code editor area with line numbers. The code in the editor is as follows:

```
1 CREATE TABLE MY_EMP(
2     ID NUMBER(4),
3     FIRST_NAME VARCHAR(25),
4     LAST_NAME VARCHAR(25),
5     SALARY NUMBER(9,2),
6     USERID VARCHAR(25)
7 );
8 INSERT INTO MY_EMP VALUES ('1','PATEL', 'RALPH', '895', 'RPATEL');
9 INSERT INTO MY_EMP VALUES ('2','DANCS', 'BETTY', '860', 'BDANCS');
10 INSERT INTO MY_EMP VALUES ('3','NEWMAN', 'CHAD', '750', 'CNEWMAN');
11 INSERT INTO MY_EMP VALUES ('4','BIRI', 'BEN', '1150', 'BBIRI');
12 SELECT * FROM MY_EMP
```

Below the code editor is a results table with the following data:

ID	FIRST_NAME	LAST_NAME	SALARY	USERID
4	BIRI	BEN	1150	BBIRI
1	PATEL	RALPH	895	RPATEL
2	DANCS	BETTY	860	BDANCS
2	DANCS	BETTY	860	BDANCS
3	NEWMAN	CHAD	750	CNEWMAN

At the bottom left of the results area, it says "5 rows returned in 0.01 seconds".

6.Change the last name of employee 3 to Drexler.

QUERY:

```
Update My_employee Set last_name = 'DERXLER' where ID = 3;
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. A search bar and user information (A2 anshbhatia_27) are also present. The main workspace is titled 'SQL Commands' and contains the following SQL code:

```
1 update my_employee set last_name='drexeler'where id=3;
```

Below the code, the results tab is selected, showing the output:

```
0 row(s) updated.
```

The execution time is listed as 0.01 seconds. At the bottom, user and session details are shown along with copyright and version information.

7.Change the salary to 1000 for all the employees with a salary less than 900.

QUERY:

Update my_employee Set salary = 1000 where salary<900;

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. A search bar and user information (anh 27, anshbhatia_27) are also present. The main workspace is titled "SQL Commands" and contains the following content:

```
1 update my_employee set salary=1000 where salary<900;
```

Below the command, the "Results" tab is selected, showing the output:

```
1 row(s) updated.  
0.02 seconds
```

At the bottom of the page, footer information includes the user's email (220701027@rajalakshmi.edu.in), session ID (anshbhatia_27), and the copyright notice (Copyright © 1999, 2023, Oracle and/or its affiliates). The version is also mentioned as Oracle APEX 23.2.4.

8.Delete Betty dancs from MY_EMPLOYEE table.

QUERY:

Delete from My_employee where last_name= 'dancs';

OUTPUT:

The screenshot shows a SQL command window interface. At the top, it says "SQL Commands" and "Schema WKSP_ANSHBHATIA27". Below that is a toolbar with "Language" set to "SQL", "Rows" set to 10, and buttons for "Clear Command" and "Find Tables". The main area contains a single line of SQL code: "1 delete from my_employee where last_name='dancs';". Below the code, there are tabs for "Results", "Explain", "Describe", "Saved SQL", and "History". The "Results" tab is selected. It displays the output: "1 row(s) deleted." and "0.01 seconds".

```
↑ SQL Commands
Schema WKSP_ANSHBHATIA27

Language SQL Rows 10 Clear Command Find Tables Save

1 delete from my_employee where last_name='dancs';

Results Explain Describe Saved SQL History

1 row(s) deleted.

0.01 seconds
```

9.Empty the fourth row of the emp table.

QUERY:

Delete from emp where ID = '4';

OUTPUT:

The screenshot shows the Oracle APEX SQL Commands interface. The top bar includes 'SQL Commands', 'Schema: WKSP_ANSHBHATIA27', and a 'Run' button. The toolbar below has options for Language (SQL), Rows (10), Clear Command, Find Tables, Save, and Run. The main area contains the SQL command: '1 delete from emp where id=4;'. Below the command, the results section shows '0 row(s) deleted.' and a execution time of '0.02 seconds'. The bottom footer includes the URL 'https://apex.oracle.com/ols/apex/f?p=100:1:13123320430', copyright information 'Copyright © 1999, 2023, Oracle and/or its affiliates.', and 'Oracle APEX 25.2.4'.

```
1 delete from emp where id=4;
```

Results Explain Describe Saved SQL History

0 row(s) deleted.

0.02 seconds

https://apex.oracle.com/ols/apex/f?p=100:1:13123320430 Copyright © 1999, 2023, Oracle and/or its affiliates. Oracle APEX 25.2.4

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

RESULT:

INCLUDING CONSTRAINTS

EX_NO:3

DATE:

1.Add a table-level PRIMARY KEY constraint to the EMP table on the ID column.The constraint should be named at creation. Name the constraint my_emp_id_pk.

QUERY:

```
Alter table emp Add constraint My_dept_id_pk Primary key(ID);
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Commands interface. The query entered is:

```
1  alter table emp add constraint my_emp_id_pk primary key(id);
```

The results section shows the output:

```
Table altered.
```

Execution time: 0.07 seconds

Page footer information:

- User: 220701027@rajalakshmi.edu.in
- Session: anshbhatia_27
- Language: en
- Copyright © 1999, 2023, Oracle and/or its affiliates.
- Oracle APEX 23.2.4

2.Create a PRIMARY KEY constraint to the DEPT table using the ID column. The constraint should be named at creation. Name the constraint my_dept_id_pk.

QUERY:

```
Alter Table Dept Add constraint My_Emp_id_pk Primary key(ID);
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. A search bar and user information (A2 anshbhatia_27) are also present. The main workspace is titled "SQL Commands" and contains the following SQL code:

```
1 alter table dept add constraint my_dept_id_pk primary key(id);
```

Below the code, the "Results" tab is selected, showing the output:

```
Table altered.
```

Execution time is listed as 0.07 seconds. The bottom of the screen displays copyright information and the Oracle APEX version (23.2.4).

3.Add a column DEPT_ID to the EMP table. Add a foreign key reference on the EMP table that ensures that the employee is not assigned to nonexistent department. Name the constraint my_emp_dept_id_fk.

QUERY:

```
Alter Table Dept add constraint My_emp_dept_id_fk foreign key(ID) References Dept2(ID);
```

OUTPUT:

The screenshot shows a SQL query editor interface. At the top, there are tabs for 'Language' (set to 'SQL'), 'Rows' (set to '10'), and buttons for 'Save' and 'Run'. Below the tabs, there is a toolbar with icons for refresh, search, and other database operations. The main area contains a single line of SQL code:

```
1 ALTER TABLE DEPT ADD CONSTRAINT MY_EMP_DEPT_ID_FK FOREIGN KEY(ID) REFERENCES DEPT2(ID);
```

Below the code, there is a results pane with tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is selected. It displays the output of the query:

```
Table altered.  
0.05 seconds
```

4.Modify the EMP table. Add a COMMISSION column of NUMBER data type, precision 2, scale 2. Add a constraint to the commission column that ensures that a commission value is greater than zero.

QUERY:

```
Alter Table Dept2 Add(commission number(2,2),constraint Cn check(commission));
```

OUTPUT:

S

The screenshot shows a SQL query editor interface. At the top, there are buttons for Language (SQL), Rows (10), Clear Command, Find Tables, Save, and Run. Below the toolbar, the command is entered:

```
1 ALTER TABLE DEPT2 ADD(commission number(2,2),constraint Cn check(commission>0));
```

Under the Results tab, the output is displayed:

```
Table altered.  
0.07 seconds
```

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

RESULT:

Writing Basic SQL SELECT Statements

EX_NO:4

DATE:

1.The following statement executes successfully.

Identify the Errors

```
SELECT employee_id, last_name  
sal*12 ANNUAL SALARY  
FROM employees;
```

QUERY:

2.Show the structure of departments the table. Select all the data from it.

QUERY:

OUTPUT:

3.Create a query to display the last name, job code, hire date, and employee number for each employee, with employee number appearing first.

QUERY:

OUTPUT:

4. Provide an alias STARTDATE for the hire date.

QUERY:

OUTPUT:

5.Create a query to display unique job codes from the employee table.

QUERY:

OUTPUT:

6.Display the last name concatenated with the job ID , separated by a comma and space, and name the column EMPLOYEE and TITLE.

QUERY:

OUTPUT:

7.Create a query to display all the data from the employees table. Separate each column by a comma. Name the column THE_OUTPUT.

QUERY:

OUTPUT:

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

RESULT:

Writing Basic SQL SELECT Statements

EX_NO:4

DATE:

- 1.The following statement executes successfully.

Identify the Errors

```
SELECT employee_id, last_name  
sal*12 ANNUAL SALARY  
FROM employees;
```

QUERY:

```
select employee_id, last_name, sal*12 as "ANNUAL SALARY" from employees;
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there's a search bar, a user icon, and session information (A2 anshbhatia_27). The main workspace is titled 'SQL Commands' and contains a SQL editor with the following code:

```
1 select employee_id,Last_name,"SALARY"*12 "ANNUAL_SALARY" from employees  
2  
3  
4  
5
```

Below the editor, the 'Results' tab is selected, displaying the output of the query:

EMPLOYEE_ID	LAST_NAME	ANNUAL_SALARY
1	Kumar	180000

Below the table, it says '1 rows returned in 0.01 seconds' and provides a 'Download' link. At the bottom of the page, there are footer links for email (220701027@rajalakshmi.edu.in), session (anshbhatia_27), and language (en). The copyright notice reads 'Copyright © 1999, 2023, Oracle and/or its affiliates.' and the page is identified as 'Oracle APEX 23.2.4'.

2. Show the structure of departments the table. Select all the data from it.

QUERY:

Select * from employees;

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there is a search bar, a user icon, and a session identifier 'A2 anshbhatia_27'. The main workspace is titled 'SQL Commands' and contains the following SQL code:

```
1 select*from employees
```

The results section displays the output of the query:

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	MANAGER_ID	DEPARTMENT_ID	ANNUAL_SALARY
1	Surya	Kumar	abc@gmail.com	7904656343	05/03/2024	35	15000	12	1	10000

Below the table, a message indicates "1 rows returned in 0.02 seconds" and provides a "Download" link.

3. Create a query to display the last name, job code, hire date, and employee number for each employee, with employee number appearing first.

QUERY:

Select employee_id as employee_number, last_name, job_id, hire_date from employees;

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there is a search bar, a user icon, and a session identifier 'A2 anshbhatia_27'. The main workspace is titled 'SQL Commands' and contains the following SQL code:

```
1 select employee_id as employee_number,Last_name,Job_id,Hire_date from employee;
```

The results section displays the output of the query:

EMPLOYEE_NUMBER	LAST_NAME	JOB_ID	HIRE_DATE
1	Kumar	35	05/03/2024

Below the table, a message indicates "1 rows returned in 0.04 seconds" and provides a "Download" link.

4. Provide an alias STARTDATE for the hire date.

QUERY:

Select hire_date as "Startdate" from employees;

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there's a search bar, a user icon for 'anhshbhatia_27', and a schema dropdown set to 'WKSP_ANSHBHATIA27'. The main workspace is titled 'SQL Commands' and contains the following SQL code:

```
1 select Hire_date as Star_date from employees
```

Below the code, the results tab is selected, showing the output:

STAR_DATE
05/03/2024

Text at the bottom indicates '1 rows returned in 0.01 seconds' and provides download options.

5. Create a query to display unique job codes from the employee table.

QUERY:

Select distinct job_id from employees;

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there's a search bar, a user icon for 'anhshbhatia_27', and a schema dropdown set to 'WKSP_ANSHBHATIA27'. The main workspace is titled 'SQL Commands' and contains the following SQL code:

```
1 select distinct job_id from employees
```

Below the code, the results tab is selected, showing the output:

JOB_ID
35

Text at the bottom indicates '1 rows returned in 0.01 seconds' and provides download options.

6.Display the last name concatenated with the job ID , separated by a comma and space, and name the column EMPLOYEE and TITLE.

QUERY:

```
select last_name||', '||job_id as "Employee_and_title" from employees;
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there's a search bar, user information (A2 anshbhatia_27), and a schema dropdown set to WKSP_ANSHBHATIA27. The main workspace is titled 'SQL Commands' and contains the following SQL code:

```
1 select Last_name ||','||Job_id as "Employee_and_title" from employees
```

Below the code, the results tab is selected, showing the output:

Employee_and_title
Kumar,35

Below the table, it says '1 rows returned in 0.00 seconds' and has a 'Download' link. The bottom of the page includes copyright information and the text 'Oracle APEX 23.2.4'.

7.Create a query to display all the data from the employees table. Separate each column by a comma. Name the column THE_OUTPUT.

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there's a search bar, user information (A2 anshbhatia_27), and a schema dropdown set to WKSP_ANSHBHATIA27. The main workspace is titled 'SQL Commands' and contains the following SQL code:

```
1 First_name||','||Last_name||','||email||','||Phone_number||','||Hire_date||','||Job_id||','||Salary||','||Manager_id||','||Department_id as "the_output" from employees
```

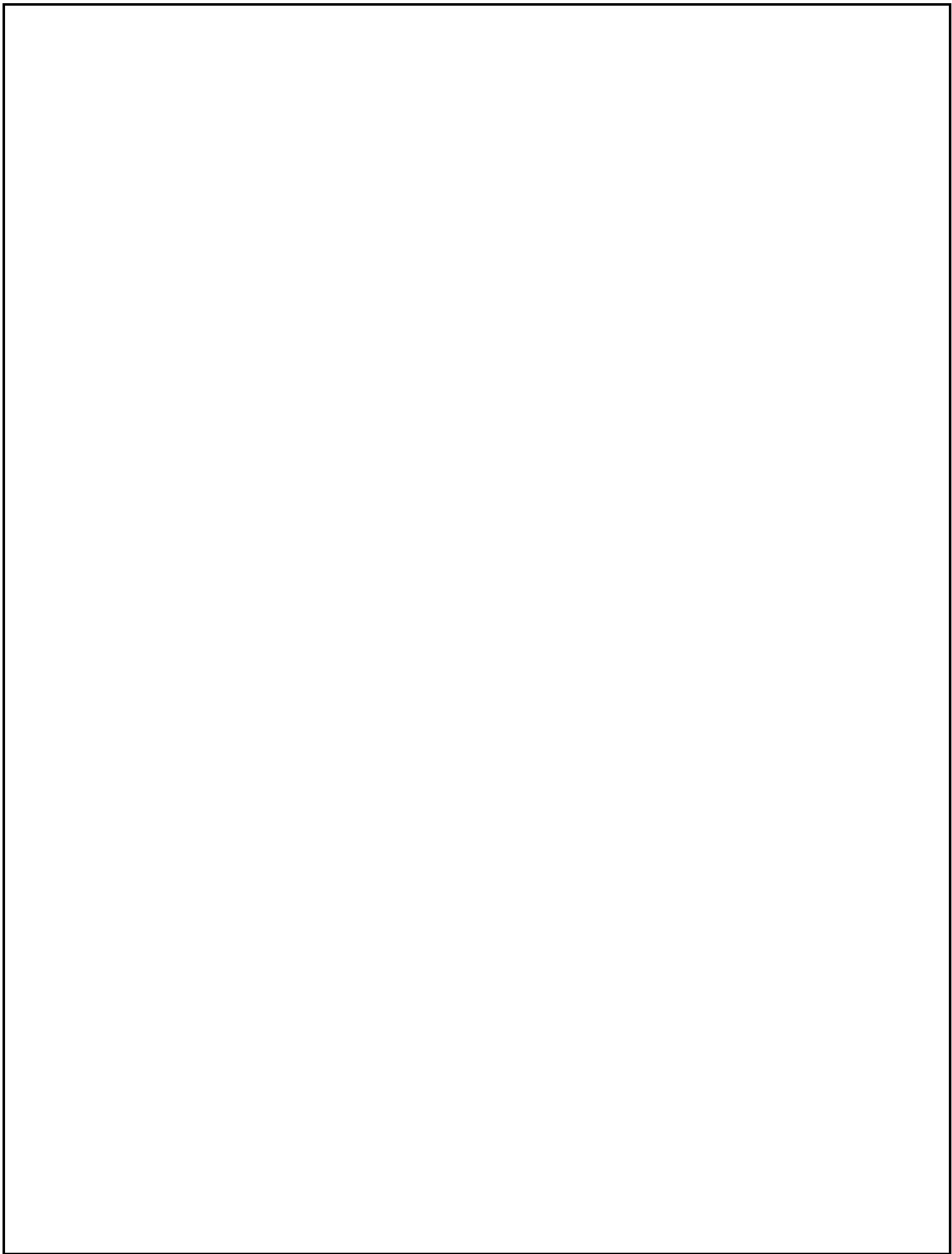
Below the code, the results tab is selected, showing the output:

the_output
1,Surya,Kumar,abc@gmail.com,7904656343,05/03/2024,35,15000,12,1

Below the table, it says '1 rows returned in 0.01 seconds' and has a 'Download' link. The bottom of the page includes copyright information and the text 'Oracle APEX 23.2.4'.

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

RESULT:



RESTRICTING AND STORING DATA

EX.NO:5

DATE: 08 – 3 - 24

REG.NO: 220701027

1. Create a query to display the last name and salary of employees earning more than 12000.

QUERY:

```
SELECT Last_name, Salary FROM EMPLOY2 WHERE Salary > 12000;
```

OUTPUT:

The screenshot shows a SQL command window with the following details:

- SQL Commands:** The interface includes a toolbar with icons for Undo, Redo, Find, and Paste, and dropdown menus for Language (SQL), Rows (10), Clear Command, and Find Tables.
- Query Editor:** The command `SELECT Last_name, Salary FROM EMPLOY2 WHERE Salary > 12000;` is entered in the editor area.
- Results:** The results are displayed in a table with columns `LAST_NAME` and `SALARY`. The data is as follows:

LAST_NAME	SALARY
Higgins	14000
Baer	15000
Partners	13500

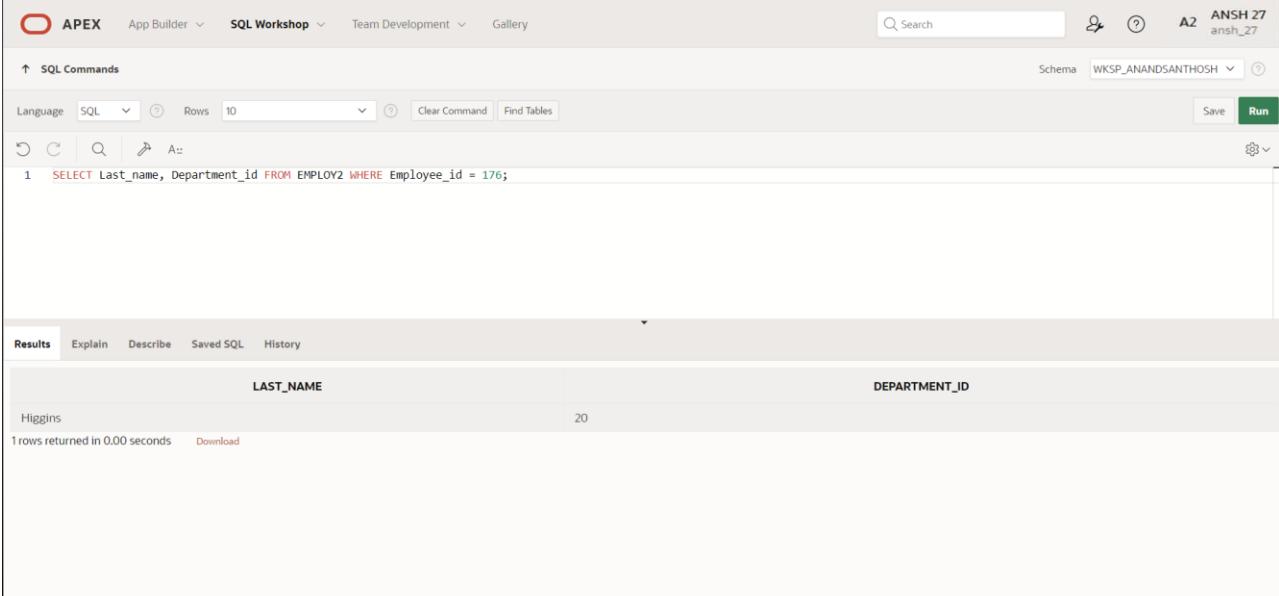
- Timing:** The message "3 rows returned in 0.02 seconds" is shown at the bottom left.

2. Create a query to display the employee last name and department number for employee number 176.

QUERY:

```
SELECT Last_name, Department_id FROM EMPLOY2 WHERE Employee_id = 176;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user ANSH 27 and the schema WKSP_ANANDSANTHOSH. The main area is titled "SQL Commands" and contains the following content:

Language: SQL | Rows: 10 | Clear Command | Find Tables | Run

1 | `SELECT Last_name, Department_id FROM EMPLOY2 WHERE Employee_id = 176;`

The results section shows the output of the query:

LAST_NAME	DEPARTMENT_ID
Higgins	20

1 rows returned in 0.00 seconds | Download

3. Create a query to display the last name and salary of employees whose salary is not in the range of 5000 and 12000. (hints: not between)

QUERY:

```
SELECT Last_name, Salary FROM EMPLOY2 WHERE Salary NOT BETWEEN 5000 AND 12000;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. At the top, there's a navigation bar with tabs for APEX, App Builder, SQL Workshop (which is selected), Team Development, and Gallery. On the right side of the header, it shows the user 'ANSH 27' and the schema 'WKSP_ANANDSANTHOSH'. Below the header is a toolbar with various icons for search, refresh, and save. The main area contains a SQL command input field with the query: 'SELECT Last_name, Salary FROM EMPLOY2 WHERE Salary NOT BETWEEN 5000 AND 12000;'. Below the input field is a results grid. The grid has two columns: 'LAST_NAME' and 'SALARY'. It displays three rows of data: Higgins (Salary 14000), Baer (Salary 15000), and Partners (Salary 13500). At the bottom left of the results grid, it says '3 rows returned in 0.01 seconds'.

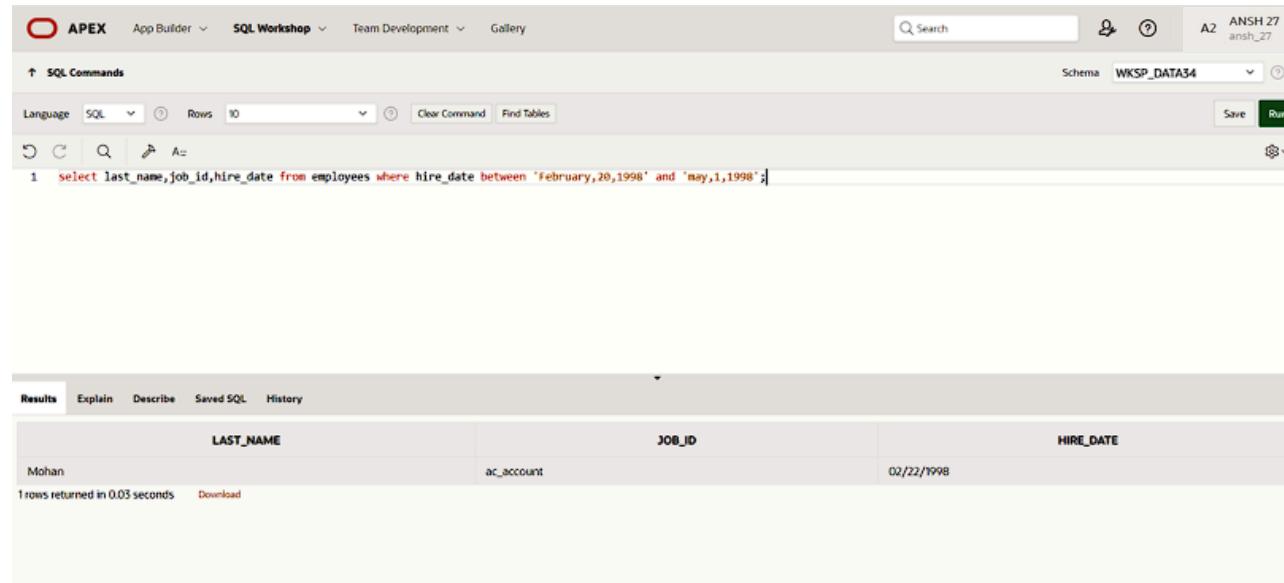
LAST_NAME	SALARY
Higgins	14000
Baer	15000
Partners	13500

4. Display the employee last name, job ID, and start date of employees hired between February 20,1998 and May 1,1998.order the query in ascending order by start date.(hints: between)

QUERY:

```
SELECT last_name, job_id, hire_date FROM employees WHERE hire_date BETWEEN  
'February,20,1998' AND 'May,01,1998'
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows user information: A2 ANSH 27 ansh_27. The main area has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab is active, showing the query: `select last_name,job_id,hire_date from employees where hire_date between 'February,20,1998' and 'May,01,1998';`. The Results tab displays the output in a table:

LAST_NAME	JOB_ID	HIRE_DATE
Mohan	ac_account	02/22/1998

Below the table, it says "1 rows returned in 0.03 seconds" and there are "Download" links.

5. Display the last name and department number of all employees in departments 20 and 50 in alphabetical order by name.(hints: in, orderby)

QUERY:

```
SELECT Last_name, Department_id FROM EMPLOY2 WHERE Department_id IN (20, 50)  
ORDER BY Last_name;
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. On the right, there's a user profile for 'ANSH 27' and a search bar. Below the toolbar, the schema is set to 'WKSP_ANANDSANTHOSH'. The main area has tabs for 'SQL Commands' (selected) and 'Results'. Under 'SQL Commands', the query is displayed:

```
1 SELECT Last_name, Department_id FROM EMPLOY2 WHERE Department_id IN (20, 50) ORDER BY Last_name;
```

The 'Results' tab shows the output of the query:

LAST_NAME	DEPARTMENT_ID
Baer	50
De Haan	20
Ernst	20
Gietz	20
Hartstein	20
Higgins	20
Hunold	50
Kochhar	20
Lorentz	50
Sciarrা	50

At the bottom left, it says '10 rows returned in 0.02 seconds' and there's a 'Download' link.

6. Display the last name and salary of all employees who earn between 5000 and 12000 and are in departments 20 and 50 in alphabetical order by name. Label the columns EMPLOYEE, MONTHLY SALARY respectively.(hints: between, in)

QUERY:

```
SELECT Last_name, Job_id, Hire_date FROM EMPLOY2 WHERE Salary BETWEEN 5000 AND 12000 AND Department_id IN (20, 50) ORDER BY Last_name;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. At the top, there are tabs for APEX, App Builder, SQL Workshop (which is selected), Team Development, and Gallery. On the right, there are user profile icons for ANSH 27 and ANSH_27. Below the tabs, there's a search bar and a toolbar with various icons. The main area is titled "SQL Commands". It shows a single line of SQL code:

```
1 SELECT Last_name, Job_id, Hire_date FROM EMPLOY2 WHERE Salary BETWEEN 5000 AND 12000 AND Department_id IN (20, 50) ORDER BY Last_name;
```

Below the code, there's a results grid. The first row is a header with three columns: LAST_NAME, JOB_ID, and HIRE_DATE. The data rows are:

LAST_NAME	JOB_ID	HIRE_DATE
Ernst	SA_REP	1991-07-01
Gietz	SA_REP	1994-05-17
Hartstein	SA_REP	1996-05-01
Hunold	ST_CLERK	1990-08-03
Lorentz	ST_CLERK	1997-04-01
Sciarra	ST_CLERK	1995-06-14

At the bottom left of the results grid, it says "6 rows returned in 0.00 seconds".

7. Display the last name and hire date of every employee who was hired in 1994.(hints: like)

QUERY:

```
SELECT Last_name, Hire_date FROM EMPLOY2 WHERE Hire_date LIKE '1994-%-%';
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. At the top, there are tabs for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there are user details (ANSH 27, ansh_27) and a search bar. Below the tabs, there's a toolbar with icons for Undo, Redo, Search, and Run. The main area is titled "SQL Commands". It shows a single line of SQL code: "1 SELECT Last_name, Hire_date FROM EMPLOY2 WHERE Hire_date LIKE '1994-%-%';". To the right of the code are "Save" and "Run" buttons. Below the command area, there's a "Results" tab selected, followed by Explain, Describe, Saved SQL, and History. The results table has two columns: LAST_NAME and HIRE_DATE. A single row is displayed: Gietz, 1994-05-17. At the bottom left, it says "1 rows returned in 0.00 seconds".

LAST_NAME	HIRE_DATE
Gietz	1994-05-17

8. Display the last name and job title of all employees who do not have a manager.(hints: is null)

QUERY:

```
SELECT Last_name, Job_id FROM EMPLOY2 WHERE Manager_id IS NULL;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. The right side shows a user profile for 'ANSH 27 ansh_27'. The main area has tabs for 'SQL Commands' and 'Results'. In the 'SQL Commands' tab, the query 'SELECT Last_name, Job_id FROM EMPLOY2 WHERE Manager_id IS NULL;' is entered. The 'Results' tab displays the output in a table:

LAST_NAME	JOB_ID
Higgins	SA_MAN
Baer	ST_MAN
De Haan	SA_MAN
Kochhar	SA_MAN

Below the table, it says '4 rows returned in 0.01 seconds'.

9. Display the last name, salary, and commission for all employees who earn commissions. Sort data in descending order of salary and commissions.(hints: is not nul,orderby)

QUERY:

```
SELECT Last_name, Salary, Commission_pct FROM EMPLOY2 WHERE Commission_pct IS NOT NULL ORDER BY Salary DESC, Commission_pct DESC;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there's a user profile for 'Anand S' (anand_santhosh) and a schema dropdown set to 'WKSP_ANANDSANTHOSH'. The main area is titled 'SQL Commands' with a 'Run' button. The query entered is:

```
1 SELECT Last_name, Salary, Commission_pct FROM EMPLOY2 WHERE Commission_pct IS NOT NULL ORDER BY Salary DESC, Commission_pct DESC;
```

The results tab is selected, displaying the following data:

LAST_NAME	SALARY	COMMISSION_PCT
Kochhar	17000	0
Beez	15000	0
Higgins	14000	0
De Haan	14000	0
Partners	13500	0
Hartstein	12000	0
Fay	11000	0
Greenberg	11000	0
Lorentz	9000	0
Hunold	9000	0

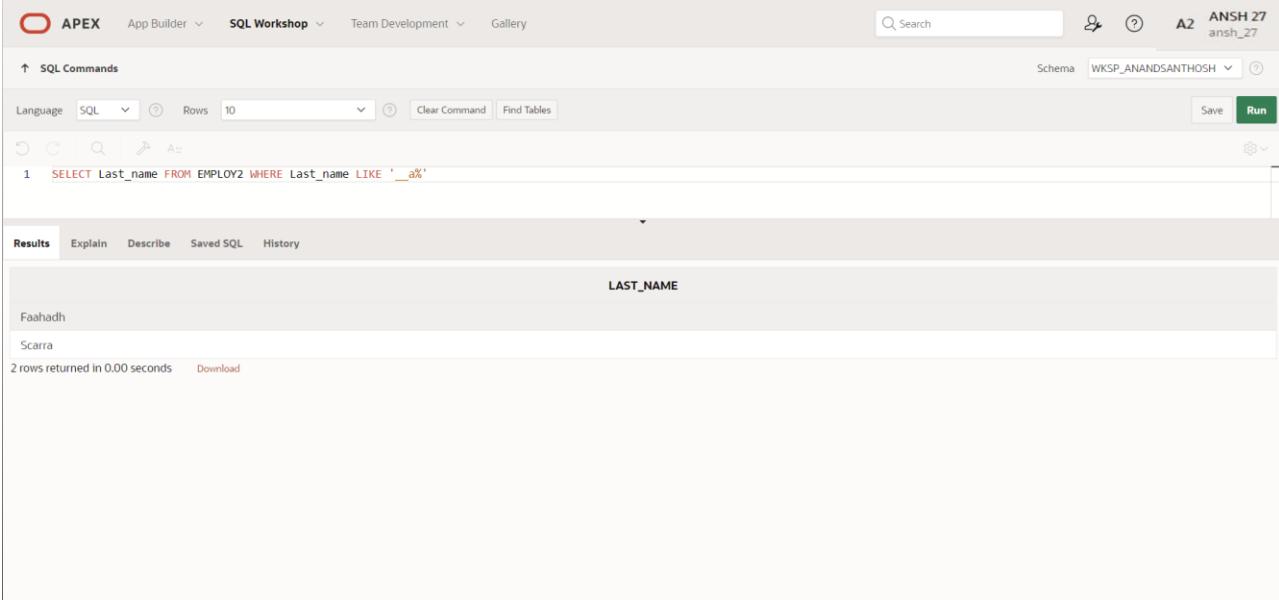
Text at the bottom indicates: More than 10 rows available. Increase rows selector to view more rows. 10 rows returned in 0.01 seconds. Download.

10. Display the last name of all employees where the third letter of the name is *a*.(hints:like)

QUERY:

```
SELECT Last_name FROM EMPLOY2 WHERE Last_name LIKE '__a%'
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right side, there are user profile icons, a search bar, and session information (ANSH 27, ansh_27). The main workspace has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab is active, displaying the query: `SELECT Last_name FROM EMPLOY2 WHERE Last_name LIKE '__a%'`. The Results tab shows the output of the query, which consists of two rows: Faahadh and Scarra. The results are displayed in a table with a single column labeled LAST_NAME.

LAST_NAME
Faahadh
Scarra

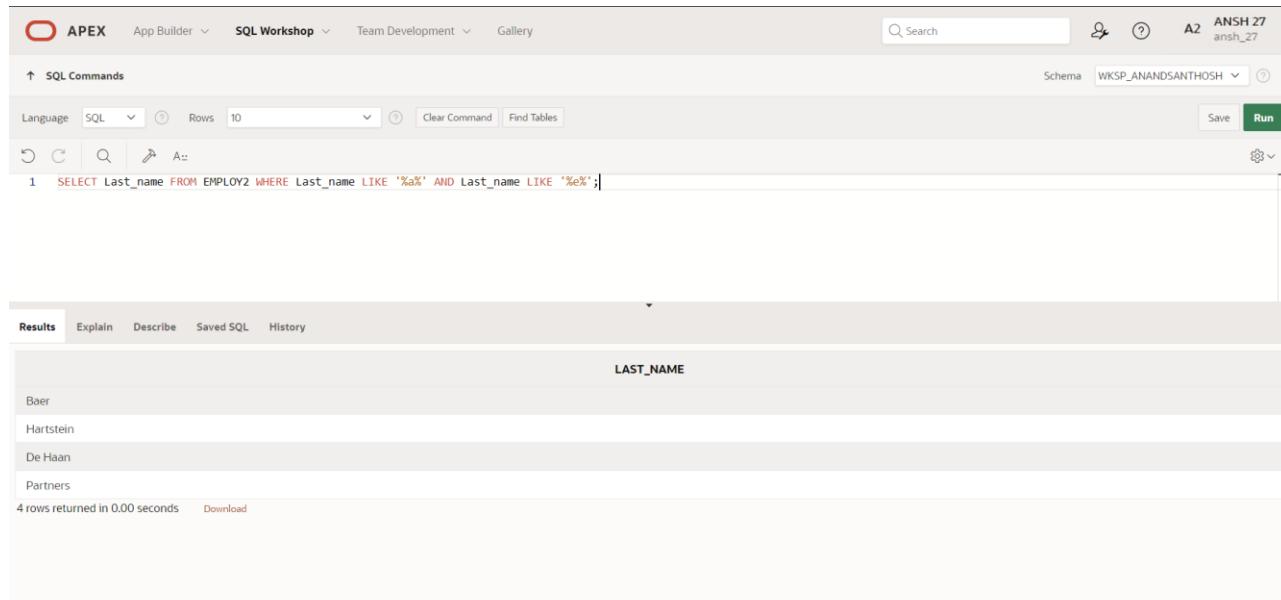
2 rows returned in 0.00 seconds [Download](#)

11. Display the last name of all employees who have an *a* and an *e* in their last name.(hints: like)

QUERY:

```
SELECT Last_name FROM EMPLOY2 WHERE Last_name LIKE '%a%' AND Last_name LIKE '%e%';
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, it shows user information (ANSH 27, ansh_27) and a schema dropdown (WKSP_ANANDSANTHOSH). The main area has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab contains the query: `SELECT Last_name FROM EMPLOY2 WHERE Last_name LIKE '%a%' AND Last_name LIKE '%e%';`. The Results tab displays the output in a table with a single column labeled LAST_NAME, containing the values Baer, Hartstein, De Haan, and Partners.

LAST_NAME
Baer
Hartstein
De Haan
Partners

12. Display the last name and job and salary for all employees whose job is sales representative or stock clerk and whose salary is not equal to 2500 ,3500 or 7000.(hints:in,not in)

QUERY:

```
SELECT Last_name, Job_ID, Salary FROM EMPLOY2 WHERE (Job_ID = 'SA_REP' OR Job_ID = 'ST_CLERK') AND Salary NOT IN (2500, 3500, 7000);
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows the user ANSH 27 and schema WKSP_ANANDSANTOSH. The main area has tabs for SQL Commands, Results (selected), Explain, Describe, Saved SQL, and History. The SQL Commands tab contains the query: `SELECT Last_name, Job_ID, Salary FROM EMPLOY2 WHERE (Job_ID = 'SA_REP' OR Job_ID = 'ST_CLERK') AND Salary NOT IN (2500, 3500, 7000);`. The Results tab displays the following data:

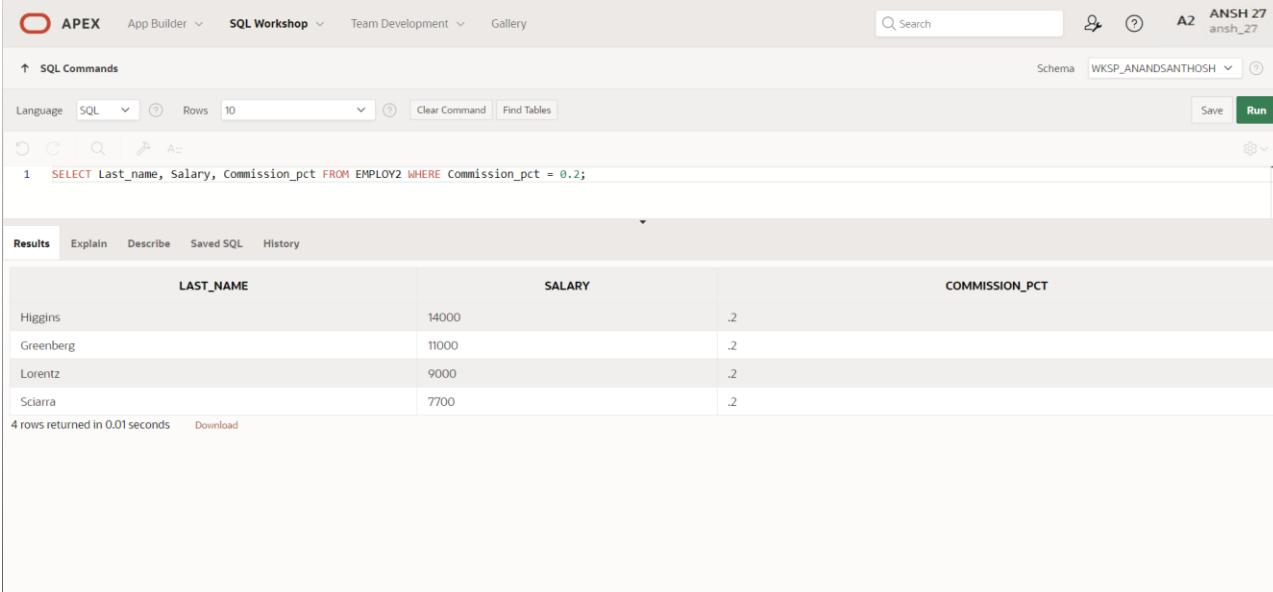
LAST_NAME	JOB_ID	SALARY
Hunold	ST_CLERK	9000
Hartstein	SA_REP	12000
Fay	SA_REP	11000
Greenberg	SA_REP	11000
Partners	SA_REP	13500
Lorentz	ST_CLERK	9000
Gietz	SA_REP	8600
Ernst	SA_REP	6000
Sciarras	ST_CLERK	7700

13. Display the last name, salary, and commission for all employees whose commission amount is 20%.(hints:use predicate logic)

QUERY:

```
SELECT Last_name, Salary, Commission_pct FROM EMPLOY2 WHERE Commission_pct = 0.2;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. On the right, it shows a user profile 'ANSH 27 ansh_27' and a schema 'WKSP_ANANDSANTHOSH'. The main area has tabs for 'SQL Commands' and 'Results'. Under 'SQL Commands', a single line of SQL is entered: 'SELECT Last_name, Salary, Commission_pct FROM EMPLOY2 WHERE Commission_pct = 0.2;'. Under 'Results', a table is displayed with four rows of data:

LAST_NAME	SALARY	COMMISSION_PCT
Higgins	14000	.2
Greenberg	11000	.2
Lorentz	9000	.2
Sciarras	7700	.2

Below the table, it says '4 rows returned in 0.01 seconds' and there is a 'Download' link.

	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

SINGLE ROW FUNCTIONS

EX.NO:6

DATE: 12 – 3 - 24

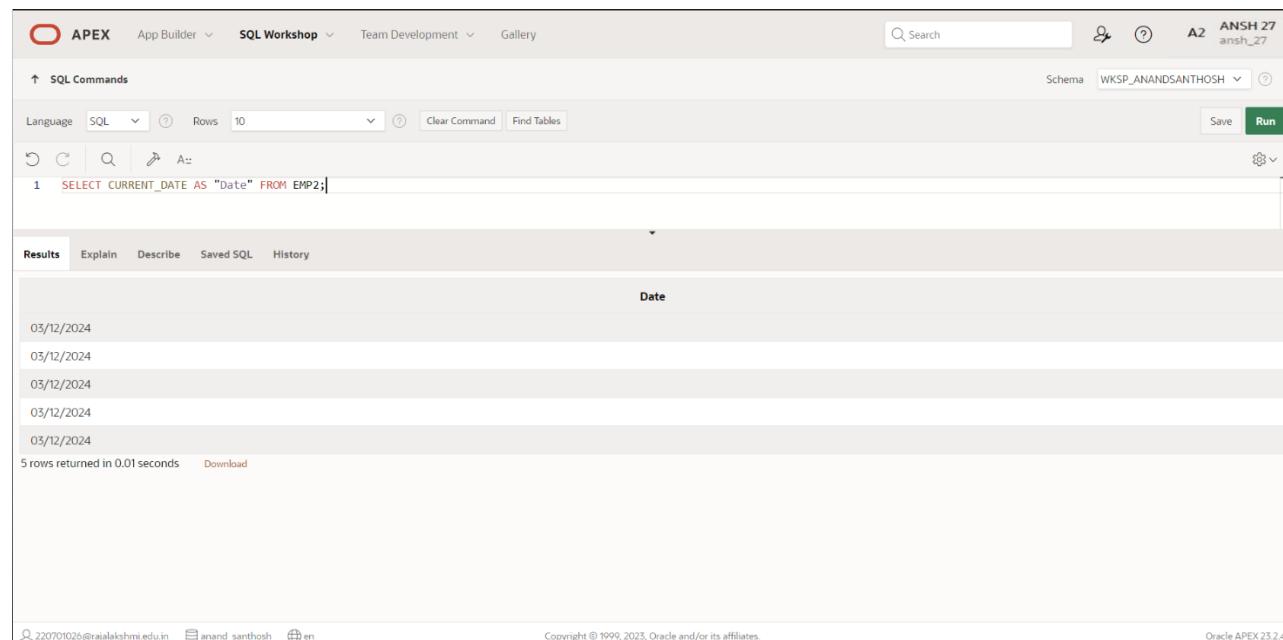
REG.NO: 220701026

1. Write a query to display the current date. Label the column Date.

QUERY:

```
SELECT CURRENT_DATE AS "Date" FROM EMP2;
```

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. The right side shows user information: 'ANSH 27' and 'ansh_27'. The main area has a 'Search' bar and a toolbar with icons for undo, redo, search, and run. The 'Schema' dropdown is set to 'WKSP_ANANDSANTHOSH'. The SQL command input field contains the query: '1 SELECT CURRENT_DATE AS "Date" FROM EMP2;'. The results tab is selected, showing a single column 'Date' with five rows, all containing the value '03/12/2024'. Below the results, it says '5 rows returned in 0.01 seconds' and there is a 'Download' link. At the bottom, there are footer links for '220701026@rajalakshmi.edu.in', 'anand_santhosh', and 'en', along with copyright and version information: 'Copyright © 1999, 2023, Oracle and/or its affiliates.' and 'Oracle APEX 23.2.4'.

2. The HR department needs a report to display the employee number, last name, salary, and increased by 15.5% (expressed as a whole number) for each employee. Label the column New Salary.

QUERY:

```
SELECT employee_number, last_name, salary, ROUND(salary * 0.155, 0) AS "New Salary"  
FROM EMP2;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. At the top, there are tabs for APEX, App Builder, SQL Workshop (which is selected), Team Development, and Gallery. On the right, there's a search bar, user information (ANSH 27), and a schema dropdown set to WKSP_ANANDSANTHOSH. Below the tabs, there are buttons for Language (SQL), Rows (set to 10), Clear Command, Find Tables, Save, and Run. The main area contains the SQL command: `SELECT employee_number, last_name, salary, ROUND(salary * 0.155, 0) AS "New Salary" FROM EMP2;`. Below the command, the Results tab is selected, showing a table with four columns: EMPLOYEE_NUMBER, LAST_NAME, SALARY, and New Salary. The data returned is as follows:

EMPLOYEE_NUMBER	LAST_NAME	SALARY	New Salary
1004	Jones	90000	13950
1002	Johnson	6000	930
1003	Williams	66000	10230
1005	Brown	9000	1395
1001	Smith	50000	7750

At the bottom left, it says "5 rows returned in 0.01 seconds".

3. Modify your query lab_03_02.sql to add a column that subtracts the old salary from the new salary. Label the column Increase.

QUERY:

```
SELECT employee_number, last_name, salary, ROUND(salary * 0.155, 0) AS "New Salary",
       salary - ROUND(salary * 0.155, 0) AS "Increase" FROM EMP2;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The top right shows the user's name (ANSH 27) and schema (WKSP_ANANDSANTHOSH). The main area has tabs for SQL Commands, Explain, Describe, Saved SQL, and History. The SQL Commands tab is active, displaying the following SQL code:

```
1  SELECT employee_number, last_name, salary, ROUND(salary * 0.155, 0) AS "New Salary",
       salary - ROUND(salary * 0.155, 0) AS "Increase" FROM EMP2;
```

Below the code, the Results tab is selected, showing the output of the query:

EMPLOYEE_NUMBER	LAST_NAME	SALARY	New Salary	Increase
1004	Jones	90000	13950	76050
1002	Johnson	6000	930	5070
1003	Williams	66000	10230	55770
1005	Brown	9000	1395	7605
1001	Smith	50000	7750	42250

At the bottom left, it says "5 rows returned in 0.01 seconds".

4. Write a query that displays the last name (with the first letter uppercase and all other letters lowercase) and the length of the last name for all employees whose name starts with the letters J, A, or M. Give each column an appropriate label. Sort the results by the employees' last names.

QUERY:

```
SELECT last_name, LENGTH(last_name) AS "Length" FROM EMP2 WHERE last_name LIKE 'J%' OR last_name LIKE 'A%' OR last_name LIKE 'M%';
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. On the right, it shows the user 'ANSH 27' and 'Schema WKSP_ANANDSANTHOSH'. The main area has tabs for 'SQL Commands' and 'Results'. Under 'SQL Commands', the query is pasted:

```
1 SELECT last_name, LENGTH(last_name) AS "Length" FROM EMP2 WHERE last_name LIKE 'J%' OR last_name LIKE 'A%' OR last_name LIKE 'M%';
2
3
```

Under 'Results', the output is displayed in a table:

LAST_NAME	Length
Jones	5
Johnson	7

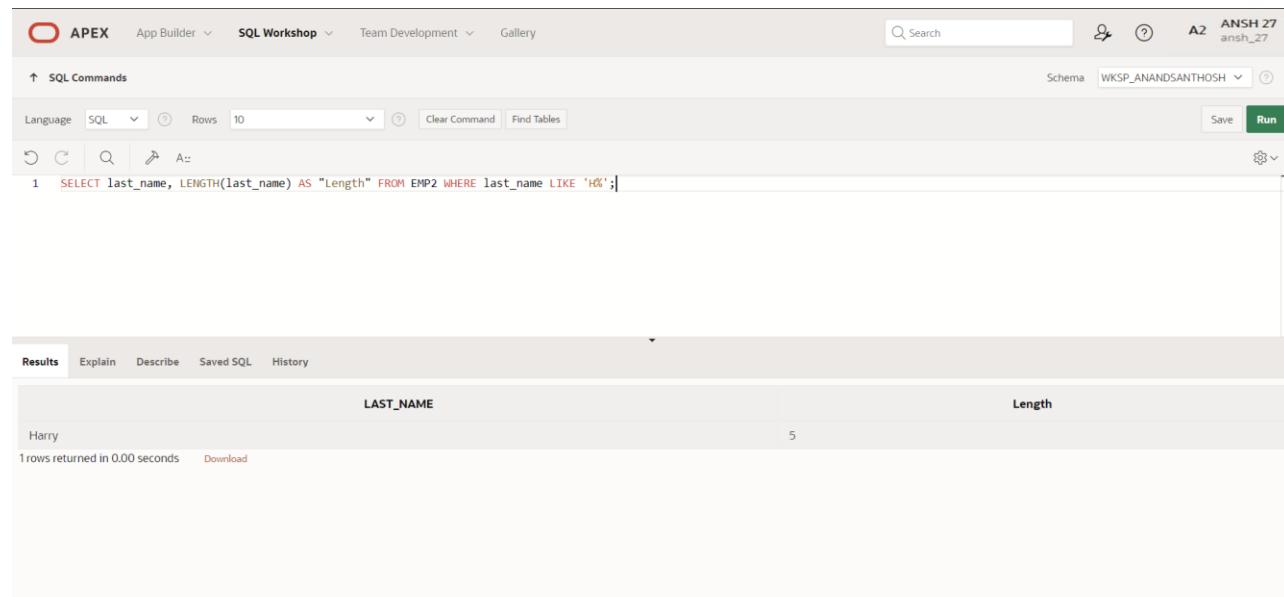
Below the table, it says '2 rows returned in 0.01 seconds' and has a 'Download' link.

5. Rewrite the query so that the user is prompted to enter a letter that starts the last name. For example, if the user enters H when prompted for a letter, then the output should show all employees whose last name starts with the letter H.

QUERY:

```
SELECT last_name, LENGTH(last_name) AS "Length" FROM EMP2 WHERE last_name LIKE 'H%';
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, it shows the user 'ANSH 27' and the schema 'WKSP_ANANDSANTOSH'. The main area is titled 'SQL Commands' with a sub-section '1'. The command entered is:

```
1 SELECT last_name, LENGTH(last_name) AS "Length" FROM EMP2 WHERE last_name LIKE 'H%';
```

Below the command, the results section shows a single row:

LAST_NAME	Length
Harry	5

At the bottom left, it says '1 rows returned in 0.00 seconds' and there is a 'Download' link.

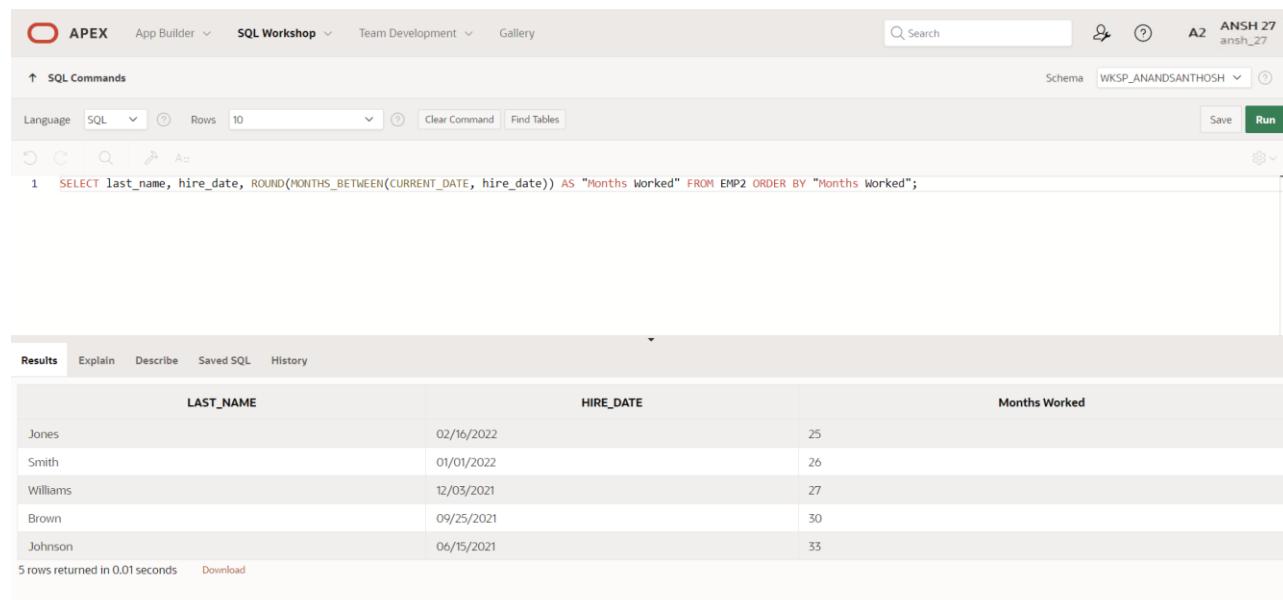
6. The HR department wants to find the length of employment for each employee. For each employee, display the last name and calculate the number of months between today and the date on which the employee was hired. Label the column MONTHS_WORKED. Order your results by the number of months employed. Round the number of months up to the closest whole number.

Note: Your results will differ.

QUERY:

```
SELECT last_name, hire_date, ROUND(MONTHS_BETWEEN(CURRENT_DATE, hire_date))  
AS "Months Worked" FROM EMP2 ORDER BY "Months Worked";
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The SQL Commands tab is active. The schema is set to WKSP_ANANDSANHOSH. The query entered is:

```
1 SELECT last_name, hire_date, ROUND(MONTHS_BETWEEN(CURRENT_DATE, hire_date)) AS "Months Worked" FROM EMP2 ORDER BY "Months Worked";
```

The results section displays the following data:

LAST_NAME	HIRE_DATE	Months Worked
Jones	02/16/2022	25
Smith	01/01/2022	26
Williams	12/03/2021	27
Brown	09/25/2021	30
Johnson	06/15/2021	33

5 rows returned in 0.01 seconds [Download](#)

7. Create a report that produces the following for each employee:
<employee last name> earns <salary> monthly but wants <3 times salary>. Label the column Dream Salaries.

QUERY:

```
SELECT last_name, salary, ROUND(salary * 3, 0) AS "Dream Salaries" FROM EMP2;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. At the top, there are navigation tabs: APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there are user profile details: ANSH 27 and ansh_27. Below the tabs, there's a search bar and some icons. The main area is titled 'SQL Commands' with a sub-section '1'. The command entered is:

```
1 SELECT last_name, salary, ROUND(salary * 3, 0) AS "Dream Salaries" FROM EMP2;
```

Below the command, there's a results grid. The columns are LAST_NAME, SALARY, and Dream Salaries. The data returned is:

LAST_NAME	SALARY	Dream Salaries
Jones	90000	270000
Johnson	6000	18000
Williams	66000	198000
Brown	9000	27000
Smith	50000	150000

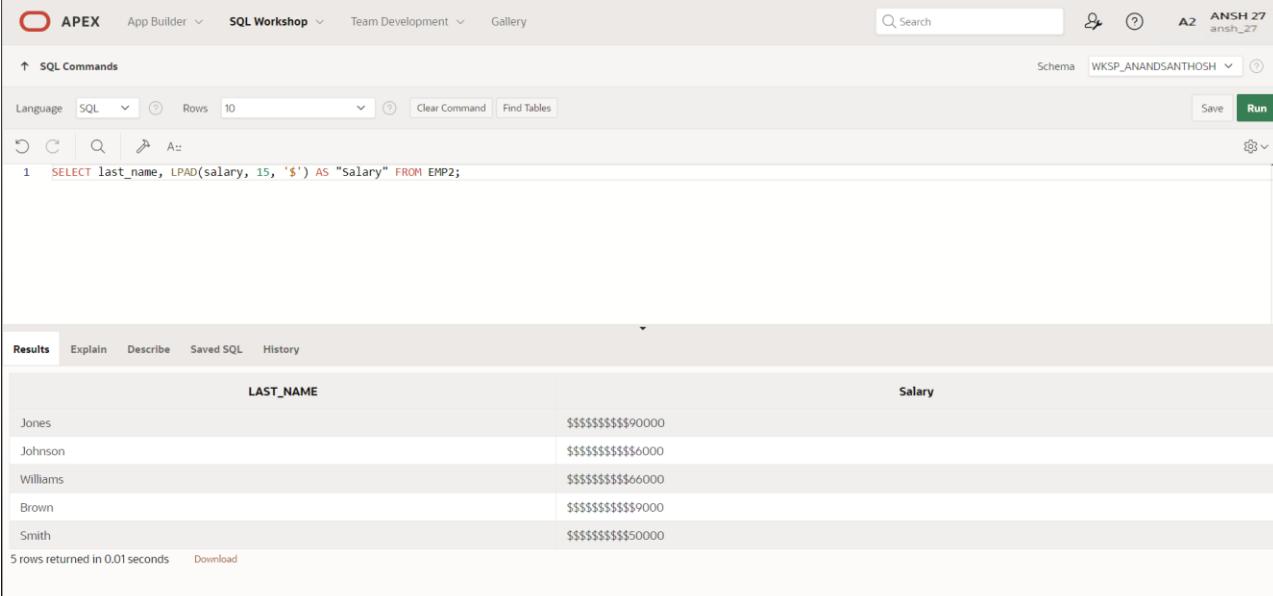
At the bottom left, it says '5 rows returned in 0.01 seconds' and there's a 'Download' link.

8. Create a query to display the last name and salary for all employees. Format the salary to be 15 characters long, left-padded with the \$ symbol. Label the column SALARY.

QUERY:

```
SELECT last_name, LPAD(salary, 15, '$') AS "Salary" FROM EMP2;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows the user ANSH 27 and schema WKSP_ANANDSANTHOSH. The main area has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab displays the query: `SELECT last_name, LPAD(salary, 15, '$') AS "Salary" FROM EMP2;`. The Results tab shows the output:

LAST_NAME	Salary
Jones	\$\$\$\$\$\$\$\$\$\$90000
Johnson	\$\$\$\$\$\$\$\$\$\$6000
Williams	\$\$\$\$\$\$\$\$\$\$66000
Brown	\$\$\$\$\$\$\$\$\$\$9000
Smith	\$\$\$\$\$\$\$\$\$\$50000

Below the table, it says 5 rows returned in 0.01 seconds and there is a Download link.

9. Display each employee's last name, hire date, and salary review date, which is the first Monday after six months of service. Label the column REVIEW. Format the dates to appear in the format similar to "Monday, the Thirty-First of July, 2000."

QUERY:

```
SELECT last_name,hire_date,TO_CHAR(NEXT_DAY(ADD_MONTHS(hire_date, 6), 'MONDAY'),'FMDay, "the  
"FMDD "of "FMMonth, YYYY') AS REVIEW FROM employees;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The top right shows the user ANSH 27 and the schema WKSP_DATA34. The main area has tabs for SQL Commands, Explain, Describe, Saved SQL, and History. The SQL Commands tab is active, displaying the following code:

```
1 SELECT last_name,hire_date,TO_CHAR(NEXT_DAY(ADD_MONTHS(hire_date, 6), 'MONDAY'),'FMDay, "the "FMDD "of "FMMonth, YYYY') AS REVIEW FROM employees;  
2
```

Below the code, the Results tab is selected, showing the output of the query:

LAST_NAME	HIRE_DATE	REVIEW
popp	03/05/2024	Monday, the 09 of September, 2024
raphealy	02/03/1999	Monday, the 09 of August, 1999
Mohan	02/22/1998	Monday, the 24 of August, 1998

At the bottom left, it says "3 rows returned in 0.01 seconds".

10. Display the last name, hire date, and day of the week on which the employee started. Label the column DAY. Order the results by the day of the week, starting with Monday.

QUERY:

```
SELECT last_name, TO_CHAR(hire_date, 'Day') AS "Day" FROM EMP2 ORDER BY "Day";
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows user information: A2 ANSH 27 and schema WKSP_ANANDSANTHOSH. The main area has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab contains the query: `SELECT last_name, TO_CHAR(hire_date, 'Day') AS "Day" FROM EMP2 ORDER BY "Day";`. The Results tab displays the output:

LAST_NAME	Day
Williams	Friday
Smith	Saturday
Brown	Saturday
Johnson	Tuesday
Jones	Wednesday

Below the table, it says "5 rows returned in 0.01 seconds" and there is a "Download" link.

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

DISPLAYING DATA FROM MULTIPLE TABLES

EX.NO:7

DATE: 15 – 3 - 24

REG.NO: 220701026

1. Write a query to display the last name, department number, and department name for all employees .

QUERY:

```
SELECT e.last_name, e.department_id, d.department_name FROM employees e JOIN departments d ON e.department_id = d.department_id ORDER BY e.last_name;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows user information: ANSH 27 and schema WKSP_ANANDSANHOSH. The main area has tabs for SQL Commands, Results (selected), Explain, Describe, Saved SQL, and History. The SQL Commands tab contains the query: `SELECT e.last_name, e.department_id, d.department_name FROM employees e JOIN departments d ON e.department_id = d.department_id ORDER BY e.last_name;`. The Results tab displays the following table:

LAST_NAME	DEPARTMENT_ID	DEPARTMENT_NAME
De Haan	20	Research
King	10	Accounting
Kochhar	10	Accounting

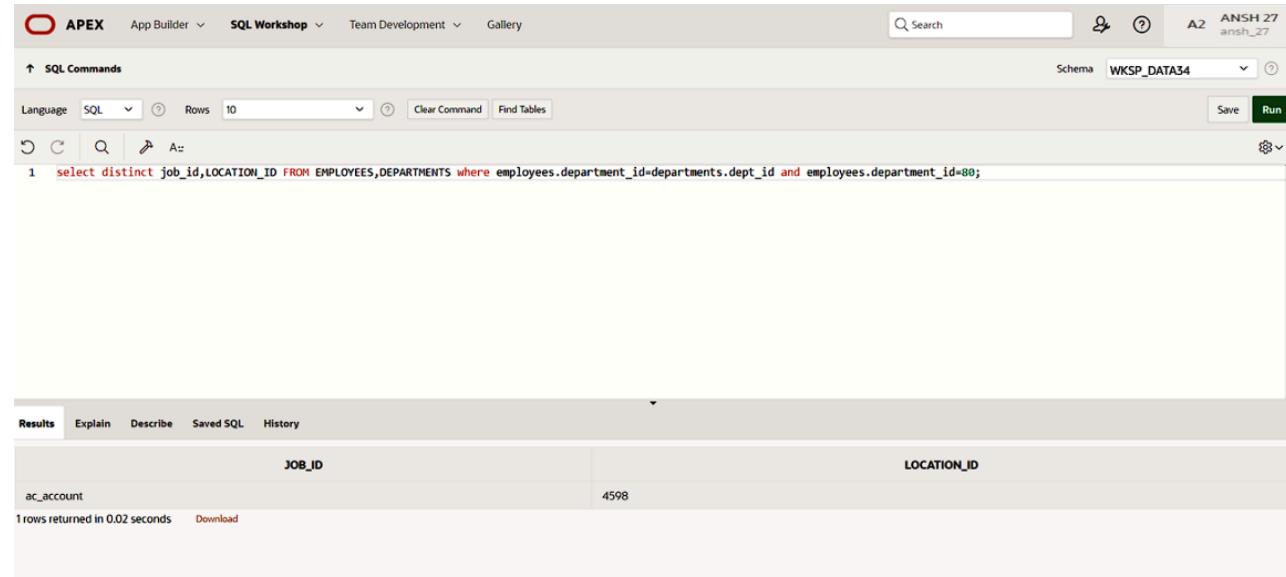
At the bottom of the results table, it says "3 rows returned in 0.01 seconds".

2. Create a unique listing of all jobs that are in department 80. Include the location of the department in the output.

QUERY:

```
SELECT DISTINCT j.job_title, l.city FROM jobs j JOIN departments d ON j.min_salary <= d.department_budget AND j.max_salary >= d.department_budget JOIN locations l ON d.location_id = l.location_id WHERE d.department_id = 80;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user 'ANSH 27' and the schema 'WKSP_DATA34'. The main workspace is titled 'SQL Commands' and contains the following content:

Language: SQL | Rows: 10 | Clear Command | Find Tables | Save | Run

1 select distinct job_id,location_id FROM EMPLOYEES,DEPARTMENTS where employees.department_id=departments.dept_id and employees.department_id=80;

The results section shows a single row of data:

JOB_ID	LOCATION_ID
ac_account	4598

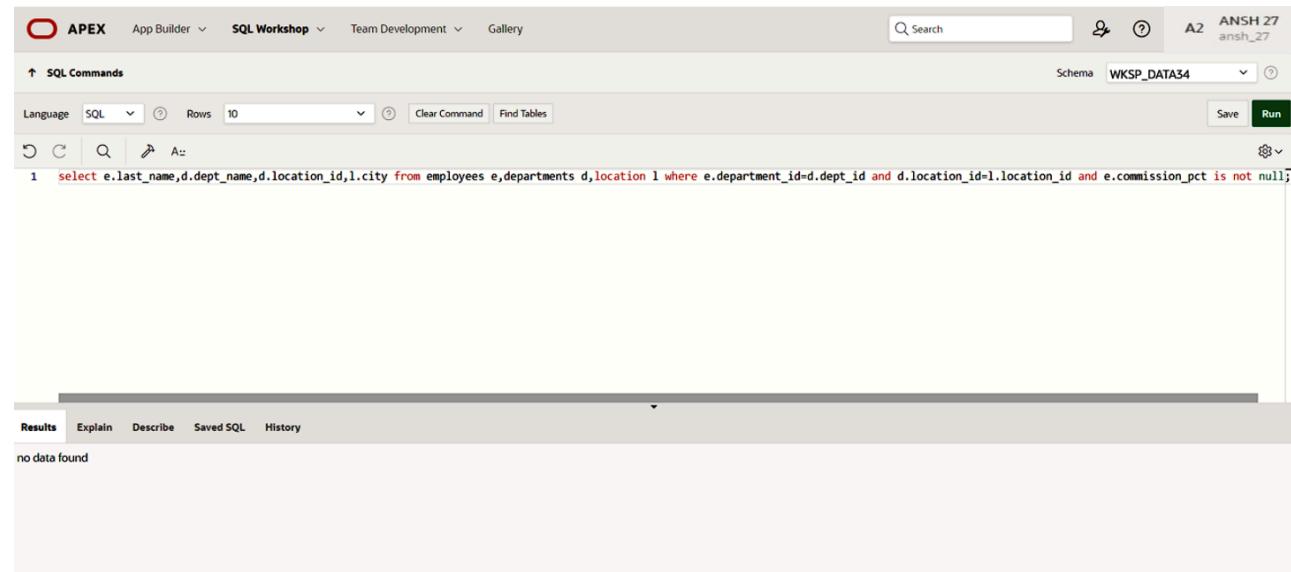
1 rows returned in 0.02 seconds | Download

3. Write a query to display the employee last name, department name, location ID, and city of all employees who earn a commission

QUERY:

```
SELECT e.last_name, d.department_name, l.location_id, l.city FROM employees e JOIN departments d ON e.department_id = d.department_id JOIN locations l ON d.location_id = l.location_id WHERE e.commission_pct IS NOT NULL;
```

OUTPUT



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user ANSH 27 and workspace ansh_27. The main area is titled "SQL Commands". The language is set to SQL, and the number of rows is set to 10. The schema is set to WKSP_DATA34. A "Run" button is visible. The SQL command entered is:

```
1 select e.last_name,d.dept_name,d.location_id,l.city from employees e,departments d,location l where e.department_id=d.dept_id and d.location_id=l.location_id and e.commission_pct is not null;
```

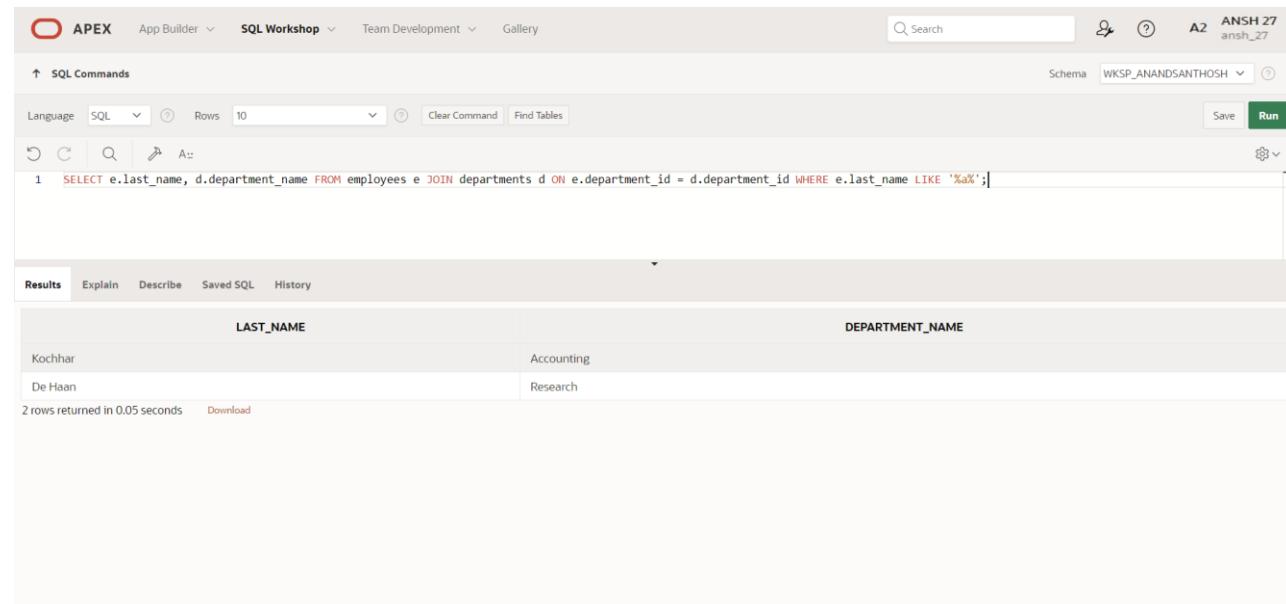
Below the command, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is selected, showing the message "no data found".

4. Display the employee last name and department name for all employees who have an a(lowercase) in their last names.

QUERY:

```
SELECT e.last_name, d.department_name FROM employees e JOIN departments d ON e.department_id = d.department_id WHERE e.last_name LIKE '%a%';
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The top right shows the user ANSH 27 and session WKSP_ANANDSANTHOSH. The main area has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab is active, displaying the query: `SELECT e.last_name, d.department_name FROM employees e JOIN departments d ON e.department_id = d.department_id WHERE e.last_name LIKE '%a%'`. The Results tab shows the output:

LAST_NAME	DEPARTMENT_NAME
Kochhar	Accounting
De Haan	Research

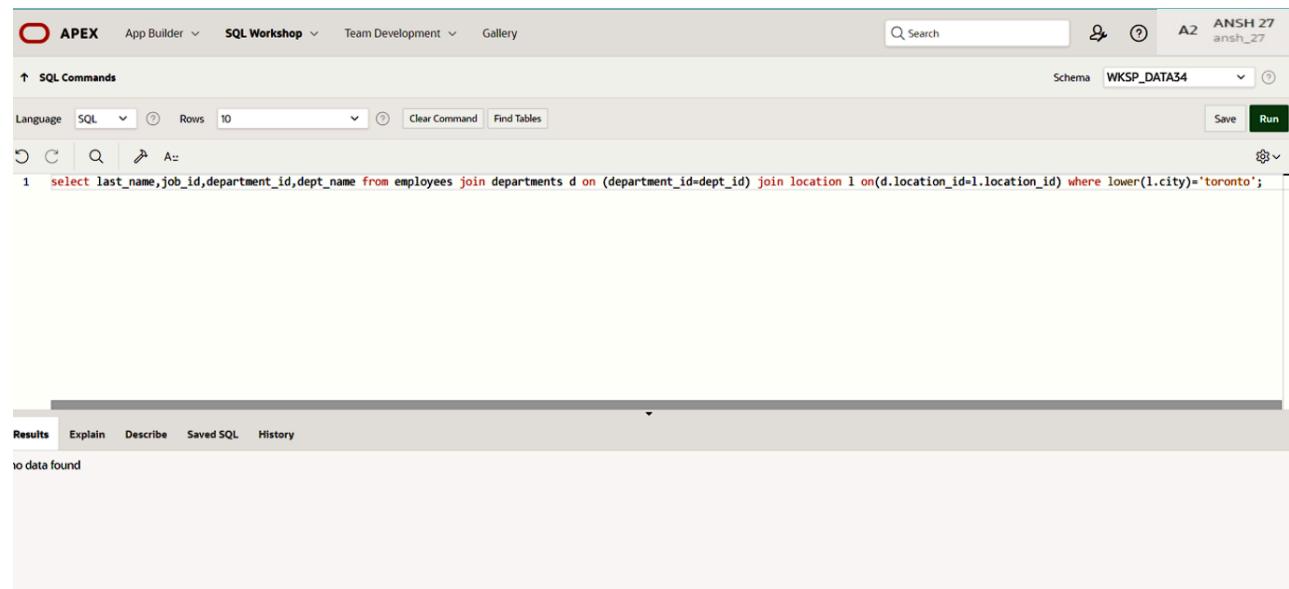
2 rows returned in 0.05 seconds. There is a Download button at the bottom of the results table.

5. Write a query to display the last name, job, department number, and department name for all employees who work in Toronto.

QUERY:

```
SELECT e.last_name, j.job_title, e.department_id, d.department_name FROM employees e JOIN departments d ON e.department_id = d.department_id JOIN jobs j ON e.job_id = j.job_id JOIN locations l ON d.location_id = l.location_id WHERE l.city = 'Toronto';
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows a session labeled A2 ANSH 27 ansh_27. The main area is titled 'SQL Commands' with a schema dropdown set to WKSP_DATA34. The command input field contains the following SQL query:

```
1 select last_name,job_id,department_id,dept_name from employees join departments d on (department_id=dept_id) join location l on(d.location_id=l.location_id) where lower(l.city)='toronto';
```

The results tab is selected at the bottom, showing the message "no data found".

6. Display the employee last name and employee number along with their manager's last name and manager number. Label the columns Employee, Emp#, Manager, and Mgr#, Respectively

QUERY:

```
SELECT e.last_name AS Employee, e.employee_id AS Emp#, m.last_name AS Manager,  
m.employee_id AS Mgr# FROM employees e JOIN employees m ON e.manager_id =  
m.employee_id ORDER BY e.employee_id;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows a user profile for ANSH 27. The main area has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab contains the executed query:

```
1 SELECT e.last_name AS Employee, e.employee_id AS Emp#, m.last_name AS Manager, m.employee_id AS Mgr# FROM employees e JOIN employees m ON e.manager_id = m.employee_id ORDER BY e.employee_id;
```

The Results tab displays the output of the query:

EMPLOYEE	EMP#	MANAGER	MGR#
Kochhar	101	King	100
De Haan	102	King	100

Below the table, it says "2 rows returned in 0.01 seconds" and there is a "Download" link.

7. Modify lab4_6.sql to display all employees including King, who has no manager. Order the results by the employee number.

QUERY:

```
SELECT e.last_name AS Employee, e.employee_id AS Emp#, m.last_name AS Manager,
m.employee_id AS Mgr# FROM employees e LEFT JOIN employees m ON e.manager_id =
m.employee_id ORDER BY e.employee_id;
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user's name (ANSH 27 ansh_27) and a search bar. The main workspace is titled "SQL Commands". It contains a language selector set to "SQL", a rows dropdown set to 10, and buttons for Clear Command and Find Tables. Below this is a toolbar with icons for Undo, Redo, Search, and Paste. The SQL command entered is:

```
1 SELECT e.last_name AS Employee, e.employee_id AS Emp#, m.last_name AS Manager, m.employee_id AS Mgr# FROM employees e LEFT JOIN employees m ON e.manager_id = m.employee_id ORDER BY e.employee_id
```

The results section shows the output of the query:

EMPLOYEE	EMP#	MANAGER	MGR#
King	100	-	-
Kochhar	101	King	100
De Haan	102	King	100

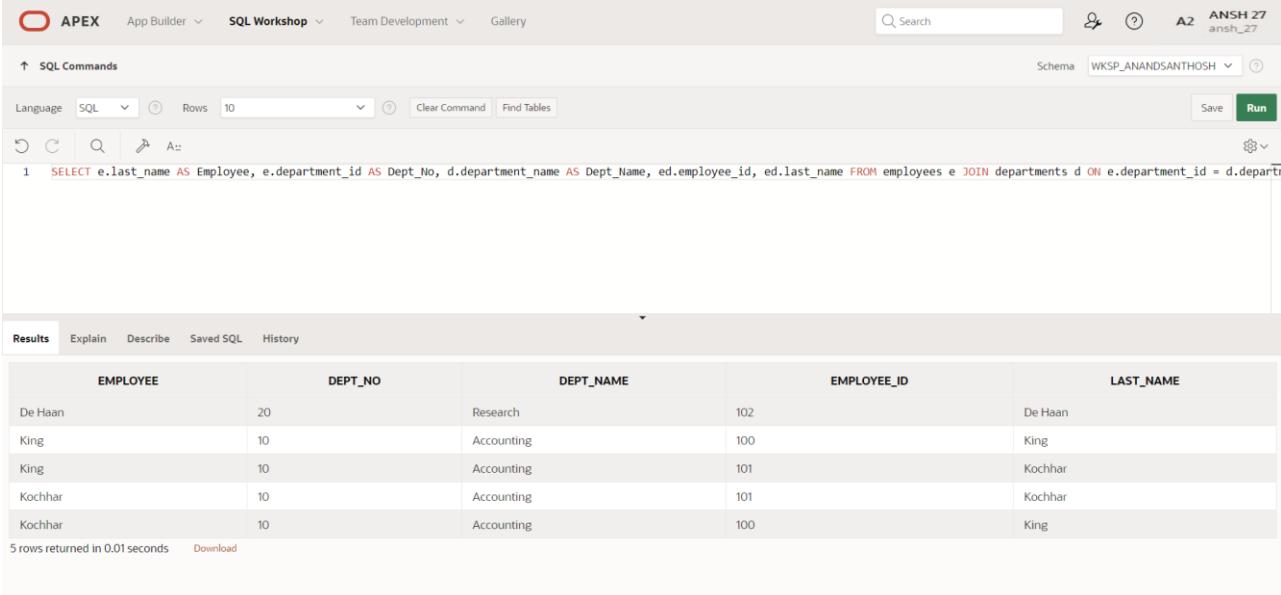
Below the table, it says "3 rows returned in 0.01 seconds" and there is a "Download" link. At the bottom of the page, there are footer links for user information (220701026@rajalakshmi.edu.in, anand_santhosh, en), copyright notice (Copyright © 1999, 2025, Oracle and/or its affiliates.), and system information (Oracle APEX 23.2.4).

8. Create a query that displays employee last names, department numbers, and all the employees who work in the same department as a given employee. Give each column an appropriate label

QUERY:

```
SELECT e.last_name AS Employee, e.department_id AS Dept_No, d.department_name AS Dept_Name, ed.employee_id, ed.last_name FROM employees e JOIN departments d ON e.department_id = d.department_id LEFT JOIN employees ed ON e.department_id = ed.department_id ORDER BY e.last_name;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop, Team Development, and Gallery. The right side shows a user profile for ANSH 27 (ansh_27). The main area is titled "SQL Commands". The query entered is:

```
1 SELECT e.last_name AS Employee, e.department_id AS Dept_No, d.department_name AS Dept_Name, ed.employee_id, ed.last_name FROM employees e JOIN departments d ON e.department_id = d.department_id LEFT JOIN employees ed ON e.department_id = ed.department_id ORDER BY e.last_name;
```

The results tab is selected, displaying the following data:

EMPLOYEE	DEPT_NO	DEPT_NAME	EMPLOYEE_ID	LAST_NAME
De Haan	20	Research	102	De Haan
King	10	Accounting	100	King
King	10	Accounting	101	Kochhar
Kochhar	10	Accounting	101	Kochhar
Kochhar	10	Accounting	100	King

5 rows returned in 0.01 seconds [Download](#)

9. Show the structure of the JOB_GRADES table. Create a query that displays the name, job, department name, salary, and grade for all employees

QUERY:

```
DESCRIBE job_grades;
```

```
SELECT e.first_name || ' ' || e.last_name AS Name, j.job_title, d.department_name, e.salary, jg.grade_level FROM employees e JOIN jobs j ON e.job_id = j.job_id JOIN departments d ON e.department_id = d.department_id JOIN job_grades jg ON e.salary BETWEEN jg.lowest_sal AND jg.highest_sal;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The SQL command window contains the DESCRIBE job_grades; command. The results pane shows the structure of the JOB_GRADES table with three columns: GRADE_LEVEL, LOWEST_SAL, and HIGHEST_SAL. The GRADE_LEVEL column is of type NUMBER with precision 4 and scale 0, marked as the primary key and nullable. The LOWEST_SAL and HIGHEST_SAL columns are also of type NUMBER with precision 8 and scale 2, both marked as nullable.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
JOB_GRADES	GRADE_LEVEL	NUMBER	-	4	0	1	-	-	-
	LOWEST_SAL	NUMBER	-	8	2	-	-	-	-
	HIGHEST_SAL	NUMBER	-	8	2	-	-	-	-

The screenshot shows the Oracle SQL Workshop interface. The SQL command window contains a SELECT query that joins four tables: employees, jobs, departments, and job_grades. The query retrieves the employee's first and last names, job title, department name, salary, and grade level. The results pane displays three rows of data for Steven King, Neena Kochhar, and Lex De Haan, showing their respective roles, departments, salaries, and grade levels.

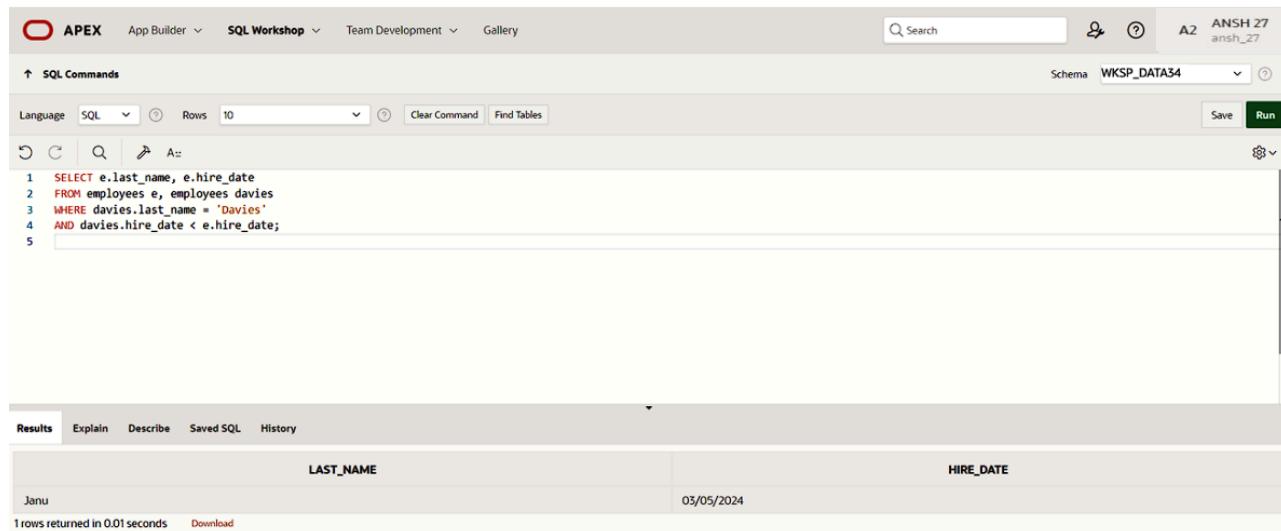
NAME	JOB_TITLE	DEPARTMENT_NAME	SALARY	GRADE_LEVEL
Steven King	Administration President	Accounting	24000	6
Neena Kochhar	Administration Vice President	Accounting	17000	5
Lex De Haan	Administration Vice President	Research	17000	5

10. Create a query to display the name and hire date of any employee hired after employee Davies.

QUERY:

```
SELECT e.first_name || ' ' || e.last_name AS Employee, e.hire_date FROM employees e WHERE e.hire_date > (SELECT e2.hire_date FROM employees e2 WHERE e2.last_name = 'Davies');
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows user information: A2 ANSH 27 and Schema WKSP_DATA34. The main area is titled "SQL Commands". The code entered is:

```
1 SELECT e.last_name, e.hire_date
2 FROM employees e, employees davies
3 WHERE davies.last_name = 'Davies'
4 AND davies.hire_date < e.hire_date;
```

The results section shows a single row:

LAST_NAME	HIRE_DATE
Janu	03/05/2024

Below the results, it says "1 rows returned in 0.01 seconds" and has a "Download" link.

11. Display the names and hire dates for all employees who were hired before their managers, along with their manager's names and hire dates. Label the columns Employee, Emp Hired, Manager, and Mgr Hired, respectively.

QUERY:

```
SELECT e.first_name || ' ' || e.last_name AS Employee, e.hire_date AS Emp_Hired, m.first_name || '  
' || m.last_name AS Manager, m.hire_date AS Mgr_Hired FROM employees e JOIN employees m  
ON e.manager_id = m.employee_id WHERE e.hire_date < m.hire_date ORDER BY e.hire_date;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows a user profile for ANSH 27. The main area has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab contains the query:

```
1 SELECT e.first_name || ' ' || e.last_name AS Employee, e.hire_date AS Emp_Hired, m.first_name || ' ' || m.last_name AS Manager, m.hire_date AS Mgr_Hired FROM employees e JOIN employees m
```

The Results tab displays the output:

EMPLOYEE	EMP_HIRED	MANAGER	MGR_HIRED
Lex De Haan	06/15/1987	Steven King	06/17/1987

1 rows returned in 0.01 seconds [Download](#)

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

AGGREGATING DATA USING GROUP FUNCTIONS

EX.NO:8

DATE: 19 – 3 - 24

REG.NO: 220701026

Determine the validity of the following three statements. Circle either True or False.

1. Group functions work across many rows to produce one result per group.

True/False

2. Group functions include nulls in calculations.

True/False

3. The WHERE clause restricts rows prior to inclusion in a group calculation.

True/False

The HR department needs the following reports:

4. Find the highest, lowest, sum, and average salary of all employees. Label the columns Maximum, Minimum, Sum, and Average, respectively. Round your results to the nearest whole number

QUERY:

```
SELECT MAX(salary) AS "Maximum", MIN(salary) AS "Minimum", SUM(salary) AS "Sum",  
ROUND(AVG(salary)) AS "Average" FROM employees;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The SQL Commands pane contains the following query:

```
1 SELECT  
2   MAX(salary) AS "Maximum",  
3   MIN(salary) AS "Minimum",  
4   SUM(salary) AS "Sum",  
5   ROUND(AVG(salary)) AS "Average"  
6  FROM employees;
```

The Results pane displays the following table:

	Maximum	Minimum	Sum	Average
	90000	70000	407000	81400

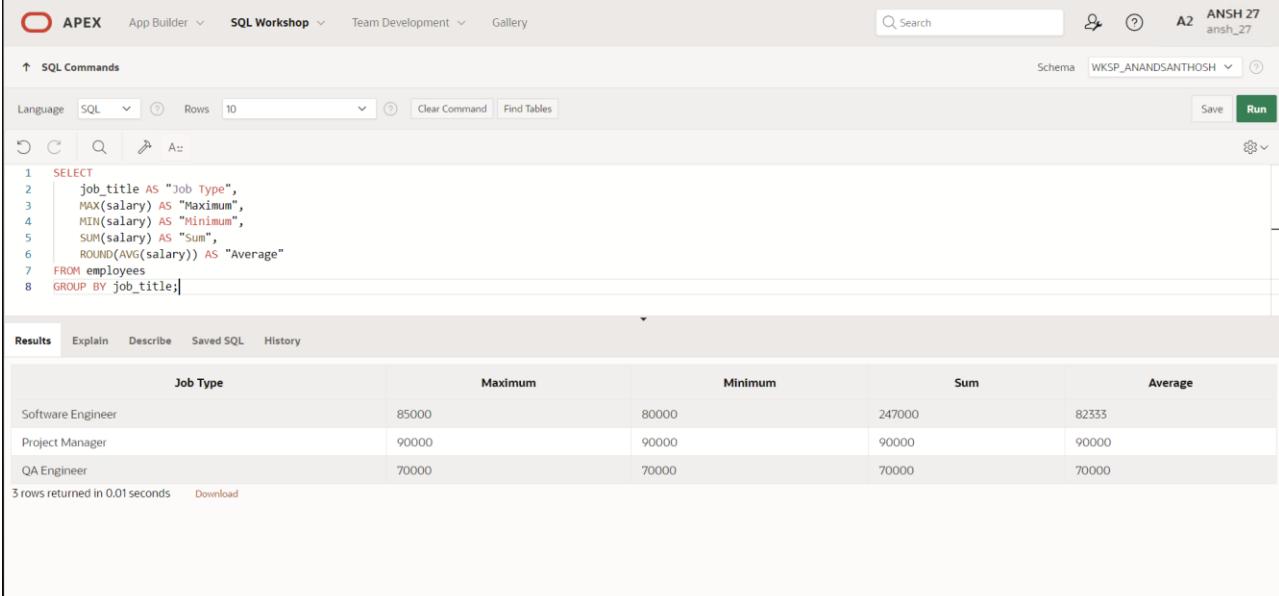
Below the table, it says "1 rows returned in 0.02 seconds".

5. Modify the above query to display the minimum, maximum, sum, and average salary for each job type.

QUERY:

```
SELECT job_title AS "Job Type", MAX(salary) AS "Maximum", MIN(salary) AS "Minimum",
SUM(salary) AS "Sum", ROUND(AVG(salary)) AS "Average" FROM employees GROUP BY
job_title;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The query has been run, and the results are displayed in a table. The table has five columns: Job Type, Maximum, Minimum, Sum, and Average. The data shows three rows for Software Engineer, Project Manager, and QA Engineer.

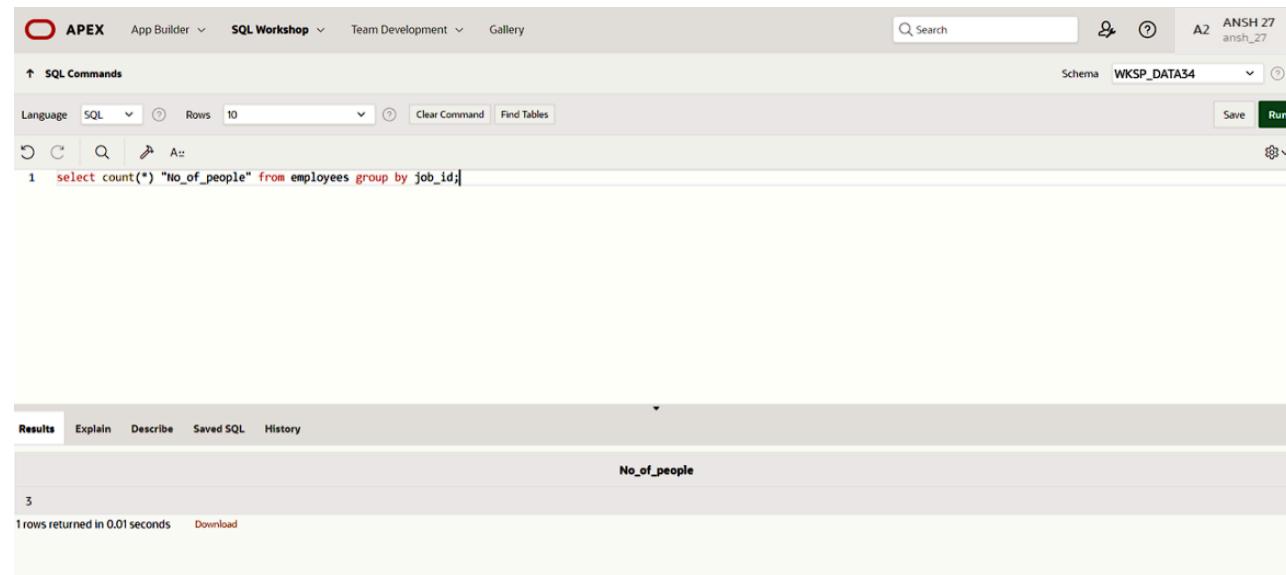
Job Type	Maximum	Minimum	Sum	Average
Software Engineer	85000	80000	247000	82333
Project Manager	90000	90000	90000	90000
QA Engineer	70000	70000	70000	70000

6. Write a query to display the number of people with the same job. Generalize the query so that the user in the HR department is prompted for a job title.

QUERY:

```
SELECT job_title, COUNT(*) AS "Number of Employees" FROM employees WHERE job_title = &job_title;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows a session labeled A2 ANSH 27 ansh_27. The main area is titled 'SQL Commands' with tabs for Language (set to SQL), Rows (set to 10), and buttons for Clear Command and Find Tables. A command line shows the following SQL statement:

```
1 select count(*) "No_of_people" from employees group by job_id;
```

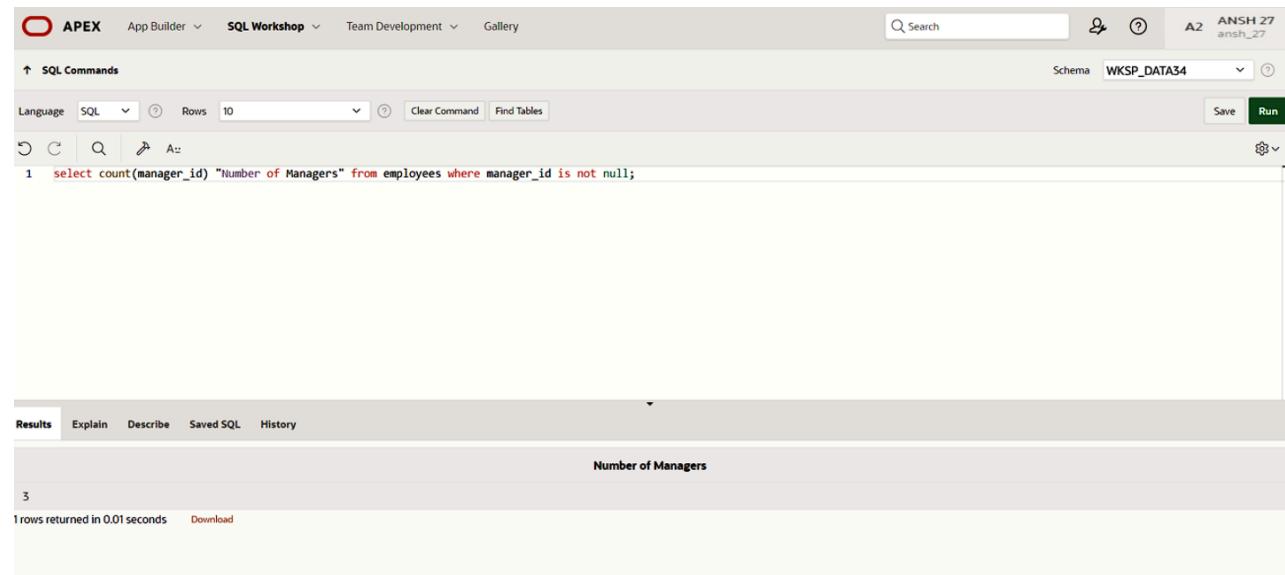
Below the command line, the results tab is selected. It displays a single row with the column header 'No_of_people' and the value '3'. A note at the bottom states '1 rows returned in 0.01 seconds' and includes a 'Download' link.

7. Determine the number of managers without listing them. Label the column Number of Managers. *Hint: Use the MANAGER_ID column to determine the number of managers.*

QUERY:

```
SELECT COUNT(*) AS "Number of Managers" FROM employees WHERE manager_id IS NOT NULL;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there are user profile details (A2 ANSH 27 ansh_27) and a search bar. The main workspace is titled 'SQL Commands' and contains the following content:

- Language: SQL
- Rows: 10
- Clear Command
- Find Tables
- Run button

The SQL command entered is:

```
1 select count(manager_id) "Number of Managers" from employees where manager_id is not null;
```

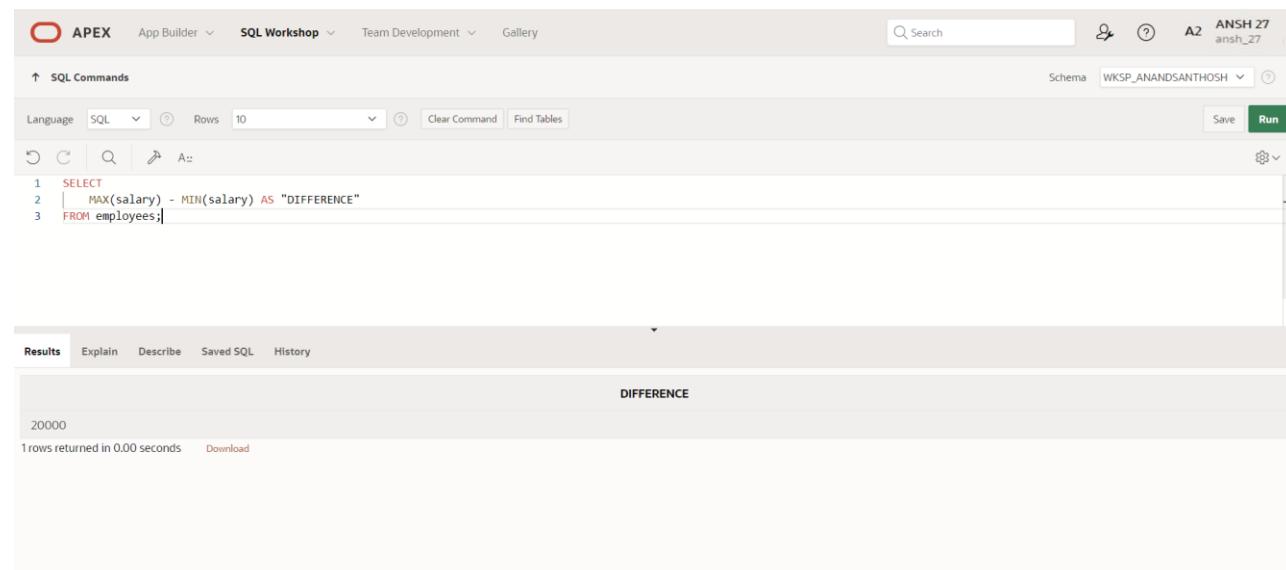
The results section shows a single row with the value '3' under the heading 'Number of Managers'. Below the results, it says '1 rows returned in 0.01 seconds' and has a 'Download' link.

8. Find the difference between the highest and lowest salaries. Label the column DIFFERENCE.

QUERY:

```
SELECT MAX(salary) - MIN(salary) AS "DIFFERENCE" FROM employees;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands pane, a query is entered:

```
1 SELECT
2   | MAX(salary) - MIN(salary) AS "DIFFERENCE"
3   FROM employees;
```

In the Results pane, the output is displayed in a single row:

DIFFERENCE
20000

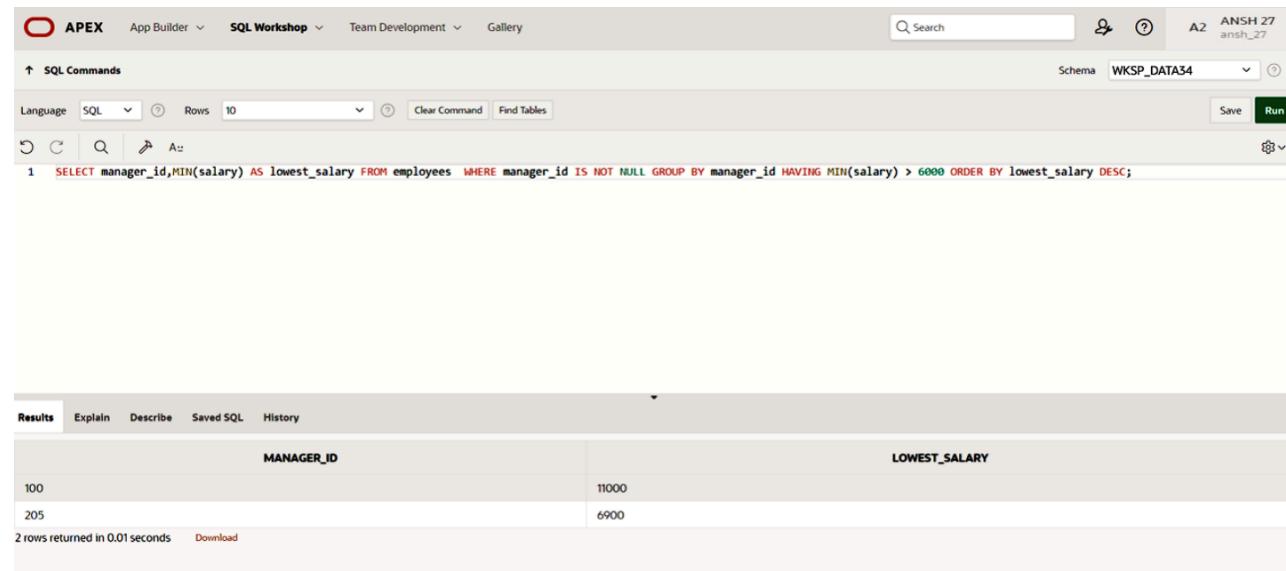
Below the results, it says "1 rows returned in 0.00 seconds".

9. Create a report to display the manager number and the salary of the lowest-paid employee for that manager. Exclude anyone whose manager is not known. Exclude any groups where the minimum salary is \$6,000 or less. Sort the output in descending order of salary.

QUERY:

```
SELECT manager_id, MIN(salary) AS "Lowest Salary" FROM employees WHERE manager_id IS NOT NULL AND salary > 6000 GROUP BY manager_id ORDER BY MIN(salary) DESC;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows a user profile for ANSH 27 (ansh_27). The main area has a search bar and a schema dropdown set to WKSP_DATA34. Below is a toolbar with Language (SQL selected), Rows (10), Clear Command, Find Tables, Save, and Run buttons. The SQL command entered is:

```
1 SELECT manager_id,MIN(salary) AS lowest_salary FROM employees WHERE manager_id IS NOT NULL GROUP BY manager_id HAVING MIN(salary) > 6000 ORDER BY lowest_salary DESC;
```

The results section shows a table with two rows:

MANAGER_ID	LOWEST_SALARY
100	11000
205	6900

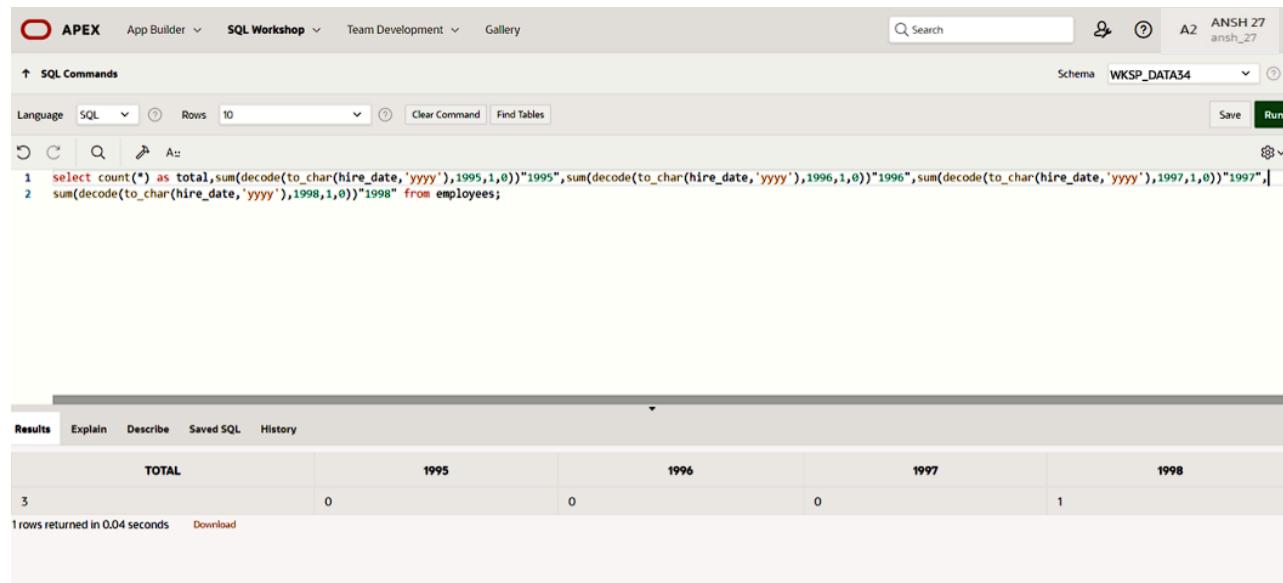
Below the table, it says "2 rows returned in 0.01 seconds" and has a "Download" link.

10. Create a query to display the total number of employees and, of that total, the number of employees hired in 1995, 1996, 1997, and 1998. Create appropriate column headings.

QUERY:

```
SELECT COUNT(*) AS "Total Employees",
SUM(CASE WHEN hire_date LIKE '1995%' THEN 1 ELSE 0 END) AS "Employees in 1995",
SUM(CASE WHEN hire_date LIKE '1996%' THEN 1 ELSE 0 END) AS "Employees in 1996",
SUM(CASE WHEN hire_date LIKE '1997%' THEN 1 ELSE 0 END) AS "Employees in 1997",
SUM(CASE WHEN hire_date LIKE '1998%' THEN 1 ELSE 0 END) AS "Employees in 1998"
FROM employees;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The top right shows user information: ANSH 27 and ansh_27. The main area is titled 'SQL Commands' with a schema dropdown set to WKSP_DATA34. The SQL editor contains the following code:

```
1 select count(*) as total,sum(decode(to_char(hire_date,'yyyy'),1995,1,0))"1995",sum(decode(to_char(hire_date,'yyyy'),1996,1,0))"1996",sum(decode(to_char(hire_date,'yyyy'),1997,1,0))"1997",
2 sum(decode(to_char(hire_date,'yyyy'),1998,1,0))"1998" from employees;
```

The results tab is selected, displaying the following output:

TOTAL	1995	1996	1997	1998
3	0	0	0	1

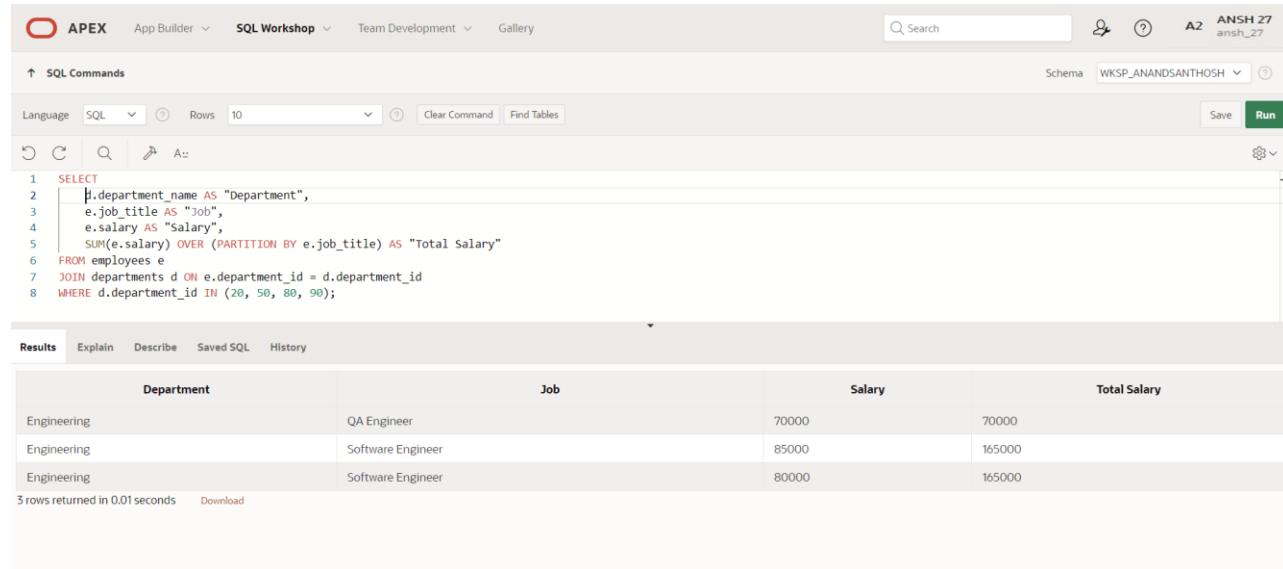
Below the table, it says '1 rows returned in 0.04 seconds' and has a 'Download' link.

11. Create a matrix query to display the job, the salary for that job based on department number, and the total salary for that job, for departments 20, 50, 80, and 90, giving each column an appropriate heading.

QUERY:

```
SELECT d.department_name AS "Department", e.job_title AS "Job", e.salary AS "Salary",
SUM(e.salary) OVER (PARTITION BY e.job_title) AS "Total Salary"
FROM employees e JOIN departments d ON e.department_id = d.department_id
WHERE d.department_id IN (20, 50, 80, 90);
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The SQL command entered is:

```
1 SELECT
2     d.department_name AS "Department",
3     e.job_title AS "Job",
4     e.salary AS "Salary",
5     SUM(e.salary) OVER (PARTITION BY e.job_title) AS "Total Salary"
6 FROM employees e
7 JOIN departments d ON e.department_id = d.department_id
8 WHERE d.department_id IN (20, 50, 80, 90);
```

The results section displays the following data:

Department	Job	Salary	Total Salary
Engineering	QA Engineer	70000	70000
Engineering	Software Engineer	85000	165000
Engineering	Software Engineer	80000	165000

3 rows returned in 0.01 seconds [Download](#)

12. Write a query to display each department's name, location, number of employees, and the average salary for all the employees in that department. Label the column name-Location, Number of people, and salary respectively. Round the average salary to two decimal places.

QUERY:

```
SELECT d.department_name AS "Location", d.location_id AS "Department", COUNT(*) AS  
"Number of people", ROUND(AVG(e.salary), 2) AS "Salary" FROM employees e JOIN  
departments d ON e.department_id = d.department_id GROUP BY d.department_name, d.location  
ORDER BY "Salary" DESC;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows user information: ANSH 27 and ansh_27. The main area has tabs for SQL Commands, Explain, Describe, Saved SQL, and History. The SQL Commands tab is active, displaying the following SQL code:

```
1 select d.dept_name as "Department name",l.location_id as "Location",count(e.department_id) as "Number of people",round(avg(e.salary),2) as "Salary"  
2 from departments d,employees e,location l where d.dept_id=e.department_id group by d.dept_name,l.location_id,e.department_id;
```

Below the code, the Results tab is selected, showing the query results in a table:

Department name	Location	Number of people	Salary
Public Relations	4598	1	6900
Public Relations	1231	1	6900
finance	4598	1	11000
finance	1231	1	11000

At the bottom left, it says "4 rows returned in 0.02 seconds".

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

SUB QUERIES

EX_NO:9

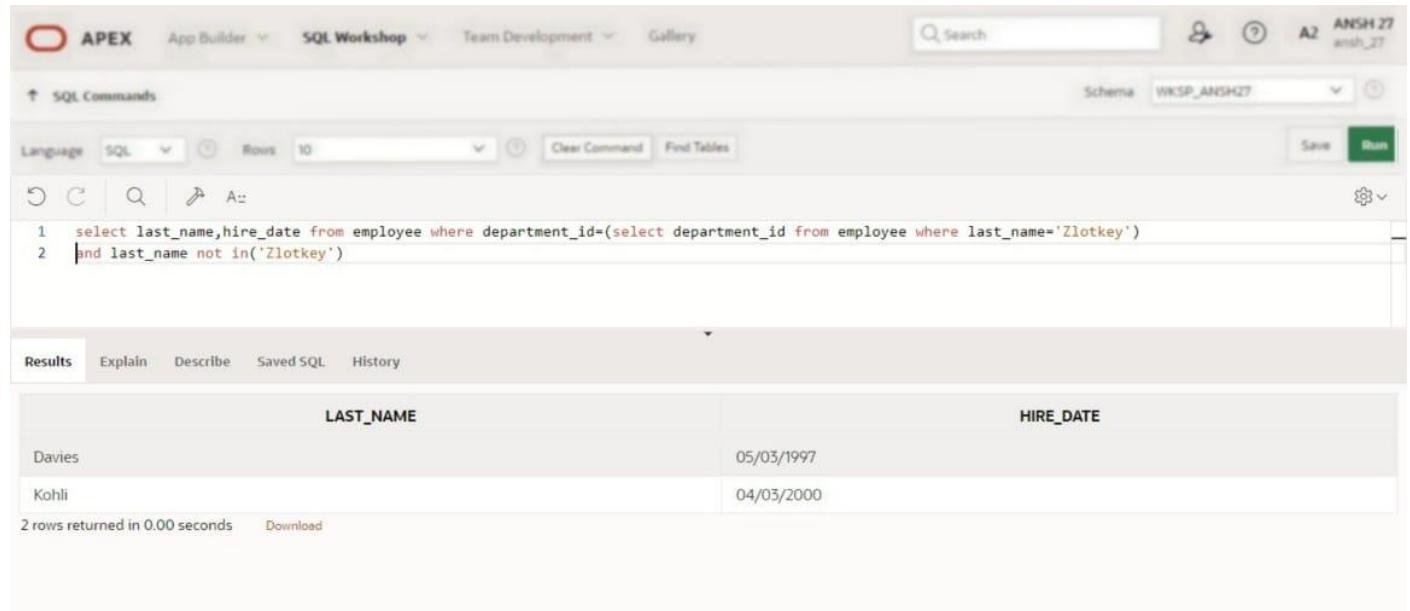
DATE:

1.)The HR department needs a query that prompts the user for an employee last name. The query then displays the last name and hire date of any employee in the same department as the employee whose name they supply (excluding that employee). For example, if the user enters Zlotkey, find all employees who work with Zlotkey (excluding Zlotkey).

QUERY:

```
select last_name,hire_date from employee where department_id=(select department_id from employee where last_name='Zlotkey') and last_name not in('Zlotkey')
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The SQL command window contains the following code:

```
1 select last_name,hire_date from employee where department_id=(select department_id from employee where last_name='Zlotkey')
2 and last_name not in('Zlotkey')
```

The results window displays the following output:

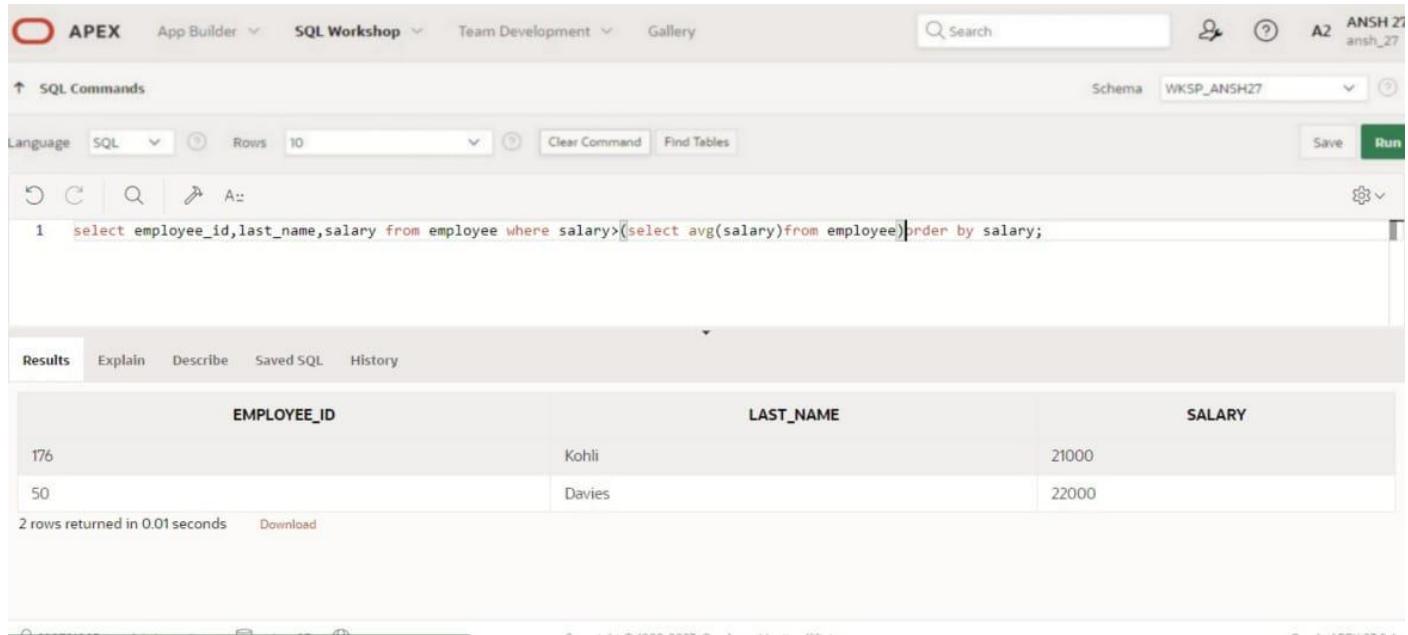
LAST_NAME	HIRE_DATE
Davies	05/03/1997
Kohli	04/03/2000

Below the results, it says "2 rows returned in 0.00 seconds".

2.) Create a report that displays the employee number, last name, and salary of all employees who earn more than the average salary. Sort the results in order of ascending salary.

QUERY: select employee_id, last_name, salary from employee where salary > (select avg(salary) from employee) order by salary;

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', 'Gallery', and a search bar. The schema is set to 'WKSP_ANSH27'. The SQL command window contains the following query:

```
1 select employee_id, last_name, salary from employee where salary > (select avg(salary) from employee) order by salary;
```

The results section shows the output:

EMPLOYEE_ID	LAST_NAME	SALARY
176	Kohli	21000
50	Davies	22000

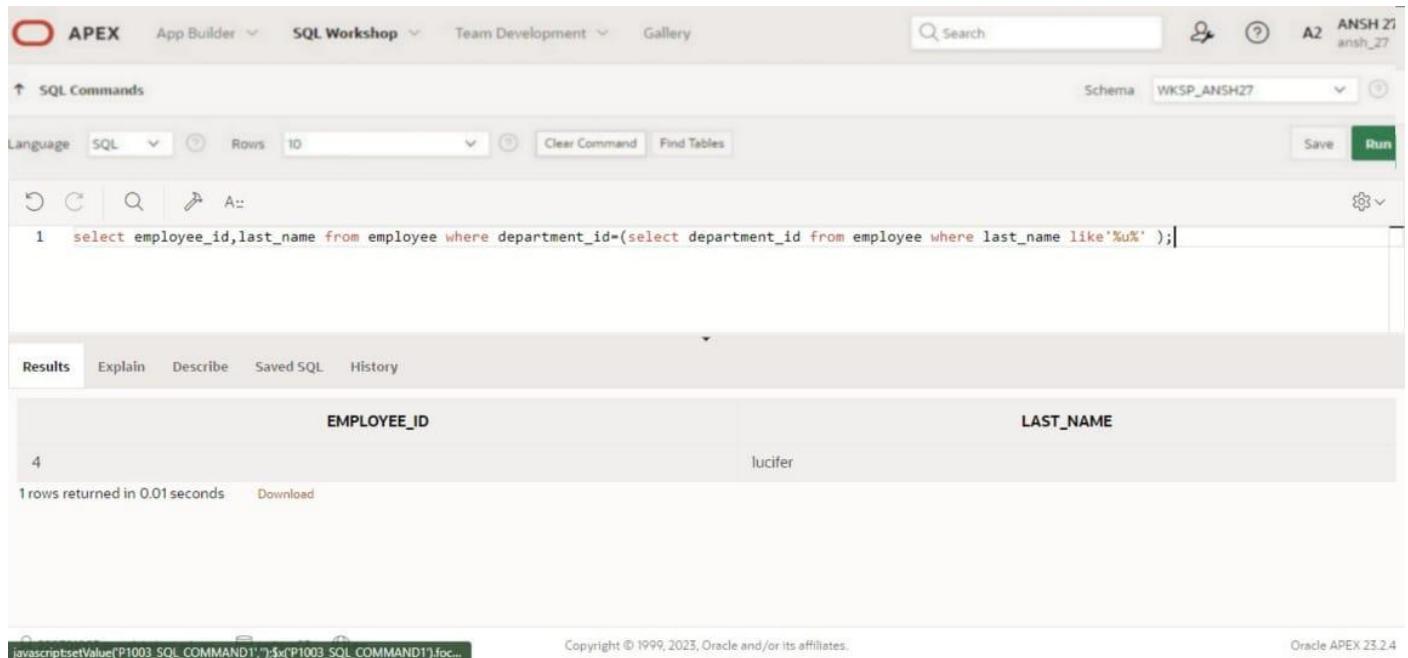
2 rows returned in 0.01 seconds. There is a 'Download' link below the results table.

3.) Write a query that displays the employee number and last name of all employees who work in a department with any employee whose last name contains a u.

QUERY:

```
select employee_id, last_name from employee where department_id = (select department_id from employee where last_name like '%u%');
```

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', 'Gallery', and a search bar. The schema is set to 'WKSP_ANSH27'. The SQL command window contains the following query:

```
1 select employee_id, last_name from employee where department_id = (select department_id from employee where last_name like '%u%');
```

The results section shows the output:

EMPLOYEE_ID	LAST_NAME
4	lucifer

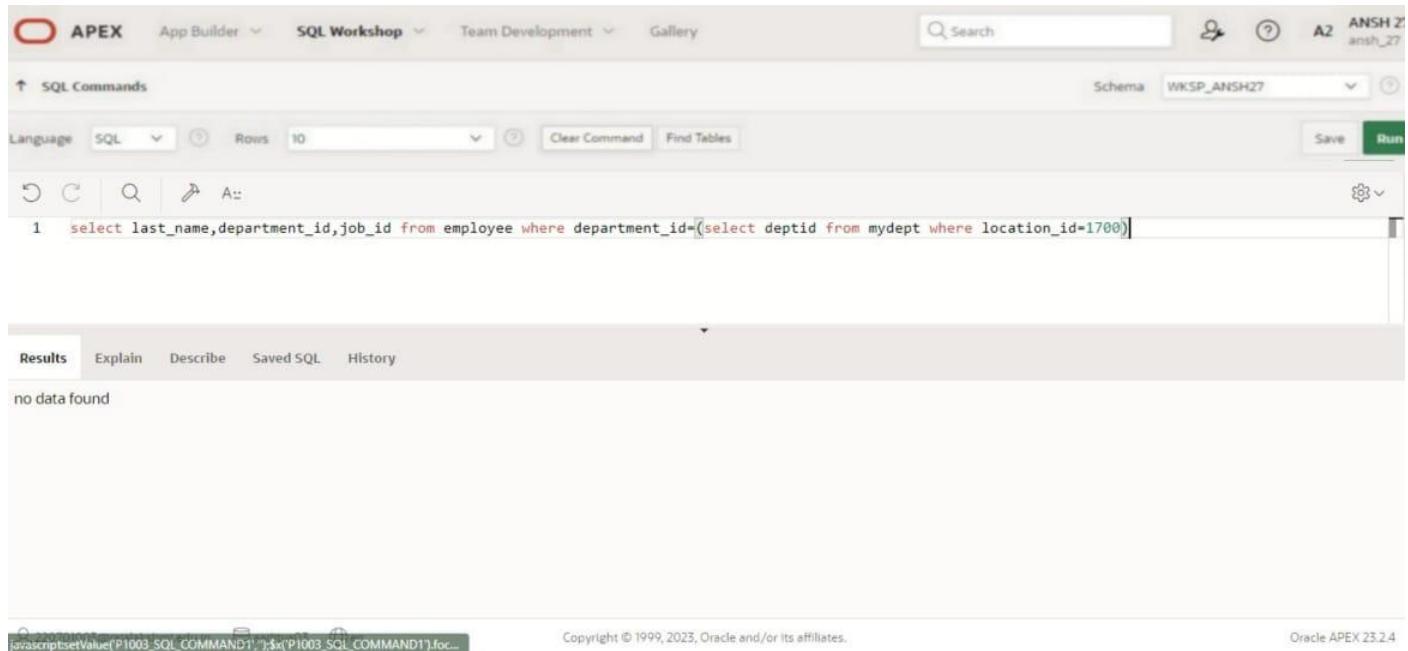
1 rows returned in 0.01 seconds. There is a 'Download' link below the results table.

4.) The HR department needs a report that displays the last name, department number, and job ID of all employees whose department location ID is 1700.

QUERY:

```
select last_name,department_id,job_id from employee where department_id=(select deptid from mydept where location_id=1700);
```

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. The right side shows the schema 'WKSP_ANSH27' and user 'ANSH_Z'. The main area has tabs for 'SQL Commands' and 'Results'. Under 'SQL Commands', the language is set to 'SQL' and rows to '10'. The command entered is:

```
1 select last_name,department_id,job_id from employee where department_id=(select deptid from mydept where location_id=1700);
```

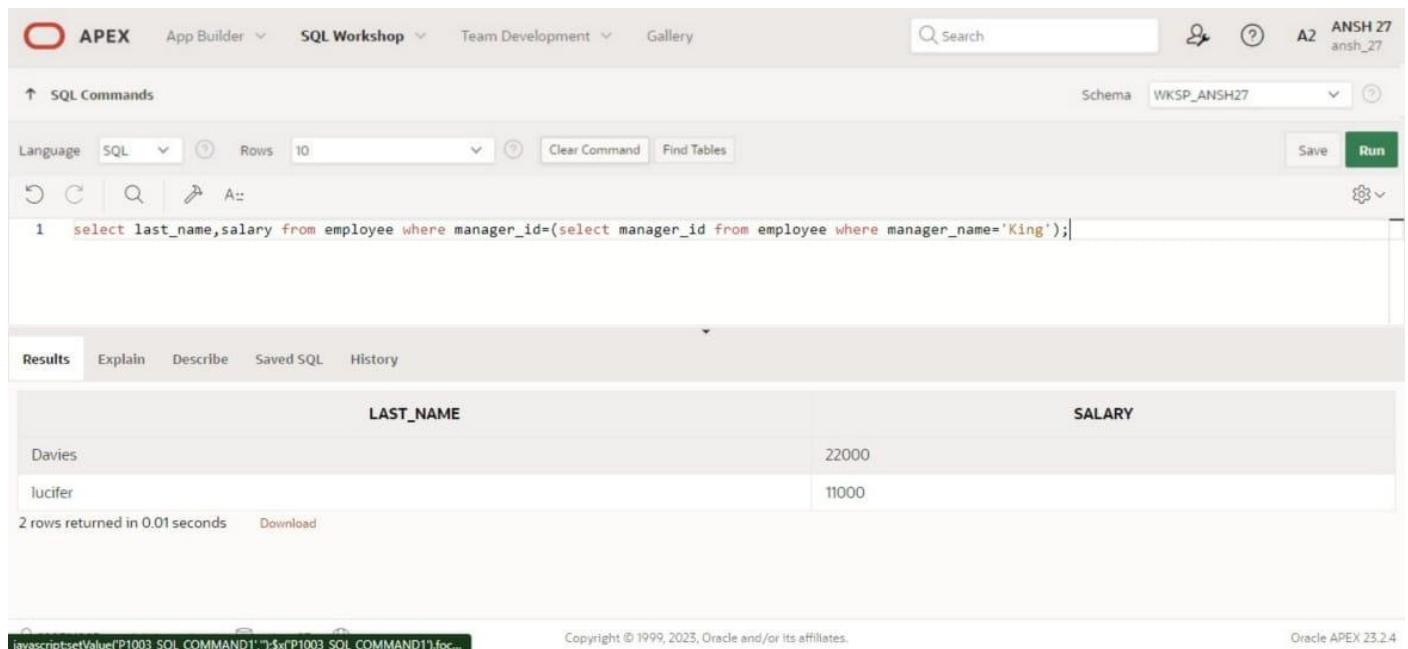
Under the 'Results' tab, it says 'no data found'.

5.) Create a report for HR that displays the last name and salary of every employee who reports to King.

QUERY:

```
select last_name,salary from employee where manager_id=(select manager_id from employee where manager_name='King');
```

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface, identical to the previous one but with different results. The command is the same as above. The results table shows two rows:

LAST_NAME	SALARY
Davies	22000
Lucifer	11000

At the bottom, it says '2 rows returned in 0.01 seconds'.

6.) Create a report for HR that displays the department number, last name, and job ID for every employee in the Executive department.

QUERY:

```
select department_id, last_name, job_id from employee where department_id in (select deptid from mydept where dept_name='Executive');
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. The search bar contains 'Search'. On the right, it shows 'A2 ANSH 27 ansh_27'. Below the toolbar, there are buttons for 'Language' (set to 'SQL'), 'Rows' (set to 10), 'Clear Command', 'Find Tables', 'Save', and 'Run'. The main area contains the SQL command:

```
1 select department_id, last_name, job_id from employee where department_id in (select deptid from mydept where dept_name='Executive');
```

Below the command, the results tab is selected. The output table has columns: DEPARTMENT_ID, LAST_NAME, and JOB_ID. The data rows are:

DEPARTMENT_ID	LAST_NAME	JOB_ID
78	Zlotkey	56
78	Davies	58
78	Kohli	36

At the bottom, it says '3 rows returned in 0.00 seconds' and 'Download'. The footer includes user information (aaditya03@rajalakshmi.edu.in) and copyright information (Copyright © 1999, 2023, Oracle and/or its affiliates). The version is 'Oracle APEX 23.2.4'.

7.) Modify the query 3 to display the employee number, last name, and salary of all employees who earn more than the average salary and who work in a department with any employee whose last name contains a u.

QUERY:

```
select employee_id, last_name, salary from employee where salary > (select avg(salary) from employee where last_name like '%u%');
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. The search bar contains 'Search'. On the right, it shows 'A2 ANSH 27 ansh_27'. Below the toolbar, there are buttons for 'Language' (set to 'SQL'), 'Rows' (set to 10), 'Clear Command', 'Find Tables', 'Save', and 'Run'. The main area contains the SQL command:

```
1 select employee_id, last_name, salary from employee where salary > (select avg(salary) from employee where last_name like '%u%');
```

Below the command, the results tab is selected. The output table has columns: EMPLOYEE_ID, LAST_NAME, and SALARY. The data rows are:

EMPLOYEE_ID	LAST_NAME	SALARY
3	Zlotkey	15000
50	Davies	22000
176	Kohli	21000

At the bottom, it says '3 rows returned in 0.01 seconds' and 'Download'. The footer includes user information (aaditya03@rajalakshmi.edu.in) and copyright information (Copyright © 1999, 2023, Oracle and/or its affiliates). The version is 'Oracle APEX 23.2.4'.

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

RESULT:

USING THE SET OPERATORS

EX.NO:10

DATE:

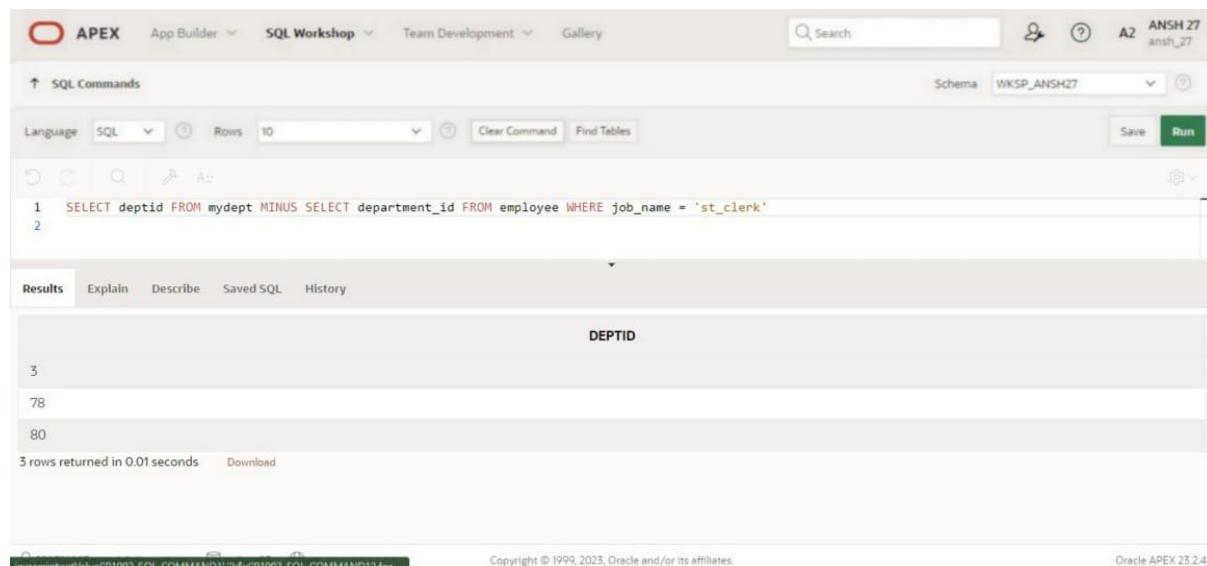
Find the Solution for the following:

1. The HR department needs a list of department IDs for departments that do not contain the job ID ST_CLERK. Use set operators to create this report.

QUERY:

```
SELECT deptid FROM mydept MINUS SELECT department_id FROM employee WHERE job_name = 'st_clerk';
```

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery. The user is connected to schema 'WKSP_ANSH27' under user 'ANSH 27'. The main workspace displays a SQL command window with the following content:

```
1  SELECT deptid FROM mydept MINUS SELECT department_id FROM employee WHERE job_name = 'st_clerk'
2
```

The results section shows the output of the query:

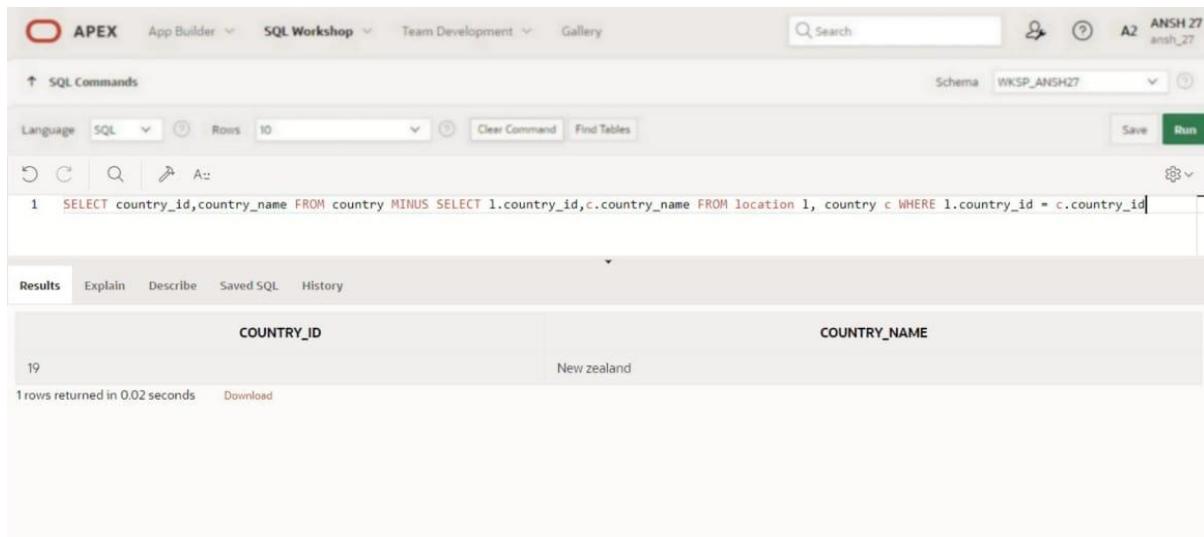
DEPTID
3
78
80

Below the results, it says '3 rows returned in 0.01 seconds' and provides a 'Download' link. The bottom of the page includes copyright information for Oracle and a note about Oracle APEX version 23.2.4.

2. The HR department needs a list of countries that have no departments located in them. Display the country ID and the name of the countries. Use set operators to create this report.

QUERY: SELECT country_id, country_name FROM country MINUS SELECT l.country_id, c.country_name FROM location l, country c WHERE l.country_id = c.country_id;

OUTPUT:



COUNTRY_ID	COUNTRY_NAME
19	New Zealand

1 rows returned in 0.02 seconds [Download](#)

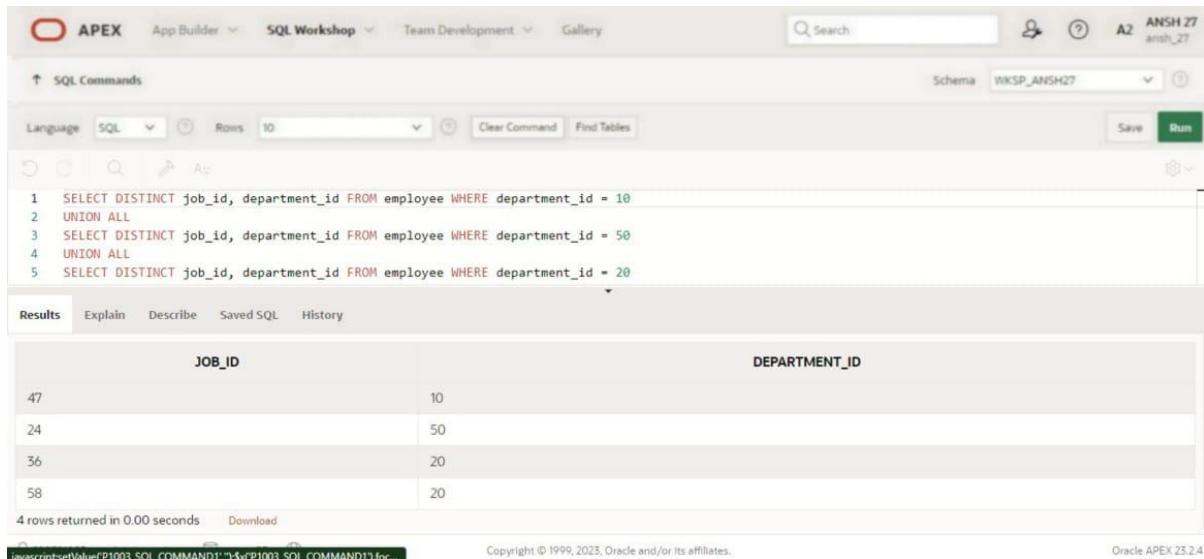
3. Produce a list of jobs for departments 10, 50, and 20, in that order. Display job ID and department ID using set operators.

QUERY: SELECT DISTINCT job_id, department_id FROM employee WHERE department_id = 10 UNION ALL

SELECT DISTINCT job_id, department_id FROM employee WHERE department_id = 50 UNION ALL

SELECT DISTINCT job_id, department_id FROM employee WHERE department_id = 20

OUTPUT:



JOB_ID	DEPARTMENT_ID
47	10
24	50
36	20
58	20

4 rows returned in 0.00 seconds [Download](#)

javascript:setValue('P1003_SQL_COMMAND1','');setValue('P1003_SQL_COMMAND1')...;

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Oracle APEX 23.2.4

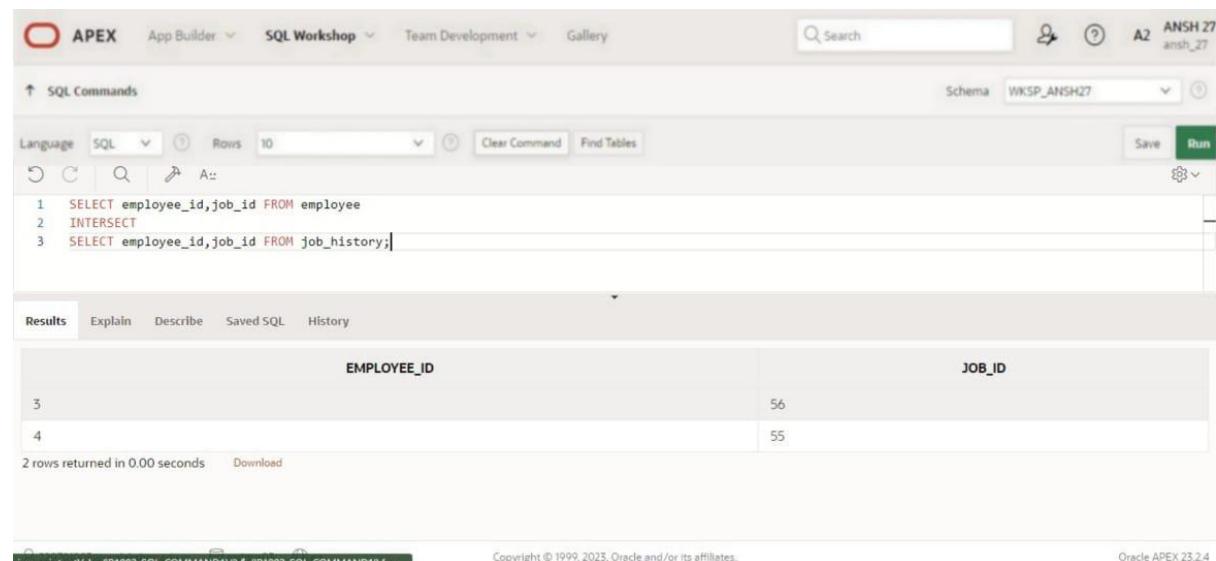
4. Create a report that lists the employee IDs and job IDs of those employees who currently have a job title that is the same as their job title when they were initially hired by the company (that is, they changed jobs but have now gone back to doing their original job).

QUERY: SELECT employee_id,job_id FROM employee

INTERSECT

SELECT employee_id,job_id FROM job_history;

OUTPUT:



The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes links for App Builder, SQL Workshop (selected), Team Development, and Gallery. The top right corner shows the user 'ANSH 27' and the workspace 'WKSP_ANSH27'. The main area is titled 'SQL Commands' with a sub-section 'Results'. The SQL editor contains the following code:

```
1 SELECT employee_id,job_id FROM employee
2 INTERSECT
3 SELECT employee_id,job_id FROM job_history;
```

The results section displays a table with two rows:

EMPLOYEE_ID	JOB_ID
3	56
4	55

Below the table, it says '2 rows returned in 0.00 seconds' and has a 'Download' link. At the bottom of the page, there are copyright notices for Oracle and APEX, and the text 'JavaServer Faces 2.3.14'.

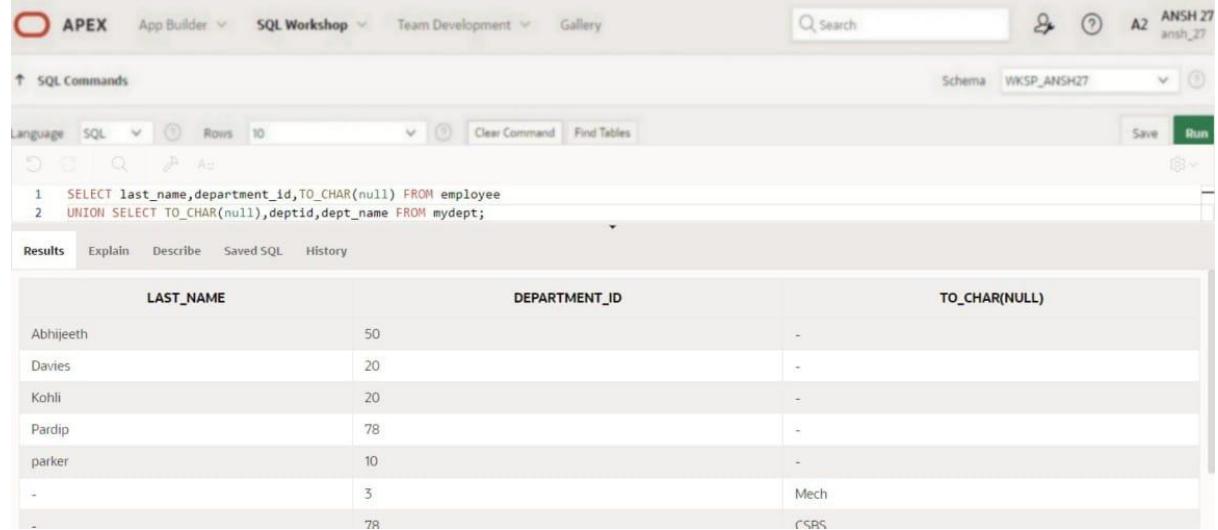
5. The HR department needs a report with the following specifications:

- Last name and department ID of all the employees from the EMPLOYEES table, regardless of whether or not they belong to a department.
- Department ID and department name of all the departments from the DEPARTMENTS table, regardless of whether or not they have employees working in them Write a compound query to accomplish this.

QUERY:
SELECT last_name,department_id,TO_CHAR(null) FROM employee

UNION SELECT TO_CHAR(null),deptid,dept_name FROM mydept

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows a user profile for ANSH 27. The main area has tabs for SQL Commands, Results (selected), Explain, Describe, Saved SQL, and History. The SQL pane contains the following code:

```
1 SELECT last_name,department_id,TO_CHAR(null) FROM employee
2 UNION SELECT TO_CHAR(null),deptid,dept_name FROM mydept;
```

The Results pane displays the output of the query:

LAST_NAME	DEPARTMENT_ID	TO_CHAR(NULL)
Abhijeeth	50	-
Davies	20	-
Kohli	20	-
Pardip	78	-
parker	10	-
-	3	Mech
-	78	CSRS

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

RESULT:

CREATING VIEWS

EX_NO:11

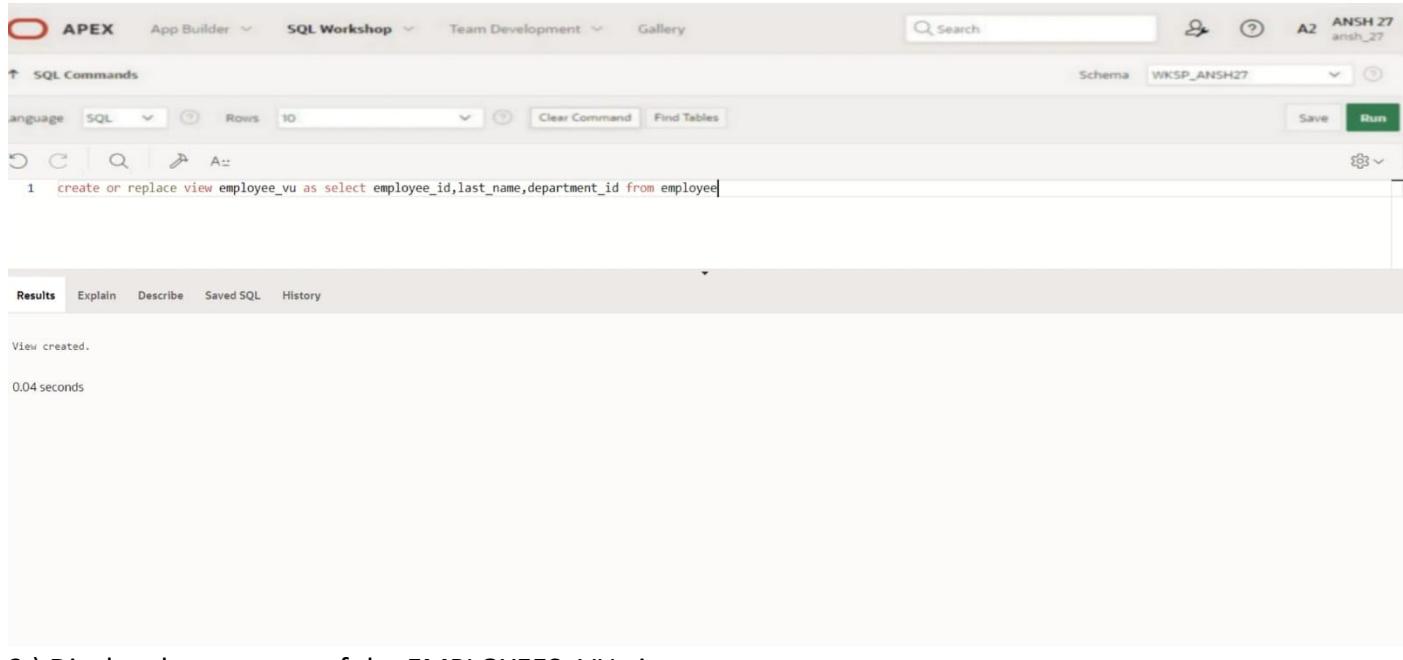
DATE:

1.) Create a view called EMPLOYEE_VU based on the employee numbers, employee names and department numbers from the EMPLOYEES table. Change the heading for the employee name to EMPLOYEE.

QUERY:

```
CREATE OR REPLACE VIEW employees_vu AS SELECT employee_id, last_name employee,
department_id FROM employees;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands pane, the command to create the view is entered:

```
1 create or replace view employee_vu as select employee_id, last_name, department_id from employees
```

In the Results pane, the output shows:

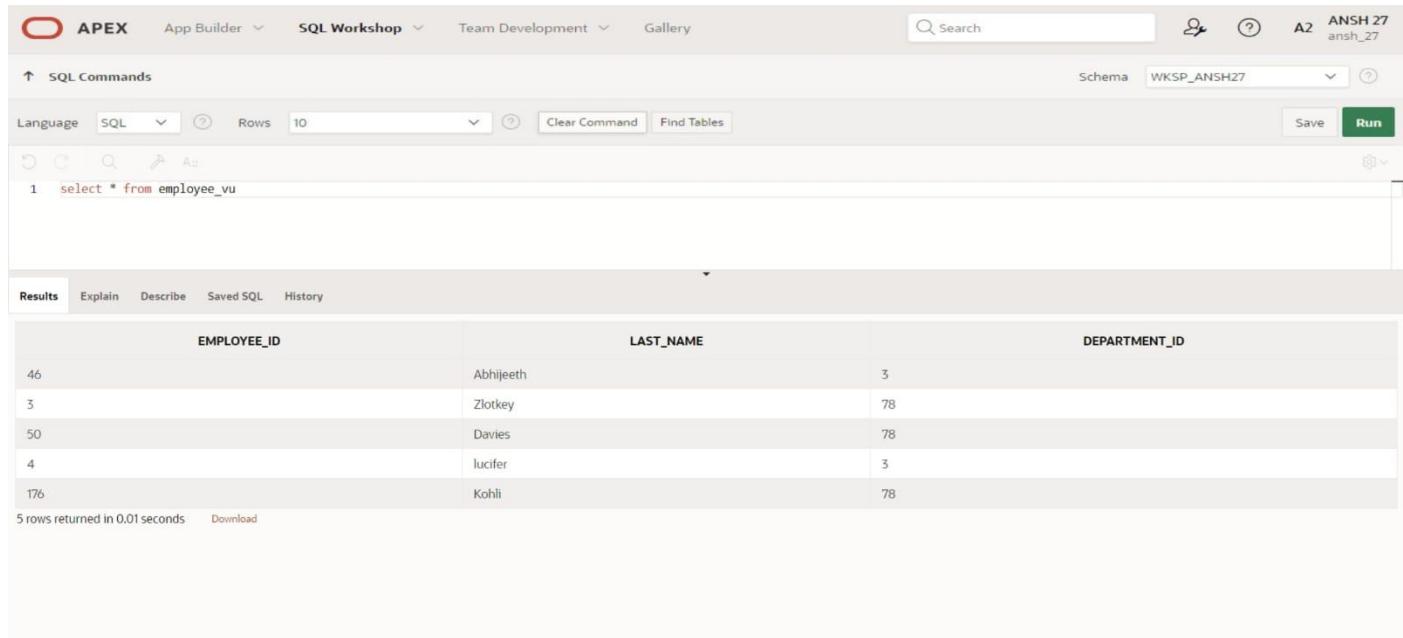
View created.
0.04 seconds

2.) Display the contents of the EMPLOYEES_VU view.

QUERY:

```
select * from employees_vu;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands pane, the command to select all from the view is entered:

```
1 select * from employee_vu
```

In the Results pane, the output is a table:

EMPLOYEE_ID	LAST_NAME	DEPARTMENT_ID
46	Abhijeeth	3
3	Zlotkey	78
50	Davies	78
4	lucifer	3
176	Kohli	78

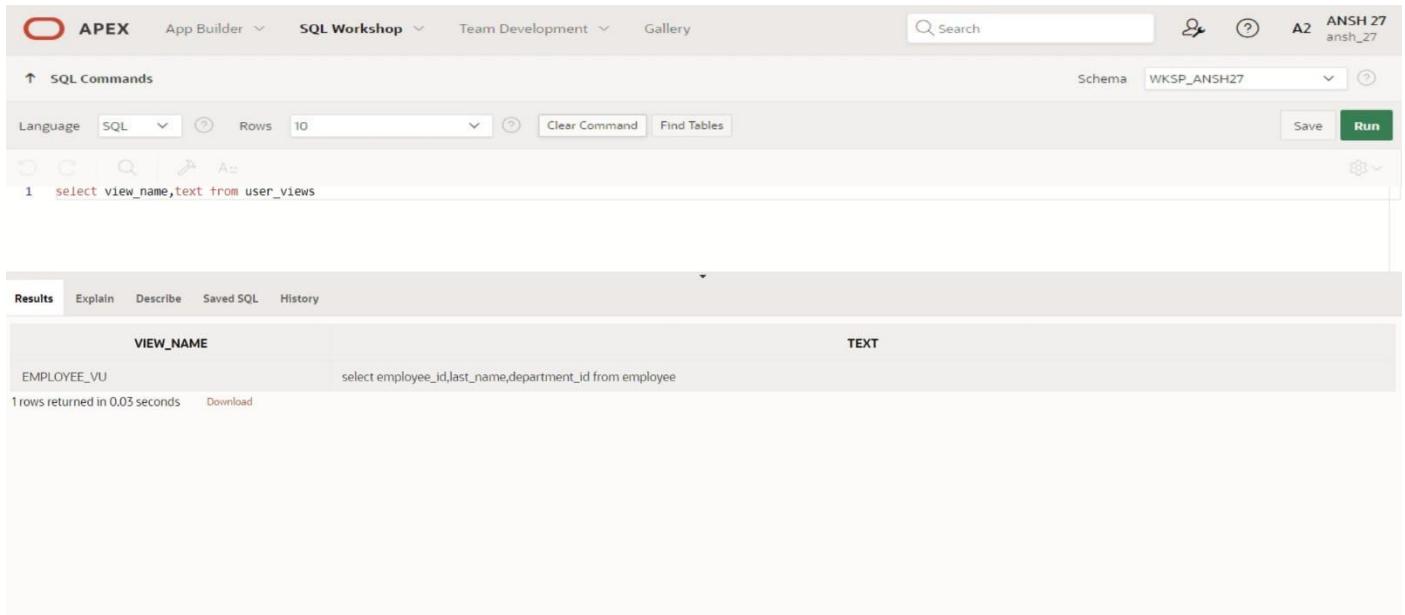
5 rows returned in 0.01 seconds Download

3.)Select the view name and text from the USER_VIEWS data dictionary views

QUERY:

SELECT view_name, text FROM user_views;

OUTPUT:



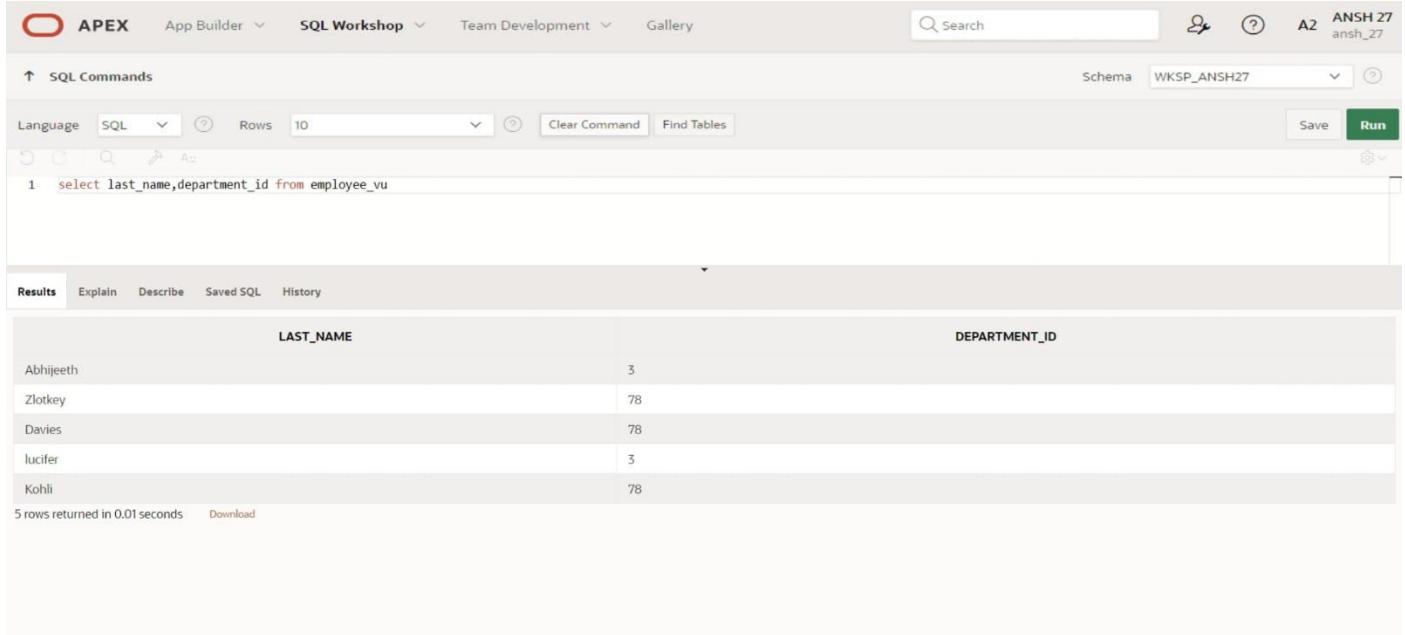
VIEW_NAME	TEXT
EMPLOYEE_VU	select employee_id,last_name,department_id from employee

4.)Using your EMPLOYEES_VU view, enter a query to display all employees names and department

QUERY:

SELECT employee, department_id FROM employees_vu;

OUTPUT:



LAST_NAME	DEPARTMENT_ID
Abhijeeth	3
Zlotkey	78
Davies	78
lucifer	3
Kohli	78

5.) Create a view named DEPT50 that contains the employee number, employee last names and department numbers for all employees in department 50. Label the view columns EMPNO, EMPLOYEE and DEPTNO. Do not allow an employee to be reassigned to another department through the view.

QUERY:

```
CREATE VIEW dept50 AS SELECT employee_id empno, last_name employee, department_id deptno
FROM employees WHERE department_id = 50 WITH CHECK OPTION CONSTRAINT emp_dept_50;
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes tabs for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. A search bar and user information (ANSH 27) are also present. The main area is titled 'SQL Commands' and contains a code editor with the following SQL statement:

```
1 create view dept50 as select employee_id EMP_NO,last_name EMPLOYEE,department_id DEPTNO from employee where department_id=50
```

Below the code editor, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is selected, showing the output:

```
View created.  
0.05 seconds
```

At the bottom of the interface, it shows the user's email (aadityaQ5@rajalakshmi.edu.in), the session ID (aadityaQ5), and the Oracle APEX version (Oracle APEX 23.2.4).

6.) Display the structure and contents of the DEPT50 view.

QUERY:

```
Describe dept50;
```

OUTPUT:

The screenshot shows the Oracle APEX SQL Workshop interface, similar to the previous one but with the 'Describe' tab selected in the Results panel. The code editor contains the following command:

```
1 describe dept50
2 
```

The results panel displays the structure of the DEPT50 view:

Object Type: VIEW Object: DEPT50									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPT50	EMP_NO	NUMBER	22	-	0	-	✓	-	-
	EMPLOYEE	VARCHAR2	20	-	-	-	✓	-	-
	DEPTNO	NUMBER	22	-	0	-	✓	-	-

7.) Attempt to reassign Matos to department 80

QUERY:

```
UPDATE dept50 SET deptno=80 WHERE employee='Matos';
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands tab, the command `update dept50 set deptno=80 where employee='Matos'` is entered. The results pane shows the output: `0 row(s) updated.` and `0.05 seconds`.

8.) Create a view called SALARY_VU based on the employee last names, department names, salaries, and salary grades for all employees. Use the Employees, DEPARTMENTS and JOB_GRADE tables. Label the column Employee, Department, salary, and Grade respectively.

QUERY:

```
create or replace view salary_vu as select e.last_name "Employee",d.dept_name Department,
e.salary "Salary",j.grade_level "Grades" from employees e,departments d,job_grade j where
e.department_id=d.dept_id and e.salary between j.lowest_sal and j.highest_sal;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands tab, the commands for creating the view are entered:
1. `create or replace view salary_vu as select e.last_name "Employee",d.dept_name "Department",e.salary "Salary",j.grade_level "Grades"`
2. `from employee e,mydept d,job_grade j where e.department_id=d.deptid and e.salary between j.lowest_sal and j.highest_sal`
3. `select * from salary_vu`

The results pane displays the data from the view:

Employee	Department	Salary	Grades
Davies	Executive	22000	2nd
Kohli	Executive	21000	2nd
Zlotkey	Executive	15000	4th

3 rows returned in 0.05 seconds

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

RESULT:

INTRO TO CONSTRAINTS: NOT NULL AND UNIQUE CONSTRAINTS

EX.NO:12

DATE: 27 - 4 - 24

REG.NO: 220701027

Global Fast Foods has been very successful this past year and has opened several new stores. They need to add a table to their database to store information about each of their store's locations. The owners want to make sure that all entries have an identification number, date opened, address, and city and that no other entry in the table can have the same email address. Based on this information, answer the following questions about the global_locations table. Use the table for your answers.

Global Fast Foods global_locations Table						
NAME	TYPE	LENGTH	PRECISION	SCALE	NULLABLE	DEFAULT
Id						
name						
date_opened						
address						
city						
zip/postal code						
phone						
email						
manager_id						
Emergency contact						

1. What is a “constraint” as it relates to data integrity?

Database can be as reliable as the data in it, and database rules are implemented as Constraint to maintain data integrity.

2. What are the limitations of constraints that may be applied at the column level and at the table level?

- Constraints referring to more than one column are defined at Table Level
- NOT NULL constraint must be defined at column level as per ANSI/ISO SQL standard.

3. Why is it important to give meaningful names to constraints?

- If a constraint is violated in a SQL statement execution, it is easy to identify the cause with user-named constraints.
- It is easy to alter names/drop constraint.

4. Based on the information provided by the owners, choose a datatype for each column. Indicate the length, precision, and scale for each NUMBER datatype.

Global Fast Foods global_locations Table						
NAME	TYPE	DataType	LENGTH	PRECISION	SCALE	NULLABLE
id	pk	NUMBER	6	0		No
name		VARCHAR2	50			
date_opened		DATE				No
address		VARCHAR2	50			No
city		VARCHAR2	30			No
zip_postal_code		VARCHAR2	12			
phone		VARCHAR2	20			
email	uk	VARCHAR2	75			
manager_id		NUMBER	6	0		
emergency_contact		VARCHAR2	20			

5. Use "(nullable)" to indicate those columns that can have null values.

Global Fast Foods global_locations Table						
NAME	TYPE	DataType	LENGTH	PRECISION	SCALE	NULLABLE
id	pk	NUMBER	6	0		No
name		VARCHAR2	50			Yes
date_opened		DATE				No
address		VARCHAR2	50			No
city		VARCHAR2	30			No
zip_postal_code		VARCHAR2	12			Yes
phone		VARCHAR2	20			Yes
email	uk	VARCHAR2	75			Yes
manager_id		NUMBER	6	0		Yes
emergency_contact		VARCHAR2	20			Yes

6. Write the CREATE TABLE statement for the Global Fast Foods locations table to define the constraints at the column level.

```

CREATE TABLE f_global_locations
( id NUMBER(6,0) CONSTRAINT f_gln_id_pk PRIMARY KEY ,
  name VARCHAR2(50),
  date_opened DATE CONSTRAINT f_gln_dt_opened_nn NOT NULL ENABLE,
  address VARCHAR2(50) CONSTRAINT f_gln_add_nn NOT NULL ENABLE,
  city VARCHAR2(30) CONSTRAINT f_gln_city_nn NOT NULL ENABLE,
  zip_postal_code VARCHAR2(12),
  phone VARCHAR2(20),
  email VARCHAR2(75) CONSTRAINT f_gln_email_uk UNIQUE,
  manager_id NUMBER(6,0),
  emergency_contact VARCHAR2(20)
);

```

7. Execute the CREATE TABLE statement in Oracle Application Express.

Table Created.

8. Execute a DESCRIBE command to view the Table Summary information.

```
DESCRIBE f_global_locations;
```

9. Rewrite the CREATE TABLE statement for the Global Fast Foods locations table to define the UNIQUE constraints at the table level. Do not execute this statement.

NAME	TYPE	LENGTH	PRECISION	SCALE	NULLABLE	DEFAULT
id	number	4				
loc_name	varchar2	20			X	
	date					
address	varchar2	30				
city	varchar2	20				
zip_postal	varchar2	20			X	
phone	varchar2	15			X	
email	varchar2	80			X	
manager_id	number	4			X	
contact	varchar2	40			X	

```
CREATE TABLE f_global_locations
( id NUMBER(6,0) CONSTRAINT f_gln_id_pk PRIMARY KEY ,
name VARCHAR2(50),
date_opened DATE CONSTRAINT f_gln_dt_opened_nn NOT NULL ENABLE,
address VARCHAR2(50) CONSTRAINT f_gln_add_nn NOT NULL ENABLE,
city VARCHAR2(30) CONSTRAINT f_gln_city_nn NOT NULL ENABLE,
zip_postal_code VARCHAR2(12),
phone VARCHAR2(20),
email VARCHAR2(75),
manager_id NUMBER(6,0),
emergency_contact VARCHAR2(20),
CONSTRAINT f_gln_email_uk UNIQUE(email)
);
```

PRIMARY KEY, FOREIGN KEY, and CHECK Constraints

1. What is the purpose of a

- PRIMARY KEY
- FOREIGN KEY
- CHECK CONSTRAINT

a. PRIMARY KEY Uniquely identify each row in table.

b. FOREIGN KEY Referential integrity constraint links back parent table's primary/unique key to child table's column.

c. CHECK CONSTRAINT Explicitly define condition to be met by each row's fields. This condition must be returned as true or unknown.

2. Using the column information for the animals table below, name constraints where applicable at the table level, otherwise name them at the column level. Define the primary key (animal_id). The license_tag_number must be unique. The admit_date and vaccination_date columns cannot contain null values.

animal_id NUMBER(6)
name VARCHAR2(25)
license_tag_number NUMBER(10)
admit_date DATE
adoption_id NUMBER(5),
vaccination_date DATE

animal_id NUMBER(6) - PRIMARY KEY

name VARCHAR2(25) license_tag_number NUMBER(10) - UNIQUE

admit_date DATE -NOT NULL

adoption_id NUMBER(5), vaccination_date DATE -NOT NULL

3. Create the animals table. Write the syntax you will use to create the table.

```
CREATE TABLE animals ( animal_id NUMBER(6,0) CONSTRAINT anl_anl_id_pk PRIMARY KEY , name  
VARCHAR2(25), license_tag_number NUMBER(10,0) CONSTRAINT anl_l_tag_num_uk UNIQUE, admit_date  
DATE CONSTRAINT anl_adt_dat_nn NOT NULL ENABLE, adoption_id NUMBER(5,0), vaccination_date DATE  
CONSTRAINT anl_vcc_dat_nn NOT NULL ENABLE );
```

4. Enter one row into the table. Execute a SELECT * statement to verify your input. Refer to the graphic below for input.

ANIMAL_ID	NAME	LICENSE_TAG_NUMBER	ADMIT_DATE	ADOPTION_ID	VACCINATION_DATE
101	Spot	35540	10-Oct-2004	205	12-Oct-2004

```
INSERT INTO animals (animal_id, name, license_tag_number, admit_date, adoption_id, vaccination_date)
VALUES( 101, 'Spot', 35540, TO_DATE('10-Oct-2004', 'DD-Mon-YYYY'), 205, TO_DATE('12-Oct-2004', 'DD-Mon- YYYY'));
```

5. Write the syntax to create a foreign key (adoption_id) in the animals table that has a corresponding primary-key reference in the adoptions table. Show both the column-level and table-level syntax. Note that because you have not actually created an adoptions table, no adoption_id primary key exists, so the foreign key cannot be added to the animals table.

COLUMN LEVEL STATEMENT: ALTER TABLE animals MODIFY (adoption_id NUMBER(5,0) CONSTRAINT anl_adopt_id_fk REFERENCES adoptions(id) ENABLE);

TABLE LEVEL STATEMENT: ALTER TABLE animals ADD CONSTRAINT anl_adopt_id_fk FOREIGN KEY (adoption_id) REFERENCES adoptions(id) ENABLE;

6. What is the effect of setting the foreign key in the ANIMAL table as:

- a. ON DELETE CASCADE
- b. ON DELETE SET NULL

a. ON DELETE CASCADE ALTER TABLE animals ADD CONSTRAINT anl_adopt_id_fk FOREIGN KEY (adoption_id) REFERENCES adoptions(id) ON DELETE CASCADE ENABLE ;

b. ON DELETE SET NULL ALTER TABLE animals ADD CONSTRAINT anl_adopt_id_fk FOREIGN KEY (adoption_id) REFERENCES adoptions(id) ON DELETE SET NULL ENABLE ;

7. What are the restrictions on defining a CHECK constraint?

- I cannot specify check constraint for a view however in this case I could use WITH CHECK OPTION clause
- I am restricted to columns from self table and fields in self row.
- I cannot use subqueries and scalar subquery expressions.

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

CREATING VIEWS

EX.NO:13

DATE: 27 – 4 - 24

REG.NO: 220701027

1. What are three uses for a view from a DBA's perspective?

- Restrict access and display selective columns
- Reduce complexity of queries from other internal systems. So, providing a way to view same data in a different manner.
- Let the app code rely on views and allow the internal implementation of tables to be modified later

2. Create a simple view called view_d_songs that contains the ID, title and artist from the DJs on Demand table for each "New Age" type code. In the subquery, use the alias "Song Title" for the title column.

```
CREATE VIEW view_d_songs AS SELECT d_songs.id, d_songs.title "Song Title", d_songs.artist from d_songs
INNER JOIN d_types ON d_songs.type_code = d_types.code where d_types.description = 'New Age';
```

3. SELECT * FROM view_d_songs. What was returned?

Results	Explain	Describe	Saved SQL	History
ID	Song Title		ARTIST	
47	Hurrah for Today		The Jubilant Trio	
49	Lets Celebrate		The Celebrants	
2 rows returned in 0.00 seconds		Download		

4. REPLACE view_d_songs. Add type_code to the column list. Use aliases for all columns. Or use alias after the CREATE statement as shown.

```
CREATE OR REPLACE VIEW view_d_songs AS SELECT d_songs.id, d_songs.title "Song Title", d_songs.artist, d_songs.type_code from d_songs INNER JOIN d_types ON d_songs.type_code = d_types.code where d_types.description = 'New Age';
```

5. Jason Tsang, the disk jockey for DJs on Demand, needs a list of the past events and those planned for the coming months so he can make arrangements for each event's equipment setup. As the company manager, you do not want him to have access to the price that clients paid for their events. Create a view for Jason to use that displays the name of the event, the event date, and the theme description. Use aliases for each column name.

```
CREATE OR REPLACE VIEW view_d_events_pkgs AS SELECT evt.name "Name of Event", TO_CHAR(evt.event_date, 'dd-Month-yyyy') "Event date", thm.description "Theme description" FROM d_events evt INNER JOIN d_themes thm ON evt.theme_code = thm.code WHERE evt.event_date <= ADD_MONTHS(SYSDATE,1);
```

6. It is company policy that only upper-level management be allowed access to individual employee salaries. The department managers, however, need to know the minimum, maximum, and average salaries, grouped by department. Use the Oracle database to prepare a view that displays the needed information for department managers.

```
CREATE OR REPLACE VIEW view_min_max_avg_dpt_salary ("Department Id", "Department Name", "Max Salary", "Min Salary", "Average Salary") AS SELECT dpt.department_id, dpt.department_name, MAX(NVL(emp.salary,0)), MIN(NVL(emp.salary,0)), ROUND(AVG(NVL(emp.salary,0)),2) FROM departments dpt LEFT OUTER JOIN employees emp ON dpt.department_id = emp.department_id GROUP BY (dpt.department_id, dpt.department_name);
```

DML OPERATIONS AND VIEWS

Use the DESCRIBE statement to verify that you have tables named copy_d_songs, copy_d_events, copy_d_cds, and copy_d_clients in your schema. If you don't, write a query to create a copy of each.

1. Query the data dictionary USER_UPDATABLE_COLUMNS to make sure the columns in the base tables will allow UPDATE, INSERT, or DELETE. All table names in the data dictionary are stored in uppercase. Use the same syntax but change table_name of the other tables.

```
SELECT owner, table_name, column_name, updatable,insertable, deletable FROM  
user_updatable_columns WHERE LOWER(table_name) = 'copy_d_songs';
```

```
SELECT owner, table_name, column_name, updatable,insertable, deletable FROM  
user_updatable_columns WHERE LOWER(table_name) = 'copy_d_events';
```

```
SELECT owner, table_name, column_name, updatable,insertable, deletable FROM  
user_updatable_columns WHERE LOWER(table_name) = 'copy_d_cds';
```

2. Use the CREATE or REPLACE option to create a view of *all* the columns in the copy_d_songs table called view_copy_d_songs.

```
CREATE OR REPLACE VIEW view_copy_d_songs AS SELECT * FROM copy_d_songs;
```

```
SELECT * FROM view_copy_d_songs;
```

3. Use view_copy_d_songs to INSERT the following data into the underlying copy_d_songs table. Execute a SELECT * from copy_d_songs to verify your DML command. See the graphic.

ID	TITLE	DURATION	ARTIST	TYPE_CODE
88	Mello Jello	2	The What	4

```
INSERT INTO view_copy_d_songs(id,title,duration,artist,type_code) VALUES(88,'Mello Jello','2 min','The  
What',4);
```

4. Create a view based on the DJs on Demand COPY_D_CDS table. Name the view read_copy_d_cds. Select all columns to be included in the view. Add a WHERE clause to restrict the year to 2000. Add the WITH READ ONLY option.

```
CREATE OR REPLACE VIEW read_copy_d_cds AS SELECT * FROM copy_d_cds WHERE year = '2000' WITH  
READ ONLY ; SELECT * FROM read_copy_d_cds;
```

5. Using the read_copy_d_cds view, execute a DELETE FROM read_copy_d_cds WHERE cd_number = 90;

ORA-42399: cannot perform a DML operation on a read-only view

6. Use REPLACE to modify read_copy_d_cds. Replace the READ ONLY option with WITH CHECK OPTION CONSTRAINT ck_read_copy_d_cds. Execute a SELECT * statement to verify that the view exists.

```
CREATE OR REPLACE VIEW read_copy_d_cds AS SELECT * FROM copy_d_cds WHERE year = '2000' WITH  
CHECK OPTION CONSTRAINT ck_read_copy_d_cds;
```

7. Use the read_copy_d_cds view to delete any CD of year 2000 from the underlying copy_d_cds.

```
DELETE FROM read_copy_d_cds WHERE year = '2000';
```

8. Use the read_copy_d_cds view to delete cd_number 90 from the underlying copy_d_cds table.

```
DELETE FROM read_copy_d_cds WHERE cd_number = 90;
```

2. Use the read_copy_d_cds view to delete year 2001 records.

```
DELETE FROM read_copy_d_cds WHERE year = '2001';
```

3. Execute a SELECT * statement for the base table copy_d_cds. What rows were deleted?

Only the one in problem 7 above, not the one in 8 and 9

11. What are the restrictions on modifying data through a view?

DELETE, INSERT, MODIFY restricted if it contains:

Group functions

GROUP BY CLAUSE

DISTINCT

pseudocolumn ROWNUM Keyword

12. What is Moore's Law? Do you consider that it will continue to apply indefinitely? Support your opinion with research from the internet.

It roughly predicted that computing power nearly doubles every year. But Moore also said in 2005 that as per nature of exponential functions, this trend may not continue forever.

13. What is the "singularity" in terms of computing?

Singularity is the hypothesis that the invention of artificial superintelligence will abruptly trigger runaway technological growth, resulting in unfathomable changes to human civilization

Managing Views

1. Create a view from the copy_d_songs table called view_copy_d_songs that includes only the title and artist. Execute a SELECT * statement to verify that the view exists.

```
CREATE OR REPLACE VIEW view_copy_d_songs ASSELECT title, artistFROM copy_d_songs;SELECT * FROM view_copy_d_songs;
```

2. Issue a DROP view_copy_d_songs. Execute a SELECT * statement to verify that the view has been deleted.

```
DROP VIEW view_copy_d_songs; SELECT * FROM view_copy_d_songs;
```

ORA-00942: table or view does not exist

3. Create a query that selects the last name and salary from the Oracle database. Rank the salaries from highest to lowest for the top three employees.

```
SELECT * FROM(SELECT last_name, salary FROM employees ORDER BY salary DESC)WHERE ROWNUM <= 3;
```

4. Construct an inline view from the Oracle database that lists the last name, salary, department ID, and maximum salary for each department. Hint: One query will need to calculate maximum salary by department ID.

```
SELECT empm.last_name, empm.salary, dptmx.department_idFROM(SELECT dpt.department_id, MAX(NVL(emp.salary,0)) max_dpt_salFROM departments dpt LEFT OUTER JOIN employees emp ON dpt.department_id = emp.department_idGROUP BY dpt.department_id) dptmx LEFT OUTER JOIN employees empm ON dptmx.department_id = empm.department_idWHERE NVL(empm.salary,0) = dptmx.max_dpt_sal;
```

5. Create a query that will return the staff members of Global Fast Foods ranked by salary from lowest to highest.

```
SELECT ROWNUM, last_name, salary FROM (SELECT * FROM f_staffs ORDER BY SALARY);
```

Indexes and Synonyms

1. What is an index and what is it used for?

Definition: These are schema objects which make retrieval of rows from table faster.

Purpose: An index provides direct and fast access to row in table. They provide indexed path to locate data quickly, so hereby reduce necessity of heavy disk input/output operations.

2. What is a ROWID, and how is it used?

Indexes use ROWID's (base 64 string representation of the row address containing block identifier, row location in the block and the database file identifier) which is the fastest way to access any particular row.

3. When will an index be created automatically?

Primary key/unique key use already existing unique index but if index is not present already, it is created while applying unique/primary key constraint.

4. Create a nonunique index (foreign key) for the DJs on Demand column (cd_number) in the D_TRACK_LISTINGS table. Use the Oracle Application Express SQL Workshop Data Browser to confirm that the index was created.

```
CREATE INDEX d_tlg_cd_number_fk_i ON d_track_listings (cd_number);
```

5. Use the join statement to display the indexes and uniqueness that exist in the data dictionary for the DJs on Demand D_SONGS table.

```
SELECT ucm.index_name, ucm.column_name, ucm.column_position, uix.uniqueness FROM user_indexes
uix INNER JOIN user_ind_columns ucm ON uix.index_name = ucm.index_name WHERE ucm.table_name =
'D_SONGS';
```

6. Use a SELECT statement to display the index_name, table_name, and uniqueness from the data dictionary USER_INDEXES for the DJs on Demand D_EVENTS table.

```
SELECT index_name, table_name, uniqueness FROM user_indexes WHERE table_name = 'D_EVENTS';
```

7. Write a query to create a synonym called dj_tracks for the DJs on Demand d_track_listings table.

```
CREATE SYNONYM dj_tracks FOR d_track_listings;
```

8. Create a function-based index for the last_name column in DJs on Demand D_PARTNERS table that makes it possible not to have to capitalize the table name for searches. Write a SELECT statement that would use this index.

```
CREATE INDEX d_ptr_last_name_idx ON d_partners(LOWER(last_name));
```

9. Create a synonym for the D_TRACK_LISTINGS table. Confirm that it has been created by querying the data dictionary.

```
CREATE SYNONYM dj_tracks2 FOR d_track_listings;
```

```
SELECT * FROM user_synonyms WHERE
```

```
table_NAME=UPPER('d_track_listings');
```

10. Drop the synonym that you created in question

```
DROP SYNONYM dj_tracks2;
```

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

OTHER DATABASE OBJECTS

EX.NO:14

DATE: 07 - 5 - 24

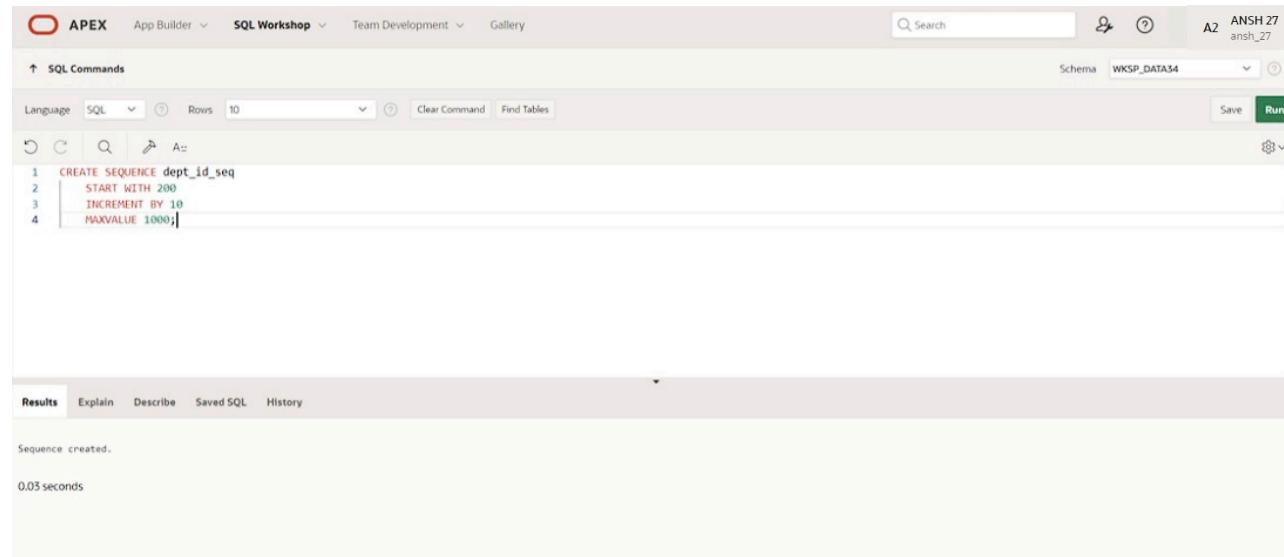
REG.NO: 220701027

1.Create a sequence to be used with the primary key column of the DEPT table. The sequence should start at 200 and have a maximum value of 1000. Have your sequence increment by ten numbers. Name the sequence DEPT_ID_SEQ.

QUERY:

```
CREATE SEQUENCE dept_id_seq START WITH 200 INCREMENT BY 10 MAXVALUE 1000;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, 'APEX' is selected. The main area is titled 'SQL Commands'. A code editor window displays the following SQL command:

```
1 CREATE SEQUENCE dept_id_seq
2   START WITH 200
3   INCREMENT BY 10
4   MAXVALUE 1000;|
```

Below the code editor, the 'Results' tab is active. The output shows:

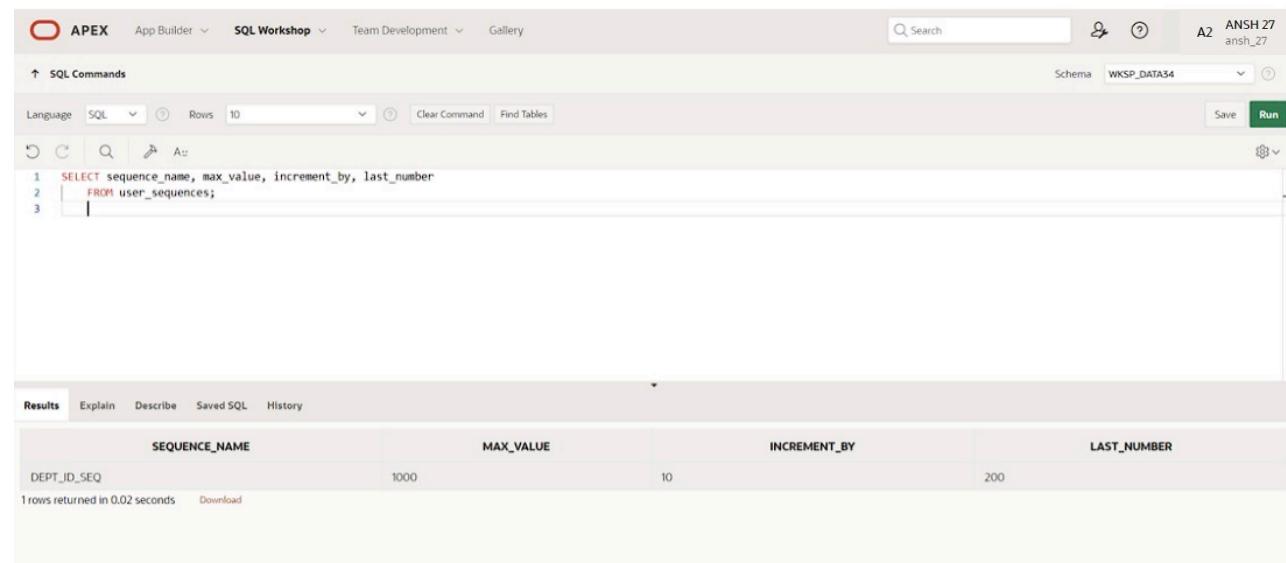
```
Sequence created.
0.03 seconds
```

2. Write a query in a script to display the following information about your sequences: sequence name, maximum value, increment size, and last number

QUERY:

```
SELECT sequence_name, max_value, increment_by, last_number FROM user_sequences;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, 'APEX' is selected. The main area is titled 'SQL Commands'. A query is entered in the command window:

```
1 SELECT sequence_name, max_value, increment_by, last_number
2   FROM user_sequences;
3
```

The results tab is selected, displaying the following table:

SEQUENCE_NAME	MAX_VALUE	INCREMENT_BY	LAST_NUMBER
DEPT_ID_SEQ	1000	10	200

Below the table, it says '1 rows returned in 0.02 seconds'.

3. Write a script to insert two rows into the DEPT table. Name your script lab12_3.sql. Be sure to use the sequence that you created for the ID column. Add two departments named Education and Administration. Confirm your additions. Run the commands in your script.

QUERY:

```
INSERT INTO dept VALUES (dept_id_seq.nextval, 'Education');
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The user is signed in as ANSH 27. The main area displays the results of a script named 'exercise14'. The script contains one statement: 'INSERT INTO dept VALUES (dept_id_seq.nextval, 'Education')'. The results show 1 row inserted. Below the results, three summary statistics are provided: 1 Statement Processed, 1 Successful, and 0 With Errors.

Number	Elapsed	Statement	Feedback	Rows
1	0.05	INSERT INTO dept VALUES (dept_id_seq.nextval, 'Education')	1 row(s) inserted.	1

Download

row(s) 1 - 1 of 1

1 Statements Processed

1 Successful

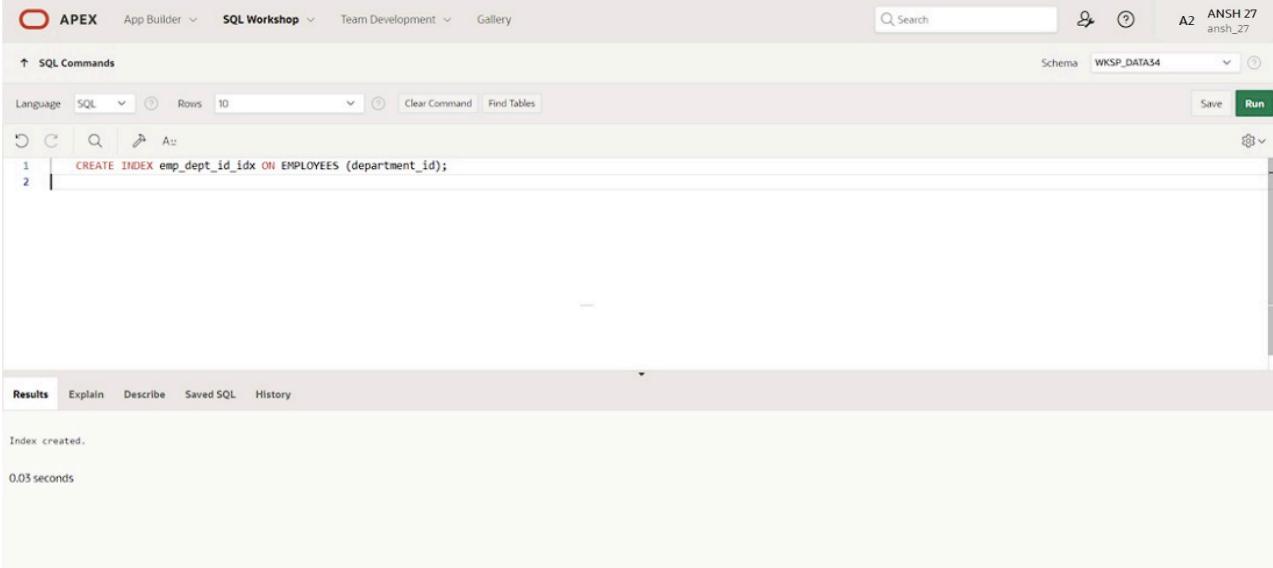
0 With Errors

4. Create a nonunique index on the foreign key column (DEPT_ID) in the EMP table.

QUERY:

```
CREATE INDEX emp_dept_id_idx ON EMPLOYEES (department_id);
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, 'APEX' is selected, followed by 'App Builder', 'SQL Workshop' (which is currently active), 'Team Development', and 'Gallery'. On the right side, there is a user profile for 'ANSH 27 ansh_27'. The main area is titled 'SQL Commands'. The language is set to 'SQL'. The command entered is:

```
1 CREATE INDEX emp_dept_id_idx ON EMPLOYEES (department_id);
2
```

Below the command, the results tab is selected, showing the output:

```
Index created.
0.03 seconds
```

5. Display the indexes and uniqueness that exist in the data dictionary for the EMP table.

QUERY:

```
SELECT index_name,table_name,uniqueness FROM user_indexes WHERE  
table_name='EMPLOYEES';
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows user information: A2 ANSH 27 ansh_27. The main area is titled "SQL Commands". The query entered is:

```
1 SELECT index_name, table_name, uniqueness  
2   FROM user_indexes  
3  WHERE table_name = 'EMPLOYEES';  
4
```

Below the command, the "Results" tab is selected. The output table has three columns: INDEX_NAME, TABLE_NAME, and UNIQUENESS. The data row is:

INDEX_NAME	TABLE_NAME	UNIQUENESS
EMP_DEPT_ID_IDX	EMPLOYEES	NONUNIQUE

At the bottom left, it says "1 rows returned in 0.03 seconds".

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

CONTROLLING USER ACCESS

EX.NO:15

DATE: 10 - 5 - 24

REG.NO: 220701027

1. What privilege should a user be given to log on to the Oracle Server? Is this a system or an object privilege?

The CREATE SESSION system privilege

2. What privilege should a user be given to create tables?

The CREATE TABLE privilege

3. If you create a table, who can pass along privileges to other users on your table?

You can, or anyone you have given those privileges to by using the WITH GRANT OPTION

4. You are the DBA. You are creating many users who require the same system privileges. What should you use to make your job easier?

Create a role containing the system privileges and grant the role to the users

5. What command do you use to change your password?

The ALTER USER statement

6. Grant another user access to your DEPARTMENTS table. Have the user grant you query access to his or her DEPARTMENTS table.

Team 2 executes the GRANT statement. GRANT select ON departments TO <user1> ;

Team 1 executes the GRANT statement. GRANT select ON departments TO <user2> ;

7. Query all the rows in your DEPARTMENTS table.

```
SELECT * FROM departments;
```

8. Add a new row to your DEPARTMENTS table. Team 1 should add Education as department number 500. Team 2 should add Human Resources department number 510. Query the other team's table.

Team 1 executes this INSERT statement.

```
INSERT INTO departments(department_id, department_name) VALUES (500, 'Education'); COMMIT;
```

Team 2 executes this INSERT statement.

```
INSERT INTO departments(department_id, department_name) VALUES (510, 'Administration'); COMMIT;
```

9. Query the USER_TABLES data dictionary to see information about the tables that you own.

```
SELECT table_name FROM user_tables;
```

10. Revoke the SELECT privilege on your table from the other team.

Team 1 revokes the privilege. REVOKE select ON departments FROM user2;

Team 2 revokes the privilege. REVOKE select ON departments FROM user1;

11. Remove the row you inserted into the DEPARTMENTS table in step 8 and save the changes.

Team 1 executes this INSERT statement.

```
DELETE FROM departments WHERE department_id = 500; COMMIT;
```

Team 2 executes this INSERT statement.

```
DELETE FROM departments WHERE department_id = 510; COMMIT;
```

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

PL/SQL

CONTROL STRUCTURES

EX.NO:16

DATE: 21 - 5 - 24

REG.NO: 220701027

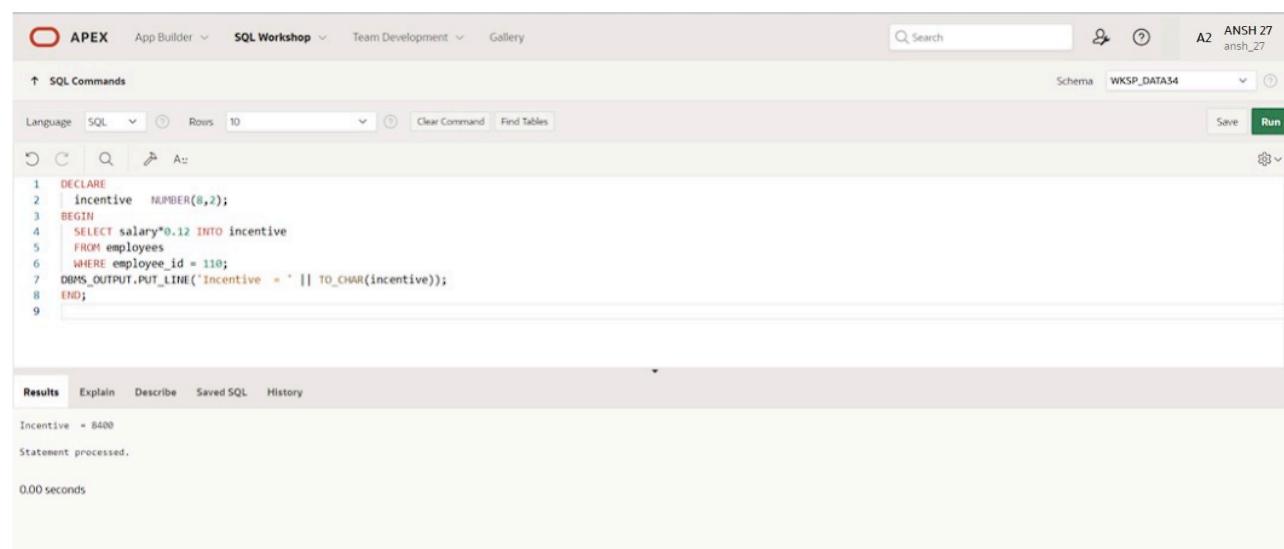
PROGRAM 1

Write a PL/SQL block to calculate the incentive of an employee whose ID is 110.

QUERY:

```
DECLARE
    incentive NUMBER(8,2);
BEGIN
    SELECT salary*0.12 INTO incentive
    FROM employees
    WHERE employee_id = 110;
    DBMS_OUTPUT.PUT_LINE('Incentive = ' || TO_CHAR(incentive));
END;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The SQL Commands tab is active, displaying the following PL/SQL code:

```
1 DECLARE
2     incentive NUMBER(8,2);
3 BEGIN
4     SELECT salary*0.12 INTO incentive
5     FROM employees
6     WHERE employee_id = 110;
7     DBMS_OUTPUT.PUT_LINE('Incentive = ' || TO_CHAR(incentive));
8 END;
```

The code is executed, and the results are shown in the Results tab:

```
Incentive = 8400
Statement processed.

0.00 seconds
```

PROGRAM 2

Write a PL/SQL block to show an invalid case-insensitive reference to a quoted and without quoted user-defined identifier.

QUERY:

```
DECLARE
WELCOME varchar2(10) := 'welcome';
BEGIN
DBMS_Output.Put_Line("Welcome");
END;
/
```

```
DECLARE
WELCOME varchar2(10) := 'welcome';
BEGIN
DBMS_Output.Put_Line("Welcome");
END;
/
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands editor, the following PL/SQL code is entered:

```
1 DECLARE
2   | "WELCOME" varchar2(10) := 'welcome';
3 BEGIN
4   | DBMS_Output.Put_Line("Welcome");
5 END;
6 /
7
```

An error message is displayed in a yellow box:

Error at line 4/25: ORA-06550: line 4, column 25:
PLS-00201: identifier 'Welcome' must be declared
ORA-06512: at "SYS.IMPV_DBMS_SQL_APEX_230200", line 881
ORA-06550: line 4, column 3:
PL/SQL: Statement ignored

The code is identical to the one in the first screenshot, but the error message is more detailed, identifying the specific identifier 'Welcome' as the cause of the declaration error.

The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands editor, the same PL/SQL code is entered:

```
1 DECLARE
2   | "WELCOME" varchar2(10) := 'welcome';
3 BEGIN
4   | DBMS_Output.Put_Line("Welcome");
5 END;
6 /
7
```

An error message is displayed in a yellow box:

Error at line 4/25: ORA-06550: line 4, column 25:
PLS-00201: identifier 'Welcome' must be declared
ORA-06512: at "SYS.IMPV_DBMS_SQL_APEX_230200", line 881
ORA-06550: line 4, column 3:
PL/SQL: Statement ignored

This screenshot is identical to the one above, showing the same PL/SQL code and the same detailed error message about the identifier 'Welcome'.

PROGRAM 3

Write a PL/SQL block to adjust the salary of the employee whose ID 122.

Sample table: employees

QUERY:

```
DECLARE
    salary_of_emp NUMBER(8,2);
    PROCEDURE approx_salary (
        emp      NUMBER,
        empsal IN OUT NUMBER,
        addless  NUMBER
    ) IS
    BEGIN
        empsal := empsal + addless;
    END;

BEGIN
    SELECT salary INTO salary_of_emp
    FROM employees
    WHERE employee_id = 122;
    DBMS_OUTPUT.PUT_LINE
    ('Before invoking procedure, salary_of_emp: ' || salary_of_emp);
    approx_salary (100, salary_of_emp, 1000);
    DBMS_OUTPUT.PUT_LINE
    ('After invoking procedure, salary_of_emp: ' || salary_of_emp);
END;
/
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop, Team Development, and Gallery. The right side of the header shows the user 'ANSH 27' and the schema 'WKSP_DATA34'. The main area is titled 'SQL Commands' and contains the following PL/SQL code:

```
1 DECLARE
2   salary_of_emp NUMBER(8,2);
3
4 PROCEDURE approx_salary (
5   emp          NUMBER,
6   empsal IN OUT NUMBER,
7   adddress    NUMBER
8 ) IS
9 BEGIN
10   empsal := empsal + adddress;
11 END;
12
13 BEGIN
14   SELECT salary INTO salary_of_emp
15   FROM employees
16   WHERE employee_id = 122;
17
```

Below the code, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is selected, displaying the following output:

```
Before invoking procedure, salary_of_emp: 6900
After invoking procedure, salary_of_emp: 7900
Statement processed.
```

At the bottom, it shows '0.00 seconds' for the execution time.

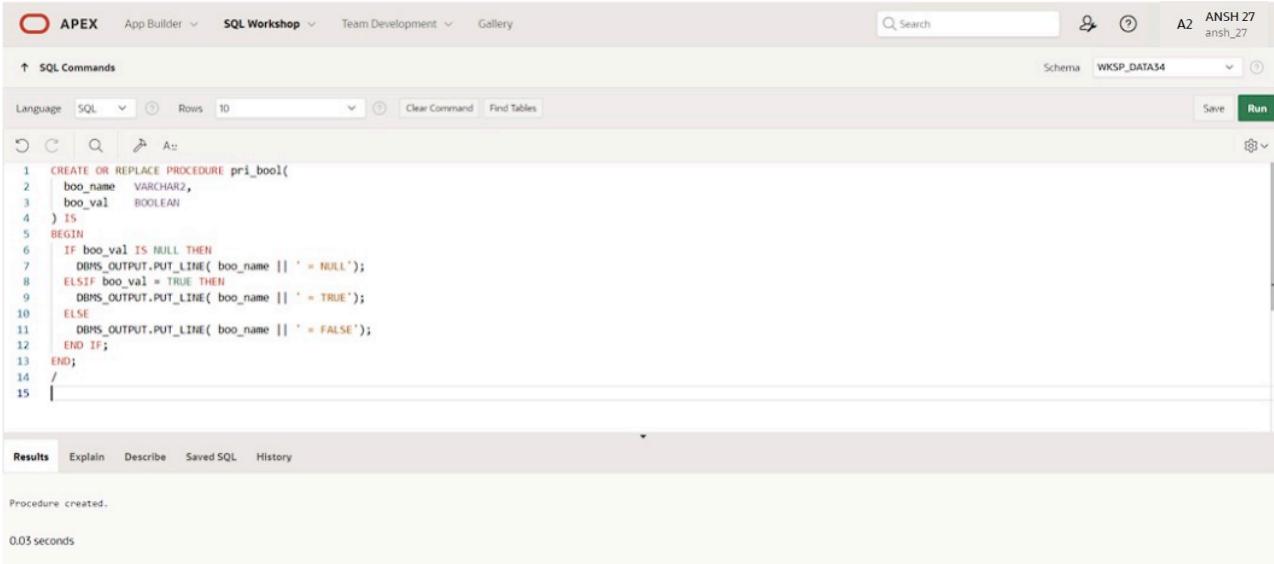
PROGRAM 4

Write a PL/SQL block to create a procedure using the "IS [NOT] NULL Operator" and show AND operator returns TRUE if and only if both operands are TRUE.

QUERY:

```
CREATE OR REPLACE PROCEDURE pri_bool(
    boo_name  VARCHAR2,
    boo_val   BOOLEAN
) IS
BEGIN
    IF boo_val IS NULL THEN
        DBMS_OUTPUT.PUT_LINE( boo_name || ' = NULL');
    ELSIF boo_val = TRUE THEN
        DBMS_OUTPUT.PUT_LINE( boo_name || ' = TRUE');
    ELSE
        DBMS_OUTPUT.PUT_LINE( boo_name || ' = FALSE');
    END IF;
END;
/
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, there are user details (ANSH 27, ansh_27) and a search bar. The main workspace is titled 'SQL Commands' and contains the PL/SQL code for the 'pri_bool' procedure. The code is identical to the one provided in the query section. Below the code, the results tab shows the message 'Procedure created.' and a execution time of '0.05 seconds'.

```
CREATE OR REPLACE PROCEDURE pri_bool(
    boo_name  VARCHAR2,
    boo_val   BOOLEAN
) IS
BEGIN
    IF boo_val IS NULL THEN
        DBMS_OUTPUT.PUT_LINE( boo_name || ' = NULL');
    ELSIF boo_val = TRUE THEN
        DBMS_OUTPUT.PUT_LINE( boo_name || ' = TRUE');
    ELSE
        DBMS_OUTPUT.PUT_LINE( boo_name || ' = FALSE');
    END IF;
END;
/
```

Results Explain Describe Saved SQL History

Procedure created.
0.05 seconds

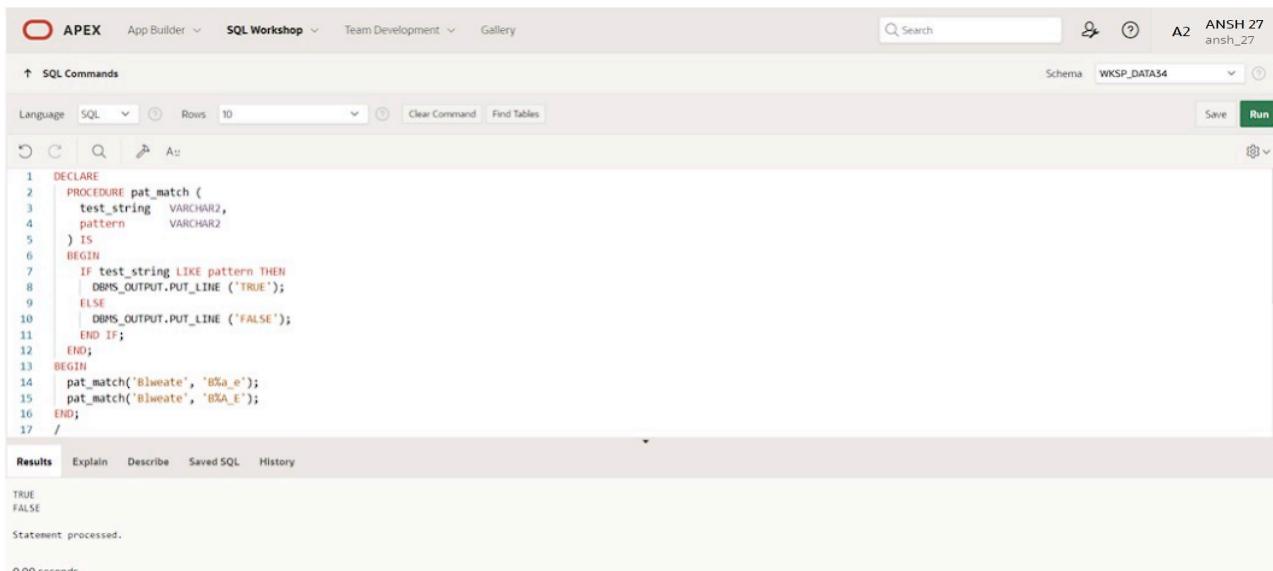
PROGRAM 5

Write a PL/SQL block to describe the usage of LIKE operator including wildcard characters and escape character.

QUERY:

```
DECLARE
  PROCEDURE pat_match (
    test_string  VARCHAR2,
    pattern      VARCHAR2
  ) IS
  BEGIN
    IF test_string LIKE pattern THEN
      DBMS_OUTPUT.PUT_LINE ('TRUE');
    ELSE
      DBMS_OUTPUT.PUT_LINE ('FALSE');
    END IF;
  END;
BEGIN
  pat_match('Blweate', 'B%a_e');
  pat_match('Blweate', 'B%A_E');
END;
/
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The code area contains the provided PL/SQL block. The results pane at the bottom shows the output: 'TRUE' followed by 'FALSE'. The status bar indicates 'Statement processed.' and '0.00 seconds'.

```
1 DECLARE
2   PROCEDURE pat_match (
3     test_string  VARCHAR2,
4     pattern      VARCHAR2
5   ) IS
6   BEGIN
7     IF test_string LIKE pattern THEN
8       DBMS_OUTPUT.PUT_LINE ('TRUE');
9     ELSE
10       DBMS_OUTPUT.PUT_LINE ('FALSE');
11     END IF;
12   END;
13 BEGIN
14   pat_match('Blweate', 'B%a_e');
15   pat_match('Blweate', 'B%A_E');
16 END;
17 /
```

Results Explain Describe Saved SQL History

TRUE
FALSE
Statement processed.
0.00 seconds

PROGRAM 6

Write a PL/SQL program to arrange the number of two variable in such a way that the small number will store in num_small variable and large number will store in num_large variable.

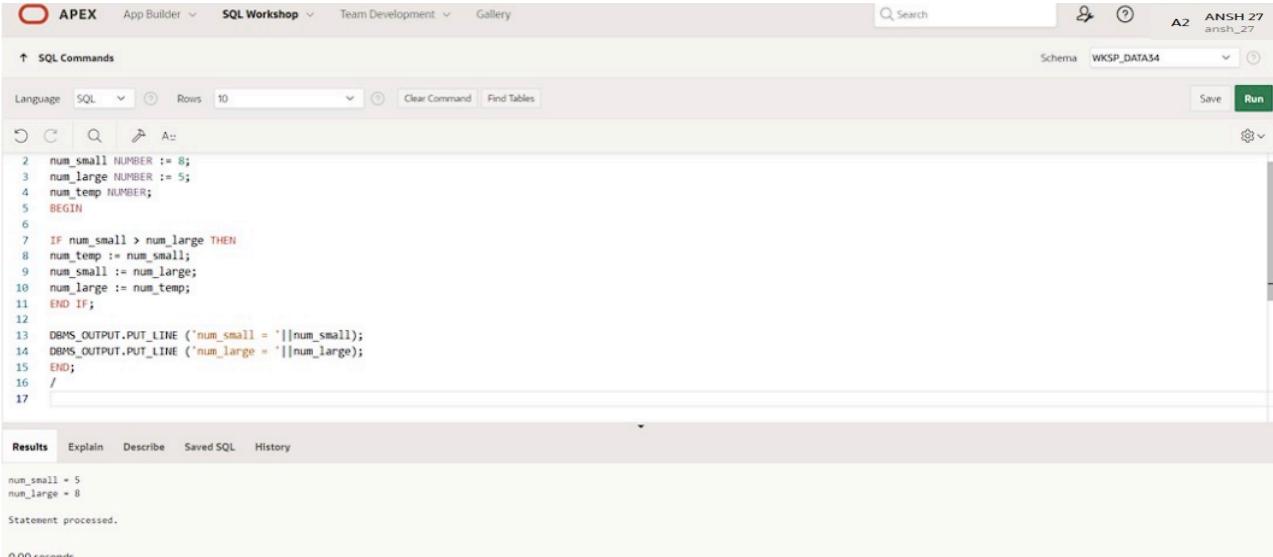
QUERY:

DECLARE

```
num_small NUMBER := 8;
num_large NUMBER := 5;
num_temp NUMBER;
BEGIN
    IF num_small > num_large THEN
        num_temp := num_small;
        num_small := num_large;
        num_large := num_temp;
    END IF;
```

```
    DBMS_OUTPUT.PUT_LINE ('num_small = '||num_small);
    DBMS_OUTPUT.PUT_LINE ('num_large = '||num_large);
END;
/
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows user information (A2 ANSH_27) and a schema dropdown (WKSP_DATA54). The main workspace is titled "SQL Commands". The code area contains a PL/SQL block with numbered lines from 2 to 17. Lines 13 and 14 show the output of DBMS_OUTPUT.PUT_LINE statements. The bottom section displays the results: "num_small = 5" and "num_large = 8", followed by the message "Statement processed." and a timestamp of "0.00 seconds".

```
2  num_small NUMBER := 8;
3  num_large NUMBER := 5;
4  num_temp NUMBER;
5  BEGIN
6
7  IF num_small > num_large THEN
8      num_temp := num_small;
9      num_small := num_large;
10     num_large := num_temp;
11  END IF;
12
13 DBMS_OUTPUT.PUT_LINE ('num_small = '||num_small);
14 DBMS_OUTPUT.PUT_LINE ('num_large = '||num_large);
15 END;
16 /
17
```

Results Explain Describe Saved SQL History

num_small = 5
num_large = 8
Statement processed.
0.00 seconds

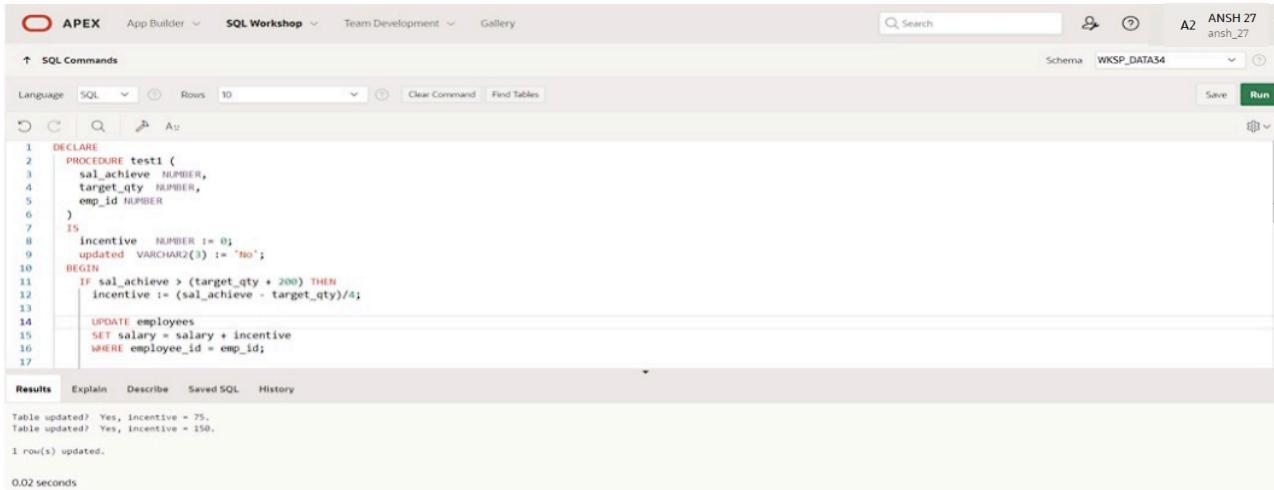
PROGRAM 7

Write a PL/SQL procedure to calculate the incentive on a target achieved and display the message either the record updated or not.

QUERY:

```
DECLARE
  PROCEDURE test1 (
    sal_achieve NUMBER,
    target_qty NUMBER,
    emp_id NUMBER
  )
  IS
    incentive NUMBER := 0;
    updated VARCHAR2(3) := 'No';
  BEGIN
    IF sal_achieve > (target_qty + 200) THEN
      incentive := (sal_achieve - target_qty)/4;
      UPDATE employees
        SET salary = salary + incentive
        WHERE employee_id = emp_id;
      updated := 'Yes';
    END IF;
    DBMS_OUTPUT.PUT_LINE (
      'Table updated? ' || updated || ', '
      'incentive = ' || incentive || '.'
    );
  END test1;
BEGIN
  test1(2300, 2000, 144);
  test1(3600, 3000, 145);
END;
/
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. The right side of the header shows 'A2 ANSH 27 ansh_27' and 'Schema WKSP_DATA34'. Below the header, there's a search bar and a toolbar with icons for undo, redo, clear, and run. The main area is titled 'SQL Commands' and contains the following PL/SQL code:

```
1  DECLARE
2      PROCEDURE test1 (
3          sal_achieve NUMBER,
4          target_qty NUMBER,
5          emp_id NUMBER
6      ) IS
7          incentive NUMBER := 0;
8          updated VARCHAR(3) := 'No';
9      BEGIN
10         IF sal_achieve > (target_qty * 200) THEN
11             incentive := (sal_achieve - target_qty)/4;
12         END IF;
13
14         UPDATE employees
15            SET salary = salary + incentive
16           WHERE employee_id = emp_id;
17     
```

Below the code, the 'Results' tab is selected, showing the output of the executed command:

```
Table updated? Yes, incentive = 75.
Table updated? Yes, incentive = 150.
1 row(s) updated.
```

At the bottom, it says '0.02 seconds'.

PROGRAM 8

Write a PL/SQL procedure to calculate incentive achieved according to the specific sale limit.

QUERY:

```
DECLARE
  PROCEDURE test1 (sal_achieve NUMBER)
  IS
    incentive NUMBER := 0;
  BEGIN
    IF sal_achieve > 44000 THEN
      incentive := 1800;
    ELSIF sal_achieve > 32000 THEN
      incentive := 800;
    ELSE
      incentive := 500;
    END IF;
    DBMS_OUTPUT.NEW_LINE;
    DBMS_OUTPUT.PUT_LINE (
      'Sale achieved : ' || sal_achieve || ', incentive : ' || incentive || '');
  END test1;
BEGIN
  test1(45000);
  test1(36000);
  test1(28000);
END;
/
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes links for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, it shows the user 'ANSH 27' and the schema 'WKSP_DATA34'. The main area is titled 'SQL Commands' with a 'Run' button. The code editor contains a PL/SQL procedure named 'test1' with the following logic:

```
1  DECLARE
2  PROCEDURE test1 (sal_achieve NUMBER)
3  IS
4      incentive NUMBER := 0;
5  BEGIN
6      IF sal_achieve > 44000 THEN
7          incentive := 1800;
8      ELSIF sal_achieve > 32000 THEN
9          incentive := 800;
10     ELSE
11         incentive := 500;
12     END IF;
13     DBMS_OUTPUT.NEW_LINE;
14     DBMS_OUTPUT.PUT_LINE (
15         'Sale achieved : ' || sal_achieve || ', incentive : ' || incentive || '.'
16 );
```

The results tab shows the output of the procedure execution:

```
Sale achieved : 45000, incentive : 1800.
Sale achieved : 36000, incentive : 800.
Sale achieved : 28000, incentive : 500.
Statement processed.
```

At the bottom, it indicates the execution took '0.00 seconds'.

PROGRAM 9

Write a PL/SQL program to count number of employees in department 50 and check whether this department have any vacancies or not. There are 45 vacancies in this department.

QUERY:

```
SET SERVEROUTPUT ON
DECLARE
    tot_emp NUMBER;
    get_dep_id NUMBER;

BEGIN
    get_dep_id := 80;
    SELECT Count(*)
    INTO tot_emp
    FROM employees e
        join departments d
        ON e.department_id = d.department_id
    WHERE e.department_id = get_dep_id;
    dbms_output.Put_line ('The employees are in the department '||get_dep_id||' is: '
        ||To_char(tot_emp));
    IF tot_emp >= 45 THEN
        dbms_output.Put_line ('There are no vacancies in the department '||get_dep_id);
    ELSE
        dbms_output.Put_line ('There are '||to_char(45-tot_emp)||' vacancies in department
        '|| get_dep_id );
    END IF;
END;
/
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. At the top, there are tabs for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. On the right, it shows a user session: A2 ANSH 27 ansh_27. The main area is titled "SQL Commands". The code entered is:

```
1 SET SERVEROUTPUT ON
2 DECLARE
3     tot_emp NUMBER;
4 BEGIN
5     SELECT Count(*)
6     INTO tot_emp
7     FROM employees e
8         join departments d
9             ON e.department_id = d.department_id
10    WHERE e.department_id = 50;
11
12    dbms_output.Put_line ('The employees are in the department 50: '
13                           ||To_char(tot_emp));
14
15    IF tot_emp >= 45 THEN
```

The "Results" tab is selected, showing the output of the script:

```
Sale achieved : 45000, incentive : 1800.
Sale achieved : 36000, incentive : 800.
Sale achieved : 28000, incentive : 500.
Statement processed.
```

At the bottom left, it says "0.00 seconds".

PROGRAM 10

Write a PL/SQL program to count number of employees in a specific department and check whether this department have any vacancies or not. If any vacancies, how many vacancies are in that department.

QUERY:

```
SET SERVEROUTPUT ON
DECLARE
    tot_emp NUMBER;
    get_dep_id NUMBER;

BEGIN
    get_dep_id := 80;
    SELECT Count(*)
    INTO tot_emp
    FROM employees e
        join departments d
            ON e.department_id = d.department_id
    WHERE e.department_id = get_dep_id;
    dbms_output.Put_line ('The employees are in the department '||get_dep_id||' is: '
        ||To_char(tot_emp));
    IF tot_emp >= 45 THEN
        dbms_output.Put_line ('There are no vacancies in the department '||get_dep_id);
    ELSE
        dbms_output.Put_line ('There are '||to_char(45-tot_emp)||' vacancies in department
    '|| get_dep_id );
    END IF;
END;
/
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user ANSH 27 and the schema WKSP_DATA34. The main area is titled "SQL Commands". The code editor contains the following PL/SQL block:

```
1  DECLARE
2      tot_emp NUMBER;
3      get_dep_id NUMBER;
4
5  BEGIN
6      get_dep_id := 80;
7      SELECT Count(*)
8          INTO  tot_emp
9         FROM employees e
10        JOIN departments d
11           ON e.department_id = d.dept_id
12      WHERE e.department_id = get_dep_id;
13
14      dbms_output.Put_line ('The employees are in the department'||get_dep_id||' is: '
15                           ||To_char(tot_emp));
```

Below the code, the "Results" tab is selected, displaying the output of the query:

```
The employees are in the department 80 is: 4
There are 41 vacancies in department 80
Statement processed.
```

At the bottom left, it says "0.05 seconds".

PROGRAM 11

Write a PL/SQL program to display the employee IDs, names, job titles, hire dates, and salaries of all employees.

QUERY:

```
DECLARE
v_employee_id employees.employee_id%TYPE;
v_full_name employees.first_name%TYPE;
v_job_id employees.job_id%TYPE;
v_hire_date employees.hire_date%TYPE;
v_salary employees.salary%TYPE;
CURSOR c_employees IS
  SELECT employee_id, first_name || ' ' || last_name AS full_name, job_id, hire_date,
salary
    FROM employees;
BEGIN
  DBMS_OUTPUT.PUT_LINE('Employee ID | Full Name | Job Title | Hire Date | Salary');
  DBMS_OUTPUT.PUT_LINE('-----');
  OPEN c_employees;
  FETCH c_employees INTO v_employee_id, v_full_name, v_job_id, v_hire_date, v_salary;
  WHILE c_employees%FOUND LOOP
    DBMS_OUTPUT.PUT_LINE(v_employee_id || ' ' || v_full_name || ' ' || v_job_id
|| ' ' || v_hire_date || ' ' || v_salary);
    FETCH c_employees INTO v_employee_id, v_full_name, v_job_id, v_hire_date, v_salary;
  END LOOP;
  CLOSE c_employees;
END;
/
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows session information: A2 ANSH 27 ansh_27. The main area has tabs for SQL Commands, Results, Explain, Describe, Saved SQL, and History. The SQL Commands tab displays the following PL/SQL code:

```
1 DECLARE
2   v_employee_id employees.employee_id%TYPE;
3   v_full_name employees.first_name%TYPE;
4   v_job_id employees.job_id%TYPE;
5   v_hire_date employees.hire_date%TYPE;
6   v_salary employees.salary%TYPE;
7   CURSOR c_employees IS
8     SELECT employee_id, first_name || ' ' || last_name AS full_name, job_id, hire_date, salary
9     FROM employees;
10  BEGIN
11    DBMS_OUTPUT.PUT_LINE('Employee ID | Full Name | Job Title | Hire Date | Salary');
12    DBMS_OUTPUT.PUT_LINE('-----');
13    OPEN c_employees;
```

The Results tab shows the output of the query:

Employee ID	Full Name	Job Title	Hire Date	Salary
110	John Smith	sales_rep	02/28/1995	70000
125	Emily Johnson	hr_rep	04/26/1998	5000
122	Jaunty Janu	ac_account	03/05/2024	6900
114	den Davies	st_clerk	02/03/1999	11000
142	Jane Doe	ac_account	03/05/1997	30000
115	Vijaya Mohan	st_clerk	02/22/1998	4800

Below the results, a message states "Statement processed."

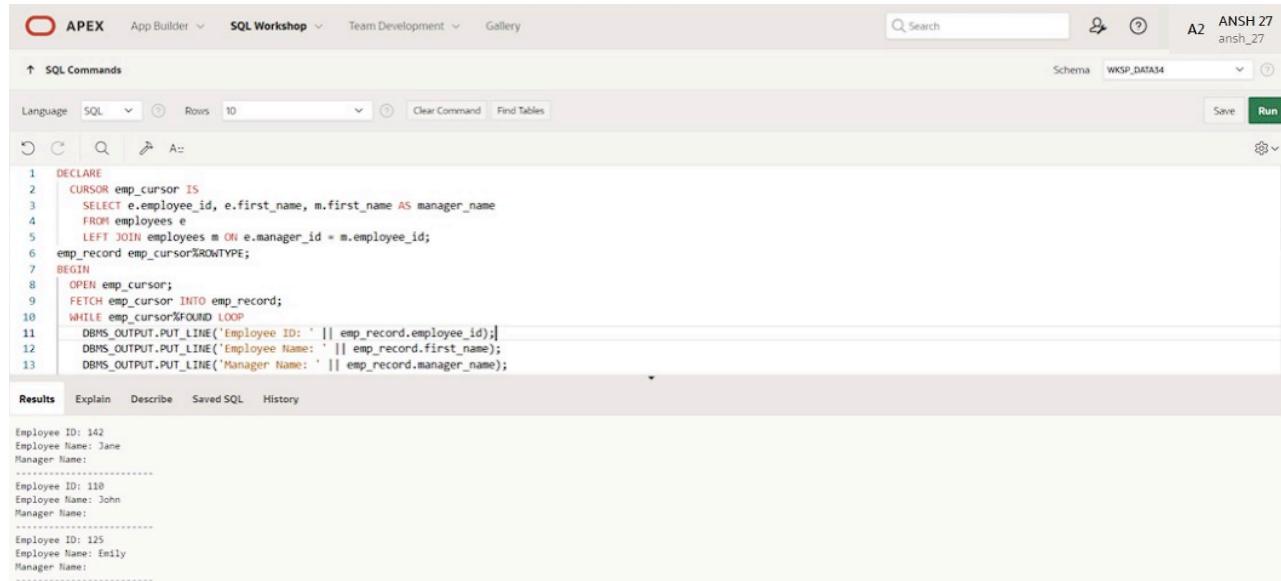
PROGRAM 12

Write a PL/SQL program to display the employee IDs, names, and department names of all employees.

QUERY:

```
DECLARE
CURSOR emp_cursor IS
  SELECT e.employee_id, e.first_name, m.first_name AS manager_name
  FROM employees e
  LEFT JOIN employees m ON e.manager_id = m.employee_id;
emp_record emp_cursor%ROWTYPE;
BEGIN
  OPEN emp_cursor;
  FETCH emp_cursor INTO emp_record;
  WHILE emp_cursor%FOUND LOOP
    DBMS_OUTPUT.PUT_LINE('Employee ID: ' || emp_record.employee_id);
    DBMS_OUTPUT.PUT_LINE('Employee Name: ' || emp_record.first_name);
    DBMS_OUTPUT.PUT_LINE('Manager Name: ' || emp_record.manager_name);
    DBMS_OUTPUT.PUT_LINE('-----');
    FETCH emp_cursor INTO emp_record;
  END LOOP;
  CLOSE emp_cursor;
END;
/
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user ANSH 27 and the schema WKSP_DATA34. The main area is titled "SQL Commands". The code editor contains the following PL/SQL block:

```
1  DECLARE
2      CURSOR emp_cursor IS
3          SELECT e.employee_id, e.first_name, m.first_name AS manager_name
4          FROM employees e
5              LEFT JOIN employees m ON e.manager_id = m.employee_id;
6      emp_record emp_cursor%ROWTYPE;
7  BEGIN
8      OPEN emp_cursor;
9      FETCH emp_cursor INTO emp_record;
10     WHILE emp_cursor%FOUND LOOP
11         DBMS_OUTPUT.PUT_LINE('Employee ID: ' || emp_record.employee_id);
12         DBMS_OUTPUT.PUT_LINE('Employee Name: ' || emp_record.first_name);
13         DBMS_OUTPUT.PUT_LINE('Manager Name: ' || emp_record.manager_name);
14     END LOOP;
15  END;
```

The results pane displays the output of the PL/SQL block:

```
Employee ID: 142
Employee Name: Jane
Manager Name:
-----
Employee ID: 118
Employee Name: John
Manager Name:
-----
Employee ID: 125
Employee Name: Emily
Manager Name:
-----
```

PROGRAM 13

Write a PL/SQL program to display the job IDs, titles, and minimum salaries of all jobs.

QUERY:

```
DECLARE
CURSOR job_cursor IS
  SELECT e.job_id, j.lowest_sal
    FROM job_grade j,employees e;
job_record job_cursor%ROWTYPE;
BEGIN
  OPEN job_cursor;
  FETCH job_cursor INTO job_record;
  WHILE job_cursor%FOUND LOOP
    DBMS_OUTPUT.PUT_LINE('Job ID: ' || job_record.job_id);
    DBMS_OUTPUT.PUT_LINE('Minimum Salary: ' || job_record.lowest_sal);
    DBMS_OUTPUT.PUT_LINE('-----');
    FETCH job_cursor INTO job_record;
  END LOOP;
  CLOSE job_cursor;
END;
/
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows session information: A2 ANSH 27 ansh_27, a search bar, and a schema dropdown set to WKSP_DATA34. Below the header is a toolbar with icons for Undo, Redo, Refresh, Save, and Run.

The main area contains a code editor with the following PL/SQL script:

```
1  DECLARE
2      CURSOR job_cursor IS
3          SELECT e.job_id, j.lowest_sal
4              FROM job_grade j,employees e;
5      job_record job_cursor%ROWTYPE;
6  BEGIN
7      OPEN job_cursor;
8      FETCH job_cursor INTO job_record;
9      WHILE job_cursor%FOUND LOOP
10         DBMS_OUTPUT.PUT_LINE('Job ID: ' || job_record.job_id);
11         DBMS_OUTPUT.PUT_LINE('Minimum Salary: ' || job_record.lowest_sal);
12         DBMS_OUTPUT.PUT_LINE('-----');
13     FETCH job_cursor INTO job_record;

```

Below the code editor is a results pane titled "Results". It displays the output of the script:

```
Job ID: sales_rep
Minimum Salary: 2500
-----
Job ID: hr_rep
Minimum Salary: 2500
-----
Job ID: ac_account
Minimum Salary: 2500
-----
Job ID: st_clerk
Minimum Salary: 2500
-----
```

PROGRAM 15

Write a PL/SQL program to display the employee IDs, names, and job history end dates of all employees.

QUERY:

```
DECLARE
  CURSOR employees_cur IS
    SELECT employee_id, last_name, job_id, start_date
      FROM employees NATURAL JOIN job_history;
    emp_start_date DATE;
BEGIN
  dbms_output.Put_line(Rpad('Employee ID', 15) || Rpad('Last Name', 25) || Rpad('Job Id',
  35) || 'Start Date');
  dbms_output.Put_line('-----');
  FOR emp_sal_rec IN employees_cur LOOP
    -- find out most recent end_date in job_history
    SELECT Max(end_date) + 1
      INTO emp_start_date
      FROM job_history
     WHERE employee_id = emp_sal_rec.employee_id;
    IF emp_start_date IS NULL THEN
      emp_start_date := emp_sal_rec.start_date;
    END IF;
    dbms_output.Put_line(Rpad(emp_sal_rec.employee_id, 15)
                         || Rpad(emp_sal_rec.last_name, 25)
                         || Rpad(emp_sal_rec.job_id, 35)
                         || To_char(emp_start_date, 'dd-mon-yyyy'));
  END LOOP;
END;
/
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side shows user information: A2 ANSH 27 and ansh_27. The main area is titled "SQL Commands". The code editor contains the following PL/SQL block:

```
1 DECLARE
2     CURSOR employees_cur IS
3         SELECT employee_id,
4                last_name,
5                job_id,
6                start_date
7           FROM employees
8      NATURAL JOIN job_history;
9    emp_start_date DATE;
10 BEGIN
11     dbms_output.Put_line(Rpad('Employee ID', 15)
12                           ||Rpad('Last Name', 25)
13                           ||Rpad('Job Id', 35)
14                           ||'Start Date'));
15
16     dbms_output.Put_line('-----');
17 
```

The results tab displays the output of the PL/SQL block:

Employee ID	Last Name	Job Id	Start Date
125	Johnson	hr_rep	22-apr-1999
125	Johnson	hr_rep	22-apr-1999

Below the results, a message states "Statement processed."

Evaluation Procedure	Marks awarded
PL/SQL Procedure(5)	
Program/Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

PROCEDURES AND FUNCTIONS

EX.NO:17

DATE: 21 - 5 - 24

REG.NO: 220701027

Program 1

FACTORIAL OF A NUMBER USING FUNCTION

QUERY:

```
DECLARE
    fac NUMBER := 1;
    n NUMBER := :1;
BEGIN
    WHILE n > 0 LOOP
        fac := n * fac;
        n := n - 1;
    END LOOP;
    DBMS_OUTPUT.PUT_LINE(fac);
END;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, 'APEX' is selected, followed by 'App Builder', 'SQL Workshop' (which is currently active), 'Team Development', and 'Gallery'. On the right side of the header, there is a search bar, a user icon, and session information 'A2 ANSH 27 ansh_27'. Below the header, the main workspace is titled 'SQL Commands'. It contains a code editor with the following PL/SQL block:

```
1  DECLARE
2      fac NUMBER := 1;
3      n NUMBER := 1; -- Use a bind variable instead of "&1"
4  BEGIN
5      WHILE n > 0 LOOP
6          fac := n * fac;
7          n := n - 1;
8      END LOOP;
9      DBMS_OUTPUT.PUT_LINE(fac);
10 END;
```

Below the code editor, there is a toolbar with icons for Undo, Redo, Search, Find Tables, Save, and Run. The 'Run' button is highlighted in green. At the bottom of the workspace, there is a tab bar with 'Results' (which is selected and highlighted in grey), 'Explain', 'Describe', 'Saved SQL', and 'History'. The results section displays the output of the executed query:

120
Statement processed.
0.00 seconds

Program 2

Write a PL/SQL program using Procedures IN,INOUT,OUT parameters to retrieve the corresponding book information in library

QUERY:

```
CREATE OR REPLACE PROCEDURE get_book_info (
    p_book_id IN NUMBER,
    p_title IN OUT VARCHAR2,
    p_author OUT VARCHAR2,
    p_year_published OUT NUMBER
)
AS
BEGIN
    SELECT title, author, year_published INTO p_title, p_author, p_year_published
    FROM books
    WHERE book_id = p_book_id;

    p_title := p_title || ' - Retrieved';
EXCEPTION
    WHEN NO_DATA_FOUND THEN
        p_title := NULL;
        p_author := NULL;
        p_year_published := NULL;
END;
```

```

DECLARE
    v_book_id NUMBER := 1;
    v_title VARCHAR2(100);
    v_author VARCHAR2(100);
    v_year_published NUMBER;
BEGIN
    v_title := 'Initial Title';

    get_book_info(p_book_id => v_book_id, p_title => v_title, p_author => v_author,
    p_year_published => v_year_published);

    DBMS_OUTPUT.PUT_LINE('Title: ' || v_title);
    DBMS_OUTPUT.PUT_LINE('Author: ' || v_author);
    DBMS_OUTPUT.PUT_LINE('Year Published: ' || v_year_published);
END;
/

```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The code area contains a PL/SQL block. The output pane shows the results of the execution, including the retrieved book information.

```

APEX App Builder SQL Workshop Team Development Gallery
Search A2 ANSH 27
Schema WKSP_DATA34 Run
SQL Commands Language SQL Rows 10 Clear Command Find Tables
1 DECLARE
2     v_book_id NUMBER := 1;
3     v_title VARCHAR2(100);
4     v_author VARCHAR2(100);
5     v_year_published NUMBER;
6 BEGIN
7     v_title := 'Initial Title';
8
9     get_book_info(p_book_id => v_book_id, p_title => v_title, p_author => v_author, p_year_published => v_year_published);
10
11    DBMS_OUTPUT.PUT_LINE('Title: ' || v_title);
12    DBMS_OUTPUT.PUT_LINE('Author: ' || v_author);
13    DBMS_OUTPUT.PUT_LINE('Year Published: ' || v_year_published);
14 END;

```

Results

Title: To Kill a Mockingbird - Retrieved
Author: Harper Lee
Year Published: 1960
Statement processed.
0.01 seconds

Evaluation Procedure	Marks awarded
PL/SQL Procedure(5)	
Program/Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

TRIGGER

EX.NO:18

DATE: 21 – 5 - 24

REG.NO: 220701027

Program 1

Write a code in PL/SQL to develop a trigger that enforces referential integrity by preventing the deletion of a parent record if child records exist.

QUERY:

```
CREATE OR REPLACE TRIGGER prevent_parent_deletion
BEFORE DELETE ON parent_table
FOR EACH ROW
DECLARE
    child_exists EXCEPTION;
    PRAGMA EXCEPTION_INIT(child_exists, -20001);
    v_child_count NUMBER;
BEGIN
    SELECT COUNT(*) INTO v_child_count FROM child_table WHERE parent_id =
:OLD.parent_id;
    IF v_child_count > 0 THEN
        RAISE child_exists;
    END IF;
EXCEPTION
    WHEN child_exists THEN
        RAISE_APPLICATION_ERROR(-20001, 'Cannot delete parent record while child
records exist.');
END;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user A2 ANSH 27 and the schema WKSP_BHARATH. The main area is titled "SQL Commands" and contains the following PL/SQL code:

```
1 CREATE OR REPLACE TRIGGER prevent_parent_deletion
2 BEFORE DELETE ON parent_table
3 FOR EACH ROW
4 DECLARE
5     child_exists EXCEPTION;
6     PRAGMA EXCEPTION_INIT(child_exists, -20001);
7     v_child_count NUMBER;
8 BEGIN
9     SELECT COUNT(*) INTO v_child_count FROM child_table WHERE parent_id = :OLD.parent_id;
10    IF v_child_count > 0 THEN
11        RAISE child_exists;
12    END IF;
13 EXCEPTION
14    WHEN child_exists THEN
15        RAISE_APPLICATION_ERROR(-20001, 'Cannot delete parent record while child records exist.');
16 END;
17 /
```

Below the code, the "Results" tab is selected, showing the output: "Trigger created." and "0.04 seconds".

Program 2

Write a code in PL/SQL to create a trigger that checks for duplicate values in a specific column and raises an exception if found.

QUERY:

```
CREATE OR REPLACE TRIGGER check_duplicates
BEFORE INSERT OR UPDATE ON unique_values_table
FOR EACH ROW
DECLARE
    duplicate_found EXCEPTION;
    PRAGMA EXCEPTION_INIT(duplicate_found, -20002);
    v_count NUMBER;
BEGIN
    SELECT COUNT(*) INTO v_count FROM unique_values_table
    WHERE unique_col = :NEW.unique_col AND id != :NEW.id;
    IF v_count > 0 THEN
        RAISE duplicate_found;
    END IF;
EXCEPTION
    WHEN duplicate_found THEN
        RAISE_APPLICATION_ERROR(-20002, 'Duplicate value found in unique_col.');
END;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user ANSH 27 and the schema WKSP_DATA34. The main area is titled "SQL Commands". The code editor contains the following PL/SQL trigger creation script:

```
4  DECLARE
5      duplicate_found EXCEPTION;
6      PRAGMA EXCEPTION_INIT(duplicate_found, -20002);
7      v_count NUMBER;
8  BEGIN
9      SELECT COUNT(*) INTO v_count FROM unique_values_table
10     WHERE unique_col = :NEW.unique_col AND id != :NEW.id;
11     IF v_count > 0 THEN
12         RAISE duplicate_found;
13     END IF;
14  EXCEPTION
15     WHEN duplicate_found THEN
16         RAISE_APPLICATION_ERROR(-20002, 'Duplicate value found in unique_col.');
17    END;
18  /
19
```

Below the code editor, the "Results" tab is selected, showing the message "Trigger created." and a execution time of "0.04 seconds".

Program 3

Write a code in PL/SQL to create a trigger that restricts the insertion of new rows if the total of a column's values exceeds a certain threshold.

QUERY:

```
CREATE OR REPLACE TRIGGER check_threshold
BEFORE INSERT OR UPDATE ON threshold_table
FOR EACH ROW
DECLARE
    threshold_exceeded EXCEPTION;
    PRAGMA EXCEPTION_INIT(threshold_exceeded, -20003);
    v_sum NUMBER;
    v_threshold NUMBER := 10000; -- Set your threshold here
BEGIN
    SELECT SUM(value_col) INTO v_sum FROM threshold_table;
    v_sum := v_sum + :NEW.value_col;
    IF v_sum > v_threshold THEN
        RAISE threshold_exceeded;
    END IF;
EXCEPTION
    WHEN threshold_exceeded THEN
        RAISE_APPLICATION_ERROR(-20003, 'Threshold exceeded for value_col.');
END;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user ANSH 27 and the schema WKSP_DATA34. The main area is titled "SQL Commands" and contains the following PL/SQL code:

```
1 CREATE OR REPLACE TRIGGER check_threshold
2 BEFORE INSERT OR UPDATE ON threshold_table
3 FOR EACH ROW
4 DECLARE
5     threshold_exceeded EXCEPTION;
6     PRAGMA EXCEPTION_INIT(threshold_exceeded, -20003);
7     v_sum NUMBER;
8     v_threshold NUMBER := 10000; -- Set your threshold here
9
10    BEGIN
11        SELECT SUM(value_col) INTO v_sum FROM threshold_table;
12        v_sum := v_sum + :NEW.value_col;
13        IF v_sum > v_threshold THEN
14            RAISE threshold_exceeded;
15        END IF;
16    EXCEPTION
17        WHEN threshold_exceeded THEN
18            RAISE_APPLICATION_ERROR(-20003, 'Threshold exceeded for value_col.');

```

Below the code, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is selected, showing the message "Trigger created." and a timestamp "0.04 seconds".

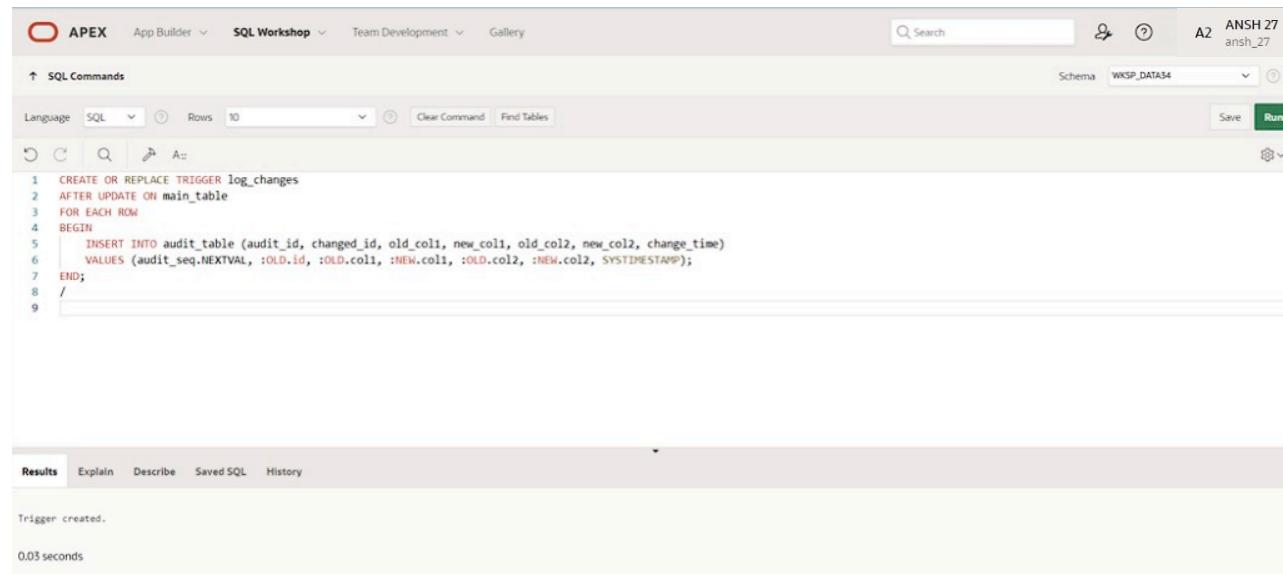
Program 4

Write a code in PL/SQL to design a trigger that captures changes made to specific columns and logs them in an audit table.

QUERY:

```
CREATE OR REPLACE TRIGGER log_changes
AFTER UPDATE ON main_table
FOR EACH ROW
BEGIN
    INSERT INTO audit_table (audit_id, changed_id, old_col1, new_col1, old_col2,
new_col2, change_time)
    VALUES (audit_seq.NEXTVAL, :OLD.id, :OLD.col1, :NEW.col1, :OLD.col2,
:NEW.col2, SYSTIMESTAMP);
END;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, 'APEX' is selected. The main area displays the SQL command for creating the trigger:

```
CREATE OR REPLACE TRIGGER log_changes
AFTER UPDATE ON main_table
FOR EACH ROW
BEGIN
    INSERT INTO audit_table (audit_id, changed_id, old_col1, new_col1, old_col2,
new_col2, change_time)
    VALUES (audit_seq.NEXTVAL, :OLD.id, :OLD.col1, :NEW.col1, :OLD.col2,
:NEW.col2, SYSTIMESTAMP);
END;
```

Below the code, the results pane shows the message "Trigger created." and a timestamp of "0.03 seconds".

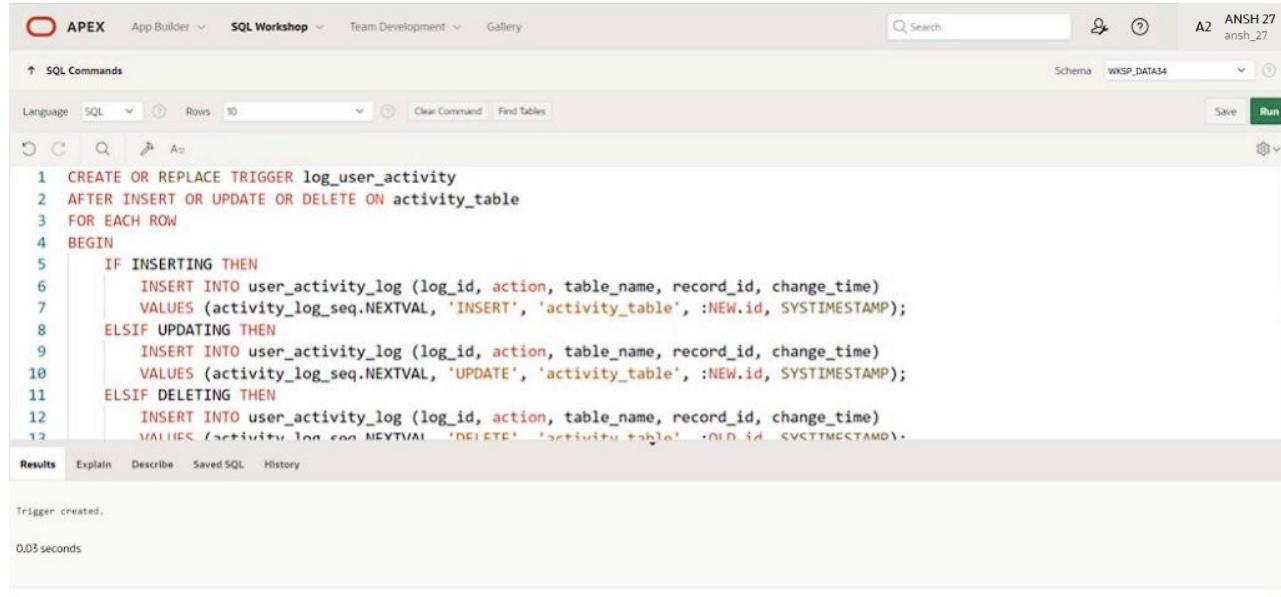
Program 5

Write a code in PL/SQL to implement a trigger that records user activity (inserts, updates, deletes) in an audit log for a given set of tables.

QUERY:

```
CREATE OR REPLACE TRIGGER log_user_activity
AFTER INSERT OR UPDATE OR DELETE ON activity_table
FOR EACH ROW
BEGIN
    IF INSERTING THEN
        INSERT INTO user_activity_log (log_id, action, table_name, record_id,
change_time)
        VALUES (activity_log_seq.NEXTVAL, 'INSERT', 'activity_table', :NEW.id,
SYSTIMESTAMP);
    ELSIF UPDATING THEN
        INSERT INTO user_activity_log (log_id, action, table_name, record_id,
change_time)
        VALUES (activity_log_seq.NEXTVAL, 'UPDATE', 'activity_table', :NEW.id,
SYSTIMESTAMP);
    ELSIF DELETING THEN
        INSERT INTO user_activity_log (log_id, action, table_name, record_id,
change_time)
        VALUES (activity_log_seq.NEXTVAL, 'DELETE', 'activity_table', :OLD.id,
SYSTIMESTAMP);
    END IF;
END;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The right side of the header shows the user ANSH 27 and session ID ansh_27. The main area is titled "SQL Commands". The schema dropdown is set to WKSP_DATA34. The SQL editor contains the following PL/SQL code:

```
1 CREATE OR REPLACE TRIGGER log_user_activity
2 AFTER INSERT OR UPDATE OR DELETE ON activity_table
3 FOR EACH ROW
4 BEGIN
5   IF INSERTING THEN
6     INSERT INTO user_activity_log (log_id, action, table_name, record_id, change_time)
7       VALUES (activity_log_seq.NEXTVAL, 'INSERT', 'activity_table', :NEW.id, SYSTIMESTAMP);
8   ELSIF UPDATING THEN
9     INSERT INTO user_activity_log (log_id, action, table_name, record_id, change_time)
10    VALUES (activity_log_seq.NEXTVAL, 'UPDATE', 'activity_table', :NEW.id, SYSTIMESTAMP);
11   ELSIF DELETING THEN
12     INSERT INTO user_activity_log (log_id, action, table_name, record_id, change_time)
13       VALUES (activity_log_seq.NEXTVAL, 'DELETE', 'activity_table', :OLD.id, SYSTIMESTAMP);

```

Below the code, the "Results" tab is selected, showing the message "Trigger created." and a execution time of "0.03 seconds".

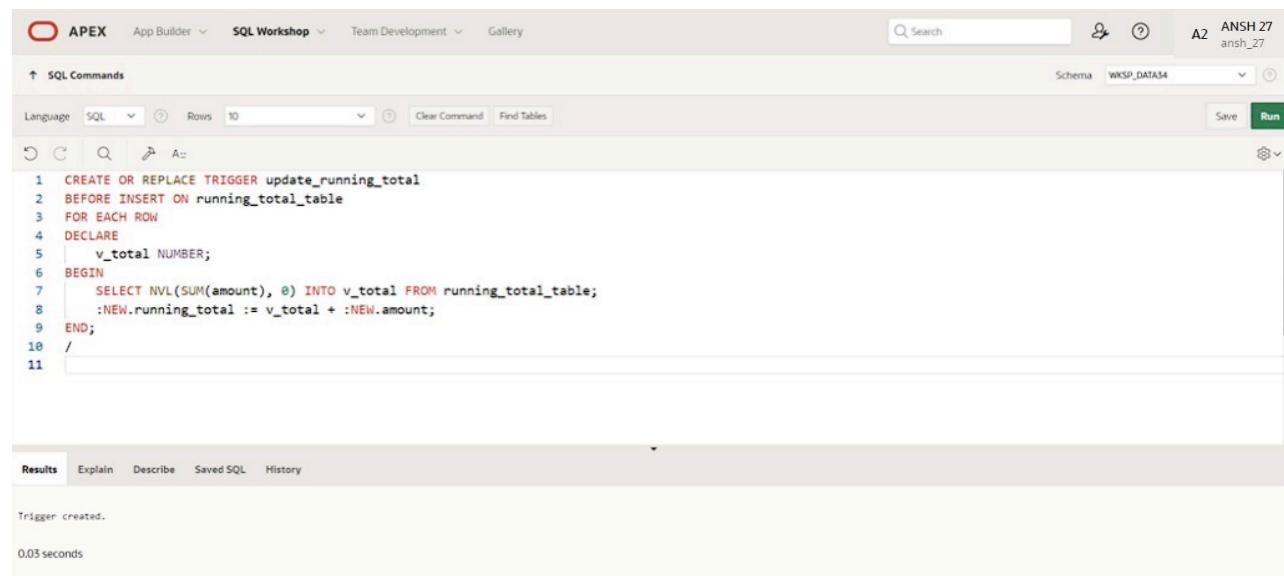
Program 6

Write a code in PL/SQL to implement a trigger that automatically calculates and updates a running total column for a table whenever new rows are inserted.

QUERY:

```
CREATE OR REPLACE TRIGGER update_running_total
BEFORE INSERT ON running_total_table
FOR EACH ROW
DECLARE
    v_total NUMBER;
BEGIN
    SELECT NVL(SUM(amount), 0) INTO v_total FROM running_total_table;
    :NEW.running_total := v_total + :NEW.amount;
END;
```

OUTPUT:



The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, 'APEX' is selected. The main area displays the SQL command for creating the trigger:

```
1 CREATE OR REPLACE TRIGGER update_running_total
2 BEFORE INSERT ON running_total_table
3 FOR EACH ROW
4 DECLARE
5     v_total NUMBER;
6 BEGIN
7     SELECT NVL(SUM(amount), 0) INTO v_total FROM running_total_table;
8     :NEW.running_total := v_total + :NEW.amount;
9 END;
10 /
11
```

Below the code, the 'Results' tab is active, showing the output: "Trigger created." and "0.03 seconds".

Program 7

Write a code in PL/SQL to create a trigger that validates the availability of items before allowing an order to be placed, considering stock levels and pending orders

QUERY:

```
CREATE OR REPLACE TRIGGER validate_order
BEFORE INSERT ON orders
FOR EACH ROW
DECLARE
    v_stock NUMBER;
    insufficient_stock EXCEPTION;
    PRAGMA EXCEPTION_INIT(insufficient_stock, -20004);
BEGIN
    SELECT stock_quantity INTO v_stock FROM items WHERE item_id =
:NEW.item_id;
    IF v_stock < :NEW.order_quantity THEN
        RAISE insufficient_stock;
    END IF;
    UPDATE items SET stock_quantity = stock_quantity - :NEW.order_quantity
WHERE item_id = :NEW.item_id;
EXCEPTION
    WHEN insufficient_stock THEN
        RAISE_APPLICATION_ERROR(-20004, 'Insufficient stock for the item.');
END;
```

OUTPUT:

The screenshot shows the Oracle SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop' (selected), 'Team Development', and 'Gallery'. The right side of the header shows the user 'ANSH 27' and the schema 'WKSP_DATA34'. The main area is titled 'SQL Commands' with a 'Run' button. Below the title are filters for 'Language' (SQL), 'Rows' (10), and buttons for 'Clear Command' and 'Find Tables'. The code area contains the following PL/SQL trigger creation script:

```
1 CREATE OR REPLACE TRIGGER validate_order
2 BEFORE INSERT ON orders
3 FOR EACH ROW
4 DECLARE
5     v_stock NUMBER;
6     insufficient_stock EXCEPTION;
7     PRAGMA EXCEPTION_INIT(insufficient_stock, -20004);
8 BEGIN
9     SELECT stock_quantity INTO v_stock FROM items WHERE item_id = :NEW.item_id;
10    IF v_stock < :NEW.order_quantity THEN
11        RAISE insufficient_stock;
12    END IF;
13    UPDATE items SET stock_quantity = stock_quantity - :NEW.order_quantity WHERE item_id = :NEW.item_id;
14 EXCEPTION
15    WHEN insufficient_stock THEN
```

Below the code, the status message 'Trigger created.' is displayed, followed by '0.05 seconds'.

Evaluation Procedure	Marks awarded
PL/SQL Procedure(5)	
Program/Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

MONGO DB

EX.NO:19

DATE: 24 - 5 - 24

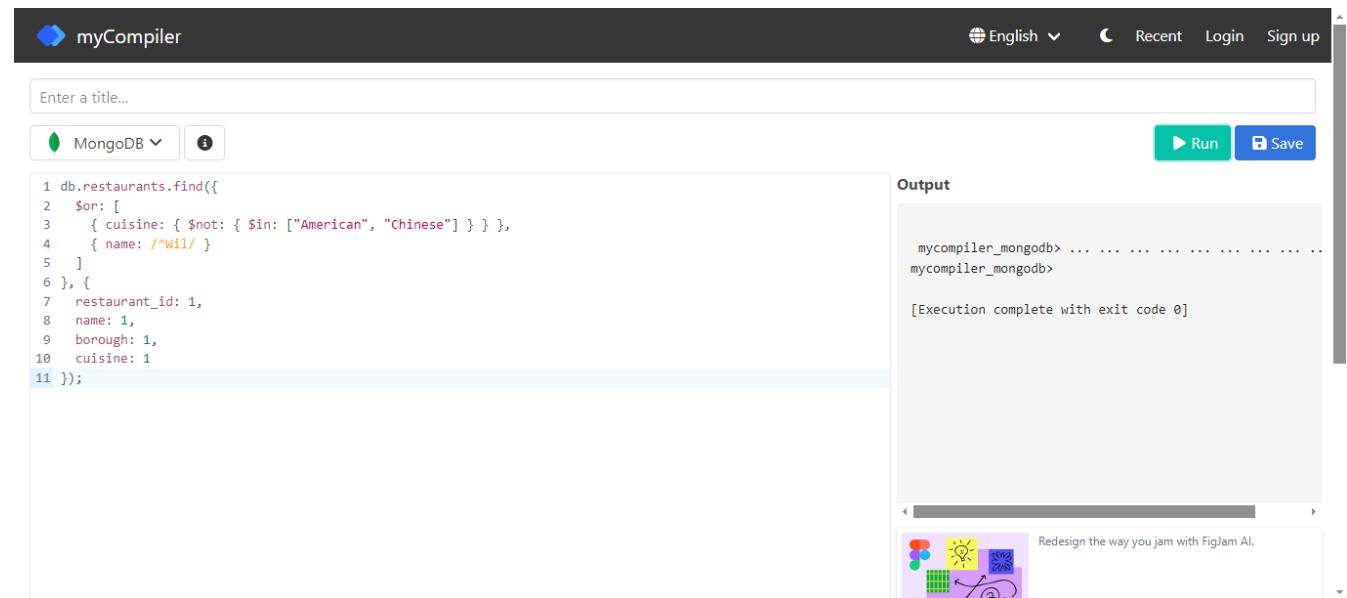
REG.NO: 220701027

1.) Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which prepared dish except 'American' and 'Chinees' or restaurant's name begins with letter 'Wil'.

QUERY:

```
db.restaurants.find( { $or: [ { name: /^Wil/ }, { cuisine: { $nin: ['American', 'Chinese'] } } ] , { restaurant_id: 1, name: 1, borough: 1, cuisine: 1 } );
```

OUTPUT:



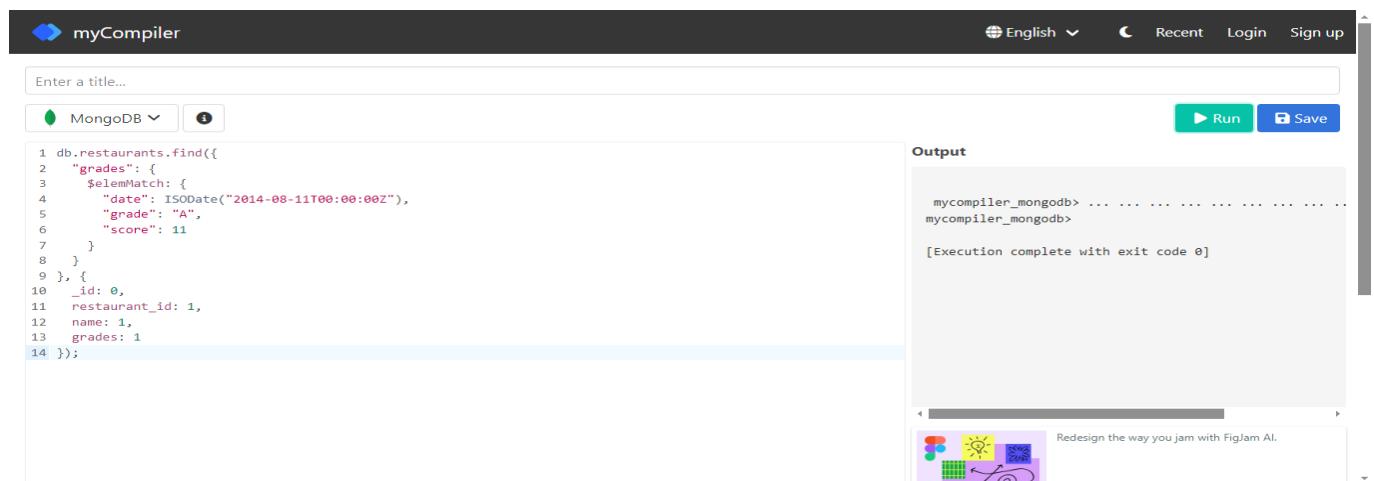
The screenshot shows the myCompiler MongoDB interface. On the left, the code editor contains the MongoDB query:1 db.restaurants.find({
2 \$or: [
3 { cuisine: { \$not: { \$in: ["American", "Chinese"] } } },
4 { name: /^Wil/ }
5],
6 }, {
7 restaurant_id: 1,
8 name: 1,
9 borough: 1,
10 cuisine: 1
11 });On the right, the 'Output' panel shows the command prompt and the results of the execution:mycompiler_mongodb> ...
mycompiler_mongodb>
[Execution complete with exit code 0]A small advertisement for FigJam AI is visible at the bottom of the interface.

2.) Write a MongoDB query to find the restaurant Id, name, and grades for those restaurants which achieved a grade of "A" and scored 11 on an ISODate "2014-08-11T00:00:00Z" among many of survey dates.

QUERY:

```
db.restaurants.find( { grades: { $elemMatch: { grade: "A", score: 11, date: ISODate("2014-08-11T00:00:00Z") } } }, { restaurant_id: 1, name: 1, grades: 1 } );
```

OUTPUT:



The screenshot shows the myCompiler MongoDB interface. On the left, the code editor contains the MongoDB query:

```
1 db.restaurants.find({
2   "grades": {
3     "$elemMatch": {
4       "date": ISODate("2014-08-11T00:00:00Z"),
5       "grade": "A",
6       "score": 11
7     }
8   },
9 }, {
10   "_id": 0,
11   "restaurant_id": 1,
12   "name": 1,
13   "grades": 1
14 });
```

On the right, the 'Output' panel shows the results of the query execution:

```
mycompiler_mongodb> ...
mycompiler_mongodb>
[Execution complete with exit code 0]
```

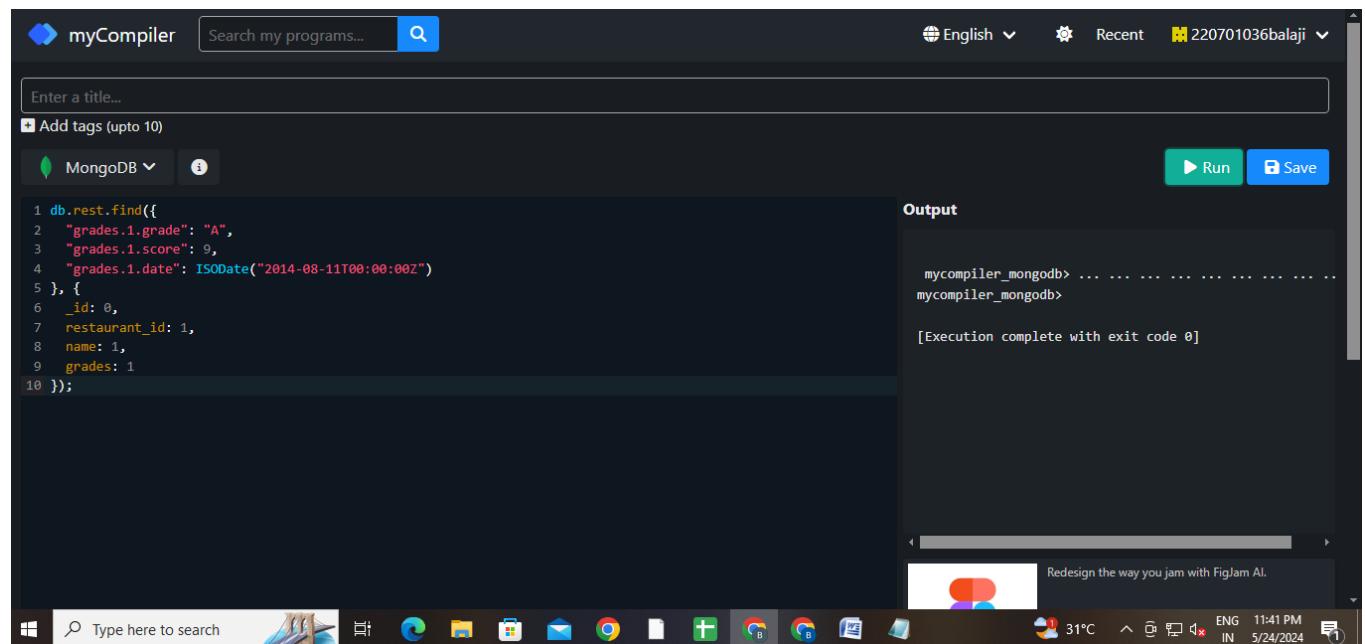
A small watermark for FigJam AI is visible at the bottom right of the interface.

3.) Write a MongoDB query to find the restaurant Id, name and grades for those restaurants where the 2nd element of grades array contains a grade of "A" and score 9 on an ISODate "2014-08-11T00:00:00Z".

QUERY:

```
db.restaurants.find( {"grades.1.grade": "A", "grades.1.score": 9, "grades.1.date": ISODate("2014-08-11T00:00:00Z") }, { restaurant_id: 1, name: 1, grades: 1 } );
```

OUTPUT:



The screenshot shows the myCompiler MongoDB interface. The code input area contains the following MongoDB query:

```
1 db.restaurants.find({  
2   "grades.1.grade": "A",  
3   "grades.1.score": 9,  
4   "grades.1.date": ISODate("2014-08-11T00:00:00Z")  
5 }, {  
6   _id: 0,  
7   restaurant_id: 1,  
8   name: 1,  
9   grades: 1  
10});
```

The output window shows the results of the query execution:

```
mycompiler_mongodb> ...  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

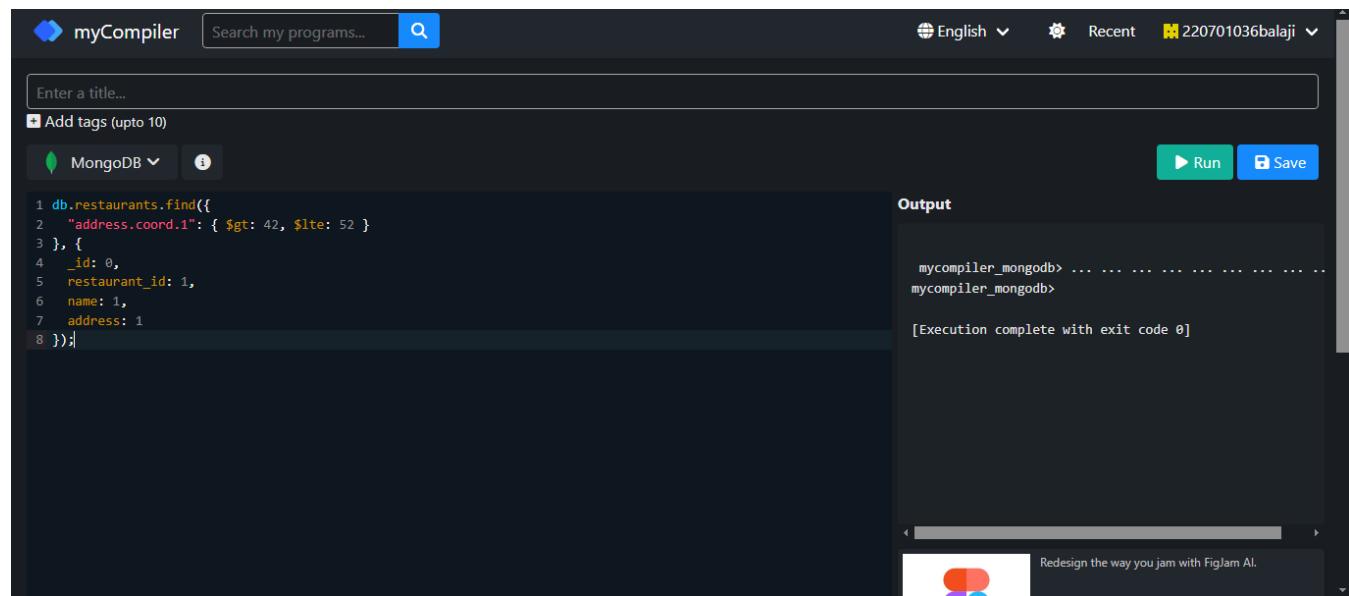
The system tray at the bottom right of the screen shows the date and time as 5/24/2024, 11:41 PM, and a temperature of 31°C.

4.)Write a MongoDB query to find the restaurant Id, name, address and geographical location for those restaurants where 2nd element of coord array contains a value which is more than 42 and upto 52

QUERY:

```
db.restaurants.find({$and : [{"address.coord.1": {$gt : 42}}, {"address.coord.1": {$lte : 52}}]}, {_id:0, restaurant_id:1, name:1, address:1})
```

OUTPUT:



The screenshot shows the myCompiler interface. In the left panel, a MongoDB query is entered:

```
1 db.restaurants.find({  
2   "address.coord.1": { $gt: 42, $lte: 52 }  
3 }, {  
4   _id: 0,  
5   restaurant_id: 1,  
6   name: 1,  
7   address: 1  
8 })$
```

In the right panel, the 'Output' section shows the results of the query execution:

```
mycompiler_mongodb> .....  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

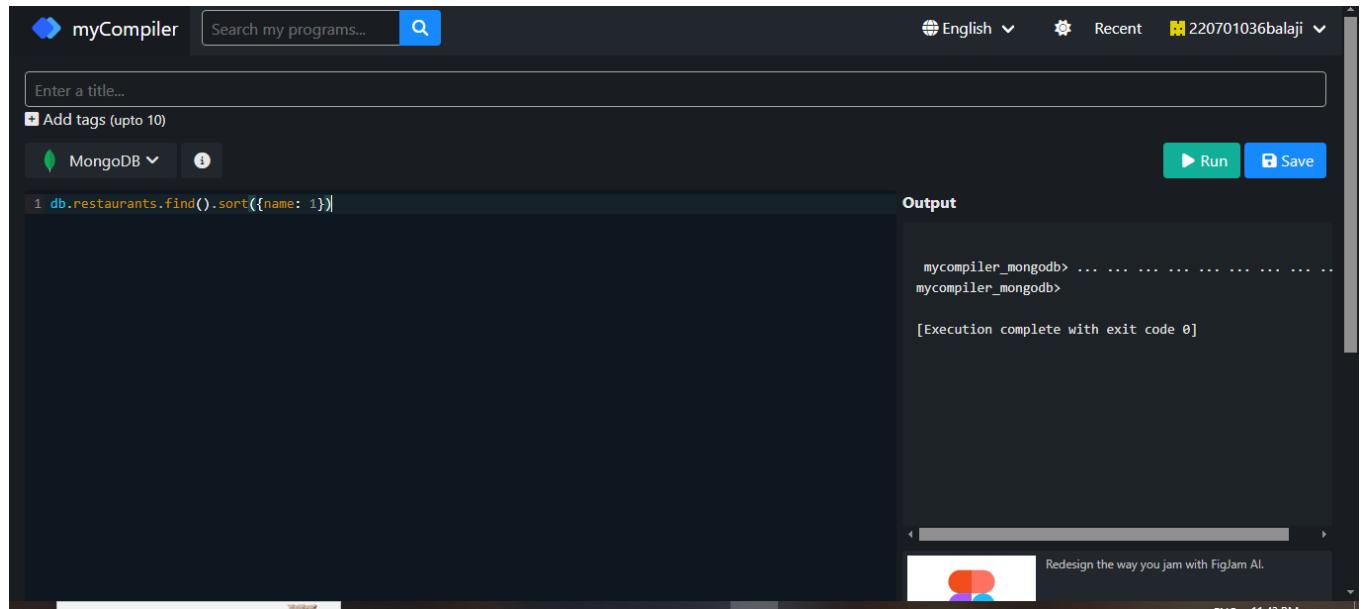
A watermark for FigJam AI is visible at the bottom of the interface.

5.)Write a MongoDB query to arrange the name of the restaurants in ascending order along with all the columns.

QUERY:

```
db.restaurants.find({}, { _id: 0 }).sort({ name: 1 });
```

OUTPUT:



The screenshot shows the myCompiler application interface. In the top bar, there is a search bar labeled "Search my programs..." and a magnifying glass icon. On the right side of the top bar, there are language settings ("English"), recent projects ("Recent"), and a user profile ("220701036balaji"). Below the top bar, there is a toolbar with a title input field ("Enter a title..."), a "Add tags (upto 10)" button, a dropdown menu set to "MongoDB", and two buttons: "Run" and "Save". The main area contains a code editor with the following MongoDB query:

```
1 db.restaurants.find().sort({name: 1})
```

To the right of the code editor is an "Output" panel. The output shows the command being run and its result:

```
mycompiler_mongodb> ... . . . . .  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

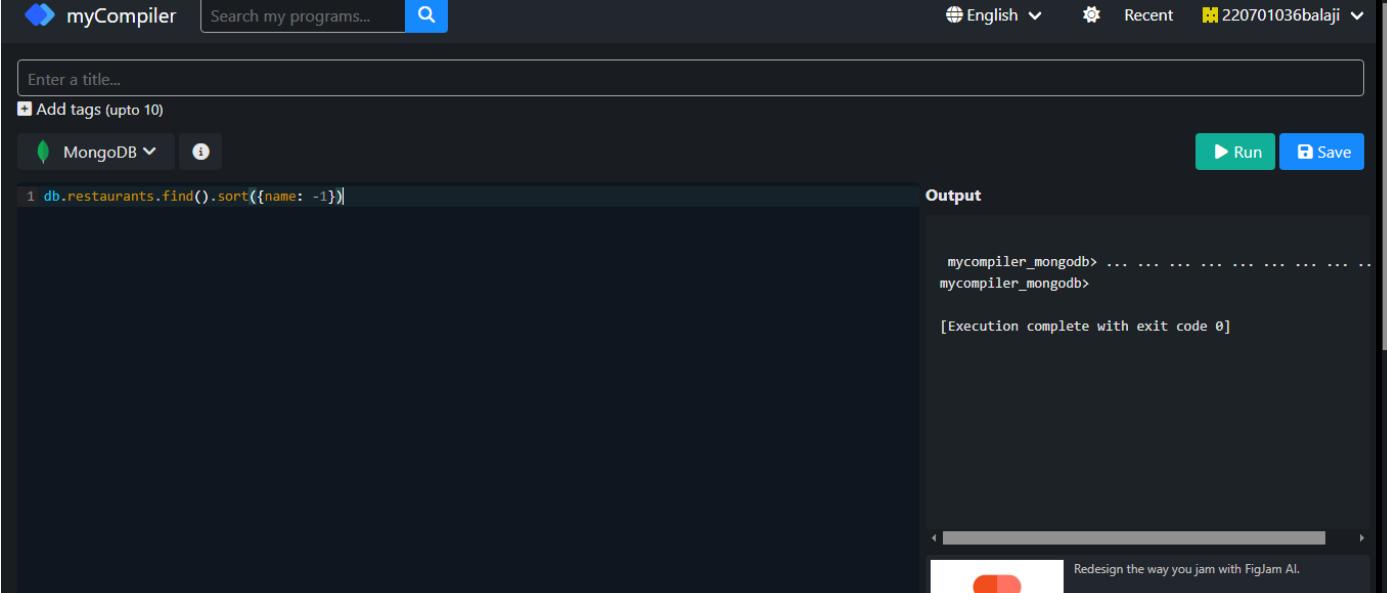
At the bottom of the screen, there is a small advertisement for FigJam AI.

6.)Write a MongoDB query to arrange the name of the restaurants in descending along with all the columns.

QUERY:

```
db.restaurants.find({}, { _id: 0 }).sort({ name: -1 })
```

OUTPUT:



The screenshot shows the myCompiler interface. On the left, there's a code editor window with the following content:

```
1 db.restaurants.find().sort({name: -1})
```

On the right, there's an "Output" window displaying the results of the MongoDB command:

```
mycompiler_mongodb> ... . . . . . . . . . . . .  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

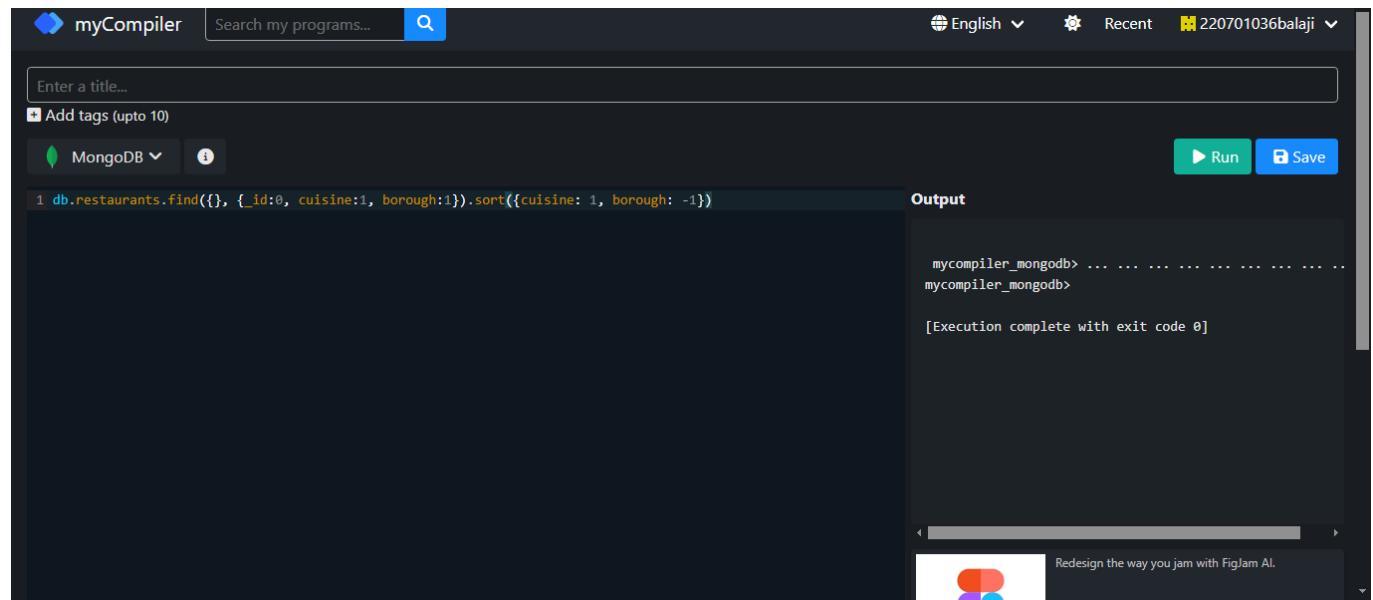
At the bottom of the interface, there's a watermark that says "Redesign the way you jam with FigJam AI." and a small FigJam logo.

7.) Write a MongoDB query to arrange the name of the cuisine in ascending order and for that same cuisine borough should be in descending order.

QUERY:

```
db.restaurants.find({}, { _id: 0 }).sort({ cuisine: 1, borough: -1 })
```

OUTPUT:



The screenshot shows the myCompiler interface. In the top bar, there are tabs for "myCompiler" and "Search my programs...", along with a search icon. On the right, there are language selection ("English"), recent projects ("Recent"), and user account ("220701036balaji"). Below the bar, there's a title input field ("Enter a title...") and a "Add tags (upto 10)" button. A dropdown menu shows "MongoDB" is selected. On the left, a code editor window contains the following MongoDB query:

```
1 db.restaurants.find({}, { _id:0, cuisine:1, borough:-1 }).sort({cuisine: 1, borough: -1})
```

To the right of the code editor is an "Output" panel. It displays the command-line interface interaction:

```
mycompiler_mongodb> ... ... ... ...
mycompiler_mongodb>
[Execution complete with exit code 0]
```

At the bottom of the interface, there's a watermark for FigJam AI.

8.) Write a MongoDB query to know whether all the addresses contains the street or not.

QUERY:

```
db.restaurants.find({ "address.street": { $exists: true, $ne: "" } })
```

OUTPUT:

The screenshot shows the myCompiler interface. At the top, there's a search bar for programs and a language dropdown set to English. Below the search bar, there's a title input field and a checkbox for adding tags. A MongoDB dropdown is selected. On the left, a code editor window displays the following MongoDB query:

```
1 db.restaurants.find({ "address.street": { $exists: true, $ne: "" } }).count() == db.restaurants.count()
```

To the right of the code editor is an "Output" window. It shows the command being run and the resulting output from the MongoDB shell:

```
mycompiler_mongodb> ...  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

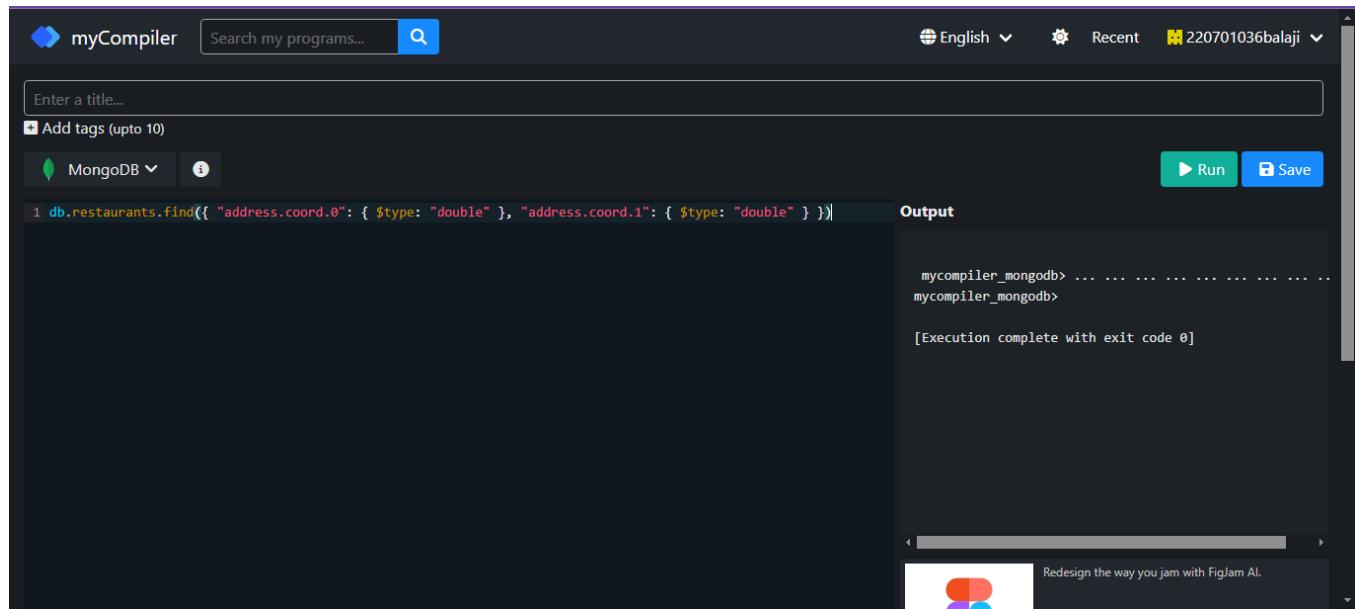
At the bottom right of the interface, there's a watermark for FigJam AI.

9.) Write a MongoDB query which will select all documents in the restaurants collection where the coord field value is Double.

QUERY:

```
db.restaurants.find({ "address.coord": { $elemMatch: { $type: "double" } } })
```

OUTPUT:



The screenshot shows the myCompiler interface. In the top left, there's a logo and the text "myCompiler". A search bar says "Search my programs..." with a magnifying glass icon. On the right, there are language selection ("English"), recent projects ("Recent"), and user information ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title...". Underneath it is a checkbox for "Add tags (upto 10)" and a dropdown menu set to "MongoDB". To the right are "Run" and "Save" buttons. The main area contains a code editor with the following query:

```
1 db.restaurants.find({ "address.coord.0": { $type: "double" }, "address.coord.1": { $type: "double" } })
```

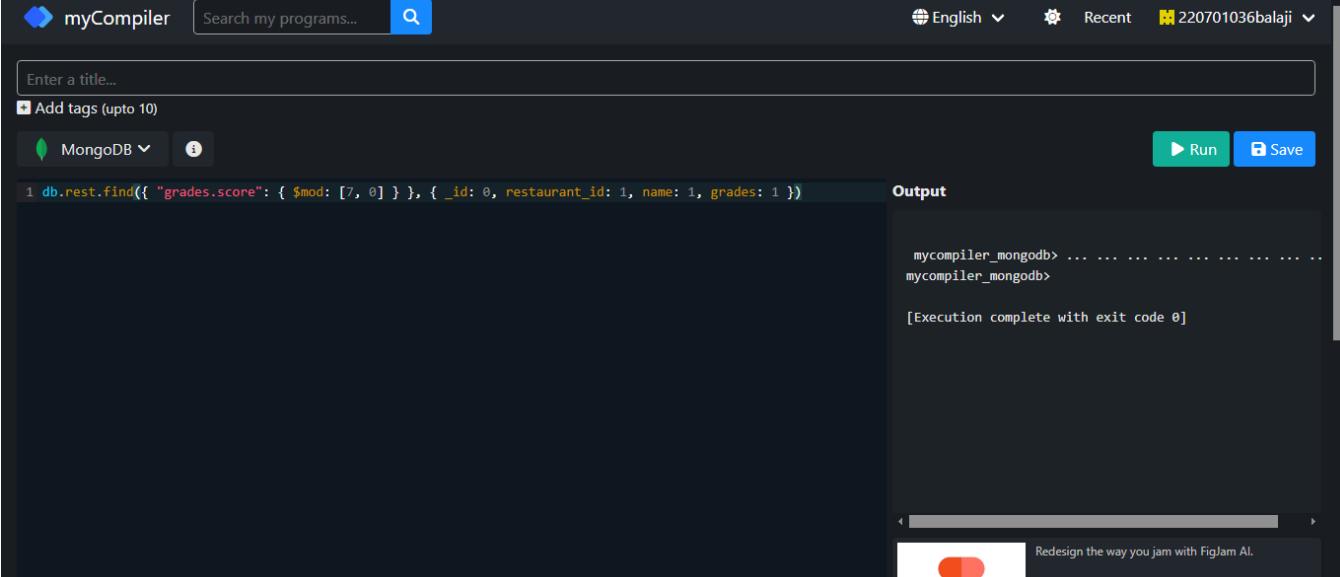
To the right of the code editor is an "Output" panel. It shows the command prompt "mycompiler_mongodb>" followed by "[Execution complete with exit code 0]". At the bottom of the output panel, there's a small advertisement for FigJam AI.

10. Write a MongoDB query which will select the restaurant Id, name and grades for those restaurants which returns 0 as a remainder after dividing the score by 7.

QUERY:

```
db.restaurants.find({ "grades.score": { $mod: [7, 0] } }, { restaurant_id: 1, name: 1, grades: 1 });
```

OUTPUT:



The screenshot shows the myCompiler interface. In the top bar, there is a logo, a search bar with placeholder text 'Search my programs...', and a magnifying glass icon. On the right side of the top bar, there are language selection ('English'), recent projects ('Recent'), and user account ('220701036balaji') dropdowns. Below the top bar, there is a toolbar with a title input field ('Enter a title...'), a 'Add tags (upto 10)' button, a MongoDB dropdown, and two small icons. To the right of the toolbar are 'Run' and 'Save' buttons. The main area contains a code editor with the following MongoDB query:

```
1 db.restaurants.find({ "grades.score": { $mod: [7, 0] } }, { _id: 0, restaurant_id: 1, name: 1, grades: 1 })
```

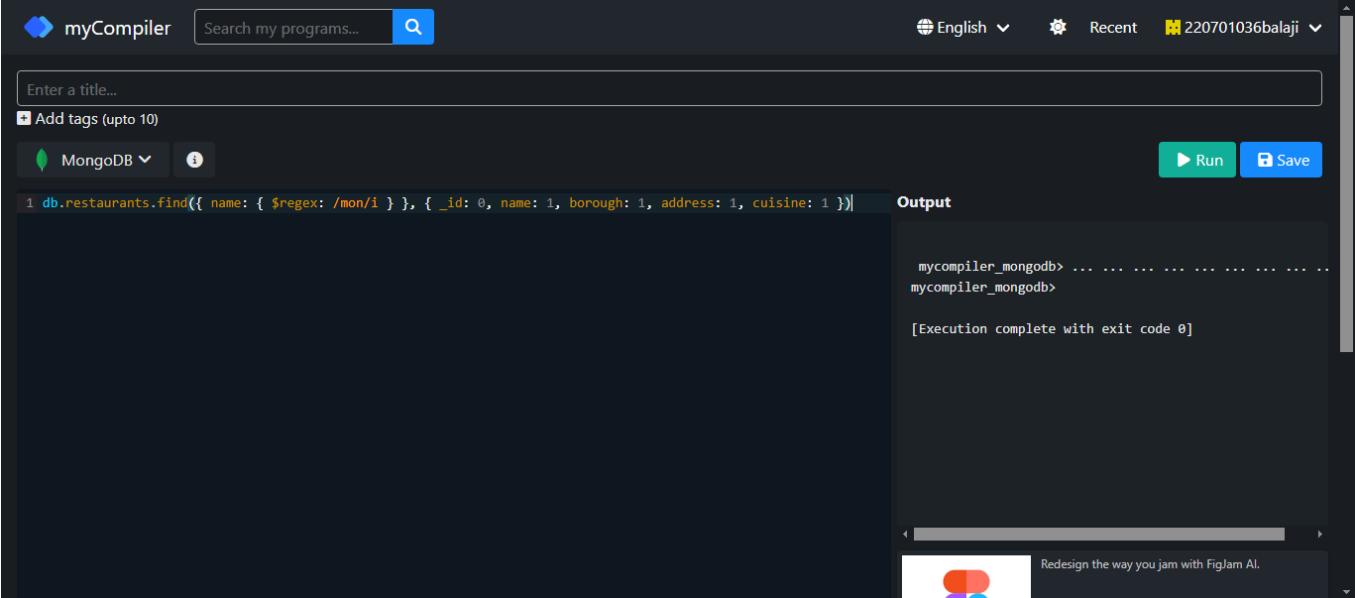
To the right of the code editor is an 'Output' panel. It displays the command prompt 'mycompiler_mongodb> ...' followed by the output of the query: 'mycompiler_mongodb> [Execution complete with exit code 0]'. At the bottom of the interface, there is a watermark for FigJam AI.

11. Write a MongoDB query to find the restaurant name, borough, longitude and attitude and cuisine for those restaurants which contains 'mon' as three letters somewhere in its name.

QUERY:

```
db.restaurants.find({ name: /mon/i }, { name: 1, borough: 1, "address.coord": 1, cuisine: 1 })
```

OUTPUT:



The screenshot shows the myCompiler interface. At the top, there's a search bar for programs and a language dropdown set to English. Below the search bar, there's a text input field for titles and a checkbox for adding tags. A MongoDB icon is present, along with a dropdown menu and a help icon. On the right, there are 'Run' and 'Save' buttons. The main area contains a code editor with the following MongoDB query:

```
1 db.restaurants.find({ name: { $regex: /mon/i } }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })|
```

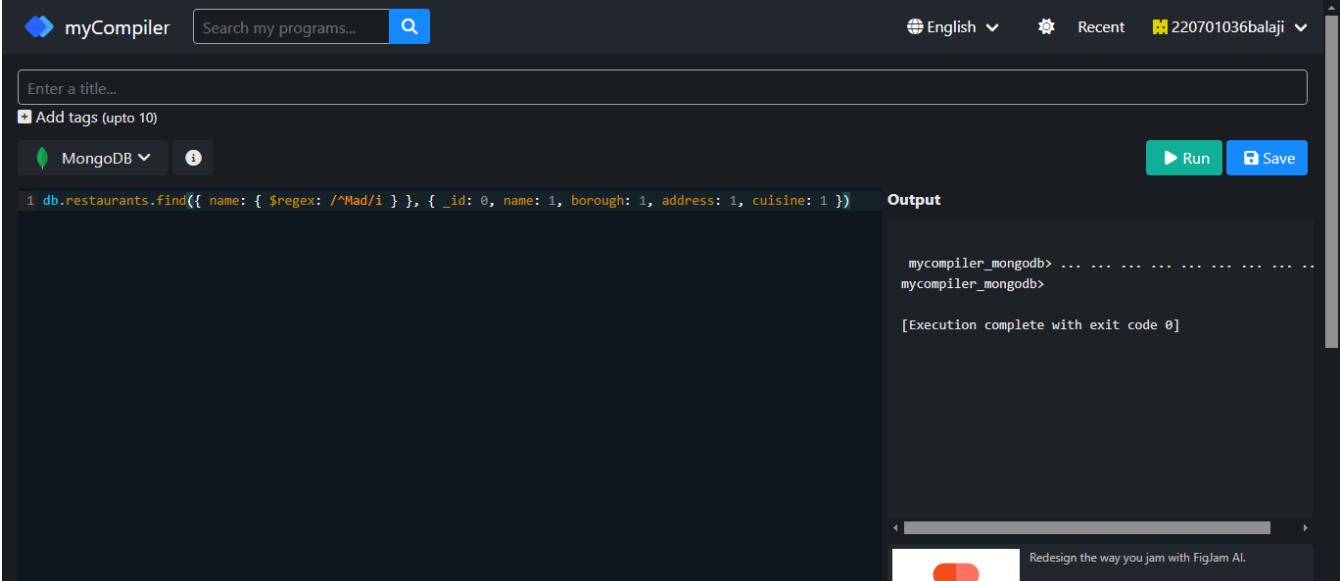
Below the code editor is an 'Output' panel. It displays the command prompt 'mycompiler_mongodb> ...' followed by '[Execution complete with exit code 0]'. There's also a small advertisement for FigJam AI at the bottom.

12. Write a MongoDB query to find the restaurant name, borough, longitude and latitude and cuisine for those restaurants which contain 'Mad' as first three letters of its name.

QUERY:

```
db.restaurants.find({ name: /^Mad/i }, { name: 1, borough: 1, "address.coord": 1, cuisine: 1 })
```

OUTPUT:



The screenshot shows the myCompiler interface. In the top left, it says "myCompiler". There is a search bar "Search my programs..." with a magnifying glass icon. On the right, there are language selection ("English"), recent projects ("Recent"), and a user ID ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title...". Underneath it is a checkbox "Add tags (upto 10)". To the right of the input fields are two buttons: "Run" (green) and "Save" (blue). The main area contains a code editor with the following MongoDB query:

```
1 db.restaurants.find({ name: { $regex: /^Mad/i } }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })
```

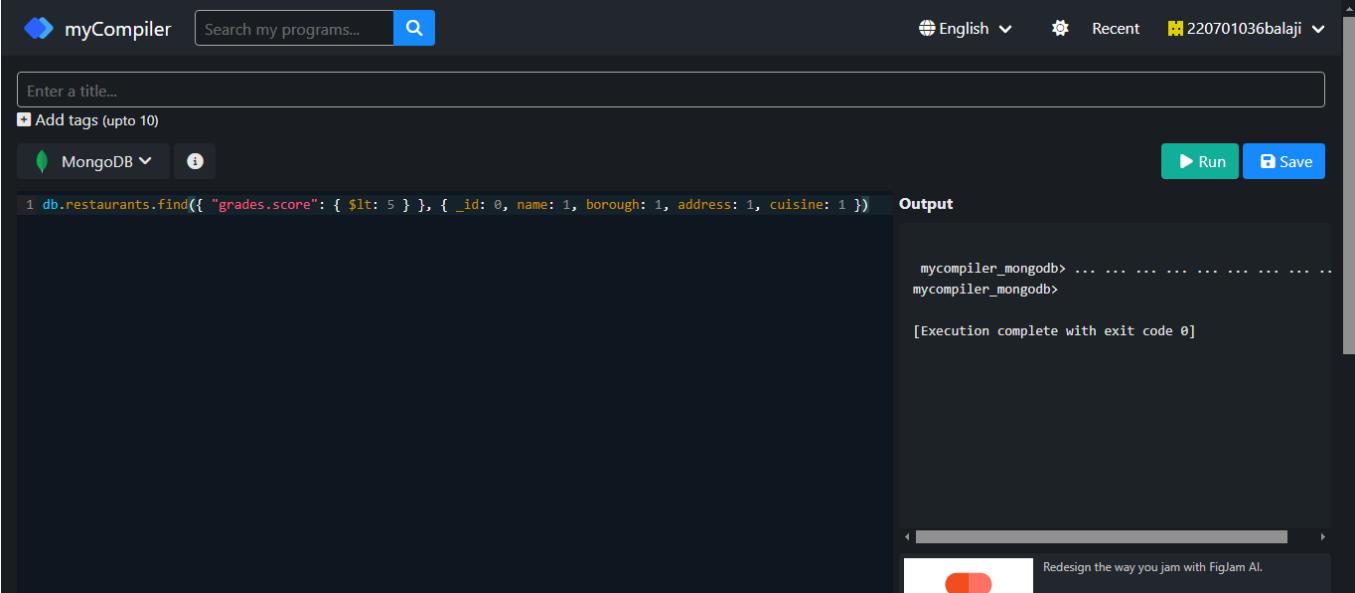
To the right of the code editor is an "Output" panel. It shows the command "mycompiler_mongodb>" followed by "mycompiler_mongodb>". Below that is the message "[Execution complete with exit code 0]". At the bottom of the output panel, there is a small advertisement for FigJam AI.

13. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5.

QUERY:

```
db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } } })
```

OUTPUT:



The screenshot shows the myCompiler interface. In the top left, there's a logo and the text "myCompiler". A search bar says "Search my programs..." with a magnifying glass icon. On the right, there are language selection ("English"), recent projects ("Recent"), and user information ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title..." and a "Add tags (upto 10)" button. To the right of the input field are "MongoDB" and "Run" buttons. The main area contains a code editor with the following query:

```
1 db.restaurants.find({ "grades.score": { $lt: 5 } }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })
```

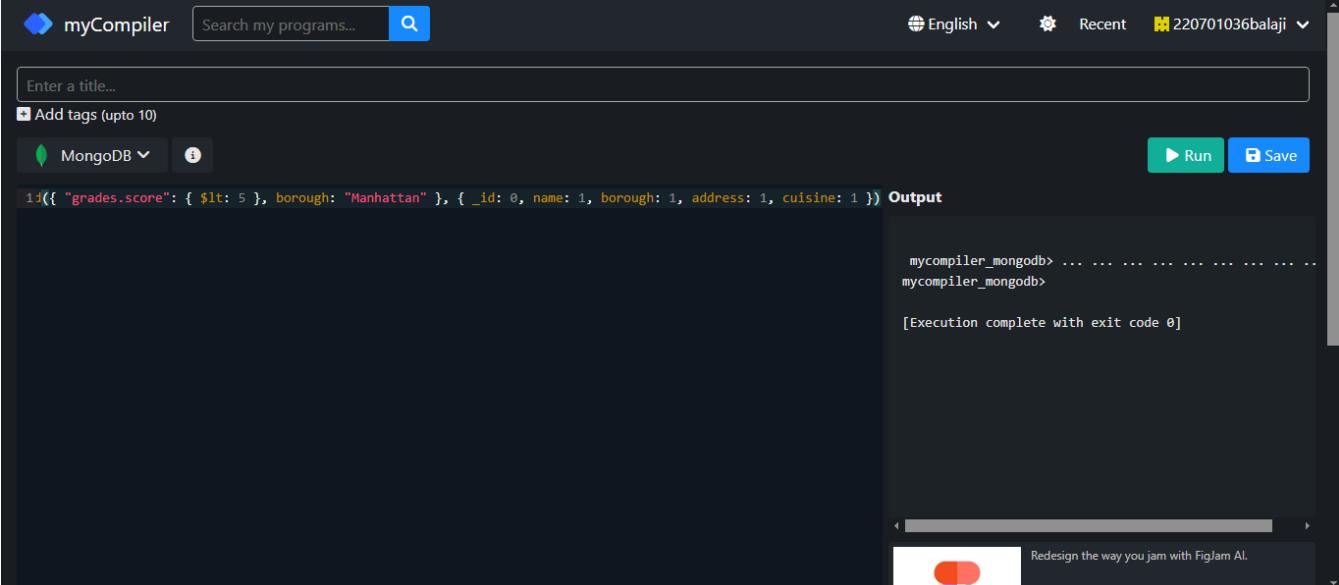
To the right of the code editor is an "Output" panel. It shows the command prompt "mycompiler_mongodb>" followed by "mycompiler_mongodb>". Below that is the message "[Execution complete with exit code 0]". At the bottom of the interface, there's a watermark for FigJam AI.

14. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5 and that are located in the borough of Manhattan.

QUERY:

```
db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } }, "borough": "Manhattan" })
```

OUTPUT:



The screenshot shows the myCompiler interface. At the top, there's a search bar for programs and a language dropdown set to MongoDB. Below the search bar is a text input field with placeholder text 'Enter a title...' and a 'Add tags (upto 10)' button. To the right of the input field are 'Run' and 'Save' buttons. The main area contains a code editor with the following MongoDB query:

```
1d({ "grades.score": { $lt: 5 }, borough: "Manhattan" }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })
```

Below the code editor is an 'Output' panel. The output shows the command being run:

```
mycompiler_mongodb> 1d({ "grades.score": { $lt: 5 }, borough: "Manhattan" }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })
```

and the response:

```
mycompiler_mongodb> .....  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

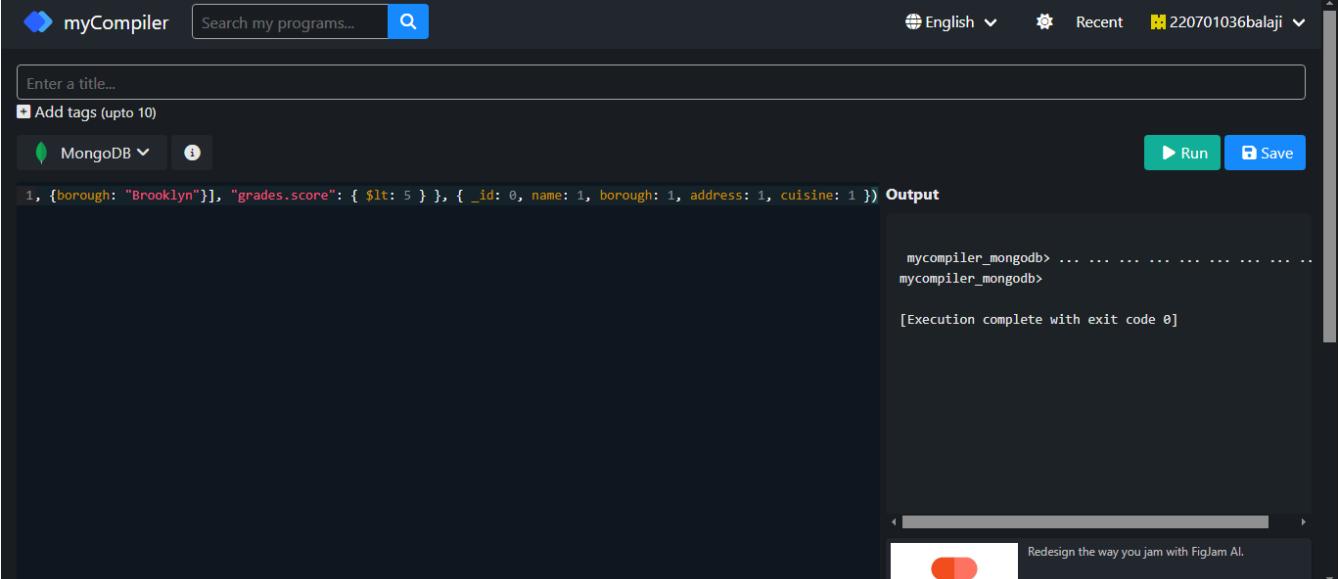
At the bottom of the interface, there's a watermark for FigJam AI.

15. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5 and that are located in the borough of Manhattan or Brooklyn.

QUERY:

```
db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } }, $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }] })
```

OUTPUT:



The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a "Run" button. Below the search bar, there's a title input field ("Enter a title...") and a "Add tags (upto 10)" button. On the left, there's a dropdown menu set to "MongoDB" and a help icon. On the right, there are "Run" and "Save" buttons. The main area contains a code editor with the following MongoDB query:

```
1, {borough: "Brooklyn"}], "grades.score": { $lt: 5 } }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 }) Output
```

Below the code editor is a terminal window showing the output of the query execution:

```
mycompiler_mongodb> ... ... ... ... ...
mycompiler_mongodb>
[Execution complete with exit code 0]
```

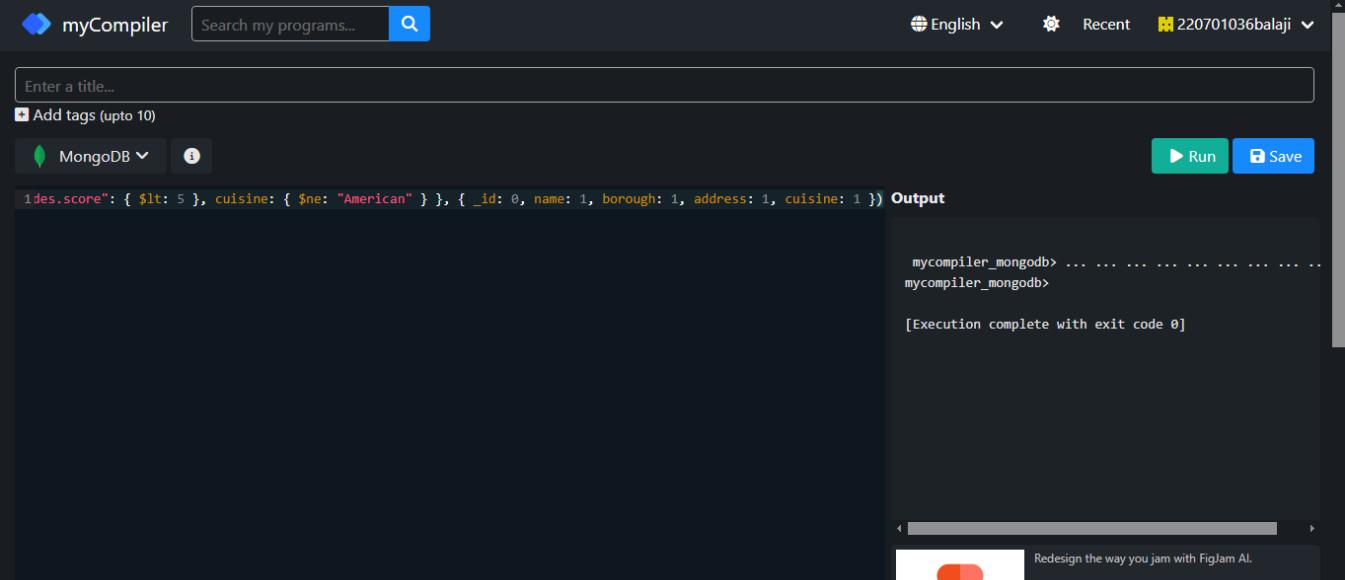
At the bottom right of the terminal window, there's a watermark: "Redesign the way you jam with FigJam AI."

16. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5 and that are located in the borough of Manhattan or Brooklyn, and their cuisine is not American.

QUERY:

```
db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } }, $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }], "cuisine": { $ne: "American" } })
```

OUTPUT:



The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a magnifying glass icon. On the right, there are language selection ("English"), recent projects ("Recent"), and user information ("220701036balaji"). Below the search bar, there's a title input field ("Enter a title...") and a checkbox for "Add tags (upto 10)". A dropdown menu shows "MongoDB". The main area contains the MongoDB query:

```
1des.score": { $lt: 5 }, cuisine: { $ne: "American" }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 }) Output
```

Below the query, the terminal window shows the command being run and the output:

```
mycompiler_mongodb> ... . . . . . . . . .  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

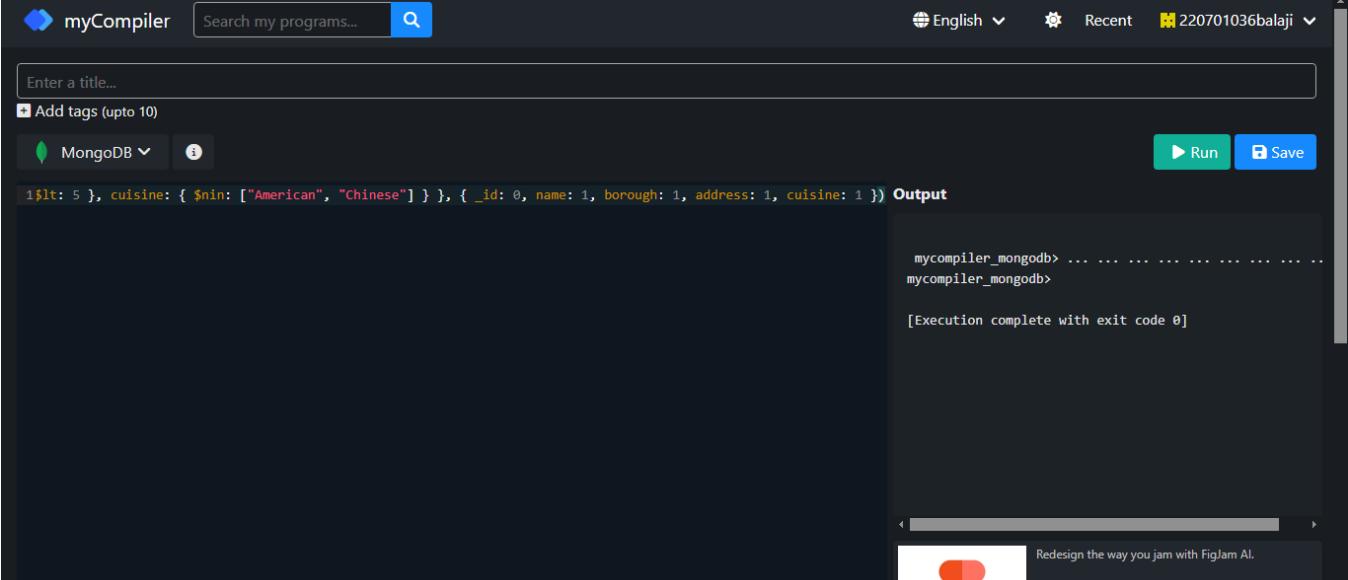
A small watermark for FigJam AI is visible in the bottom right corner of the interface.

17. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5 and that are located in the borough of Manhattan or Brooklyn, and their cuisine is not American or Chinese.

QUERY:

```
db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } }, $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }], "cuisine": { $nin: ["American", "Chinese"] } })
```

OUTPUT:



The screenshot shows the myCompiler interface. In the top bar, there's a logo, a search bar with placeholder 'Search my programs...', and user information like 'English' and 'Recent'. Below the search bar is a text input field with placeholder 'Enter a title...' and a checkbox for 'Add tags (upto 10)'. To the right of the input field are buttons for 'Run' and 'Save'. The main area contains a code editor with the following MongoDB query:

```
1{$lt: 5}, cuisine: { $nin: ["American", "Chinese"] }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 }) Output
```

Below the code editor is a terminal window showing the output of the query execution:

```
mycompiler_mongodb> ... ... ... ... ...
mycompiler_mongodb>
[Execution complete with exit code 0]
```

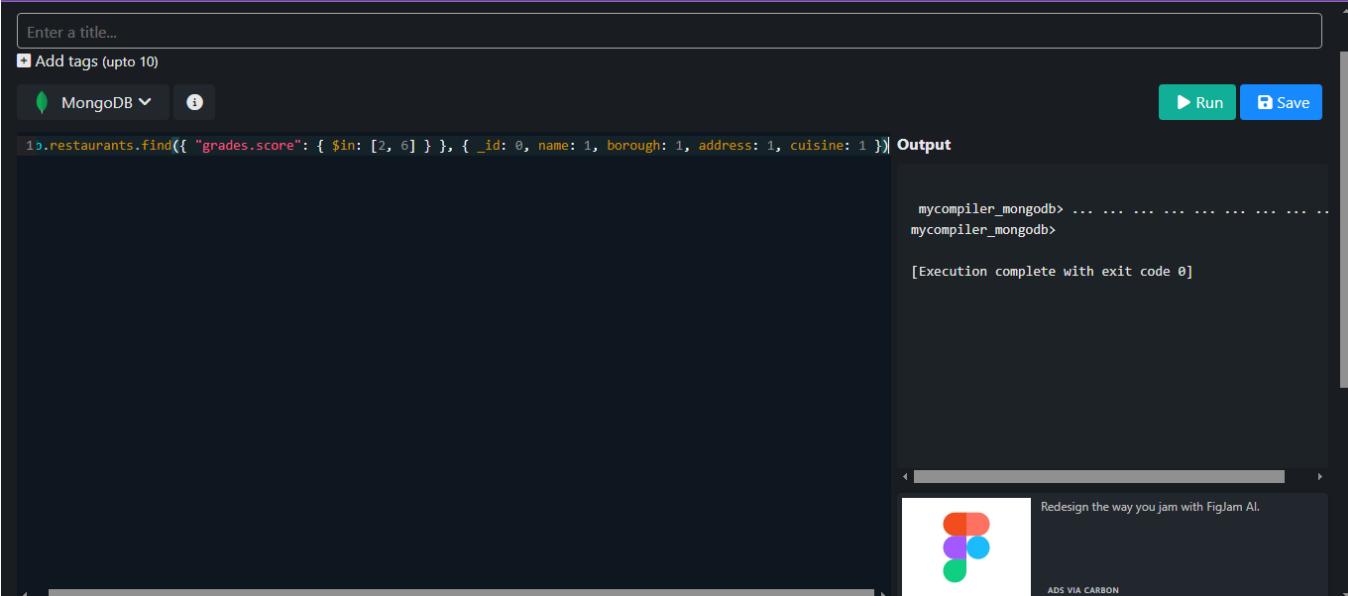
At the bottom of the interface, there's a watermark for FigJam AI.

18. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6.

QUERY:

```
db.restaurants.find({ $and: [{ "grades.grade": "A", "grades.score": 2 }, { "grades.grade": "A", "grades.score": 6 } ] })
```

OUTPUT:



The screenshot shows a MongoDB shell interface. At the top, there is a search bar labeled "Enter a title..." and a checkbox for "Add tags (upto 10)". Below the search bar, there is a dropdown menu set to "MongoDB" and a help icon. On the right side, there are two buttons: "Run" (green) and "Save" (blue). The main area contains the MongoDB command:

```
db.restaurants.find({ "grades.score": { $in: [2, 6] } }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })
```

Below the command, the output window shows the results of the query:

```
mycompiler_mongodb> ... ... ... ...
mycompiler_mongodb>
[Execution complete with exit code 0]
```

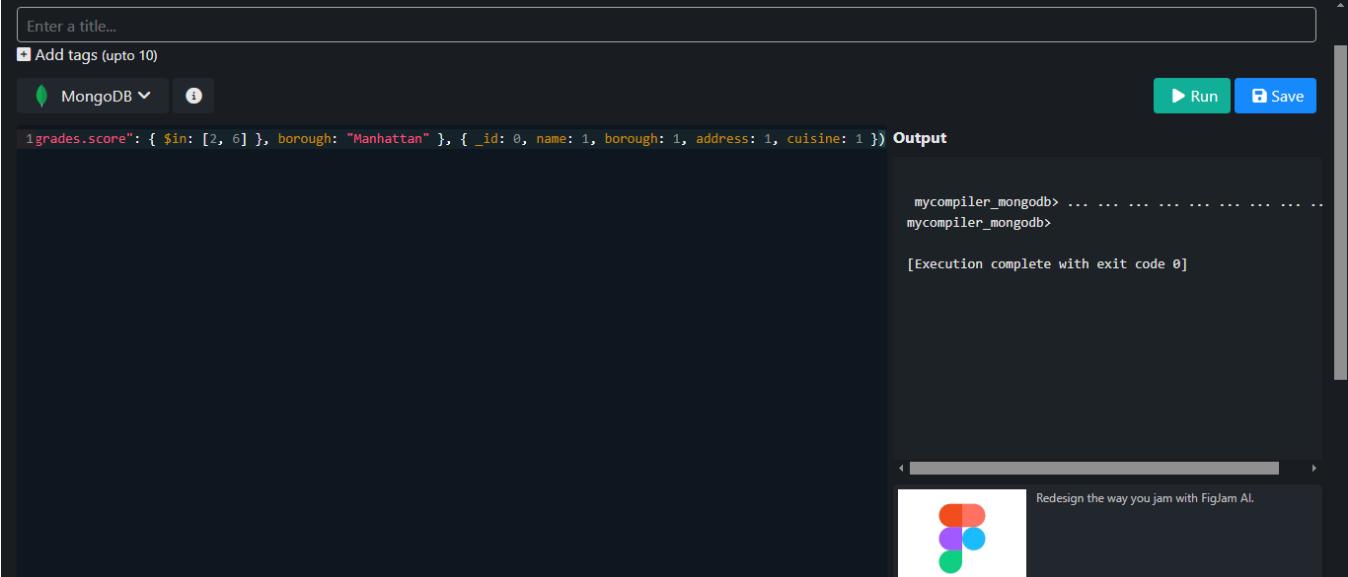
At the bottom right of the interface, there is an advertisement for FigJam AI.

19. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6 and are located in the borough of Manhattan.

QUERY:

```
db.restaurants.find({ $and: [{ "grades.grade": "A", "grades.score": 2 }, { "grades.grade": "A", "grades.score": 6 }], "borough": "Manhattan" })
```

OUTPUT:



The screenshot shows a MongoDB query editor interface. At the top, there is a search bar labeled "Enter a title..." and a button "Add tags (upto 10)". Below the search bar, there are two dropdown menus: "MongoDB" and "i". On the right side, there are "Run" and "Save" buttons. The main area displays the MongoDB command and its output. The command is:

```
1grades.score": { $in: [2, 6] }, borough: "Manhattan" }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 }) Output
```

The output shows the results of the query execution:

```
mycompiler_mongodb> .....  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

In the bottom right corner of the editor window, there is an advertisement for FigJam AI with the text "Redesign the way you jam with FigJam AI." and "ADS VIA CARBON".

20. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6 and are located in the borough of Manhattan or Brooklyn.

QUERY:

```
db.restaurants.find({ $and: [{ "grades.grade": "A", "grades.score": 2 }, { "grades.grade": "A", "grades.score": 6 }], $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }] })
```

OUTPUT:

The screenshot shows a MongoDB shell interface. At the top, there is a search bar labeled "Enter a title..." and a button for "Add tags (upto 10)". Below the search bar, there are two dropdown menus: one set to "MongoDB" and another with a question mark icon. To the right of these are "Run" and "Save" buttons. The main area contains a code input field with the following query:

```
1{borough: "Brooklyn"}, "grades.score": { $in: [2, 6] } }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 }}| Output
```

Below the code input, the output window shows the results of the query execution:

```
mycompiler_mongodb> ... ... ... ... ...
mycompiler_mongodb>
[Execution complete with exit code 0]
```

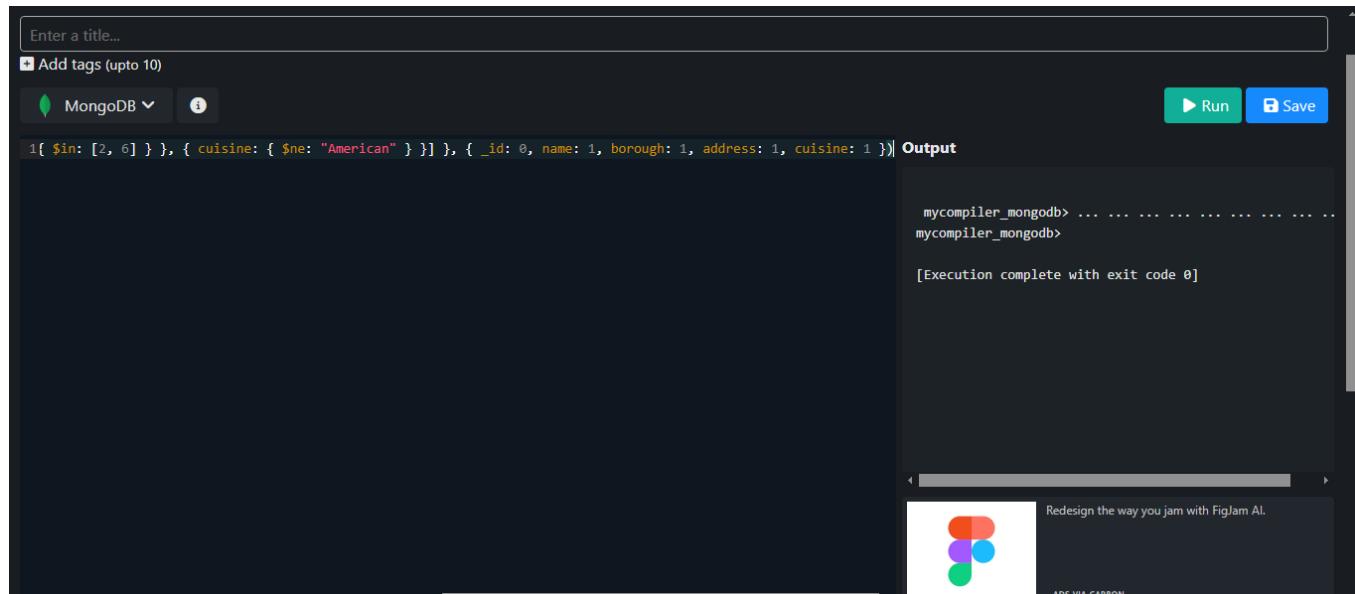
At the bottom of the interface, there is an advertisement for FigJam AI.

21. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6 and are located in the borough of Manhattan or Brooklyn, and their cuisine is not American.

QUERY:

```
db.restaurants.find({ $and: [{ "grades.grade": "A", "grades.score": 2 }, { "grades.grade": "A", "grades.score": 6 }], $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }], "cuisine": { $ne: "American" } })
```

OUTPUT:



The screenshot shows a MongoDB query editor interface. At the top, there is a search bar labeled "Enter a title..." and a button "Add tags (upto 10)". Below the search bar, there are two dropdown menus: "MongoDB" and "Run". To the right of the "Run" button is a "Save" button. The main area contains a code editor with the following query:

```
1{ $in: [2, 6] }, { cuisine: { $ne: "American" } }], { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })| Output
```

Below the code editor, the output window displays the results of the query execution:

```
mycompiler_mongodb> ... ... ... ... ...
mycompiler_mongodb>
[Execution complete with exit code 0]
```

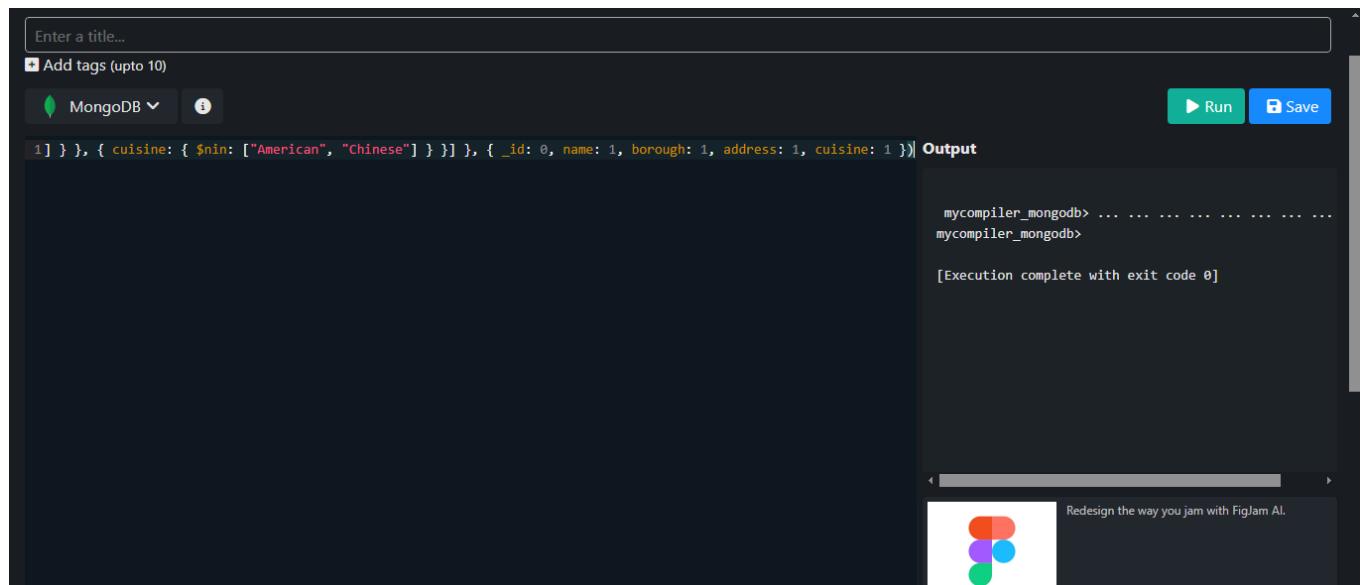
In the bottom right corner of the output window, there is an advertisement for FigJam AI.

22. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6 and are located in the borough of Manhattan or Brooklyn, and their cuisine is not American or Chinese.

QUERY:

```
db.restaurants.find({ $and: [{ "grades.grade": "A", "grades.score": 2 }, { "grades.grade": "A", "grades.score": 6 }], $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }], "cuisine": { $nin: ["American", "Chinese"] } })
```

OUTPUT:



The screenshot shows a MongoDB query editor interface. At the top, there is a search bar labeled "Enter a title...", a "Add tags (upto 10)" button, and a dropdown menu set to "MongoDB". On the right side, there are "Run" and "Save" buttons. Below the interface, the query is displayed in a code editor-like area:

```
1] } }, { cuisine: { $nin: ["American", "Chinese"] } } ] }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 } ] ) | Output
```

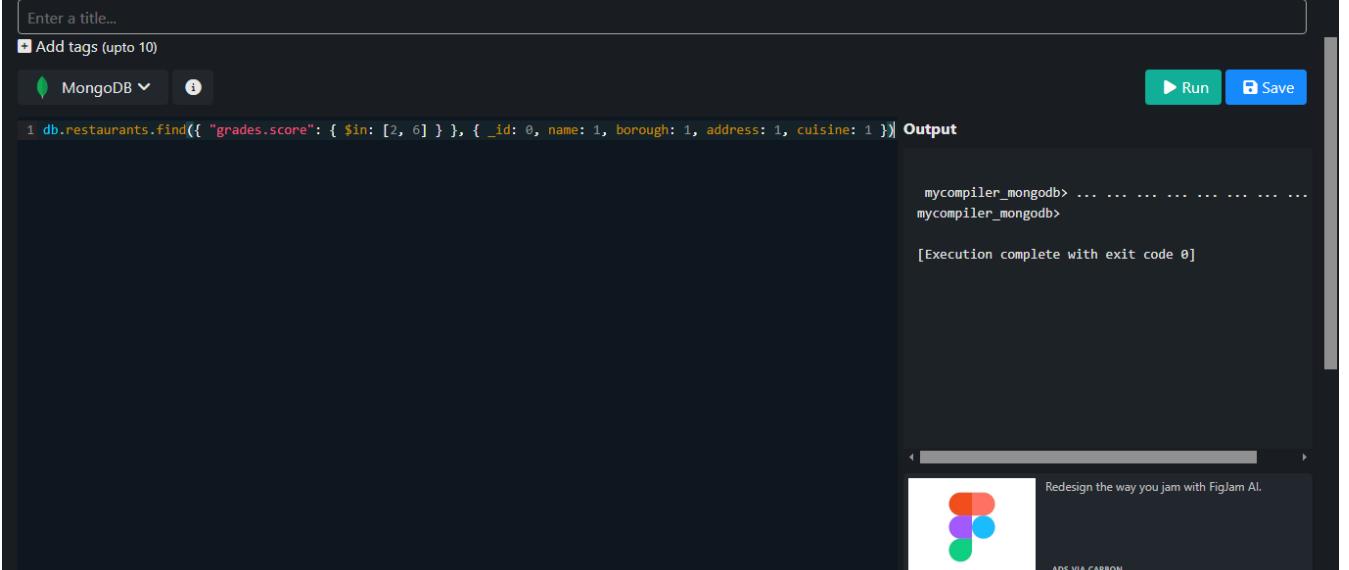
On the right, the "Output" panel shows the command prompt "mycompiler_mongodb>" followed by "[Execution complete with exit code 0]" and a small FigJam AI logo.

23. Write a MongoDB query to find the restaurants that have a grade with a score of 2 or a grade with a score of 6.

QUERY:

```
db.restaurants.find({ $or: [{ "grades.score": 2 }, { "grades.score": 6 }] })
```

OUTPUT:



The screenshot shows a MongoDB shell interface. At the top, there is a search bar labeled "Enter a title..." and a button "+ Add tags (upto 10)". Below the search bar, there are two dropdown menus: "MongoDB" and "Run". A status indicator "1" is shown next to the "Run" button. To the right of the "Run" button is a "Save" button. The main area contains a command line and its output. The command is: `db.restaurants.find({ "grades.score": { $in: [2, 6] } }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })`. The output shows the results of the query execution. The bottom right corner of the interface features an advertisement for FigJam AI.

```
1 db.restaurants.find({ "grades.score": { $in: [2, 6] } }, { _id: 0, name: 1, borough: 1, address: 1, cuisine: 1 })| Output

mycompiler_mongodb> ... . . . . .
mycompiler_mongodb>

[Execution complete with exit code 0]

ADS VIA CARBON
```

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	

MONGO DB

EX.NO:20

DATE: 24 - 5 - 24

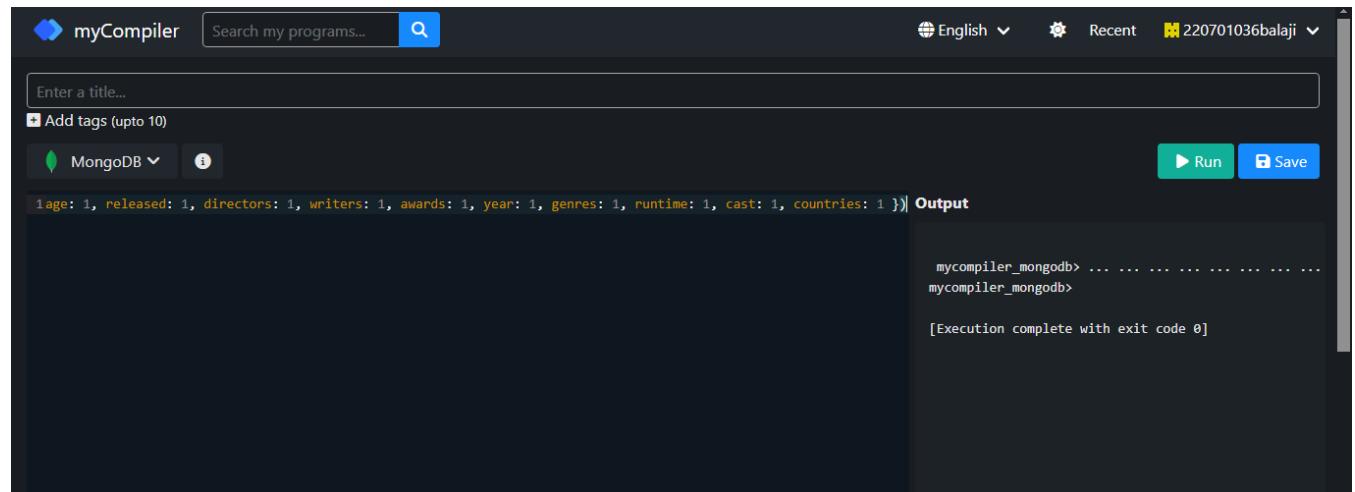
REG.NO: 220701027

1.)Find all movies with full information from the 'movies' collection that released in the year 1893.

QUERY:

```
db.movies.find({ year: 1893 })
```

OUTPUT:



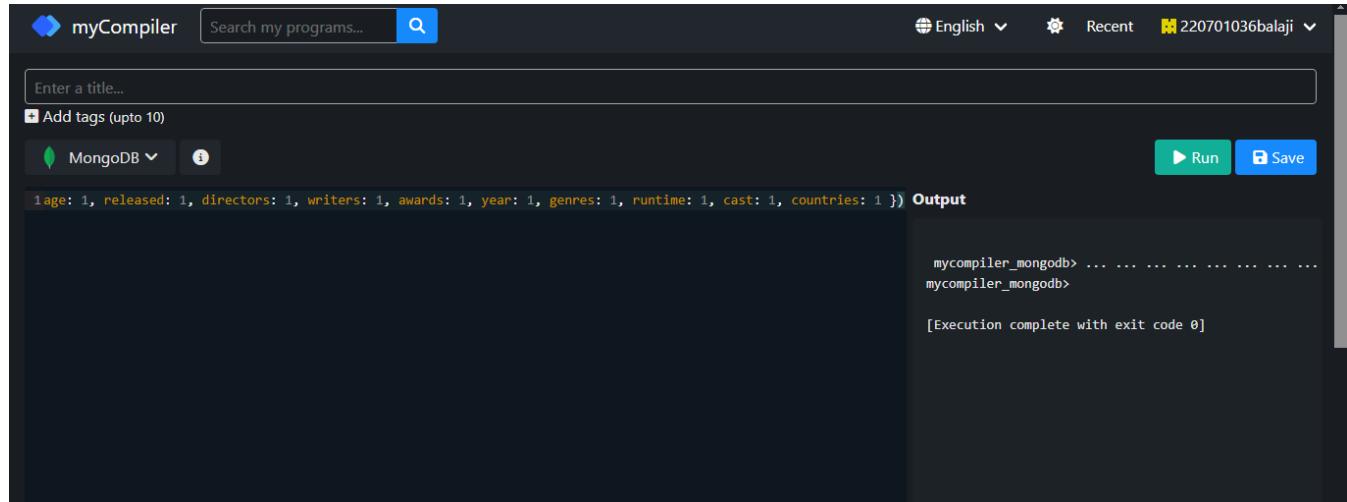
The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a magnifying glass icon. To the right are language selection ("English"), recent projects ("Recent"), and user account ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title..." and a "Add tags (upto 10)" button. On the left, there's a dropdown menu set to "MongoDB" and a help icon. On the right, there are "Run" and "Save" buttons. The main area contains a command-line interface window. The command entered is "db.movies.find({ year: 1893 })| Output". The output shows the results of the query, which is empty in this case, followed by a prompt "mycompiler_mongodb> ...". A note at the bottom right says "[Execution complete with exit code 0]".

2.)Find all movies with full information from the 'movies' collection that have a runtime greater than 120 minutes.

QUERY:

```
db.movies.find({ runtime: { $gt: 120 } })
```

OUTPUT:



The screenshot shows the myCompiler interface. In the top left, it says "myCompiler". There is a search bar "Search my programs..." with a magnifying glass icon. On the right, there are language selection ("English"), recent projects ("Recent"), and user information ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title...". Underneath it is a button "Add tags (upto 10)" with a plus sign icon. To the right of the input fields are two buttons: "Run" (green) and "Save" (blue). Below these buttons is a dropdown menu set to "MongoDB" and an info icon. The main area contains a code editor with the following query:

```
age: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 })
```

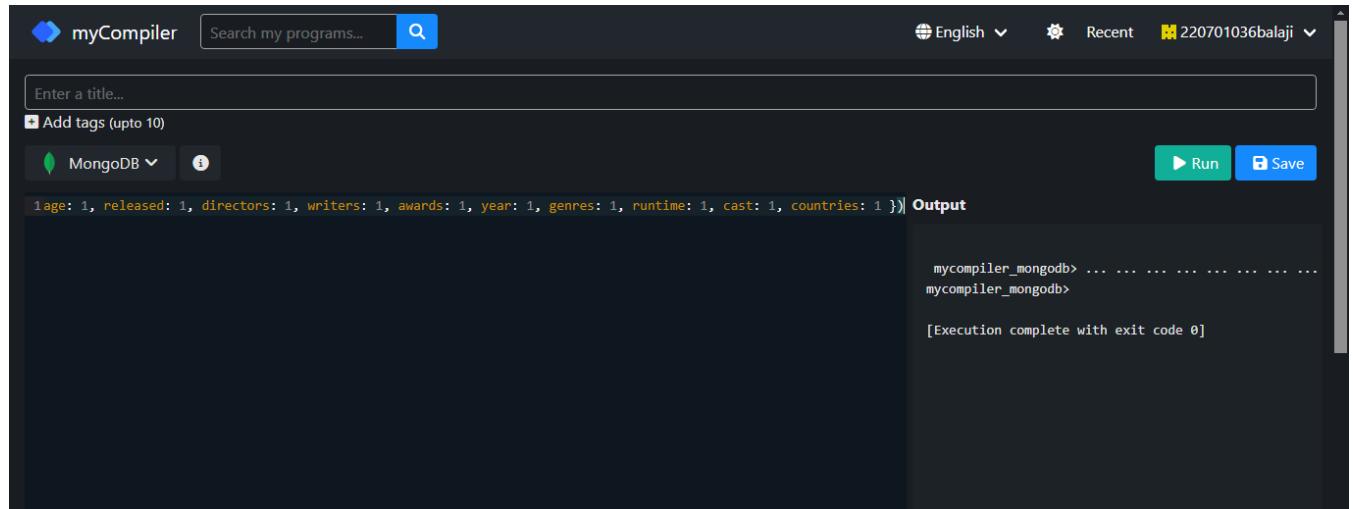
Below the code editor is a "Output" section. It shows the command "mycompiler_mongodb> ...". The output itself is empty, with only "[Execution complete with exit code 0]" visible at the bottom.

3.)Find all movies with full information from the 'movies' collection that have "Short" genre.

QUERY:

```
db.movies.find({ genres: 'Short' })
```

OUTPUT:



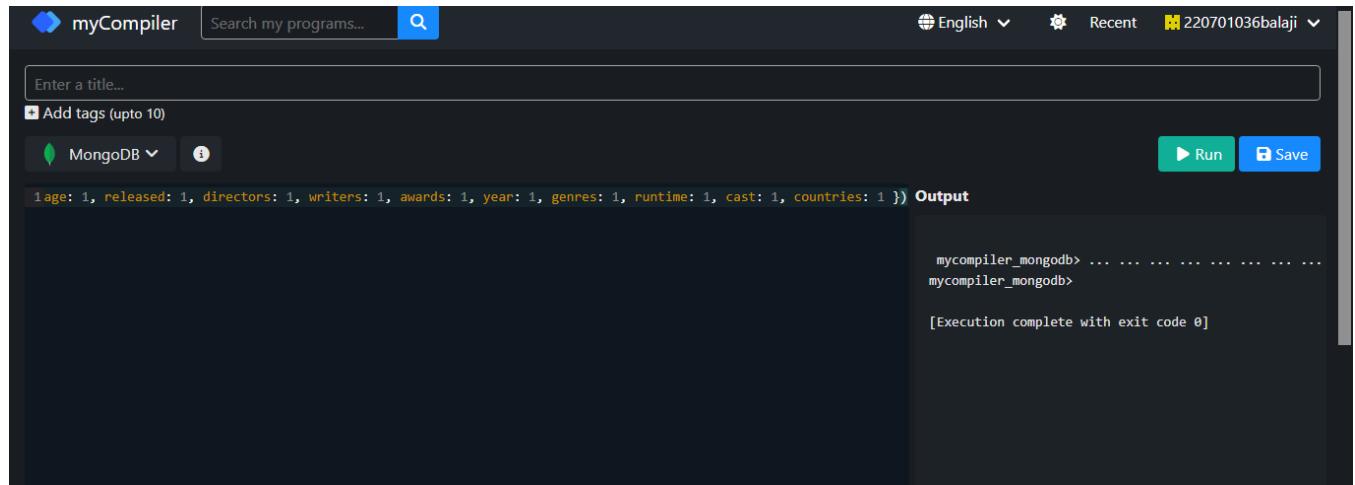
The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a magnifying glass icon. On the right, there are language selection ("English"), recent projects ("Recent"), and user account ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title..." and a "Add tags (upto 10)" button. To the right of the input field are "Run" and "Save" buttons. The main area contains a MongoDB query: `1age: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 })`. To the right of the query is a "Output" section. The output shows the command prompt: "mycompiler_mongodb> ...". It also displays the message "[Execution complete with exit code 0]".

4.) Retrieve all movies from the 'movies' collection that were directed by "William K.L. Dickson" and include complete information for each movie.

QUERY:

```
db.movies.find({ directors: 'William K.L. Dickson' })
```

OUTPUT:



The screenshot shows the 'myCompiler' application interface. At the top, there's a search bar labeled 'Search my programs...' and a magnifying glass icon. On the right side of the header, there are language settings ('English'), recent projects ('Recent'), and a user profile ('220701036balaji'). Below the header, there's a text input field with placeholder 'Enter a title...', a 'Add tags (upto 10)' button, and a dropdown menu set to 'MongoDB'. To the right of these are 'Run' and 'Save' buttons. The main area contains a code editor with the following MongoDB query:

```
age: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 })
```

Below the code editor is a terminal window titled 'Output' showing the command prompt 'mycompiler_mongodb>'. The terminal displays the command and its execution status:

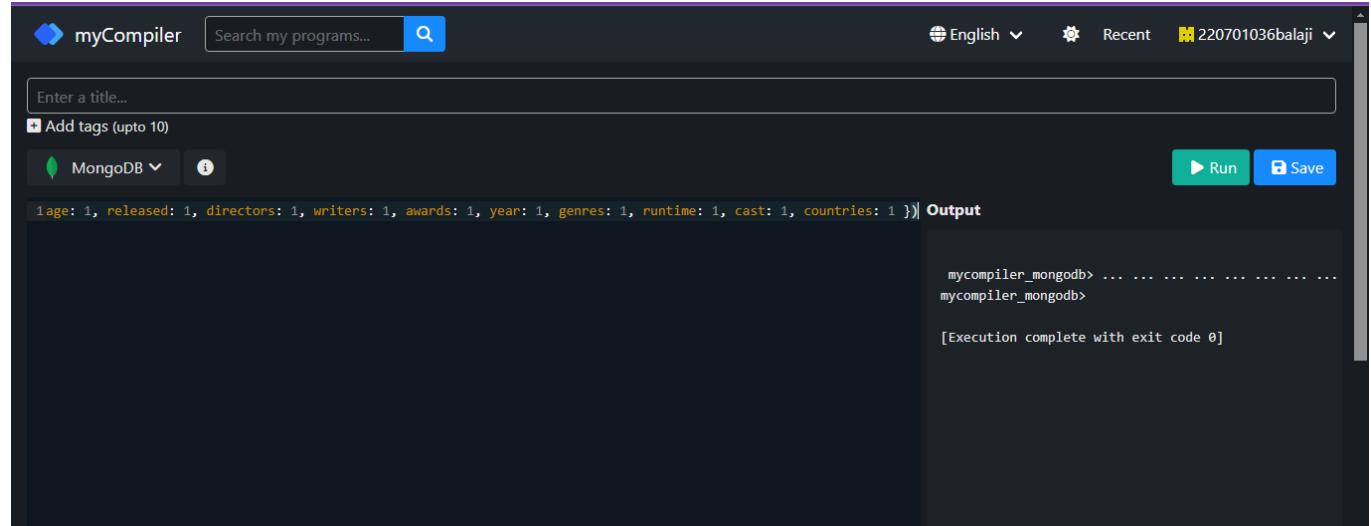
```
mycompiler_mongodb> ... . . . . . . . .  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

5.) Retrieve all movies from the 'movies' collection that were released in the USA and include complete information for each movie.

QUERY:

```
db.movies.find({ countries: 'USA' })
```

OUTPUT:



The screenshot shows the myCompiler web application interface. At the top, there's a navigation bar with the logo 'myCompiler', a search bar 'Search my programs...', and language settings ('English'). Below the header, there's a form with fields for 'Enter a title...' and 'Add tags (upto 10)'. A dropdown menu shows 'MongoDB'. On the right side of the form are 'Run' and 'Save' buttons. The main area contains a code editor with the following MongoDB query:

```
1age: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 })| Output
```

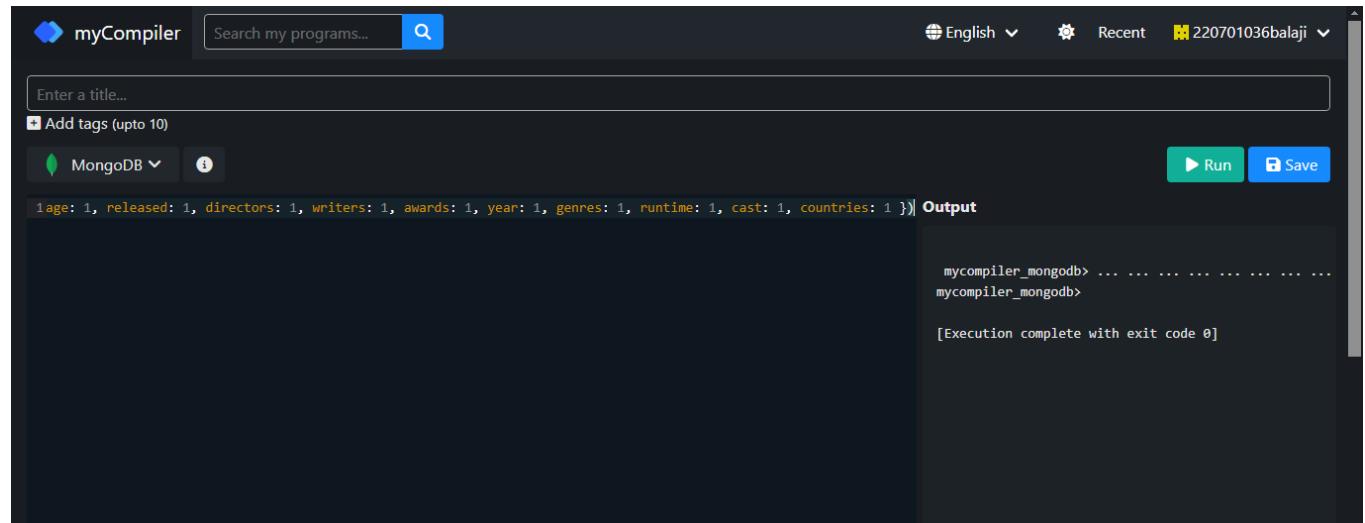
Below the code editor is a terminal window showing the command 'mycompiler_mongodb> ...' followed by '[Execution complete with exit code 0]'. The overall interface is dark-themed.

6.) Retrieve all movies from the 'movies' collection that have complete information and are rated as "UNRATED".

QUERY:

```
db.movies.find({ rated: 'UNRATED' })
```

OUTPUT:



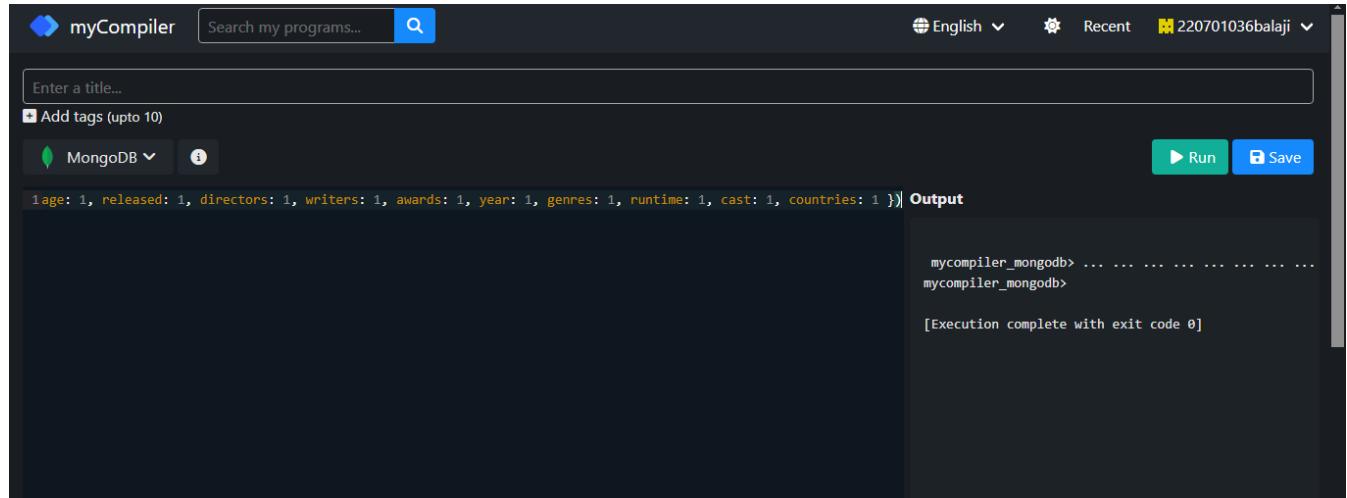
The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a magnifying glass icon. To the right are language selection ("English"), recent projects ("Recent"), and user information ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title...". Underneath it is a checkbox for "Add tags (upto 10)" and a dropdown menu set to "MongoDB". On the far right of the toolbar are "Run" and "Save" buttons. The main area is titled "Output" and contains the MongoDB command: "db.movies.find({ rated: 'UNRATED' })". The output window shows the command being run in the terminal: "mycompiler_mongodb> db.movies.find({ rated: 'UNRATED' })". The terminal then displays the results of the query, which are empty. At the bottom of the output window, a message reads "[Execution complete with exit code 0]".

7.) Retrieve all movies from the 'movies' collection that have complete information and have received more than 1000 votes on IMDb.

QUERY:

```
db.movies.find({ 'imdb.votes': { $gt: 1000 } })
```

OUTPUT:



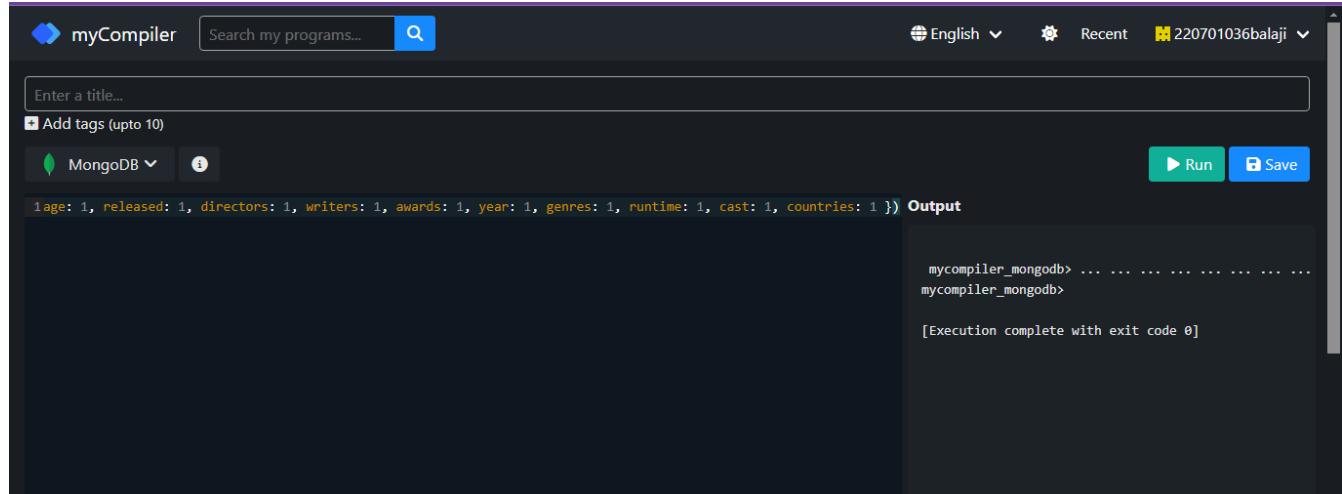
The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a magnifying glass icon. To the right are language selection ("English"), recent projects ("Recent"), and user information ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title...". Underneath it is a button labeled "+ Add tags (upto 10)". On the left, there are two buttons: "MongoDB" with a dropdown arrow and "Run" with an info icon. On the right, there are "Run" and "Save" buttons. In the center, the command entered is: `db.movies.find({ 'imdb.votes': { $gt: 1000 } })`. To the right of the command is a "Output" section. The output shows the command being run: `mycompiler_mongodb> db.movies.find({ 'imdb.votes': { $gt: 1000 } })`, followed by a series of dots indicating progress, and then `[Execution complete with exit code 0]`.

8.) Retrieve all movies from the 'movies' collection that have complete information and have an IMDb rating higher than 7.

QUERY:

```
db.movies.find({ 'imdb.rating': { $gt: 7 } })
```

OUTPUT:



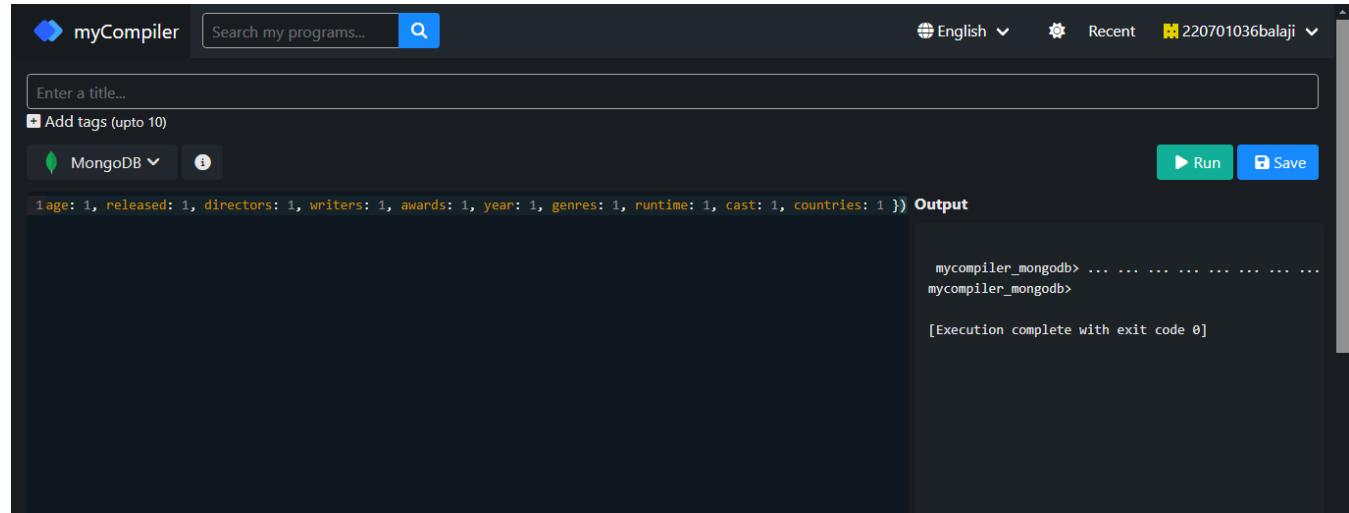
The screenshot shows the myCompiler interface. At the top, there's a search bar for programs and a language selection dropdown set to English. Below the search bar is a text input field labeled "Enter a title...". Underneath it, there's a button for adding tags and a MongoDB connection dropdown currently set to "MongoDB". On the right side of the interface, there are "Run" and "Save" buttons. The main area contains a command-line interface window titled "Output". Inside the "Output" window, the command `db.movies.find({ 'imdb.rating': { $gt: 7 } })` is typed in. The output shows the command being run and completed successfully with the message "[Execution complete with exit code 0]".

9.) Retrieve all movies from the 'movies' collection that have complete information and have a viewer rating higher than 4 on Tomatoes.

QUERY:

```
db.movies.find({ 'tomatoes.viewer.rating': { $gt: 4 } })
```

OUTPUT:



The screenshot shows the myCompiler web application interface. At the top, there's a search bar labeled "Search my programs..." with a magnifying glass icon. To the right are language selection ("English"), recent projects, and user profile ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title...". Underneath it is a "Add tags (upto 10)" button. On the left, there's a dropdown menu set to "MongoDB" and a help icon. On the right, there are "Run" and "Save" buttons. The main area contains a command-line interface window titled "Output". The command entered is "db.movies.find({ 'tomatoes.viewer.rating': { \$gt: 4 } })". The output shows the command being run and completed successfully with exit code 0. The terminal window has a dark background with light-colored text.

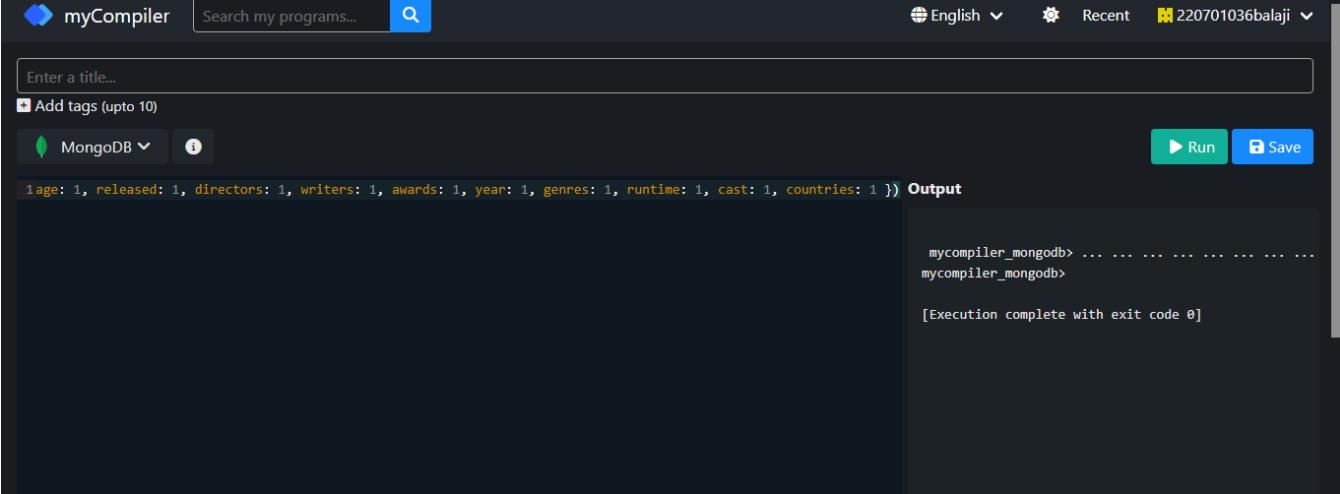
```
1age: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 }) Output
mycompiler_mongodb> ... . . . . .
mycompiler_mongodb>
[Execution complete with exit code 0]
```

10.) Retrieve all movies from the 'movies' collection that have received an award.

QUERY:

```
db.movies.find({ 'awards.wins': { $gt: 0 } })
```

OUTPUT:



The screenshot shows the myCompiler interface. At the top, there's a search bar for programs and a language selector set to English. On the right, there are buttons for Recent and a user profile (220701036balaji). Below the header, there's a text input field with placeholder "Enter a title..." and a "Add tags (upto 10)" button. To the right of the input field are "Run" and "Save" buttons. A dropdown menu is open, showing "MongoDB" and other options like "Python". The main area contains a command line interface with the following text:

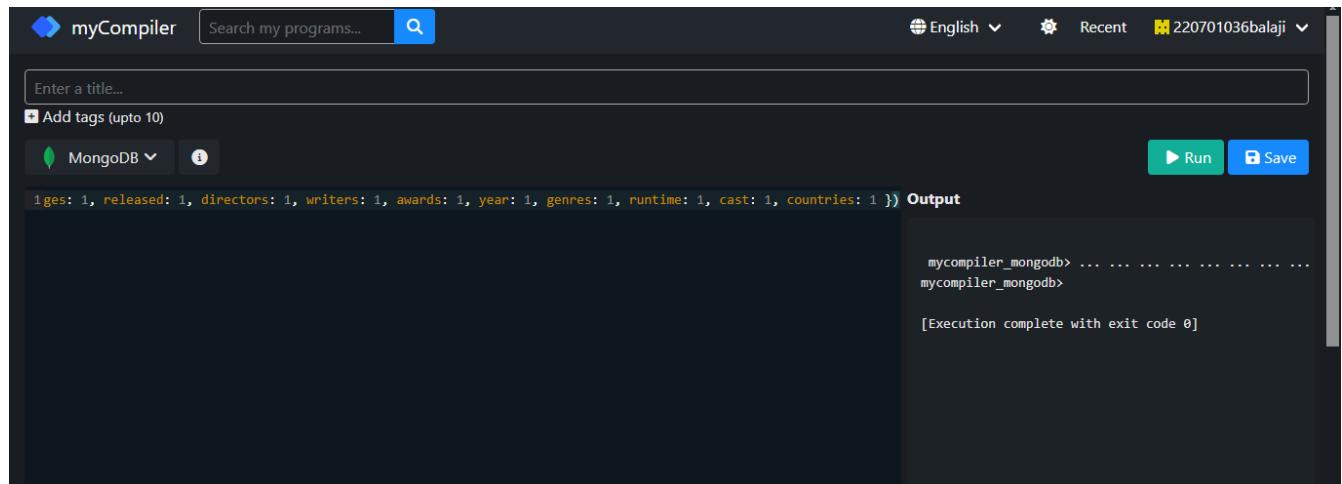
```
1age: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 }) Output
mycompiler_mongodb> ... . . . . . .
mycompiler_mongodb>
[Execution complete with exit code 0]
```

11.)Find all movies with title, languages, released, directors, writers, awards, year, genres, runtime, cast, countries from the 'movies' collection in MongoDB that have at least one nomination.

QUERY:

```
db.movies.find( { 'awards.nominations': { $gt: 0 } }, { title: 1, languages: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 } )
```

OUTPUT:



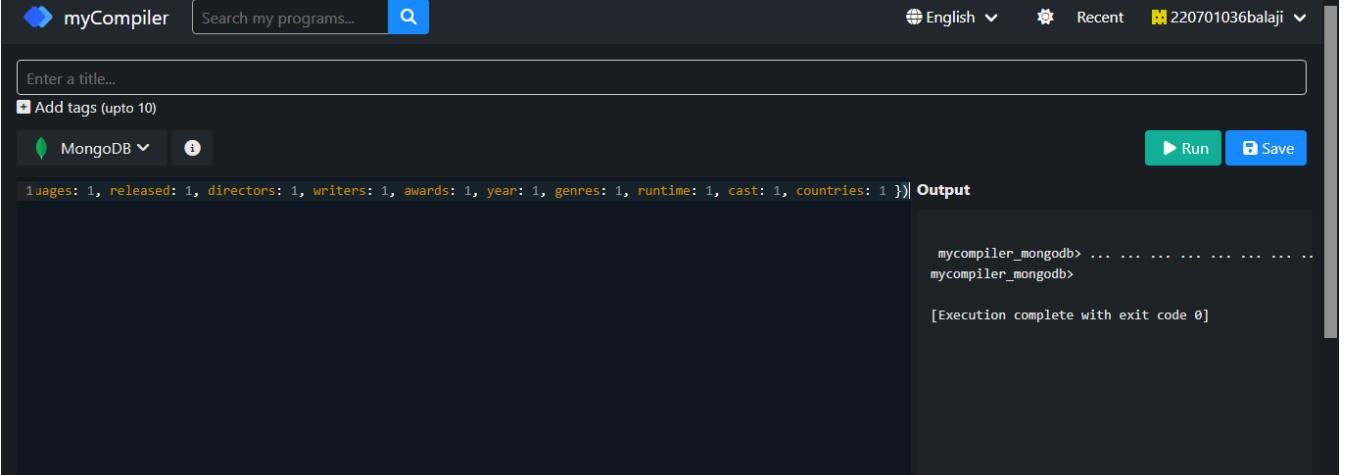
The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a magnifying glass icon. To the right are language selection ("English"), recent projects, and a user profile ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title...". Underneath it is a button labeled "+ Add tags (upto 10)". On the left, there are two dropdown menus: "MongoDB" and "i". On the right, there are "Run" and "Save" buttons. The main area is titled "Output" and contains the MongoDB query: "db.movies.find({ 'awards.nominations': { \$gt: 0 } }, { title: 1, languages: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 })". Below the query, the terminal output shows: "mycompiler_mongodb> mycompiler_mongodb> [Execution complete with exit code 0]".

12.)Find all movies with title, languages, released, directors, writers, awards, year, genres, runtime, cast, countries from the 'movies' collection in MongoDB with cast including "Charles Kayser".

QUERY:

```
db.movies.find( { cast: 'Charles Kayser' }, { title: 1, languages: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 } )
```

OUTPUT:



The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a magnifying glass icon. To the right are language selection ("English"), recent projects, and user information ("220701036balaji"). Below the search bar is a text input field with placeholder "Enter a title...". Underneath it is a button labeled "+ Add tags (upto 10)". On the left, there's a dropdown menu set to "MongoDB" and a help icon. On the right, there are "Run" and "Save" buttons. The main area is titled "Output" and contains the MongoDB query and its execution results. The query is:

```
languages: 1, released: 1, directors: 1, writers: 1, awards: 1, year: 1, genres: 1, runtime: 1, cast: 1, countries: 1 })
```

The output shows the command being run:

```
mycompiler_mongodb> ... . . . . . . . . .
```

and the response:

```
mycompiler_mongodb>
```

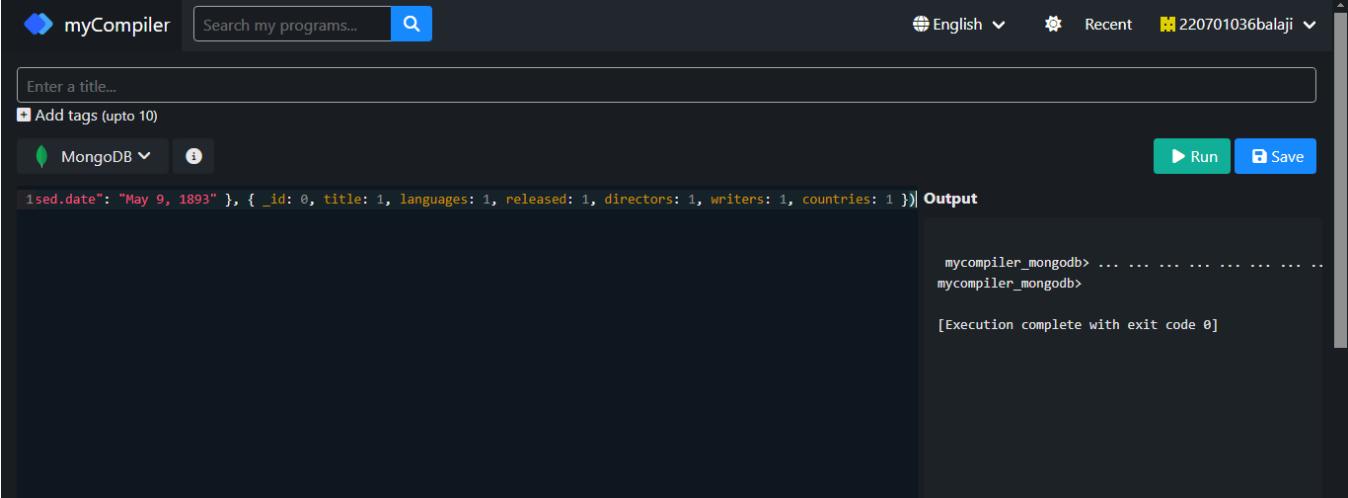
[Execution complete with exit code 0]

13.) Retrieve all movies with title, languages, released, directors, writers, countries from the 'movies' collection in MongoDB that released on May 9, 1893.

QUERY:

```
db.movies.find( { released: ISODate("1893-05-09T00:00:00.000Z") }, { title: 1, languages: 1,  
released: 1, directors: 1, writers: 1, countries: 1 } )
```

OUTPUT:



The screenshot shows the myCompiler interface. At the top, there's a search bar labeled "Search my programs..." and a magnifying glass icon. On the right side of the header, there are language settings ("English"), recent projects ("Recent"), and a user profile ("220701036balaji"). Below the header, there's a text input field with placeholder text "Enter a title..." and a checkbox for "Add tags (upto 10)". To the right of the input field are two buttons: "Run" (green) and "Save" (blue). The main area contains a code editor with the following MongoDB query:

```
1sed.date": "May 9, 1893", { _id: 0, title: 1, languages: 1, released: 1, directors: 1, writers: 1, countries: 1 }| Output
```

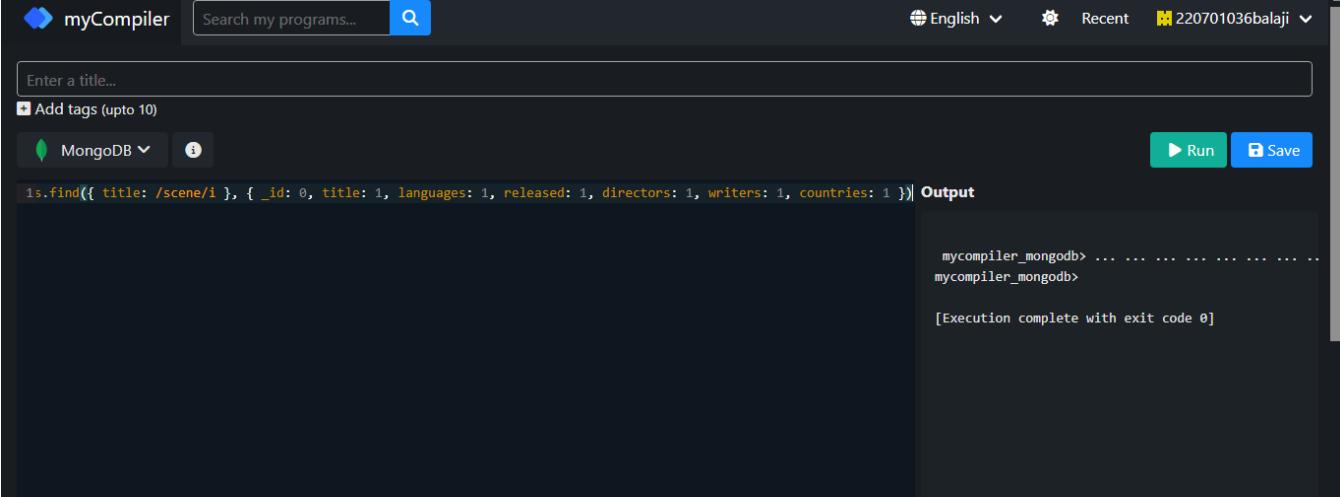
Below the code editor is a terminal window showing the command prompt "mycompiler_mongodb>". The terminal output is empty, followed by the message "[Execution complete with exit code 0]".

14.) Retrieve all movies with title, languages, released, directors, writers, countries from the 'movies' collection in MongoDB that have a word "scene" in the title.

QUERY:

```
db.movies.find( { title: /scene/i }, { title: 1, languages: 1, released: 1, directors: 1, writers: 1, countries: 1 })
```

OUTPUT:



The screenshot shows the myCompiler interface. At the top, there's a search bar with 'myCompiler' and a search icon. To the right are language selection ('English'), recent projects, and user information ('220701036balaji'). Below the search bar is a text input field with placeholder 'Enter a title...' and a 'Add tags (upto 10)' button. On the left, there's a dropdown for 'MongoDB' and a help icon. On the right, there are 'Run' and 'Save' buttons. The main area contains a code editor with the following MongoDB query:

```
db.movies.find({ title: /scene/i }, { _id: 0, title: 1, languages: 1, released: 1, directors: 1, writers: 1, countries: 1 })| Output
```

Below the code editor is a terminal window showing the output of the query:

```
mycompiler_mongodb> ... ... ... ...
mycompiler_mongodb>
[Execution complete with exit code 0]
```

Evaluation Procedure	Marks awarded
Query(5)	
Execution (5)	
Viva(5)	
Total (15)	
Faculty Signature	