Creating and Managing Tables

EX_NO:1 **DATE:**

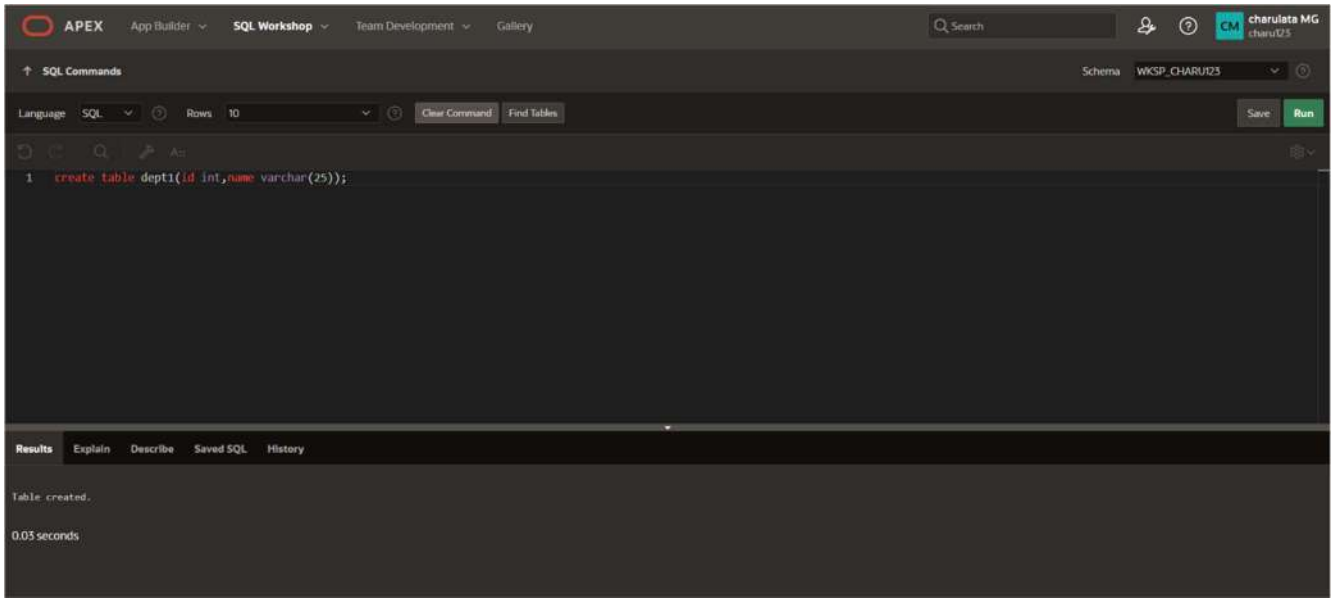
1.Create the DEPT table based on the DEPARTMENT following the table instance chart below. Confirm that the table is created.

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

QUERY:

Create table dept1(id number(7),name varchar2(25));

OUTPUT:

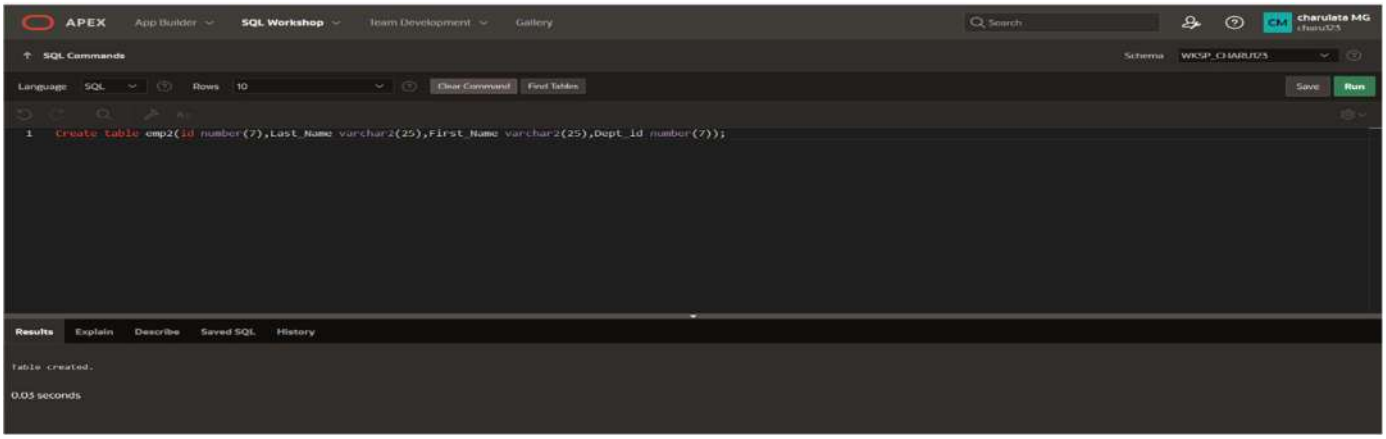


2..Create the EMP table based on the following instance chart. Confirm that the table is created.

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 varchar2(25),First_Name varchar2(25),Dept_id number(7));

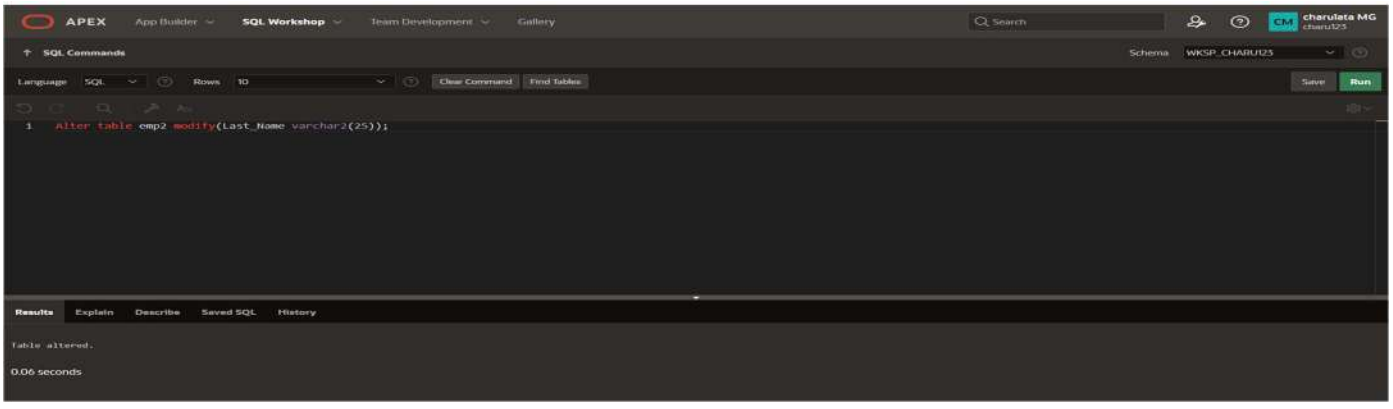
OUTPUT:



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));

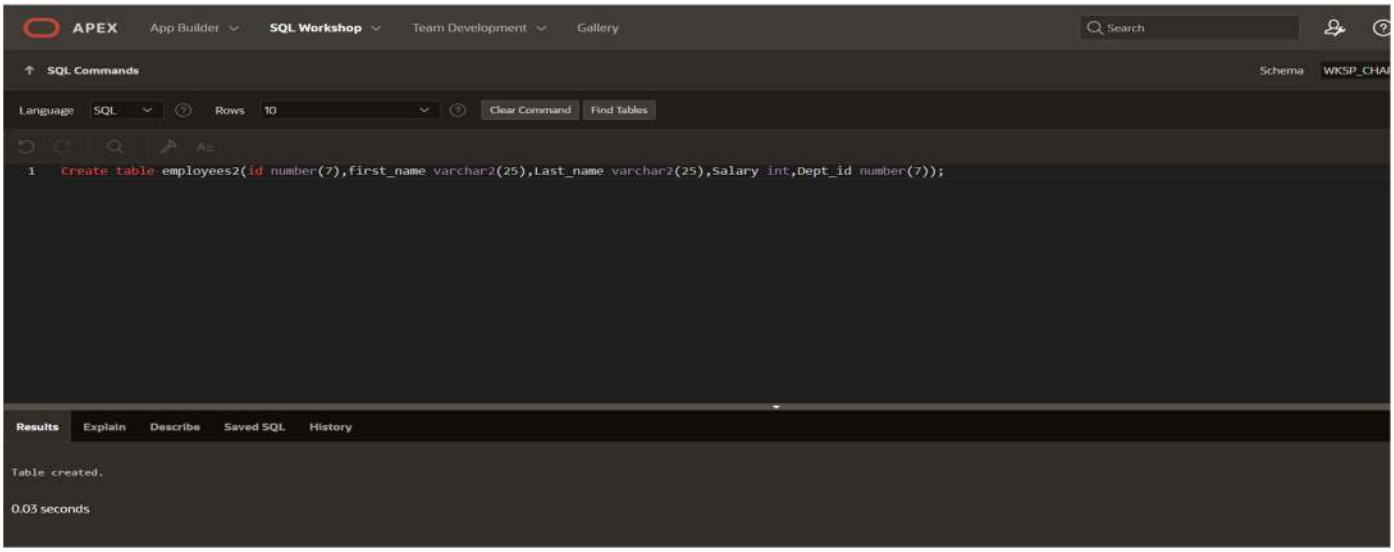
OUTPUT:



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 coloumns. Name the columns Id, First_name, Last_name, salary and Dept_id respectively.

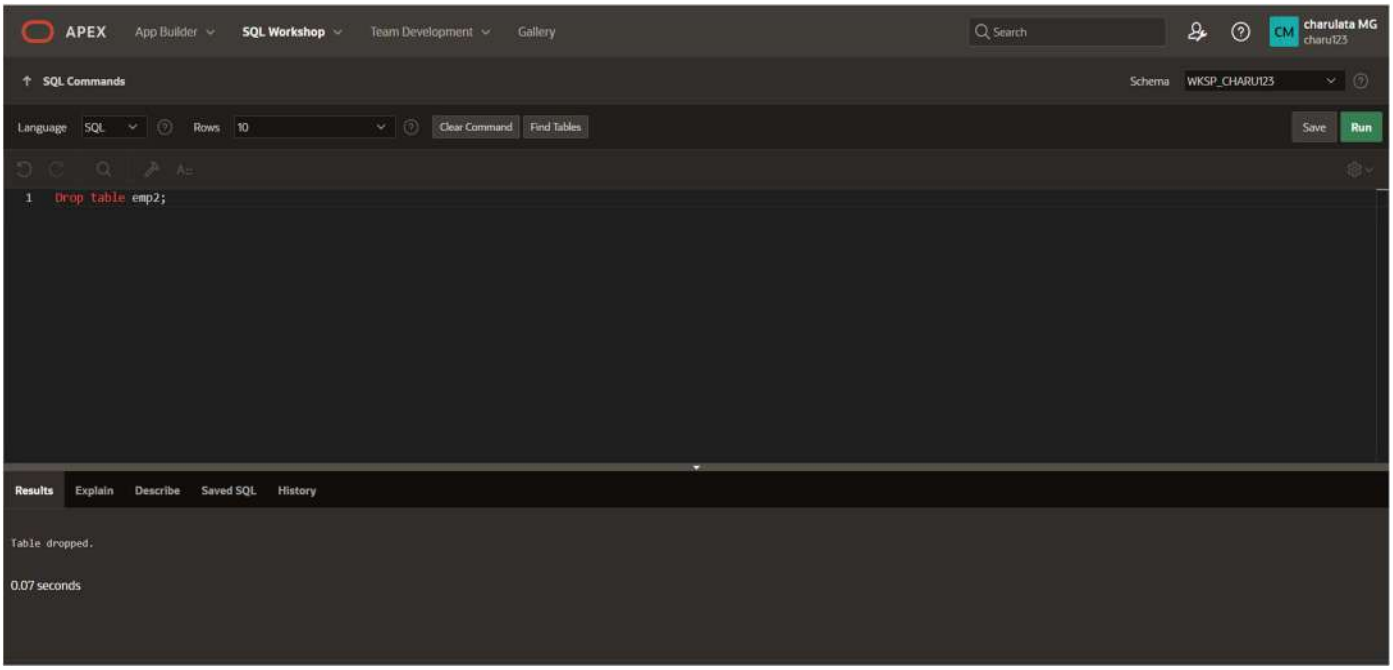
QUERY:
Create table employees2(id number(7),first_name varchar2(25),Last_name varchar2(25),Salary int,Dept_id number(7));

OUTPUT:



5.Drop the EMP table.
QUERY:
Drop table emp;

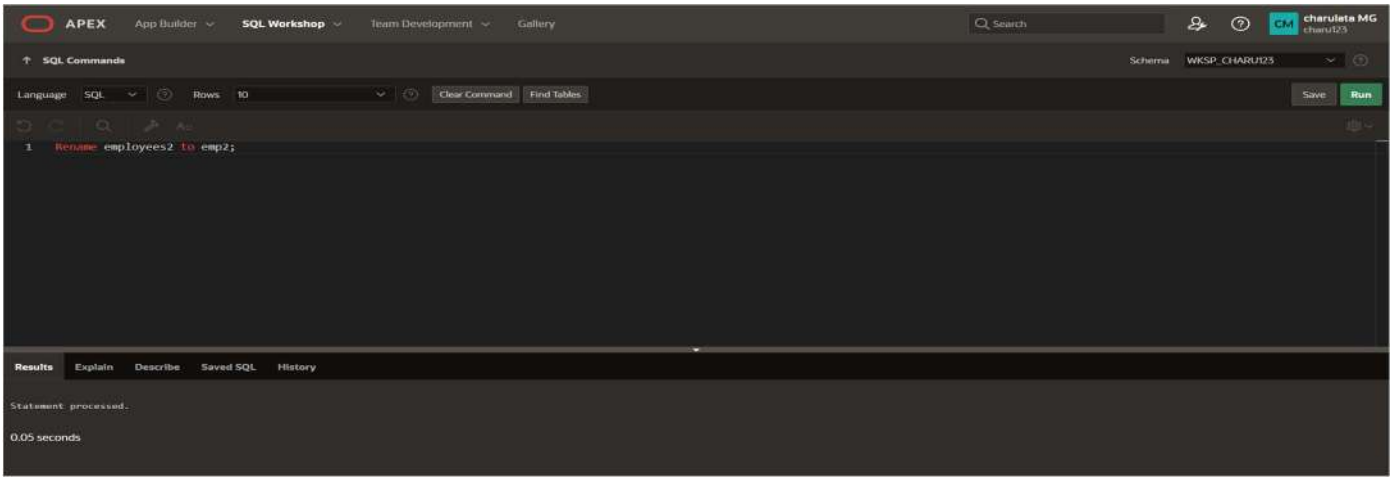
OUTPUT:



6.Rename the EMPLOYEES2 table as EMP.
QUERY:

Rename employees2 to emp;

OUTPUT:



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';

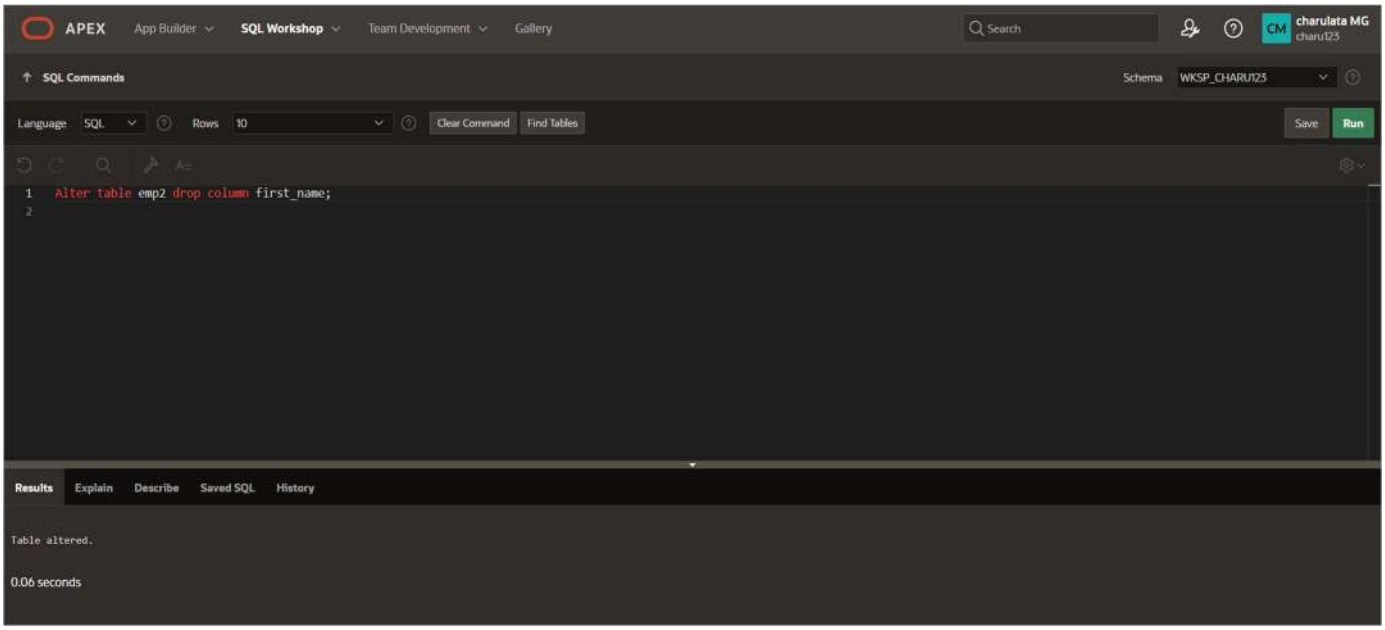
OUTPUT:

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

QUERY:

Alter table emp drop column first_name;

OUTPUT:



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

RESULT:

MANIPULATING DATA

EX_NO:2 **DATE:**

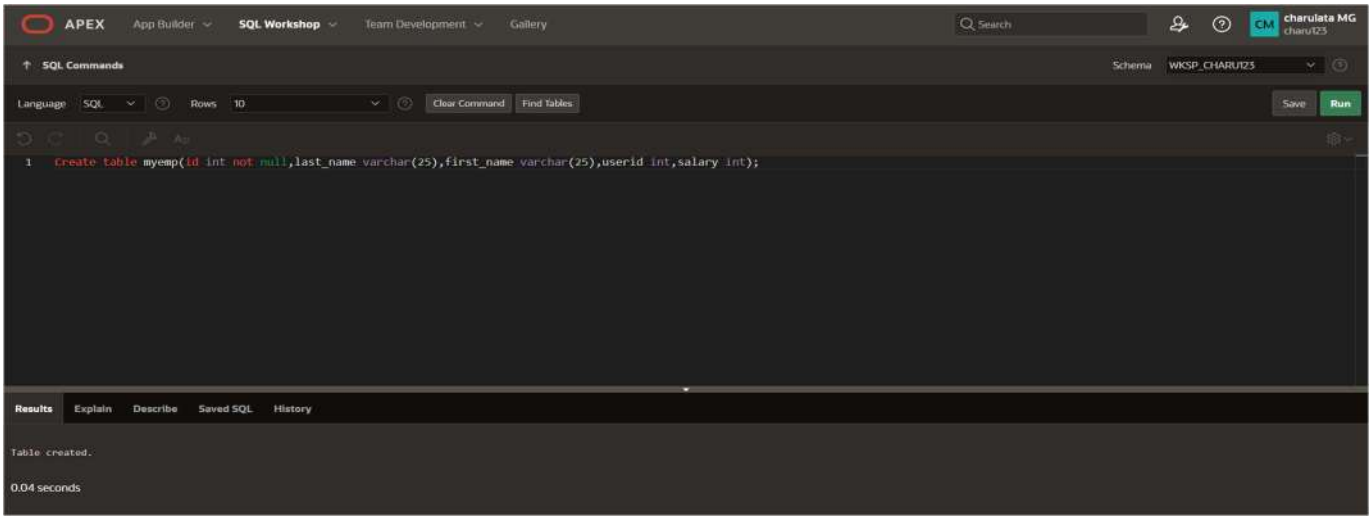
1.Create MY_EMPLOYEE table with the following structure

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 myemp(id int not null,last_name varchar(25),first_name varchar(25),userid int,salary int);

OUTPUT:

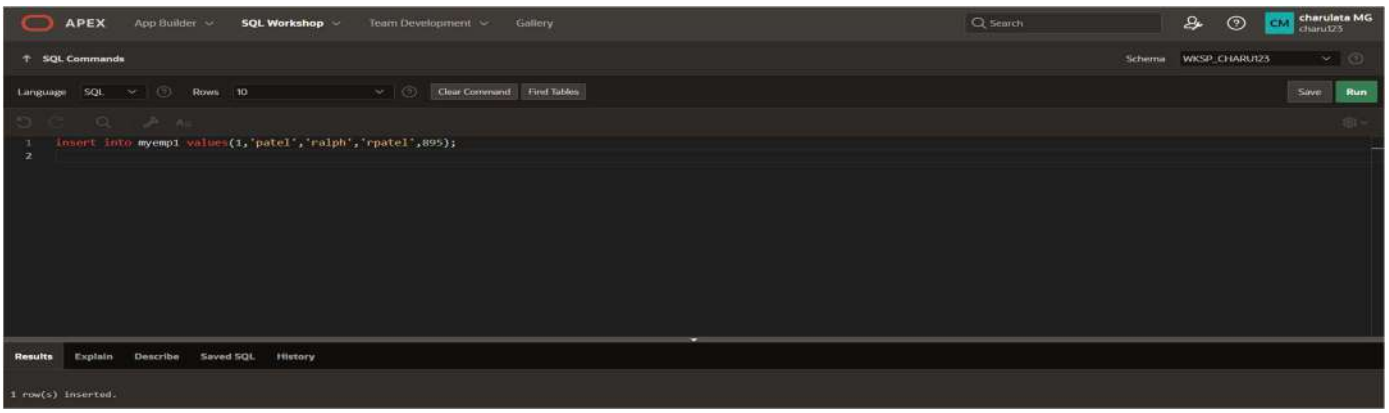


2.Add the first and second rows data to MY_EMPLOYEE table from the following sample data.

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 myemp1 values(1,'patel','ralph','rpatel',895);
insert into myemp1 values(2,'dancs','betty','bdancs',860);

OUTPUT:



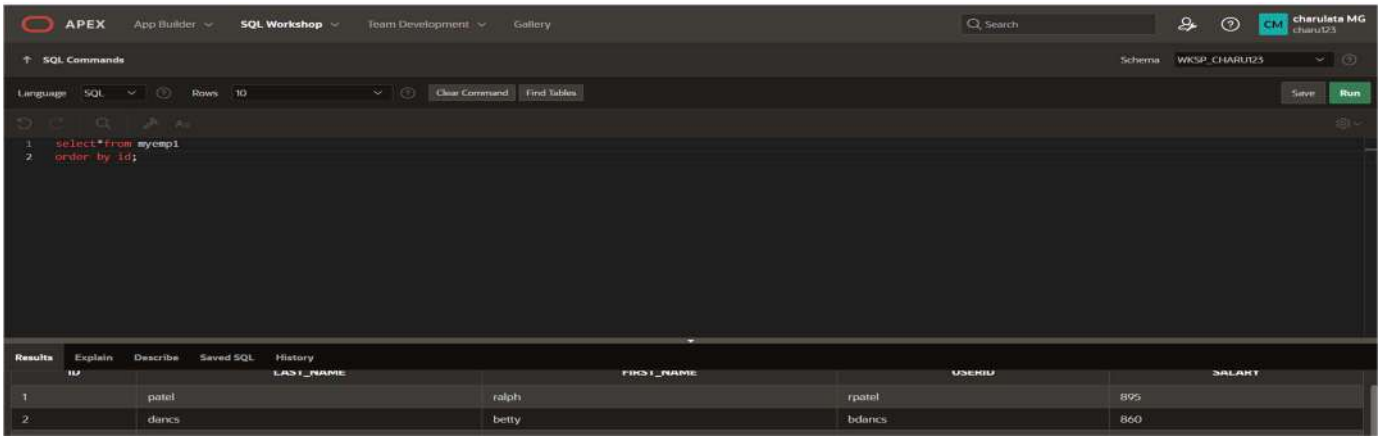
3.Display the table with values.

QUERY:

select*from myemp1

order by id;

OUTPUT:

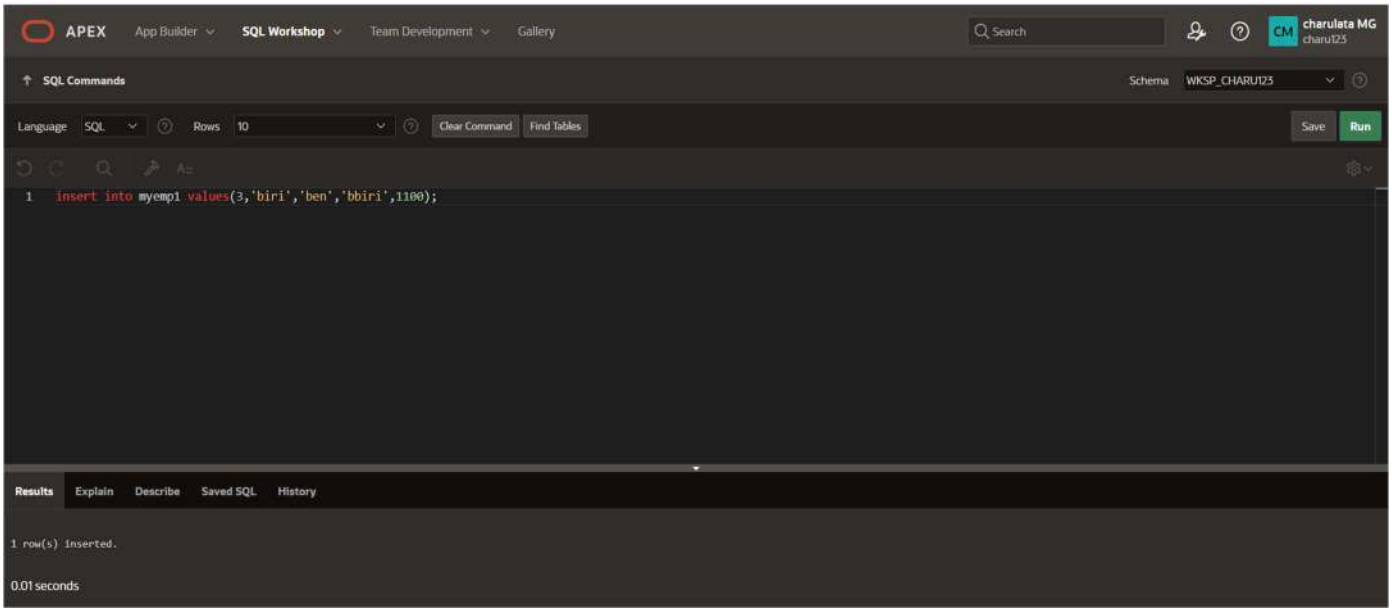


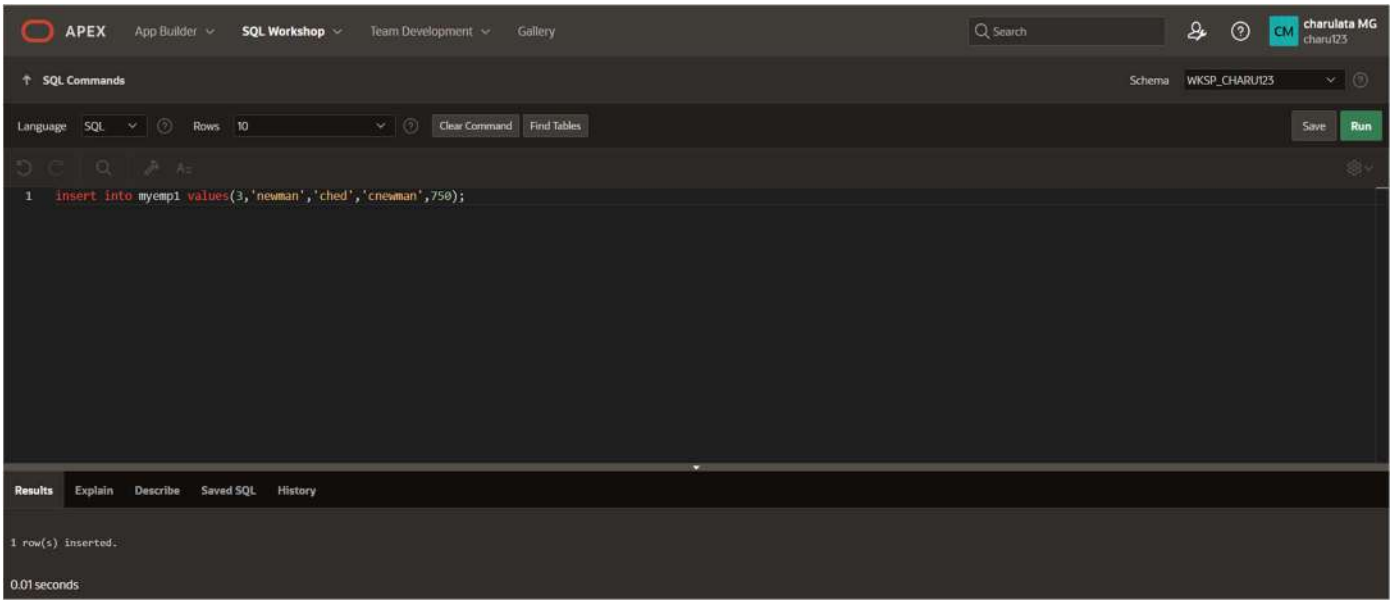
4.Populate the next two rows of data from the sample data. Concatenate the first letter of the first_name with the first seven characters of the last_name to produce Userid.

QUERY:

```
insert into myemp1 values(3,'biri','ben','bbiri',1100);
insert into myemp1 values(3,'newman','ched','cnewman',750);
```

OUTPUT:





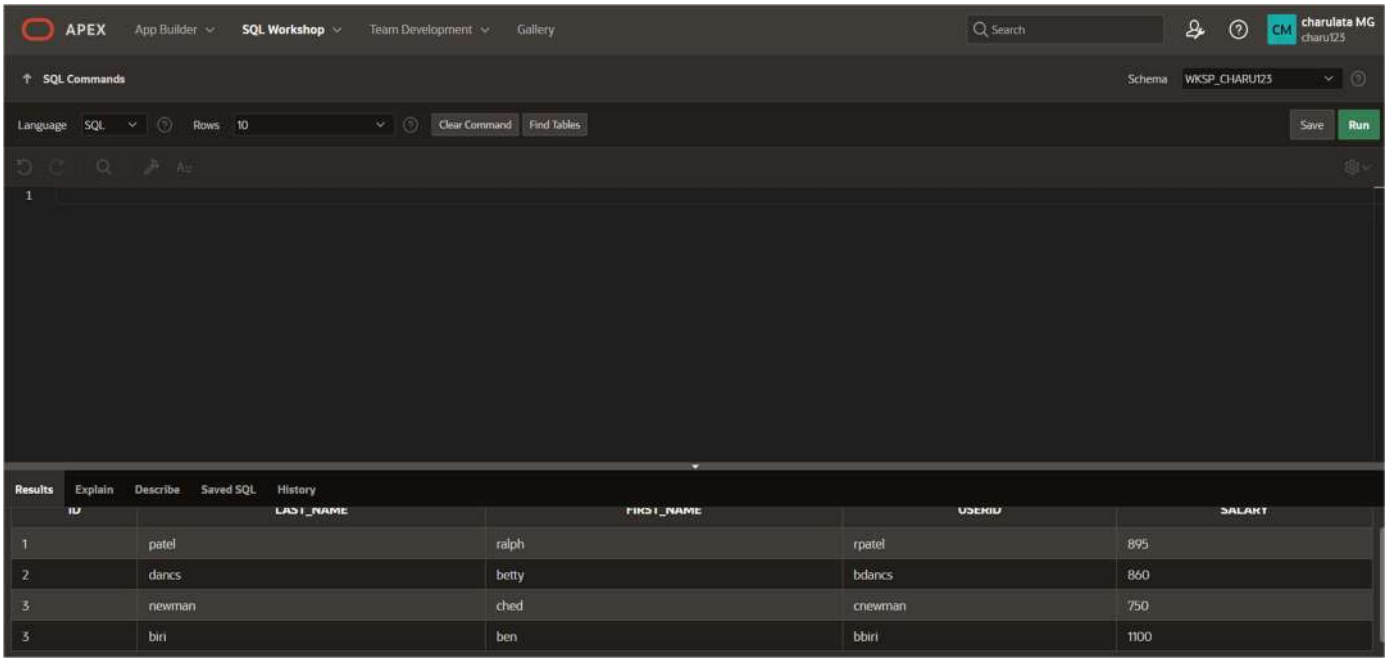
5.Make the data additions permanent.

QUERY:

select*from myemp1

order by id;

OUTPUT:

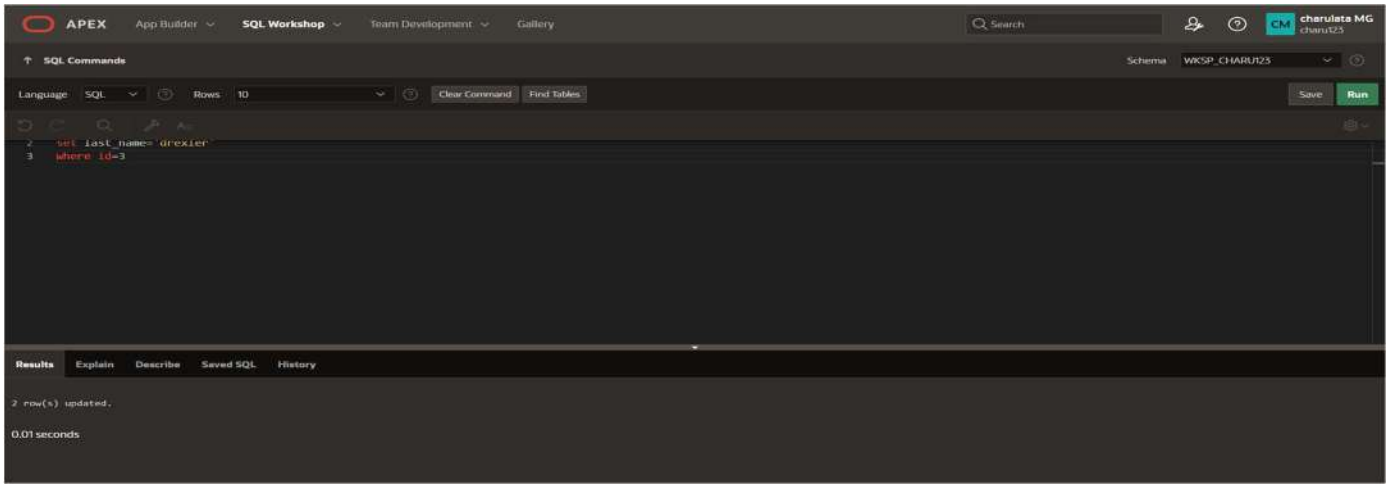


6.Change the last name of employee 3 to Drexler.

QUERY:

update myemp1set last_name='drexler' where id=3

OUTPUT:

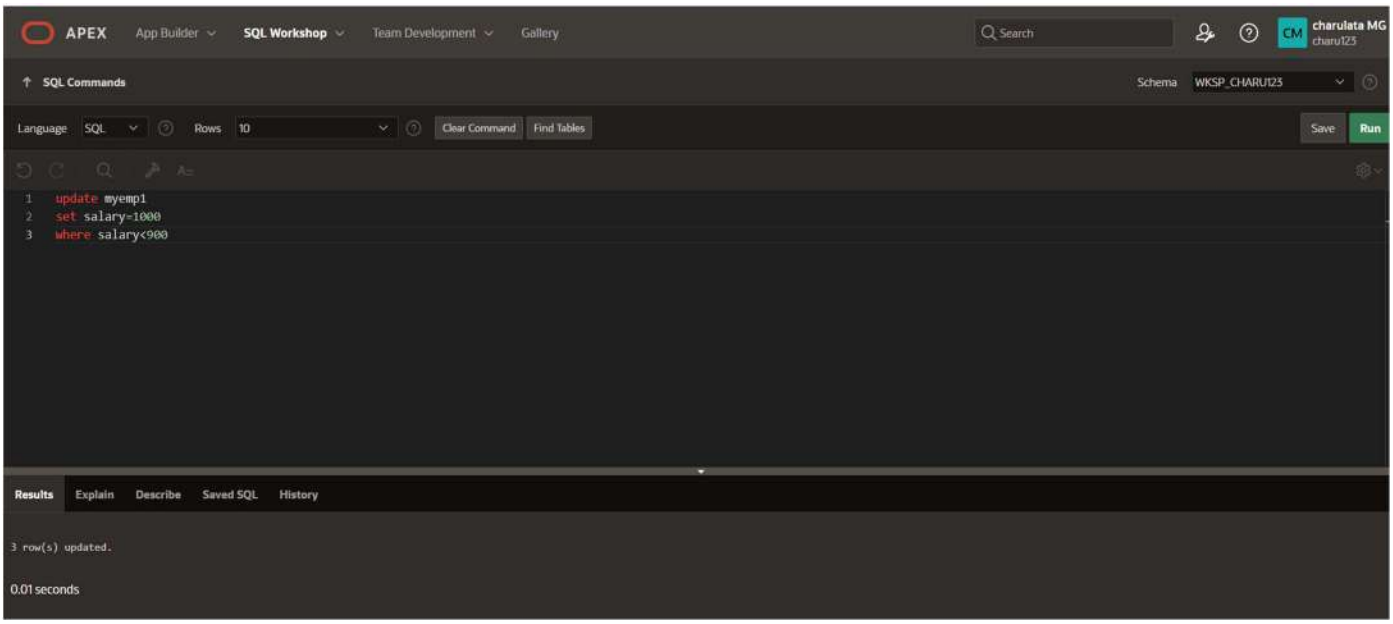


7.Change the salary to 1000 for all the employees with a salary less than 900.

QUERY:

update myemp1set salary=1000 where salary<900

OUTPUT:

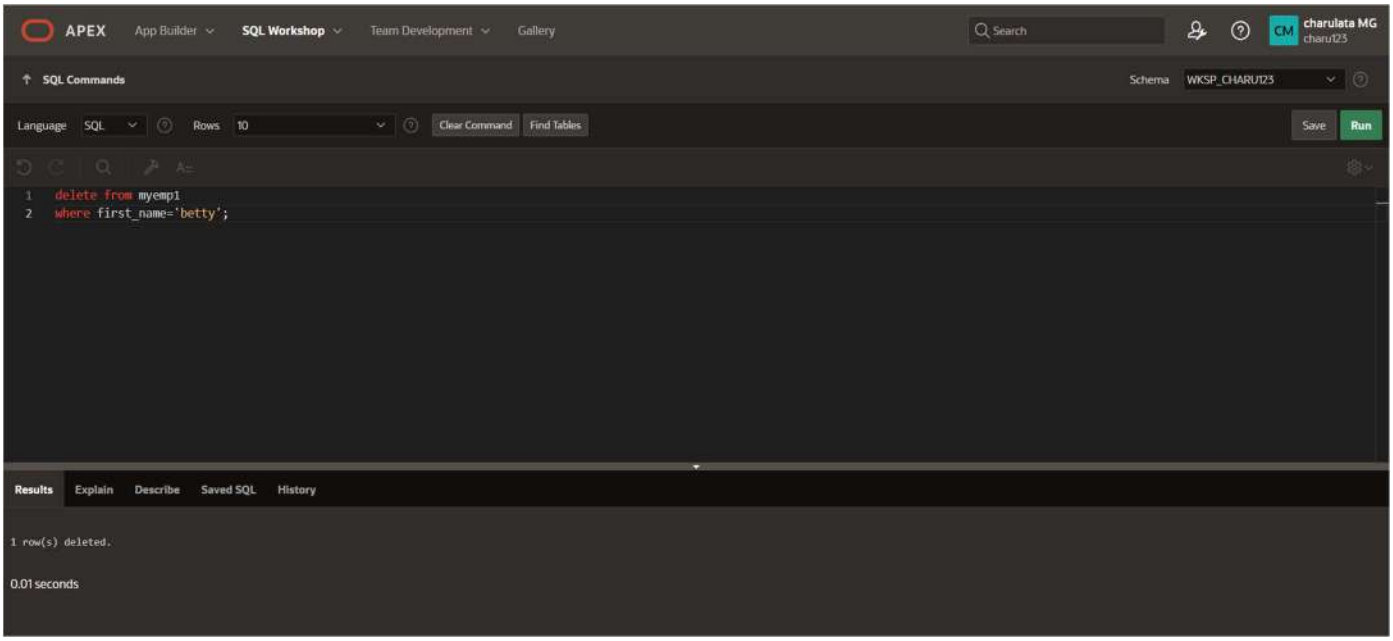


8.Delete Betty dancs from MY _EMPLOYEE table.

QUERY:

delete from myemp1 where first_name='betty';

OUTPUT:

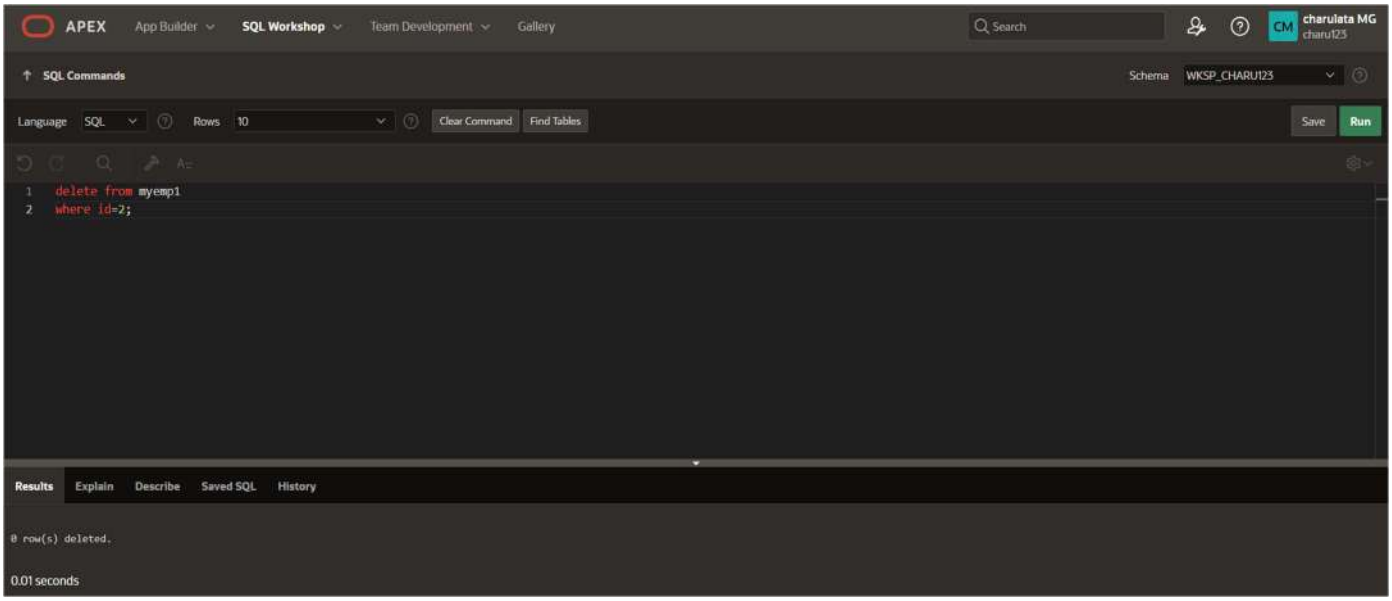


9.Empty the fourth row of the emp table.

QUERY:

delete from myemp1where id=2;

OUTPUT:



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

RESULT:

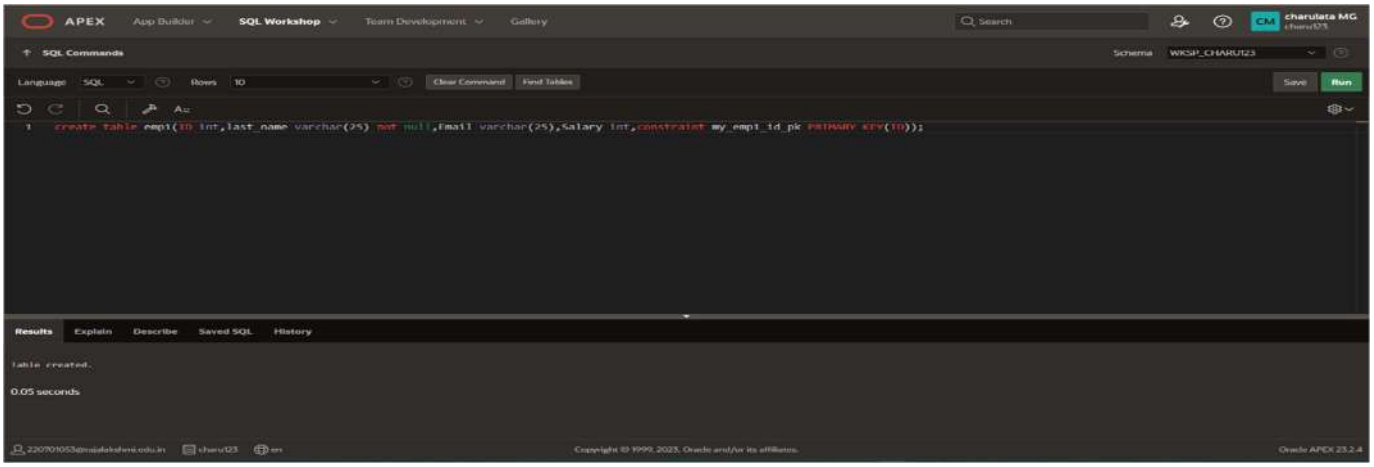
INCLUDING CONSTRAINTS

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.

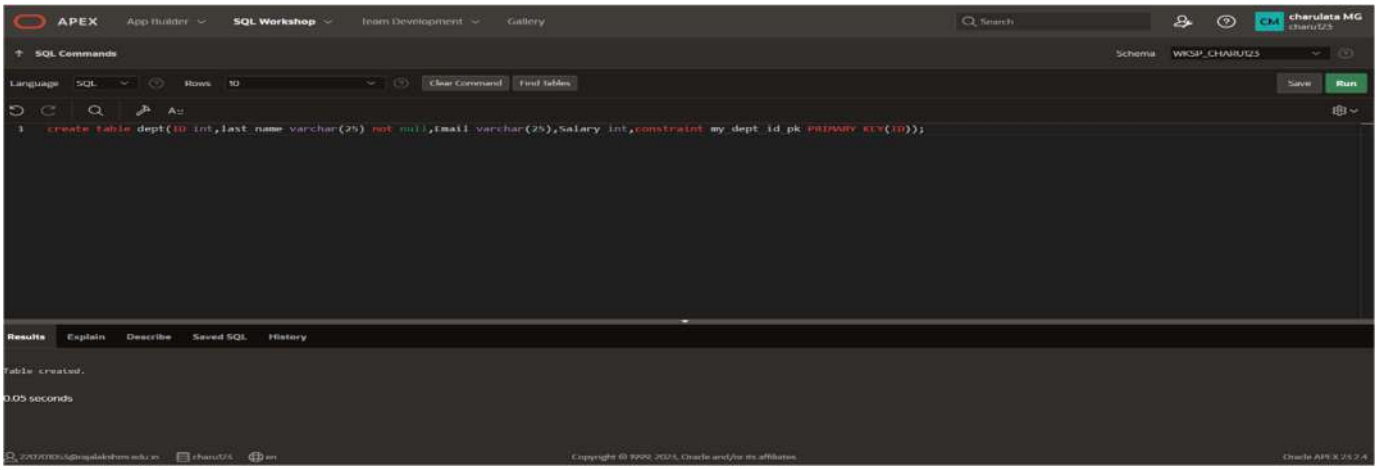
QUERY:
Create table emp1(id int,last_name varchar(25) not null,email varchar(25),salary int,constraint my_emp1_id_pk PRIMARY KEY(id));

OUTPUT:



2.Create a PRIMAY 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:
Create table dept(id int,last_name varchar(25 not null, email varchar(25),salary int, constraint my_dept_id_pk
PRIMARY KEY(id));

OUTPUT:

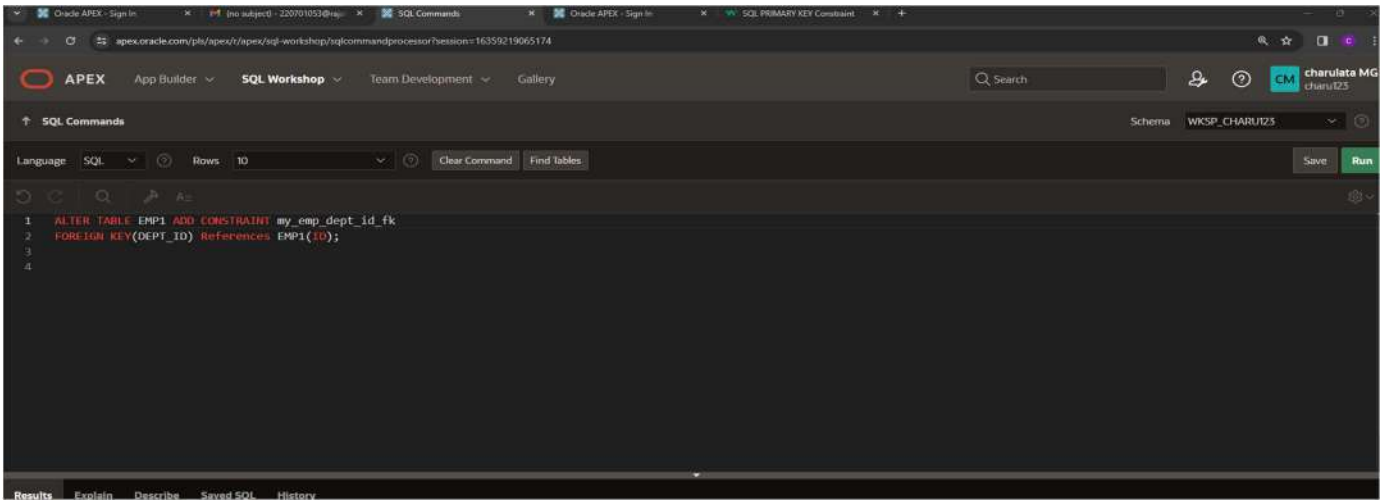


3.Add a column DEPT_ID to the EMP table. Add a foreign key reference on the EMP table that ensures that the employee is not assigned to nonexistent deparment. Name the constraint my_emp_dept_id_fk.

QUERY:

```
ALTER TABlE emp1 add constraint my_emp__dept_id_fk
FOREIGN KEY(DEPT_ID) References emp1(id);
```

OUTPUT:



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 emp1
ADD commissions number(2,2) check (commissions>0)
```

OUTPUT:

Evaluation Procedure Marks

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:

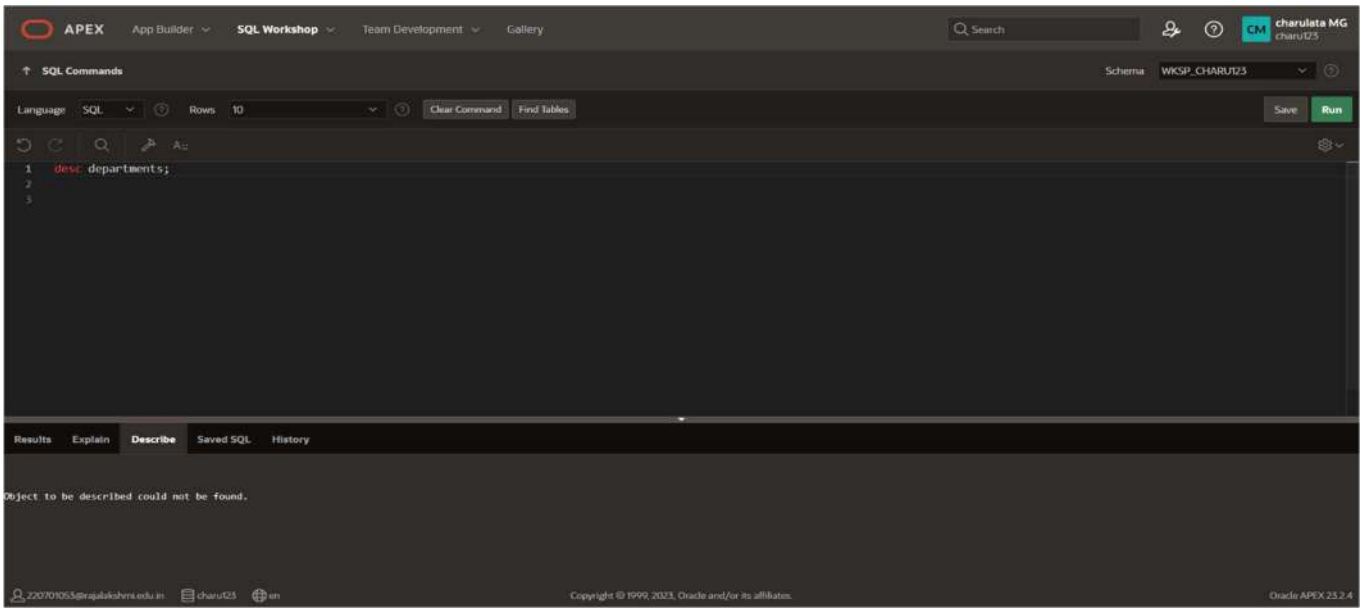
SELECT employee_id, last_name
salary*12 ANNUAL SALARY
FROM employees;

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

QUERY:

desc departments;

OUTPUT:

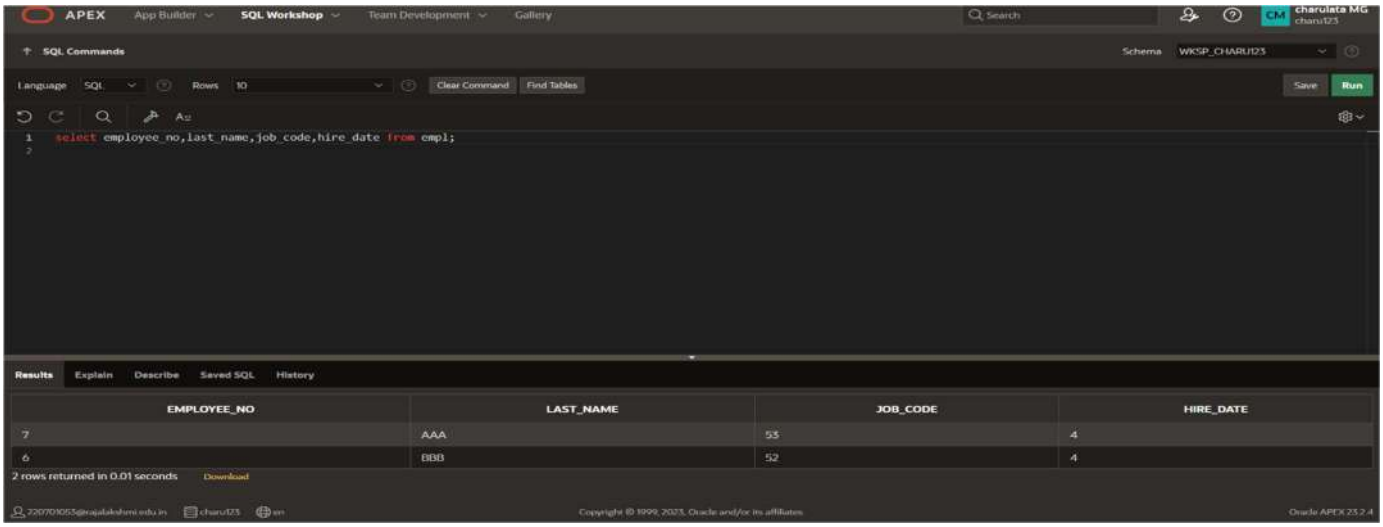


3.Create a query to display the last name, job code, hire date, and employee number for each employee, with employee number appearing first.

QUERY:

Select employee_no,last_name,job_code,hire_date from emp1;

OUTPUT:



4.Provide an alias STARTDATE for the hire date.

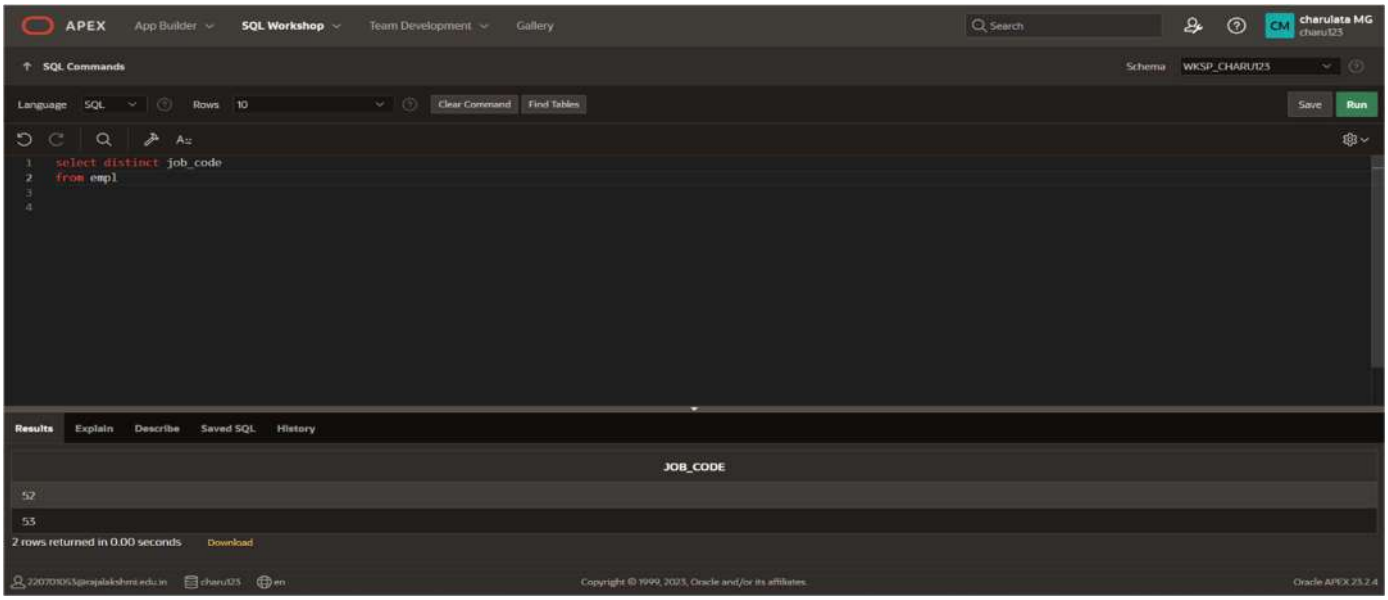
QUERY:

OUTPUT:

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

QUERY:
Select distinct job_code
From emp1

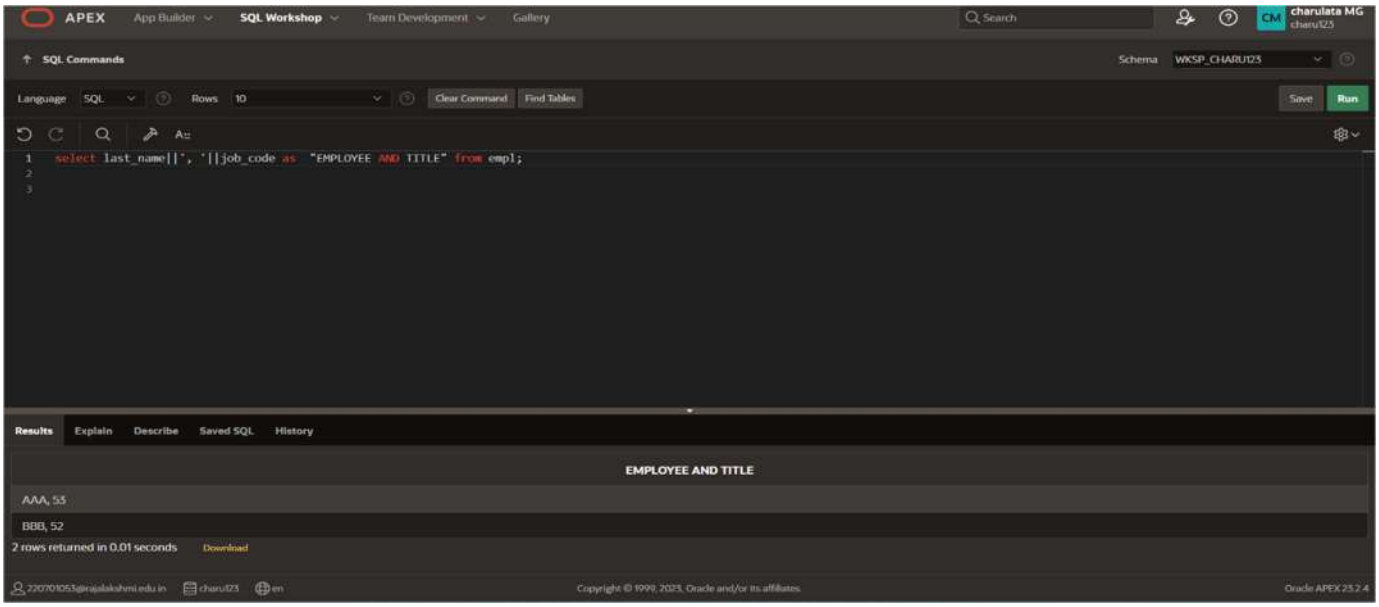
OUTPUT:



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

QUERY:
Select last_name||’,’||job_code as “EMPLOYEE AND TITLE” from emp1;

OUTPUT:

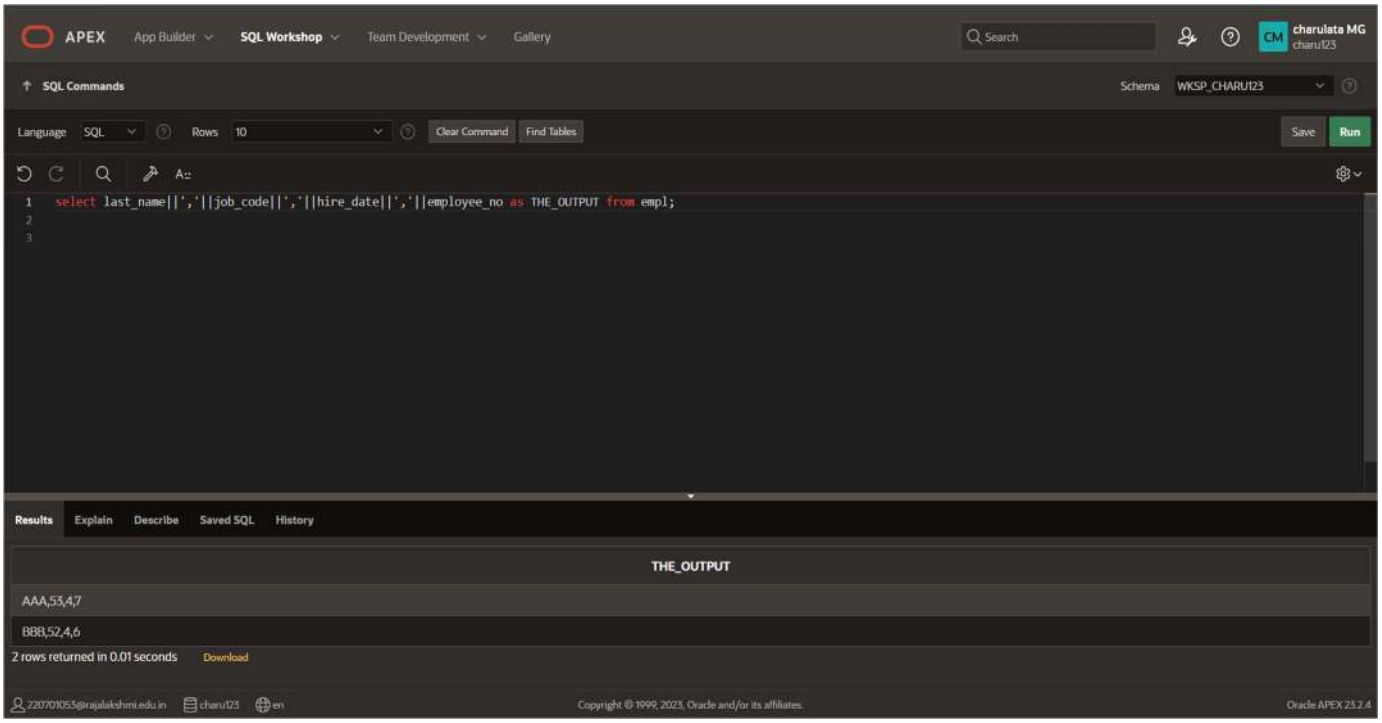


7.Create a query to display all the data from the employees table. Separate each column by a comma. Name the column THE_OUTPUT.

QUERY:

Select last_name||’,’||job_code||’,’||hire_date||’,’||employee_no as THE_OUTPUT from emp1;

OUTPUT:



Evaluation Procedure Marks

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

RESULT:

RESTRICTING AND SORTING DATA

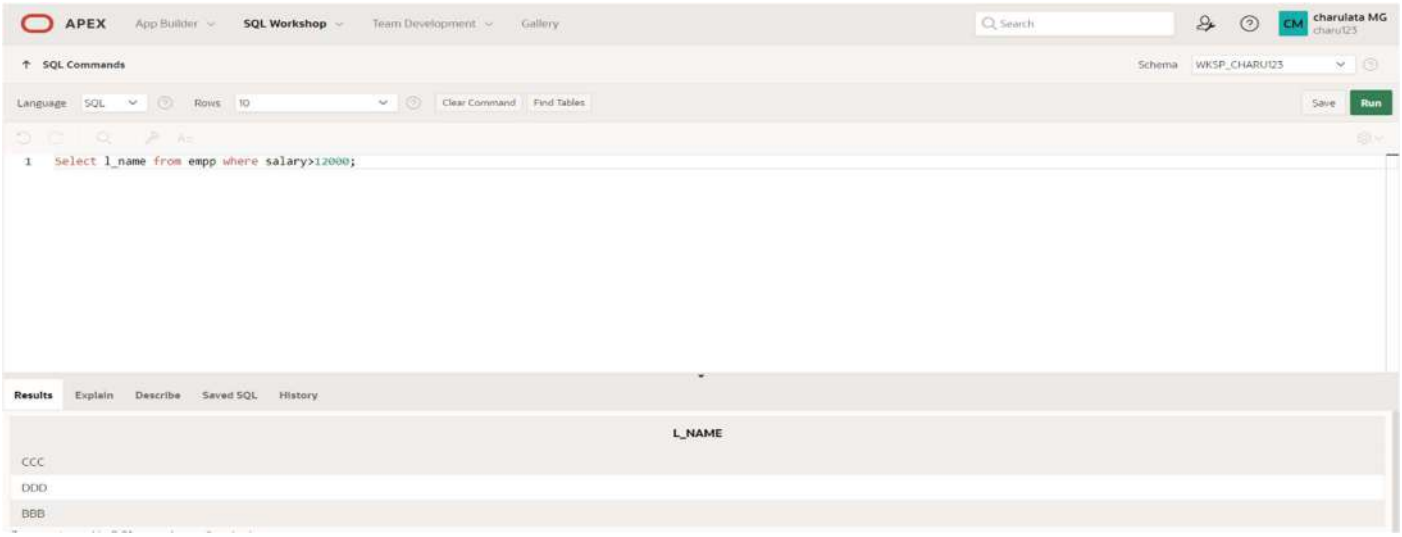
EX_NO:5 **DATE: 07-03-2024**

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

QUERY:

Select l_name from empp where salary>12000;

OUTPUT:

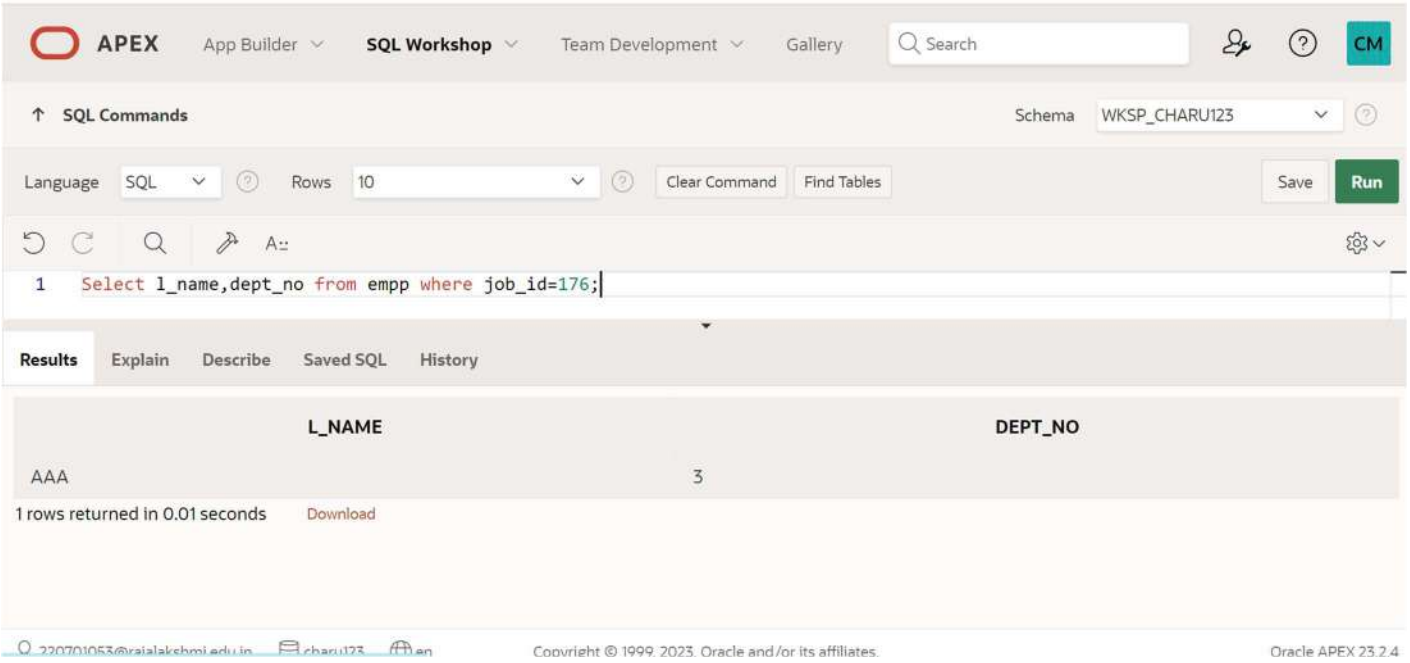


2.Create a query to display the employee last name and department number for employee number 176.

QUERY:

Select l_name,dept_id from employees where job_id=176;

OUTPUT:

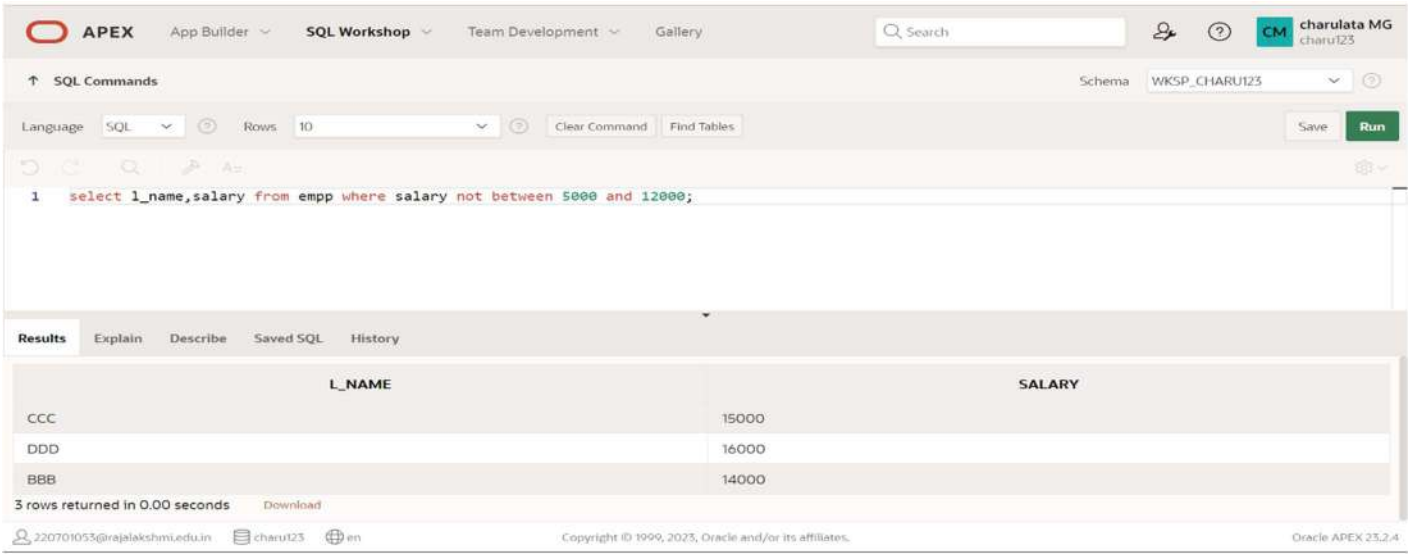


3.Create a query to display the last name and salary of employees whose salary is not in the range of 5000 and 12000. (hints: not between)

QUERY:

select l_name,salary from empp where salary not between 5000 and 12000;

OUTPUT:

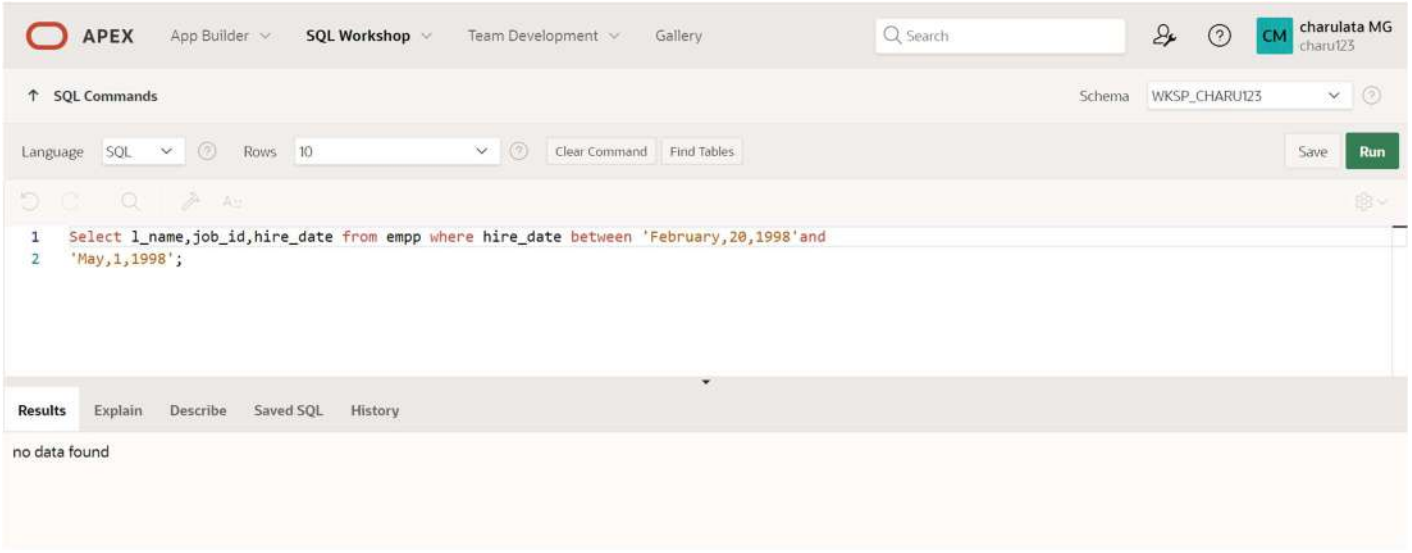


4.Display the employee last name, job ID, and start date of employees hired between February 20,1998 and May 1,1998.order the query in ascending order by start date.(hints: between)

QUERY:

Select l_name,job_id,hire_date from empp where hire_date between
'February,20,1998'and
'May,1,1998'; ‘May,1,1998’;

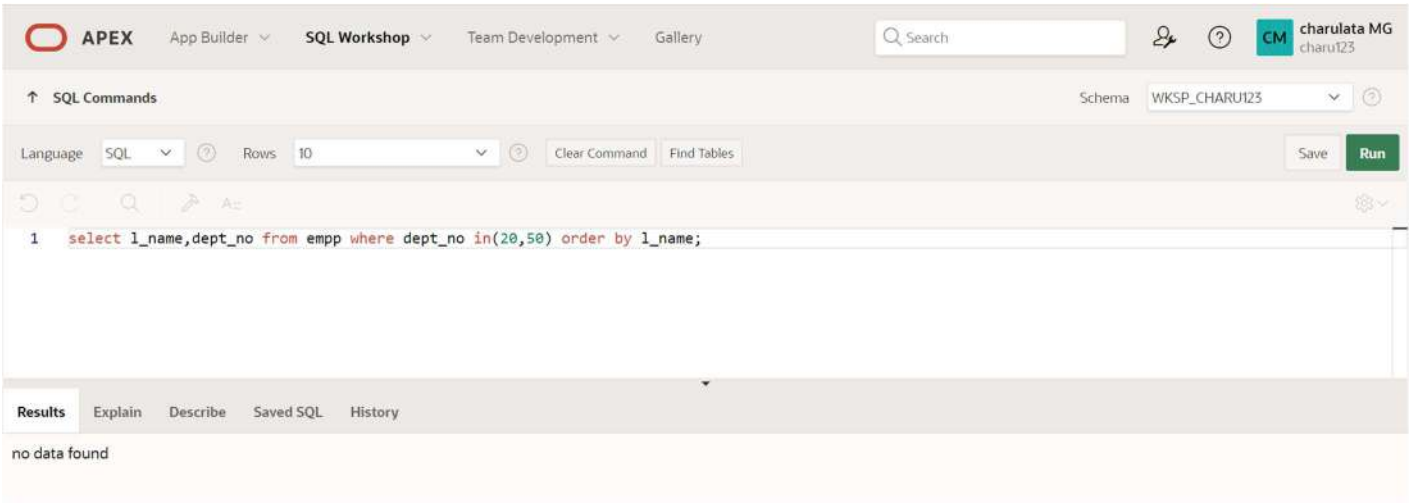
OUTPUT:



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 l_name,dept_no from empp where dept_no in(20,50) order by l_name;

OUTPUT:

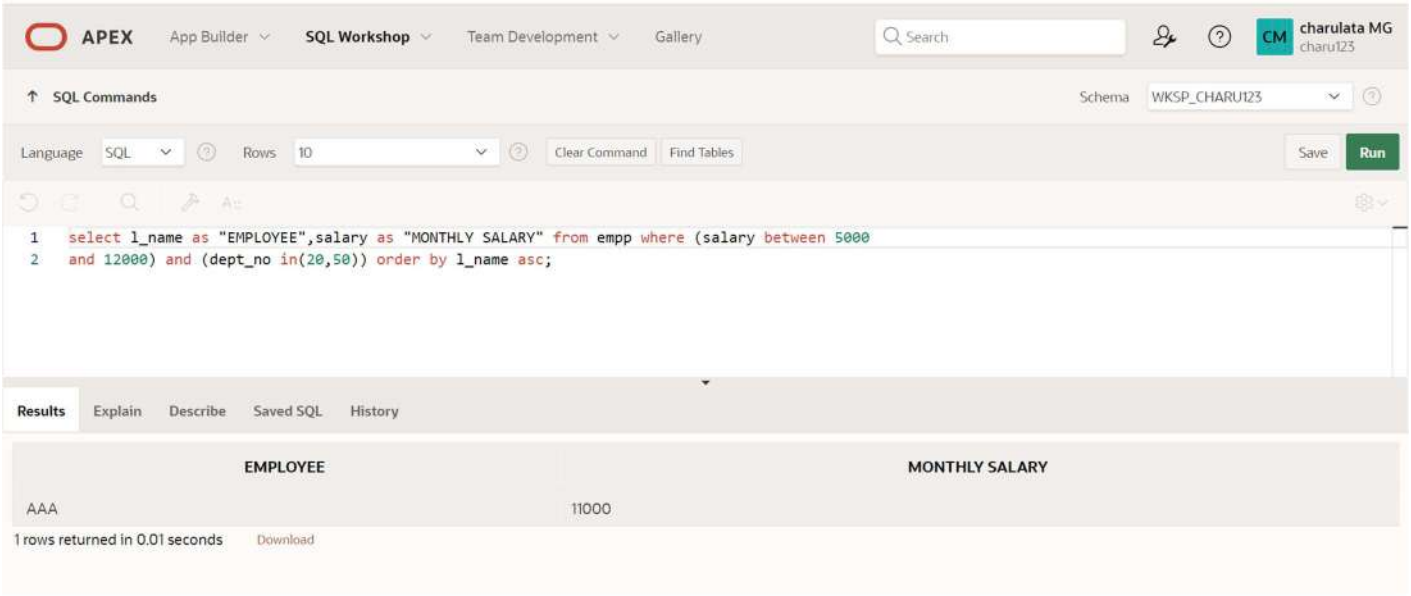


6.Display the last name and salary of all employees who earn between 5000 and 12000 and are in departments 20 and 50 in alphabetical order by name. Label the columns EMPLOYEE, MONTHLY SALARY respectively.(hints: between, in)

QUERY:

select l_name as "EMPLOYEEsalary as "MONTHLY SALARY" from empp where (salary between 5000 and 12000) and (dept_no in(20,50)) order by l_name asc;

OUTPUT:

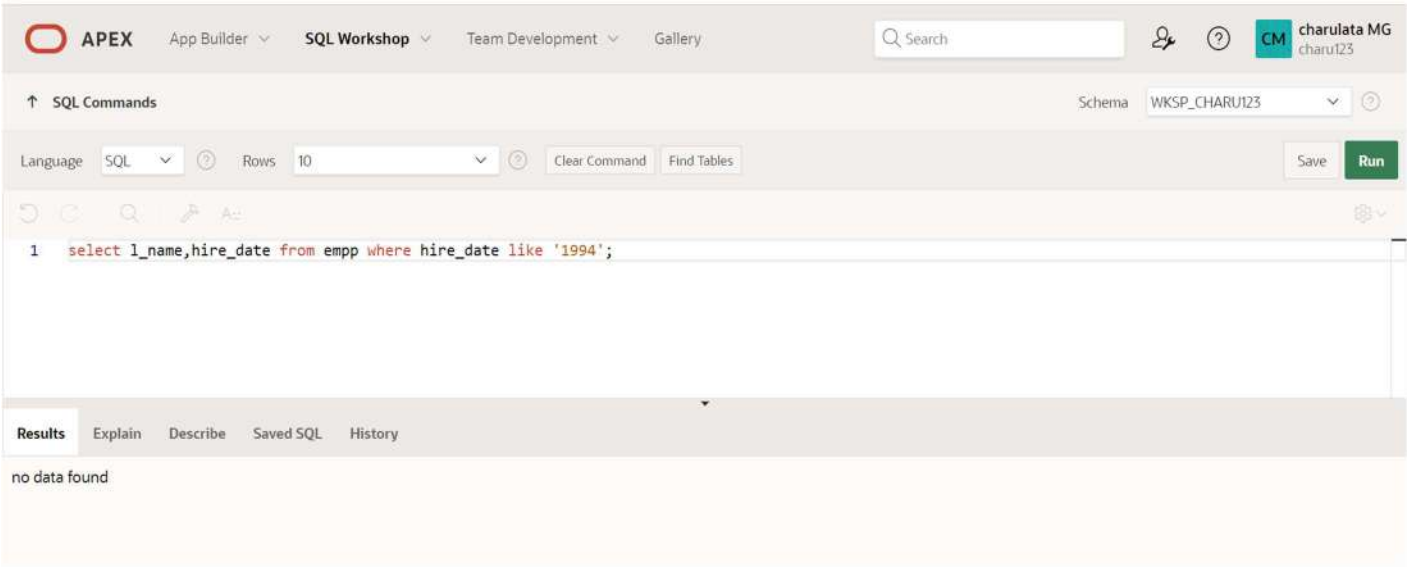


7.Display the last name and hire date of every employee who was hired in 1994.(hints: like)

QUERY:

select l_name,hire_date from empp where hire_date like '1994';

OUTPUT:

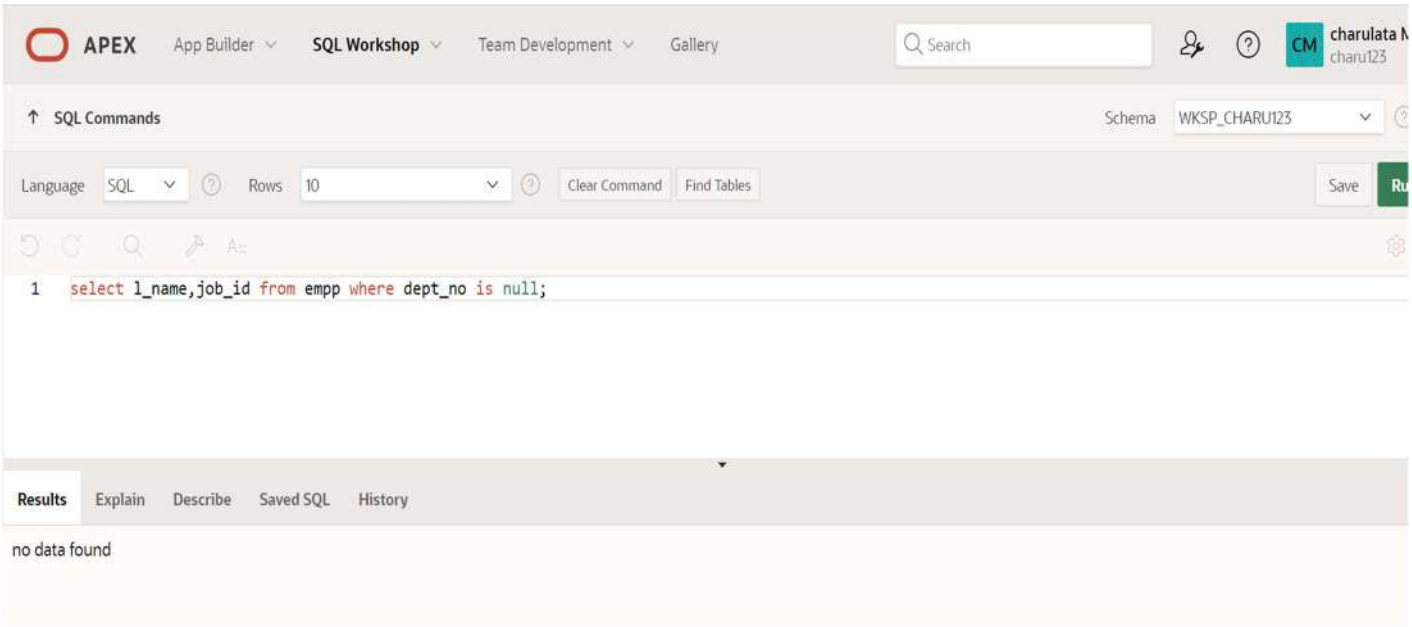


8.Display the last name and job title of all employees who do not have a manager.(hints: is null)

QUERY:

select l_name,job_id from empp where dept_no is null;

OUTPUT:

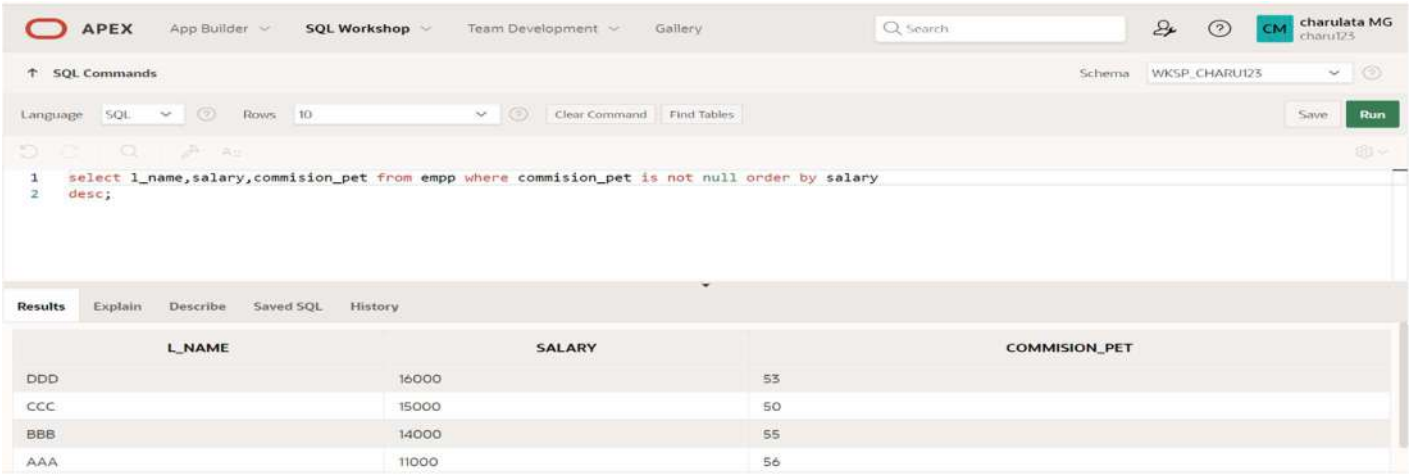


9.Display the last name, salary, and commission for all employees who earn commissions. Sort data in descending order of salary and commissions.(hints: is not nul,orderby)

QUERY:

select l_name,salary,commision_pet from empp where commision_pet is not null order by salary desc

OUTPUT:

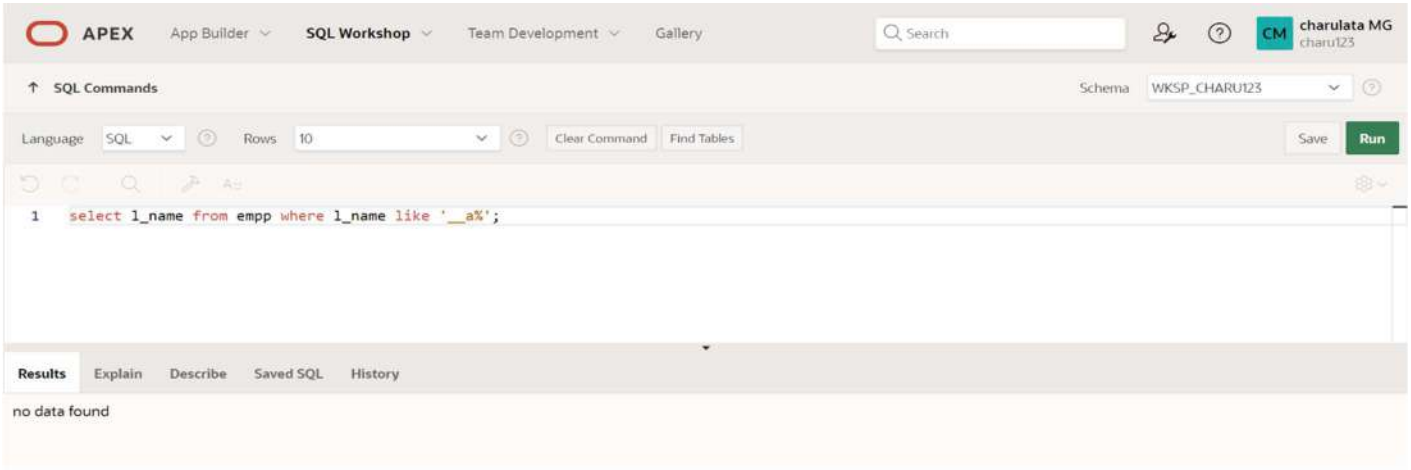


10.Display the last name of all employees where the third letter of the name is ***a***.(hints:like)

QUERY:

select l_name from empp where l_name like '__a%';

OUTPUT:

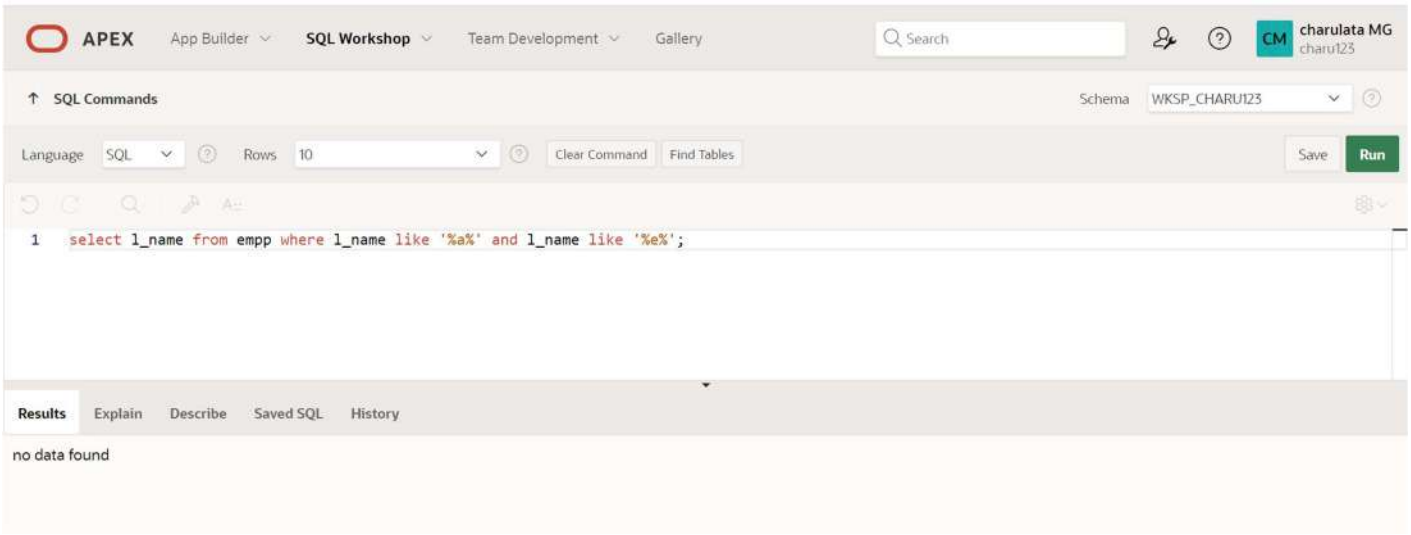


11.Display the last name of all employees who have an a and an ***e*** in their last name.(hints: like)

QUERY:

```
select l_name from empp where l_name like '%a%' and l_name like '%e%';
```

OUTPUT:

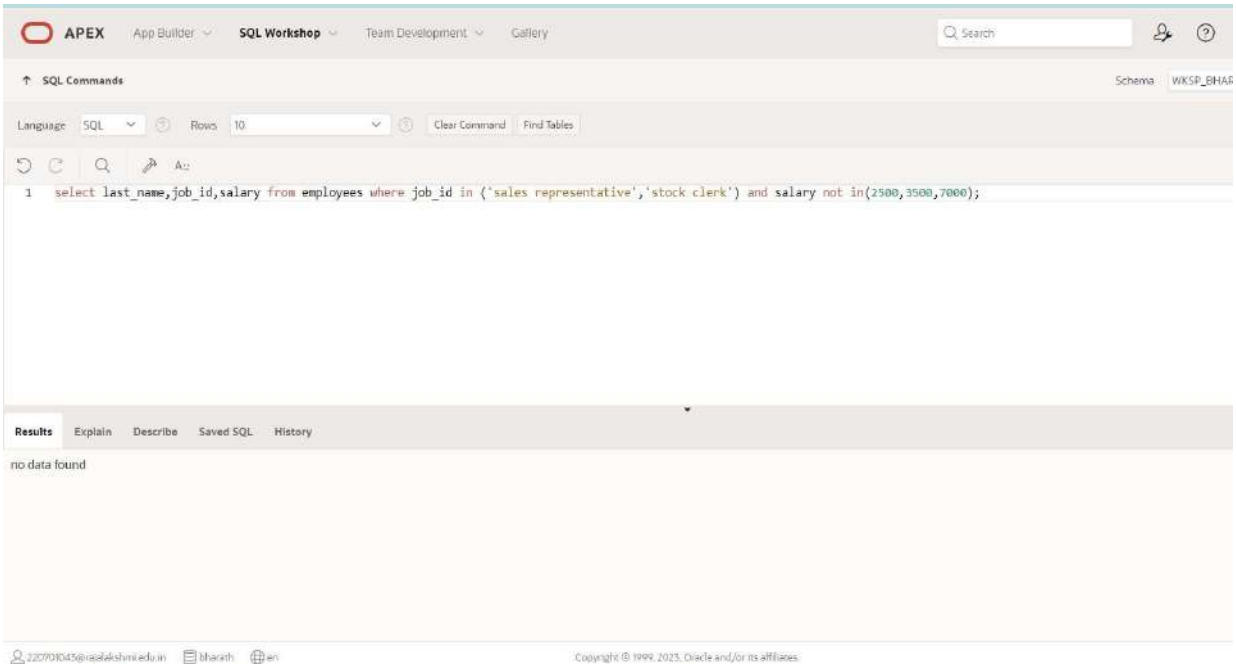


12.Display the last name and job and salary for all employees whose job is sales representative or stock clerk and whose salary is not equal to 2500 ,3500 or 7000.(hints:in,not in)

QUERY:

select last_name,job_id,salary from employees where job_id in ('sales representative','stock clerk') and salary not in(2500,3500,7000);

OUTPUT:

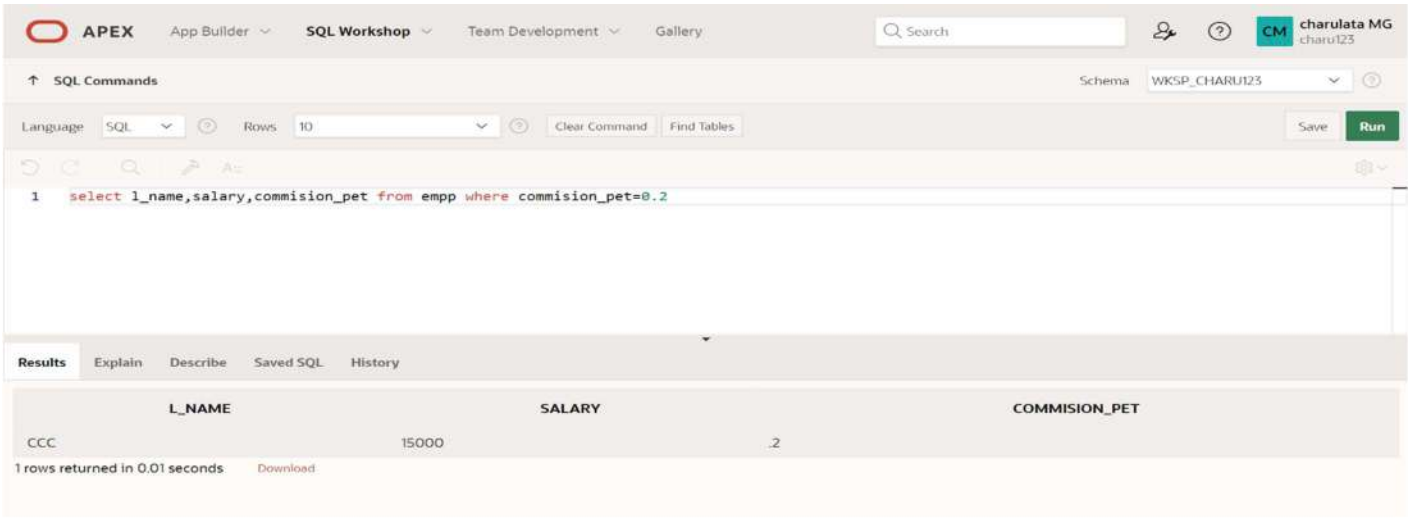


13.Display the last name, salary, and commission for all employees whose commission amount is 20%.(hints:use predicate logic)

QUERY:

select l_name,salary,commision_pet from empp where commision_pet=0.2

OUTPUT:



Evaluation Procedure Marks

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

RESULT:

SINGLE ROW FUNCTIONS

EX.NO.6 DATE:

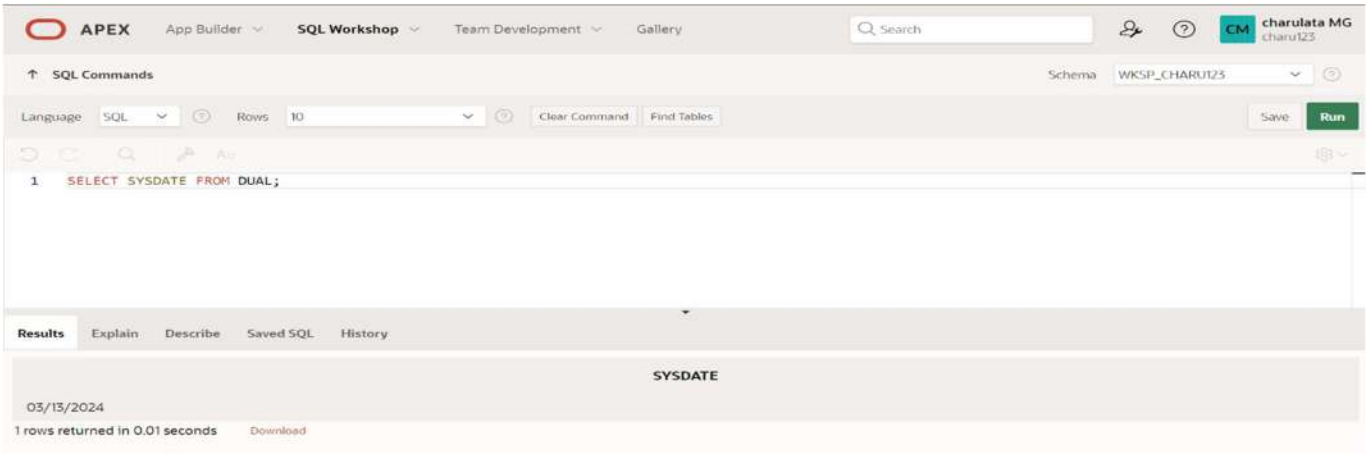
Find the Solution for the following:

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

QUERY:

```
SELECT SYSDATE AS "DATE" FROM DUAL;
```

OUTPUT:

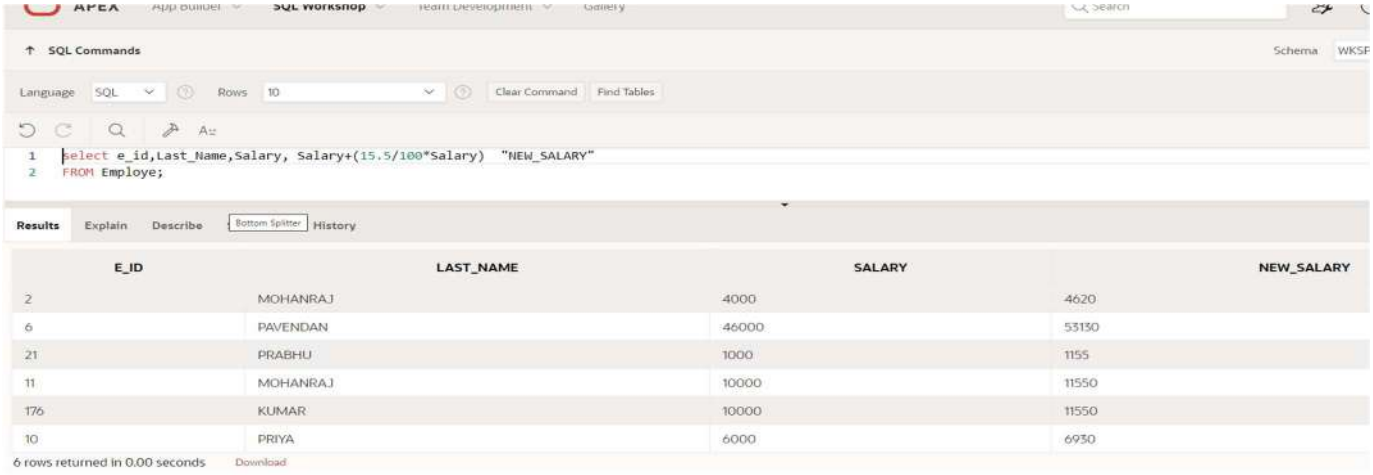


2. The HR department needs a report to display the employee number, last name, salary, and increased by 15.5% (expressed as a whole number) for each employee. Label the column New Salary.

QUERY:

```
SELECT e_id, last_name, Salary, Salary+(15.5/100*Salary) "NEW_SALARY"
From Employe;
```

OUTPUT:

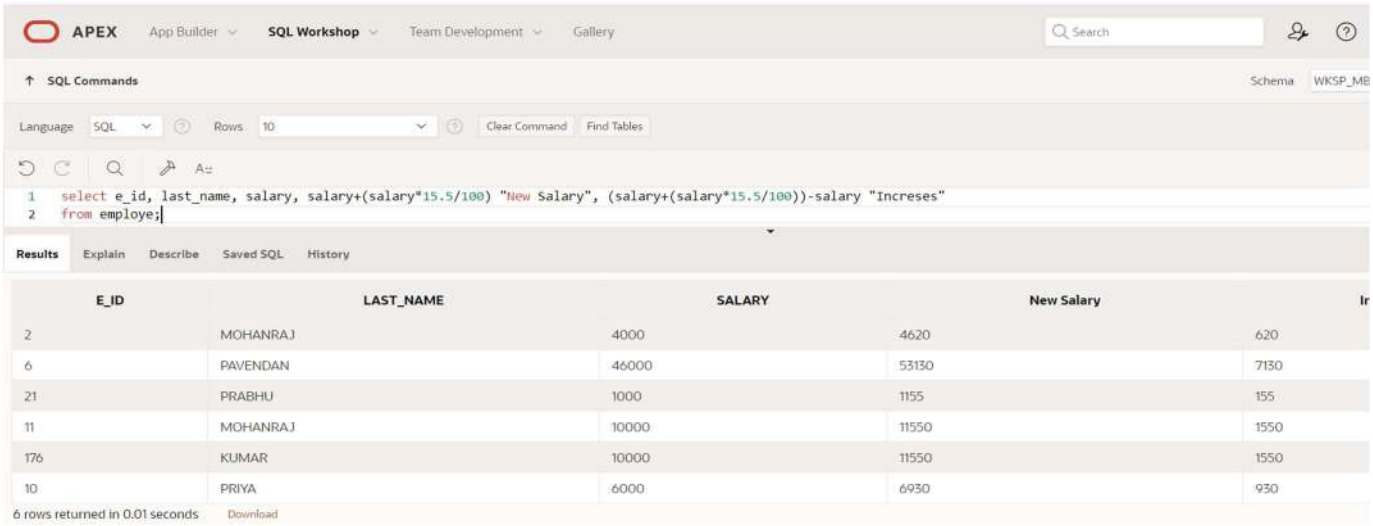


3. Modify your query lab_03_02.sql to add a column that subtracts the old salary from the new salary. Label the column Increase.

QUERY:

```
SELECT e_id, last_name, Salary, (Salary+(Salary*15.5/100))-Salary “Increase”
From Employe;
```

OUTPUT:

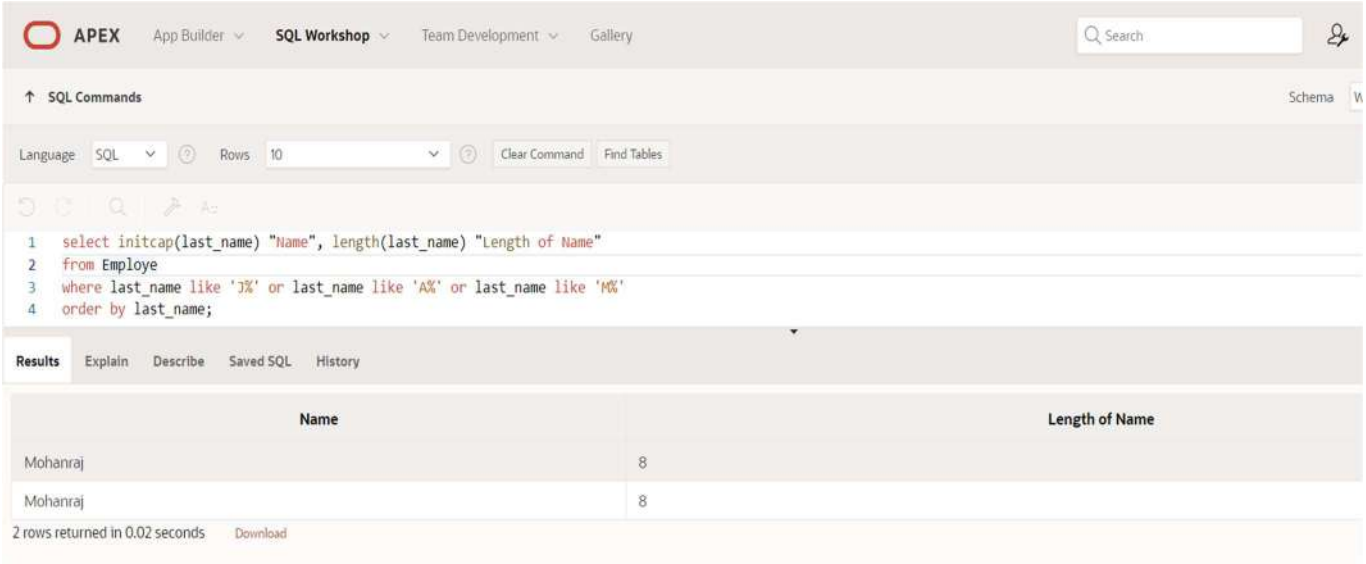


4.a query that displays the last name (with the first letter uppercase and all other letters lowercase) and the length of the last name for all employees whose name starts with the letters J, A, or M. Give each column an appropriate label. Sort the results by the employees’ last names.

QUERY:

```
Select initcap(last_name) "Name", length(last_name) "Length of Name"
from Employe
where last_name like 'J%' or last_name like 'A%' or last_name like 'M%'
order by last_name;
```

OUTPUT:

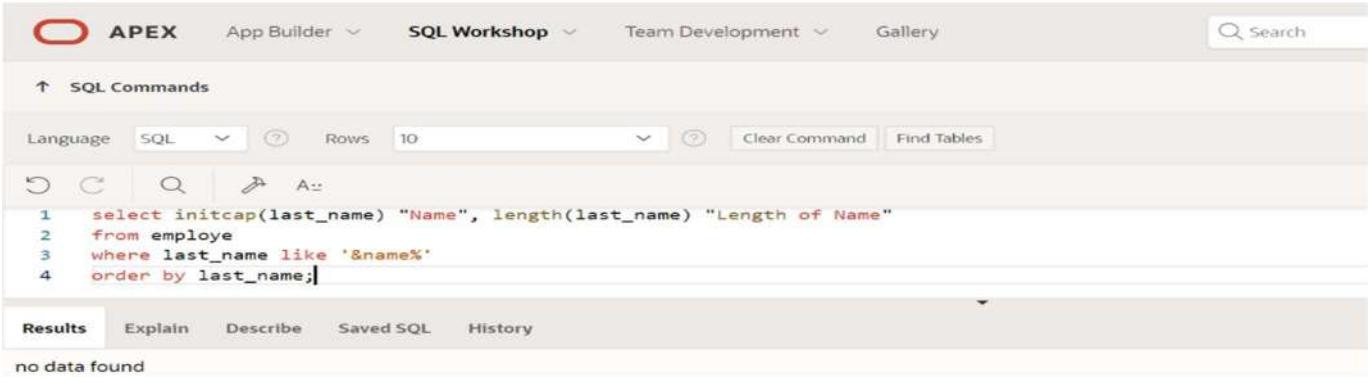


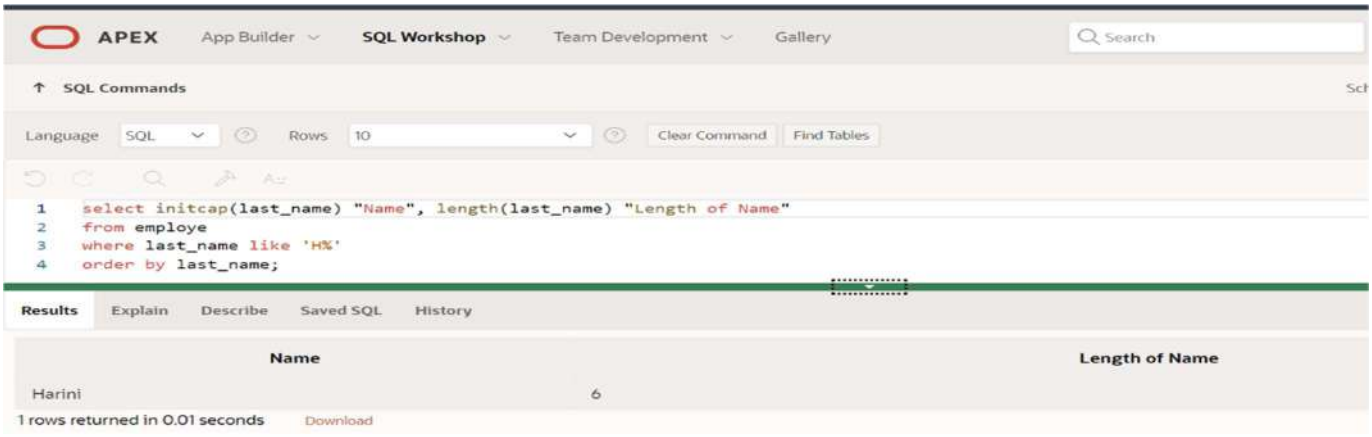
5.Rewrite the query so that the user is prompted to enter a letter that starts the last name. For example, if the user enters H when prompted for a letter, then the output should show all employees whose last name starts with the letter H.

QUERY:

```
select initcap(last_name) "Name", length(last_name) "Length of Name"
from employe
where last_name like '&name%'
order by last_name;
```

OUTPUT:



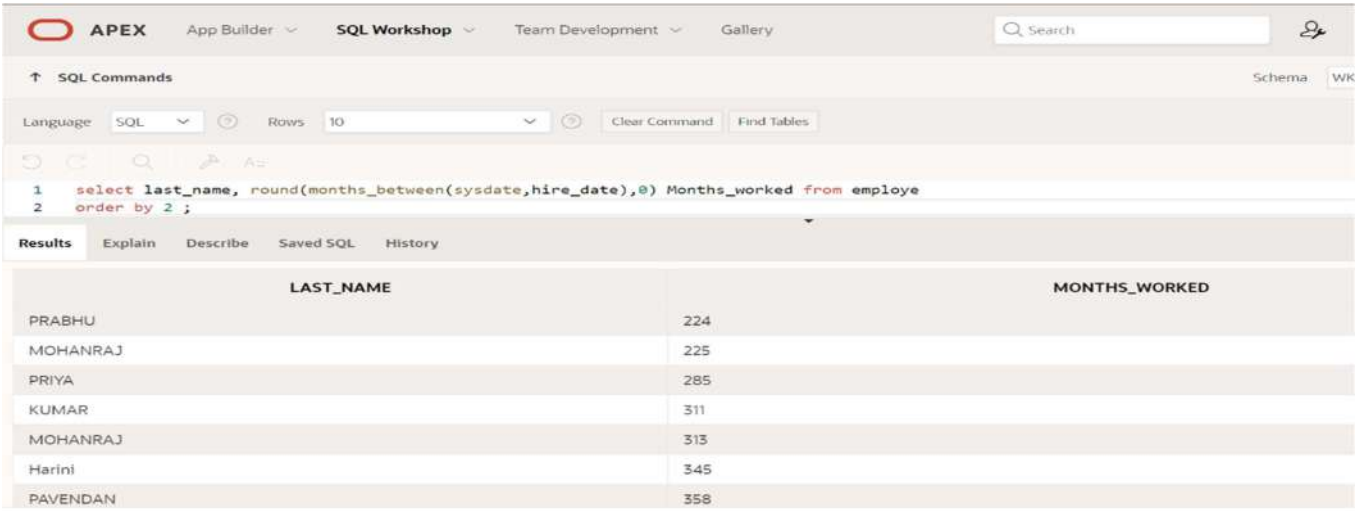


6.The HR department wants to find the length of employment for each employee. For each employee, display the last name and calculate the number of months between today and the date on which the employee was hired. Label the column MONTHS_WORKED. Order your results by the number of months employed. Round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

QUERY:

```
select last_name, round(months_between(sysdate,hire_date),0) Months_worked
from employe order by 2;
```

OUTPUT:



LAST_NAME	MONTHS_WORKED
PRABHU	224
MOHANRAJ	225
PRIYA	285
KUMAR	311
MOHANRAJ	313
Harini	345
PAVENDAN	358

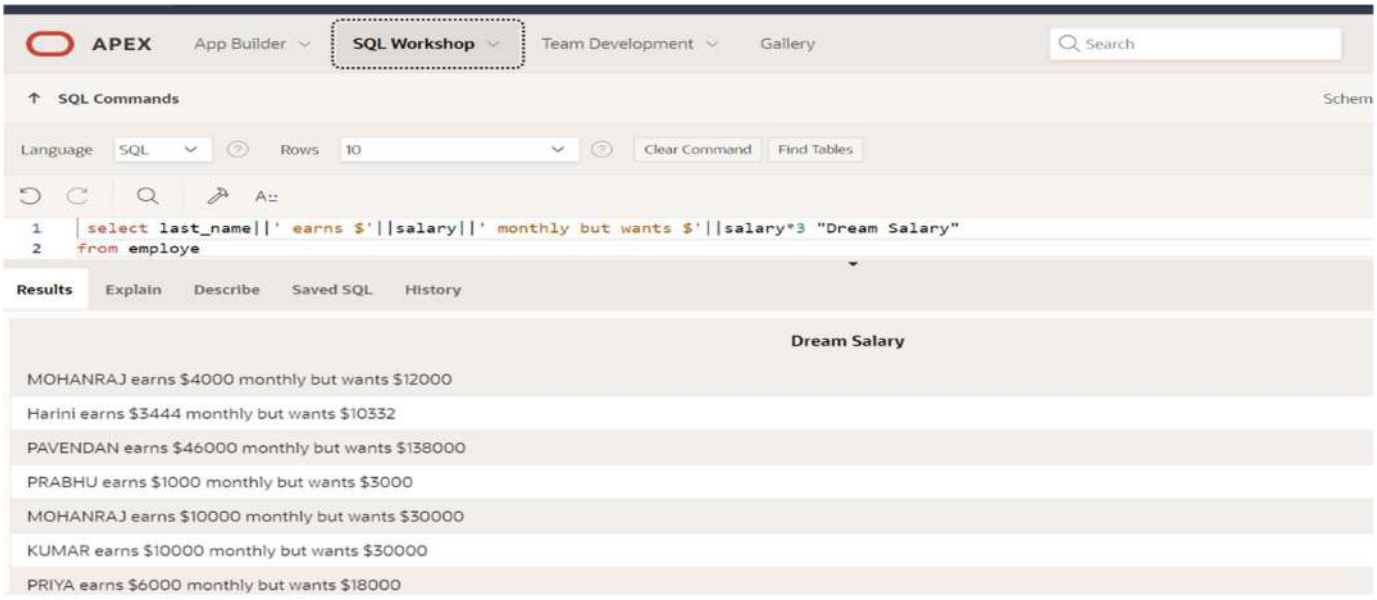
7.Create a report that produces the following for each employee:

<employee last name> earns <salary> monthly but wants <3 times salary>. Label the column Dream Salaries.

QUERY:

```
Select last_name||' earns $'||salary||' monthly but wants $'||salary*3 "Dream Salary"
from employe
```

OUTPUT:



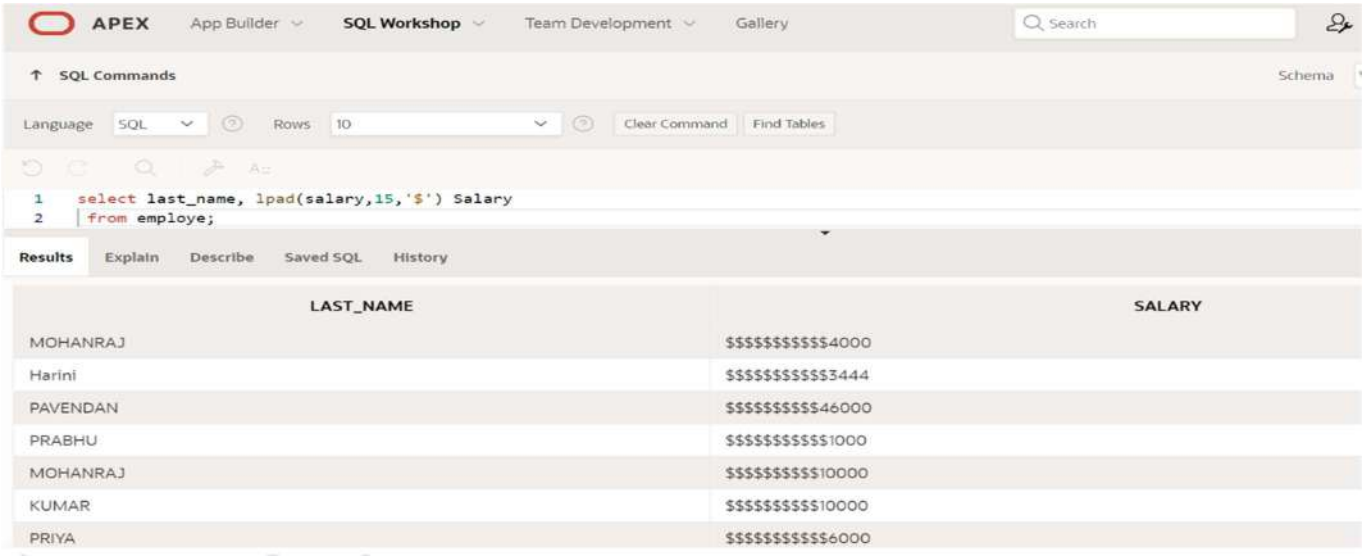
Dream Salary
MOHANRAJ earns $4000 monthly but wants $12000
Harini earns $3444 monthly but wants $10332
PAVENDAN earns $46000 monthly but wants $138000
PRABHU earns $1000 monthly but wants $3000
MOHANRAJ earns $10000 monthly but wants $30000
KUMAR earns $10000 monthly but wants $30000
PRIYA earns $6000 monthly but wants $18000

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,'$') Salary
from employe;
```

OUTPUT:



LAST_NAME	SALARY
MOHANRAJ	$$$$$$$$$$4000
Harini	$$$$$$$$$$3444
PAVENDAN	$$$$$$$$$46000
PRABHU	$$$$$$$$$$1000
MOHANRAJ	$$$$$$$$$10000
KUMAR	$$$$$$$$$10000
PRIYA	$$$$$$$$$$6000

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(hire_date,'Monday')),'fmday," the "ddspth "of" month,yyyy') "REVIEW" from employe;
```

OUTPUT:

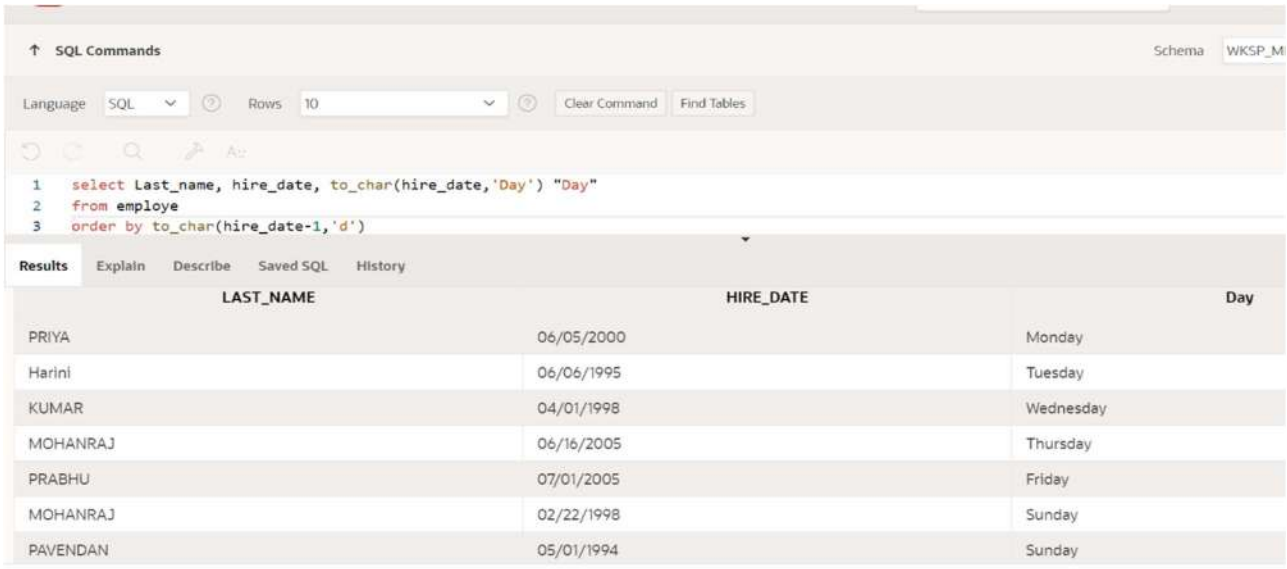
LAST_NAME	HIRE_DATE	REVIEW
MOHANRAJ	02/22/1998	monday, the twenty-third of february,1998
Harini	06/06/1995	monday, the twelfth of june,1995
PAVENDAN	05/01/1994	monday, the second of may,1994
PRABHU	07/01/2005	monday, the fourth of july,2005
MOHANRAJ	06/16/2005	monday, the twentieth of june,2005
KUMAR	04/01/1998	monday, the sixth of april,1998
PRIYA	06/05/2000	monday, the twelfth of june,2000

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, hire_date, to_char(hire_date,'Day') "Day"
from employe
order by to_char(hire_date-1,'d');
```

OUTPUT:



LAST_NAME	HIRE_DATE	Day
PRIYA	06/05/2000	Monday
Harini	06/06/1995	Tuesday
KUMAR	04/01/1998	Wednesday
MOHANRAJ	06/16/2005	Thursday
PRABHU	07/01/2005	Friday
MOHANRAJ	02/22/1998	Sunday
PAVENDAN	05/01/1994	Sunday

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

RESULT:

DISPLAYING DATA FROM MULTIPLE TABLES

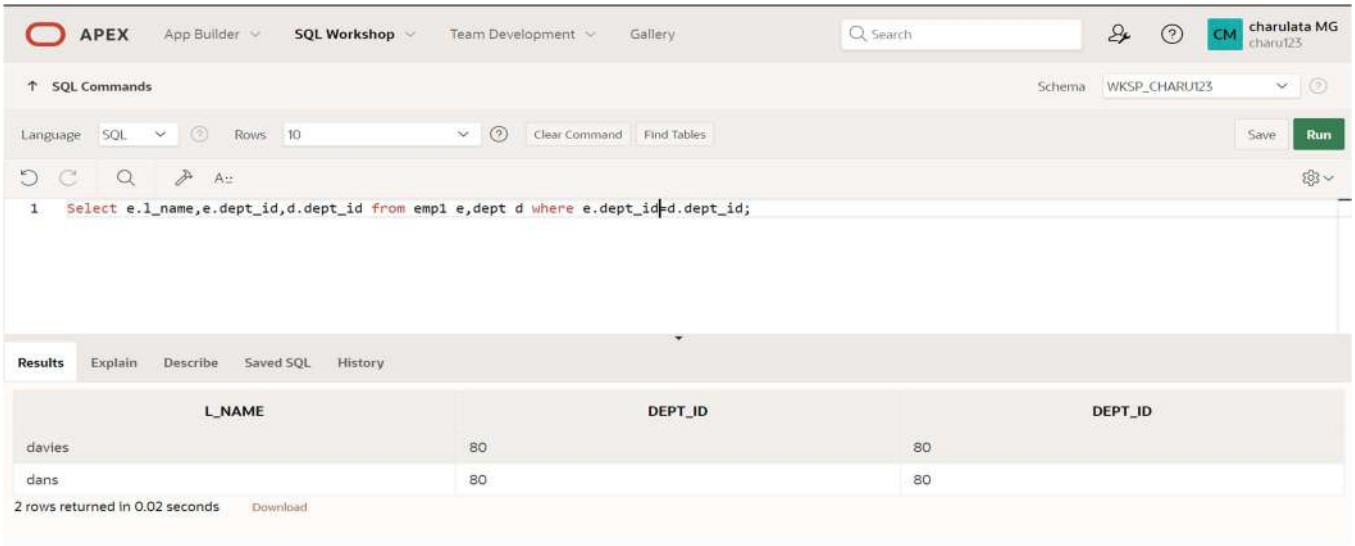
EX_NO:7 **DATE:**

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

QUERY:

Select e.l_name,e.dept_id,d.dept_id from emp1 e,dept d where e.dept_id=d.dept_id;

OUTPUT:

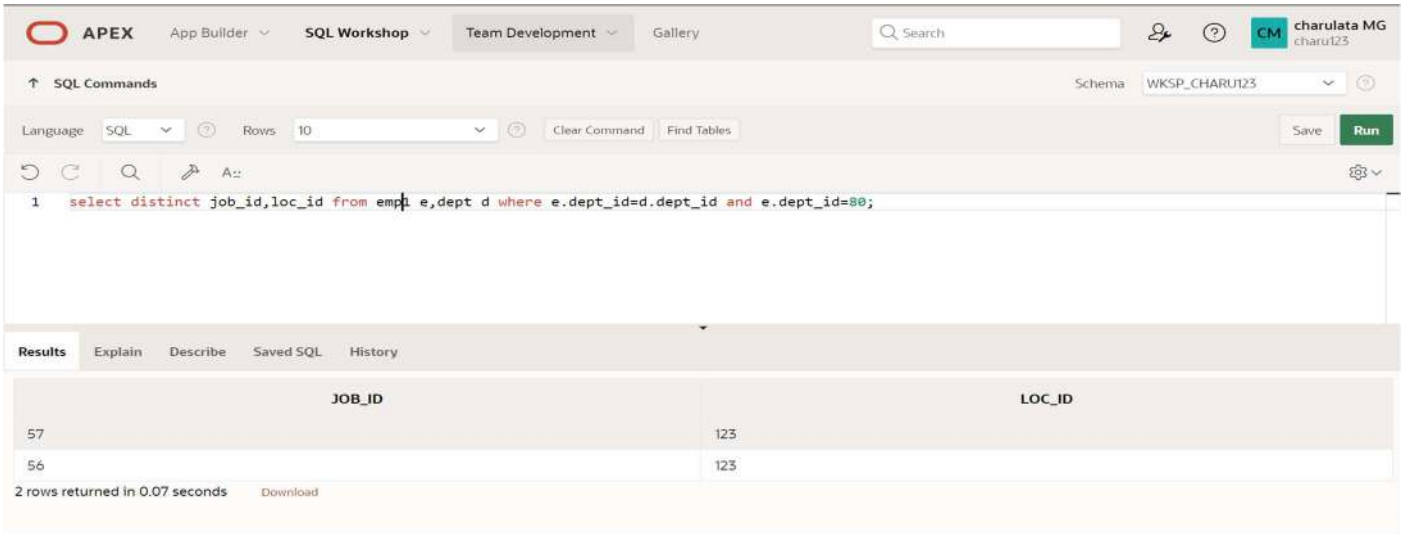


2.Create a unique listing of all jobs that are in department 80. Include the location of the department in the output.

QUERY:

select distinct job_id,loc_id from emp1 e,dept d where e.dept_id=d.dept_id and e.dept_id=80;

OUTPUT:



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.l_name,e.dept_id,d.dept_name,d.loc_id,l.city from emp1 e,dept d,loc l where e.dept_id=d.dept_id and d.loc_id=l.loc_id and e.commission is not null;

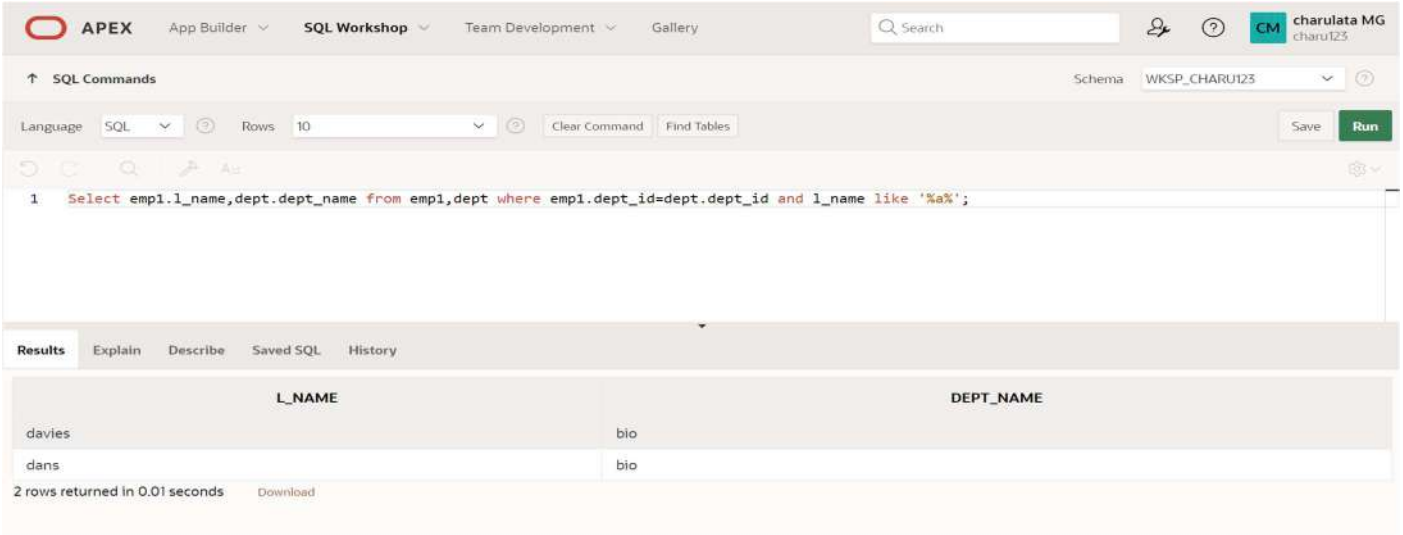
OUTPUT:

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

QUERY:

Select emp1.l_name,dept.dept_name from emp1,dept where emp1.dept_id=dept.dept_id and l_name like '%a%';

OUTPUT:

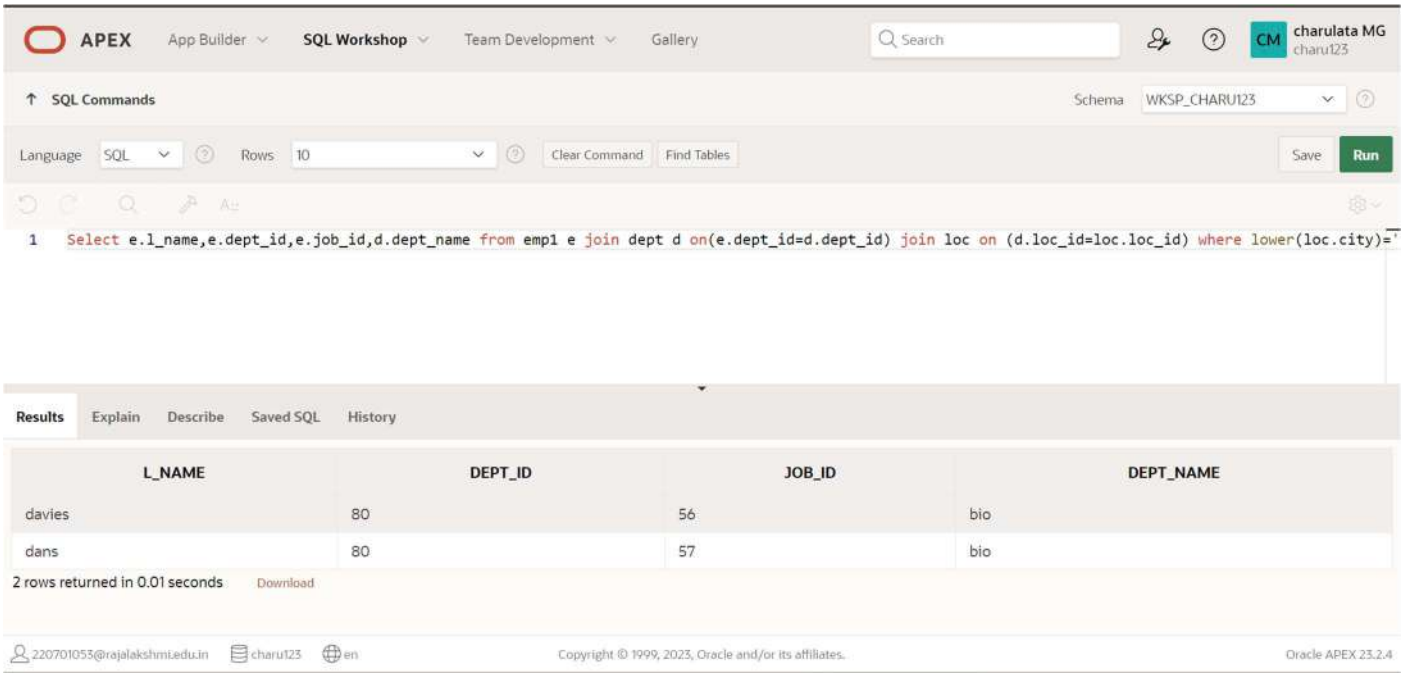


5. Write a query to display the last name, job, department number, and department name for all employees who work in Toronto.

QUERY:

Select e.l_name,e.dept_id,e.job_id,d.dept_name from emp1 e join dept d on(e.dept_id=d.dept_id) join loc on (d.loc_id=loc.loc_id) where lower(loc.city)='toronto';

OUTPUT:



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 w.last_name "Employee",w.emp_id "emp#",m.last_name 'manager",m.emp_id "Mgr#" from empo21 m on (w.manager_id=m.emp_id);

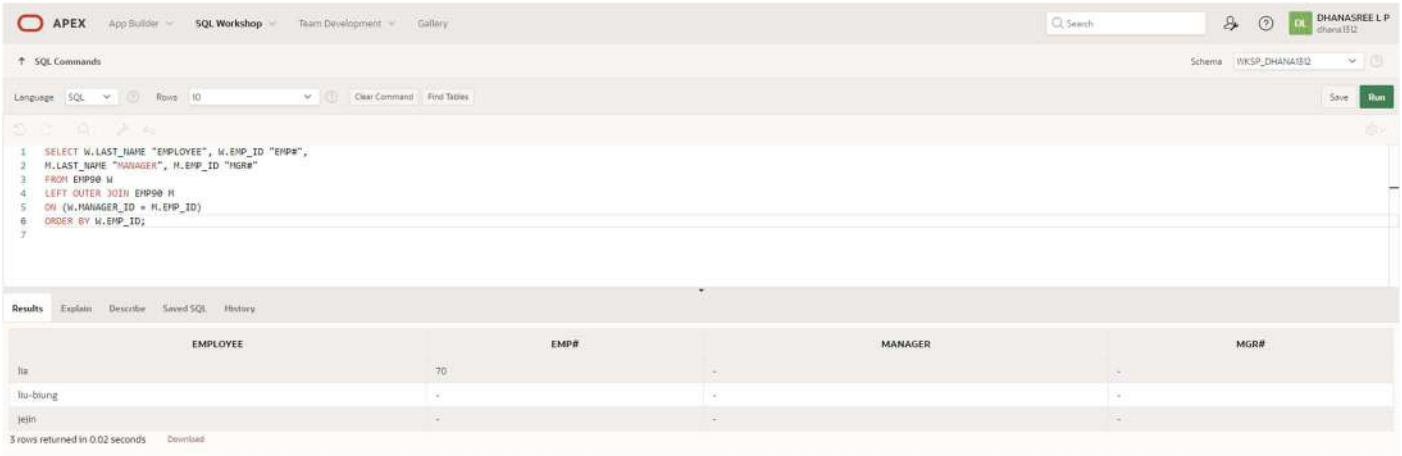
OUTPUT:

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

QUERY:

Select w.last_name “Employee”,w.emp_id “emp#”,m.last_name ‘manager”,m.emp_id “Mgr#” from empo21 w left outer join empo21 m on (w.manager_id=m.emp_id);

OUTPUT:

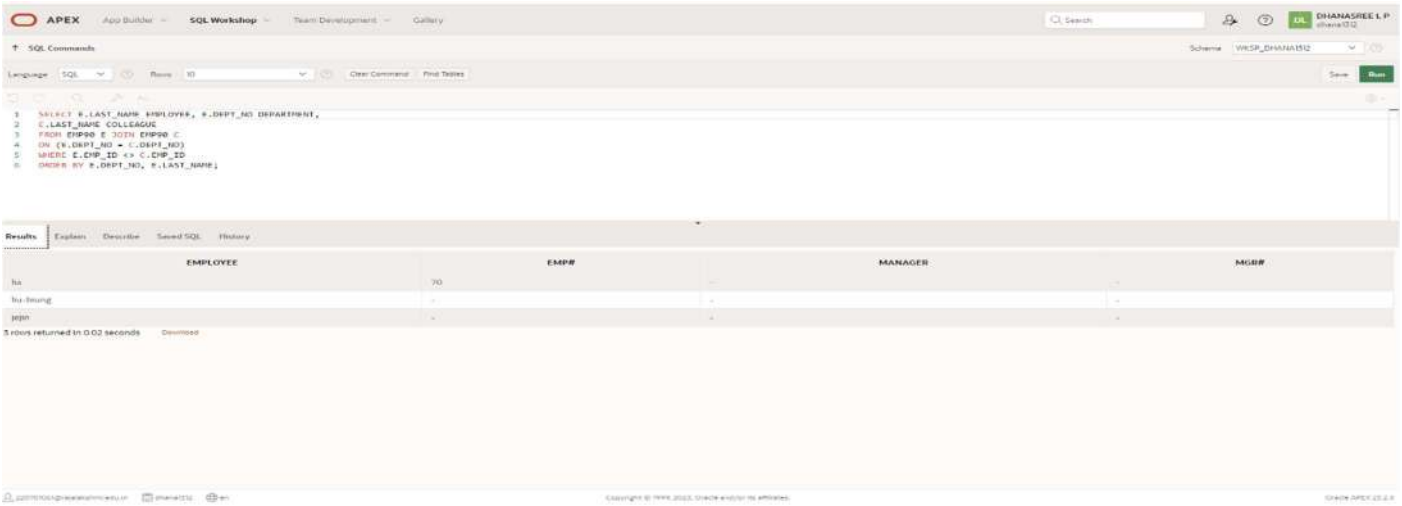


8.Create a query that displays employee last names, department numbers, and all the employees who work in the same department as a given employee. Give each column an appropriate label

QUERY:

select e.department_number dept23,e.last_name colleague from empo21 e join empo21 c on (e.department_number=c.department_number) where e.emp_id <> c.emp_id order by e.department_number,e.last_name,c.last_name;

OUTPUT:

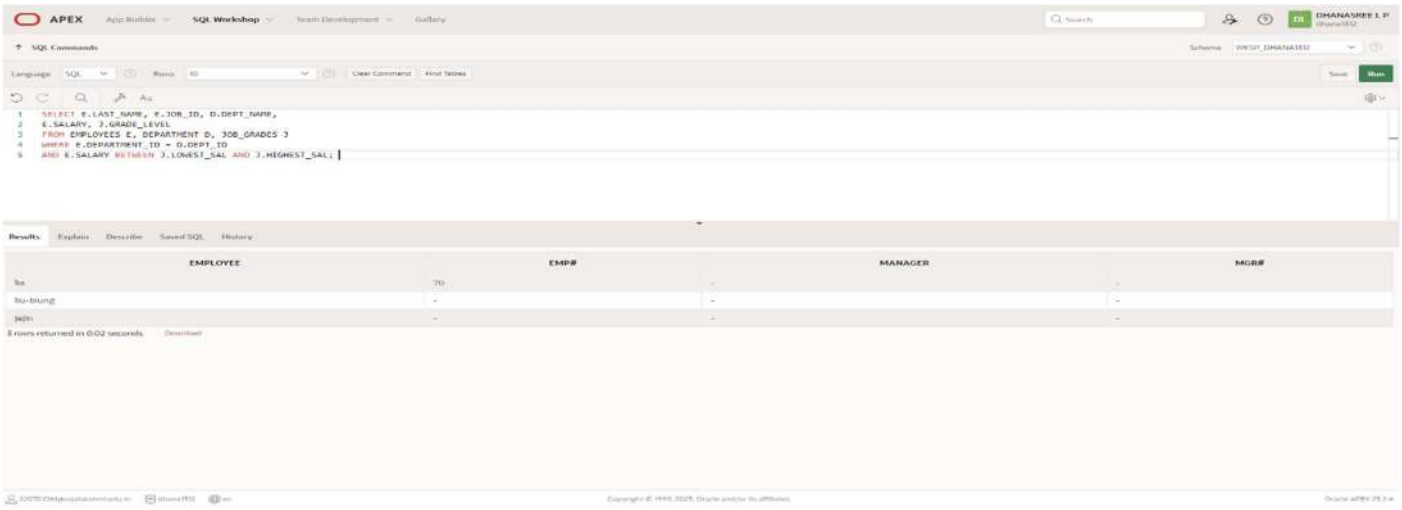


9.Show the structure of the JOB_GRADES table. Create a query that displays the name, job, department name, salary, and grade for all employees

QUERY:

SELECT e.last_name, e. job_id, d.dept_name,e.salary, j• grade_level
FROM emp18 e JOIN dept18 d
ON (e.dept_id = d. dept_id)
JOIN job_grade j
ON (e.salary BETWEEN j. lowest_ sal AND j.highest_sal);

OUTPUT:

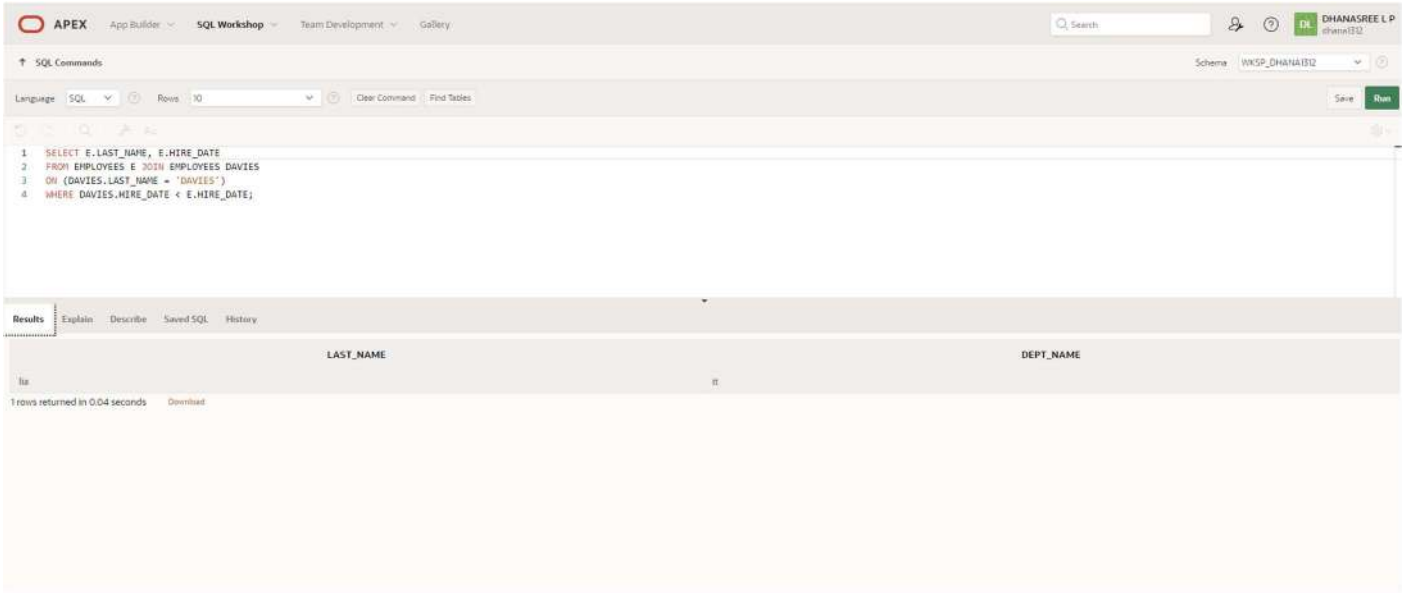


10.Create a query to display the name and hire date of any employee hired after employee Davies.

QUERY:

SELECT e. last_name, e. hire_date FROM emp18 e, emp18 davies
WHERE davies.last name = 'Davies'
AND davies.hire_date ‹ e.hire_date;

OUTPUT:

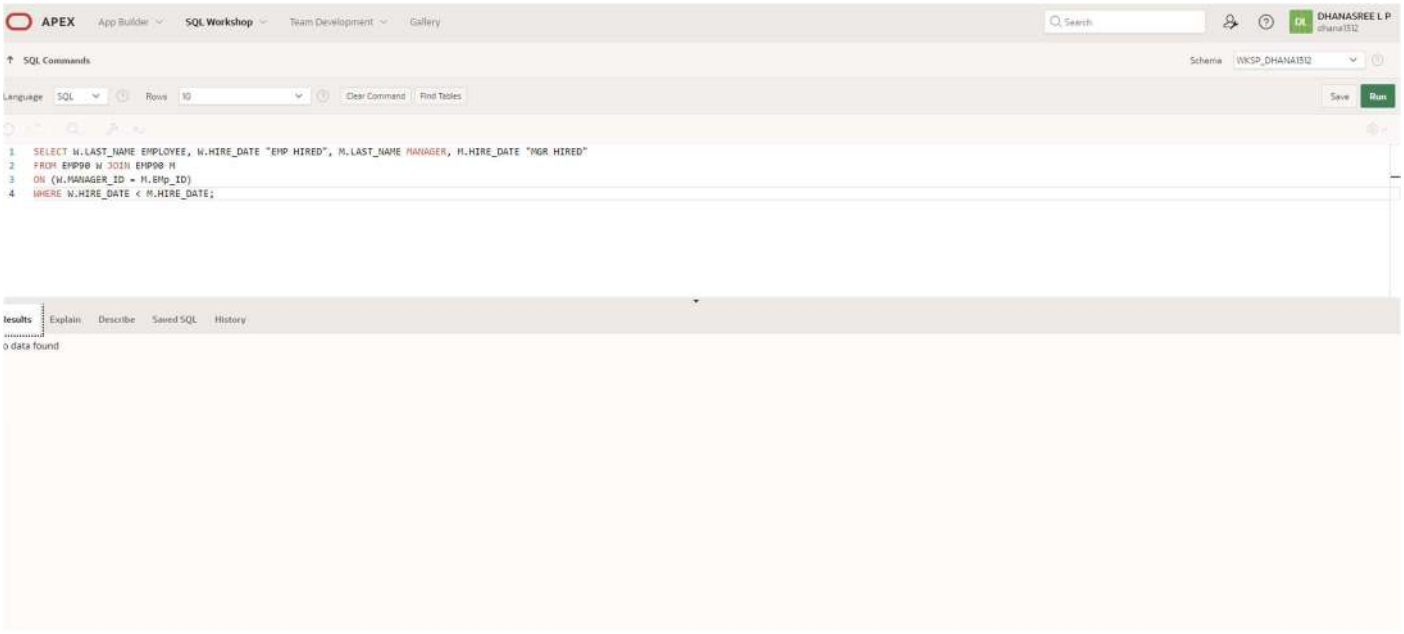


11.Display the names and hire dates for all employees who were hired before their managers,
along with their manager's names and hire dates. Label the columns Employee, Emp Hired, Manager, and Mgr Hired, respectively.

QUERY:

```
SELECT e. last_name AS Employee, e.hire_date AS Emp_Hired,
e. manager_name AS Manager, m.hire_date AS Mgr_Hired
FROM emp18 e
JOIN emp18|m ON e-manager _name = m. last_name
WHERE e.hire_date ‹ m.hire_date;
```

OUTPUT:



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

RESULT

AGGREGATING DATA USING GROUP FUNCTIONS

EX_NO : 8 **DATE:**

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

TRUE

2.Group functions include nulls in calculations.
True/False

FALSE

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

FALSE

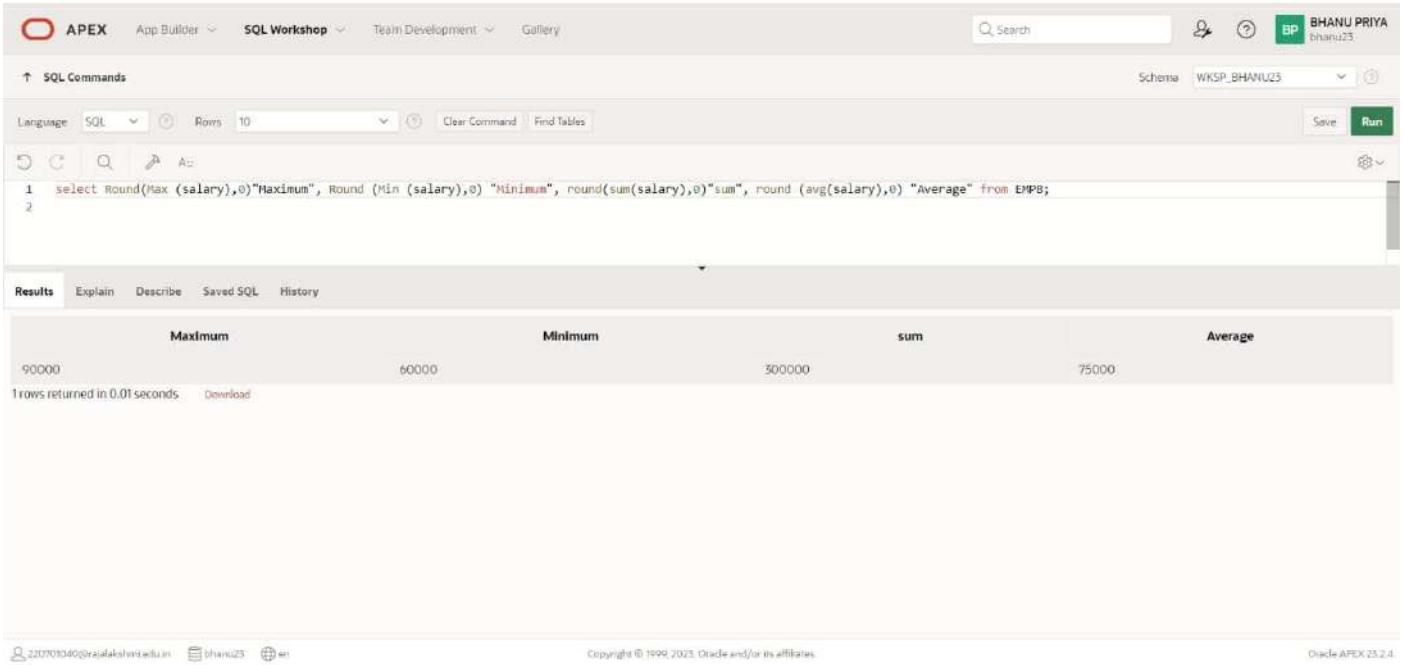
4.Find the highest, lowest, sum, and average salary of all employees. Label the columns Maximum, Minimum, Sum, and Average, respectively. Round your results to the nearest whole number

QUERY:

select Round(Max (salary),0)"Maximum", Round (Min (salary),0) "Minimum",

round(sum(salary),0)"sum", round (avg(salary),0) "Average" from EMPB;

OUTPUT:

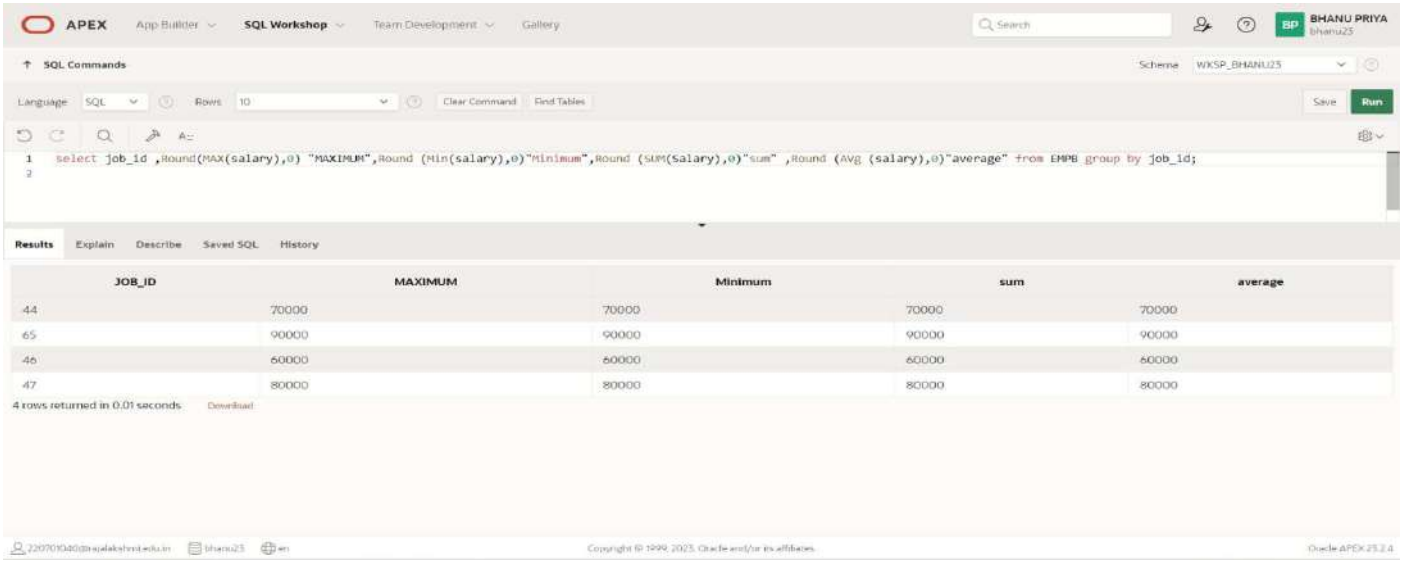


5.Modify the above query to display the minimum, maximum, sum, and average salary for each job type.

QUERY:

select job_id ,Round(MAX(salary),0) "MAXIMUM",Round (Min(salary),0)"Minimum",Round (SUM(Salary),0)"sum" ,Round (AVg (salary),0)"average" from EMPB group by job_id;

OUTPUT:



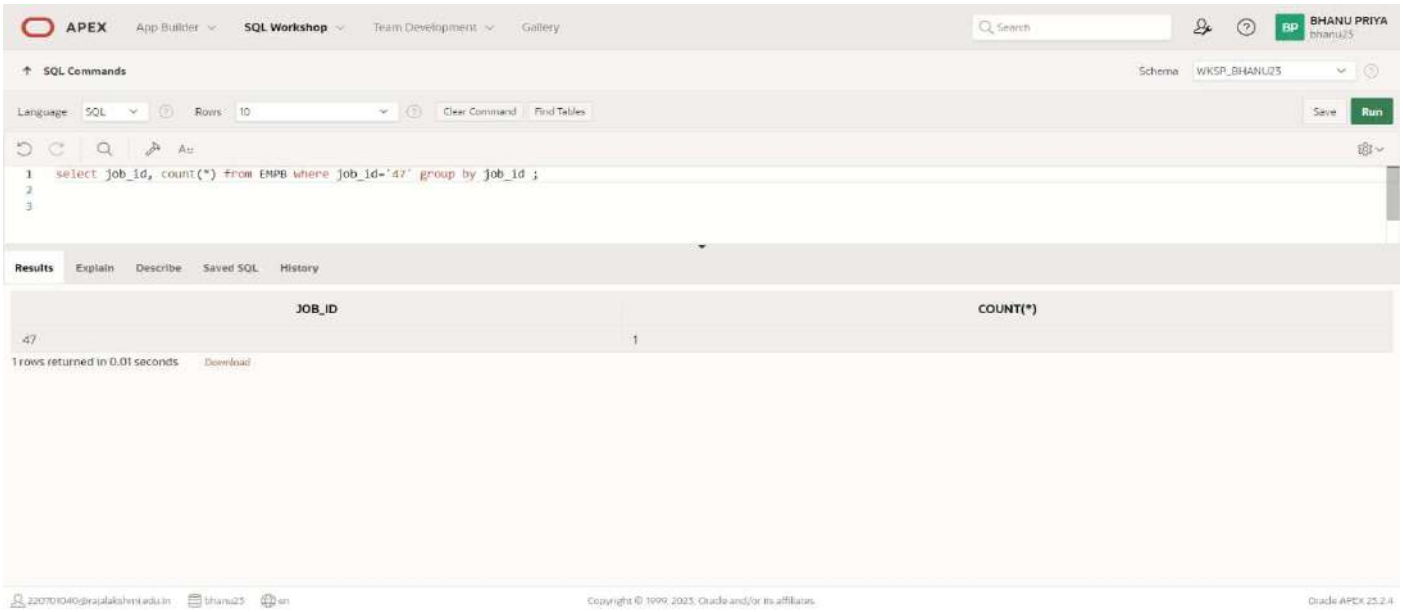
6.Write a query to display the number of people with the same job. Generalize the query so that the user in the HR department is prompted for a job title.

QUERY:

select job_id, count(*) from EMPB group by job_id ;

select job_id, count(*) from EMPB where job_id='47' group by job_id ;

OUTPUT:



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(distinct manager_id)"Number of managers" from empb;

OUTPUT:

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

QUERY:

select max(salary)-min(salary) difference from empb;

OUTPUT:

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) from empb where manager_id is not null group by manager_id having min(salary) >6000 order by min(salary) desc;

OUTPUT:

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:

selectcount(*)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",sum(decode(to_char(hire_date,'YYYY'),1998,1,0)) "1998" from empb;

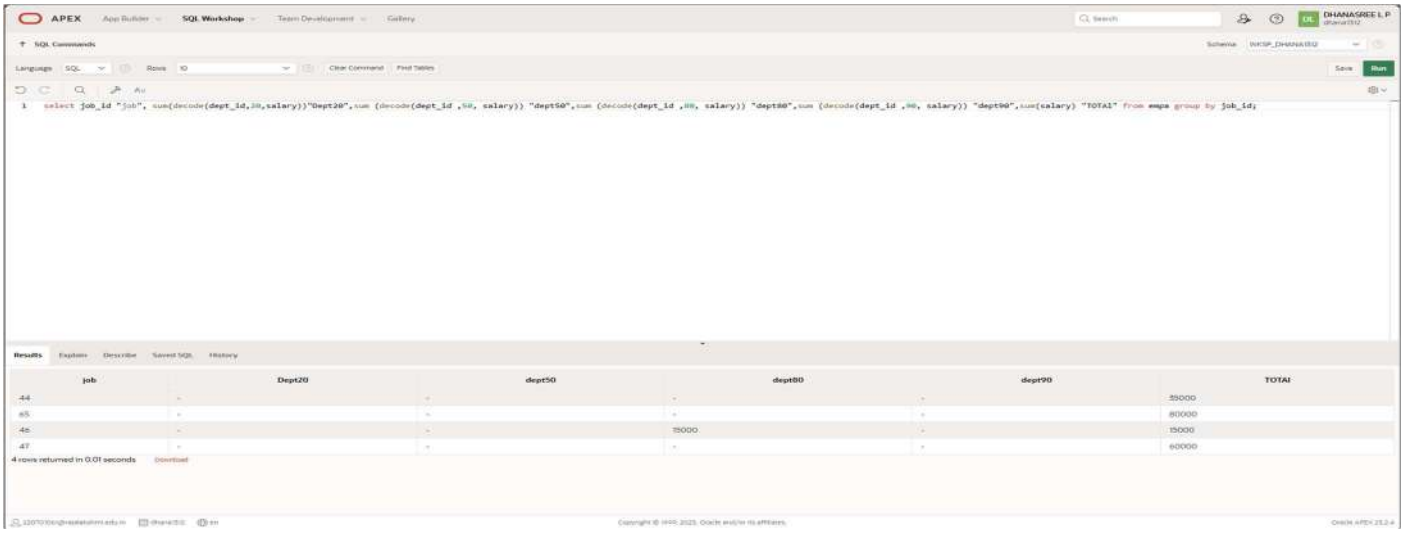
OUTPUT:

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 job_id "job", sum(decode(dept_id,20,salary))"Dept20",sum (decode(dept_id ,50, salary)) "dept50",sum (decode(dept_id ,80, salary)) "dept80",sum (decode(dept_id ,90, salary)) "dept90",sum(salary) "TOTAl" from empb group by job_id

OUTPUT:

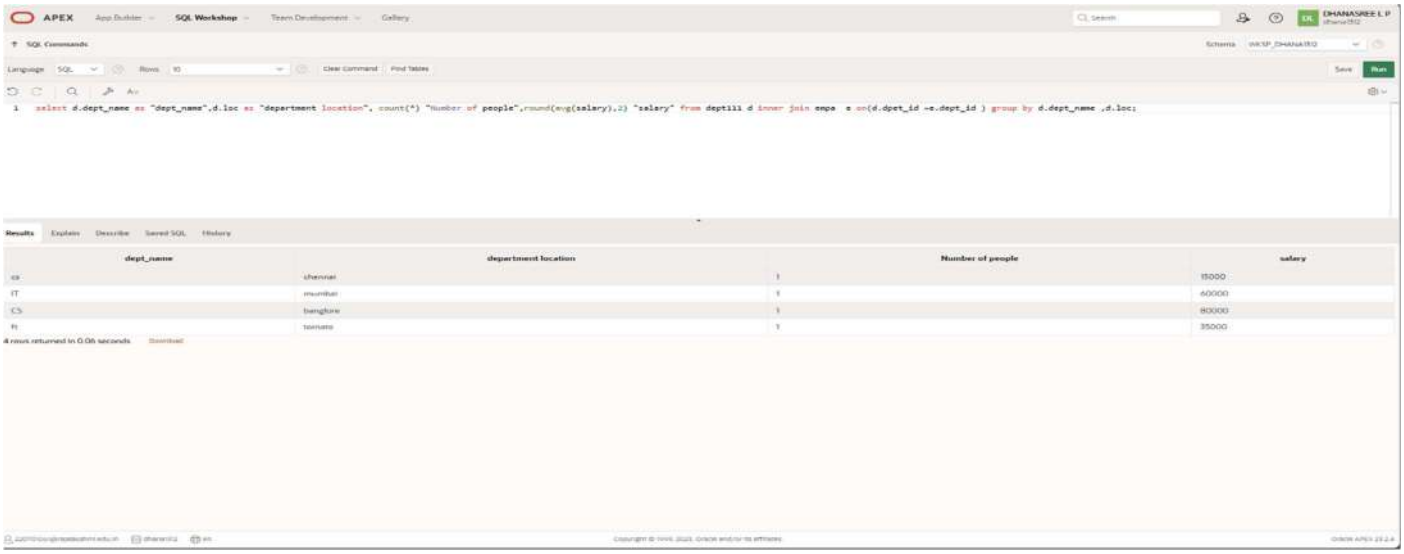


12. Write a query to display each department‘s name, location, number of employees, and the average salary for all the employees in that department. Label the column name-Location, Number of people, and salary respectively. Round the average salary to two decimal places.

QUERY:

select d.dept_name as "dept_name",d.loc as "department location", count(*) "Number of people",round(avg(salary),2) "salary" from dept111 d inner join empb e on(d.dpet_id =e.dept_id) group by d.dept_name ,d.loc;

OUTPUT:



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

RESULT:

SUB-QUERIES

EX.NO:9 DATE:

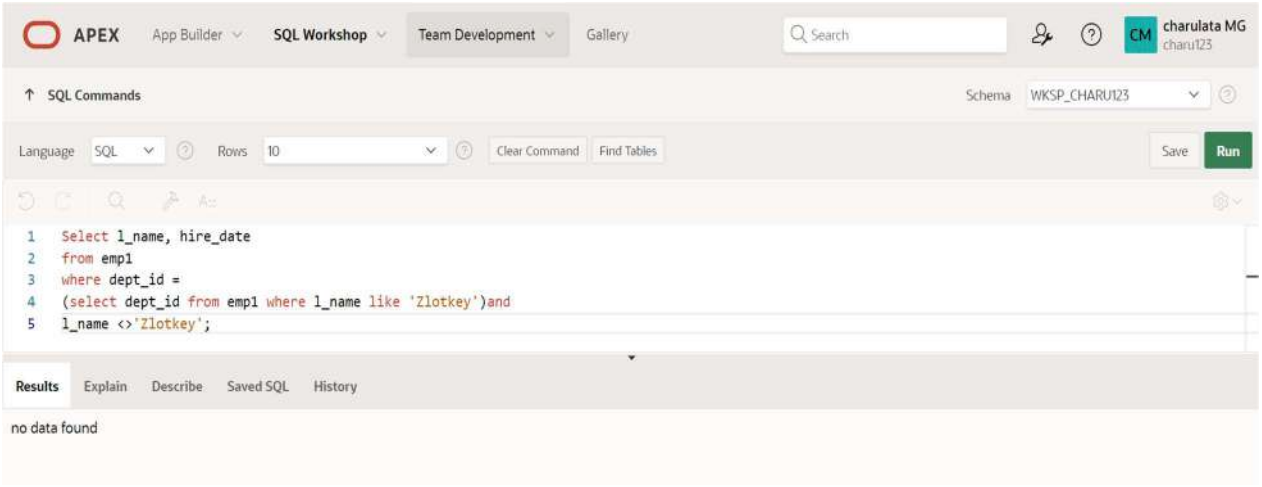
Find the Solution for the following:

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 l_name, hire_date
from emp1
where dept_id =
(select dept_id from emp1 where l_name like 'Zlotkey')and
l_name <>'Zlotkey';
```

OUTPUT:

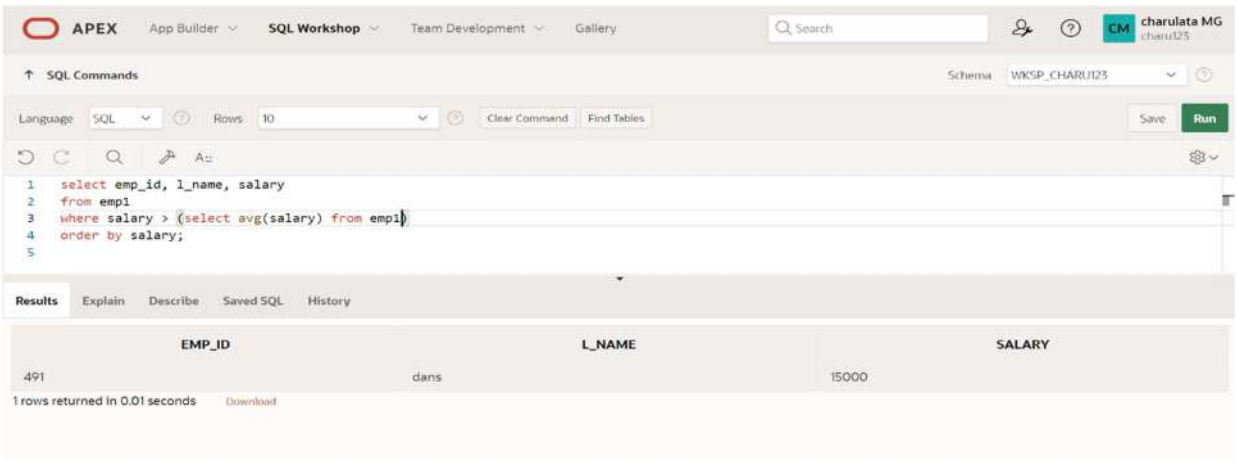


2. Create a report that displays the employee number, last name, and salary of all employees who earn more than the average salary. Sort the results in order of ascending salary.

QUERY:

```
select emp_id, l_name, salary
from emp1
where salary > (select avg(salary) from emp1)
order by salary;
```

OUTPUT:

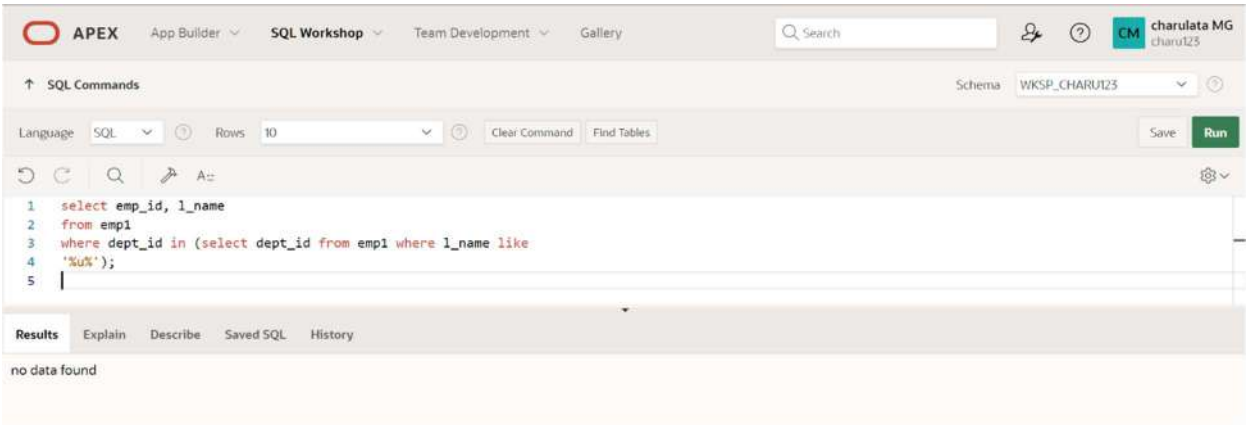


3. Write a query that displays the employee number and last name of all employees who work in a department with any employee whose last name contains a u.

QUERY:

```
select emp_id, l_name
from emp1
where dept_id in (select dept_id from emp1 where l_name like
'%u%');
```

OUTPUT:

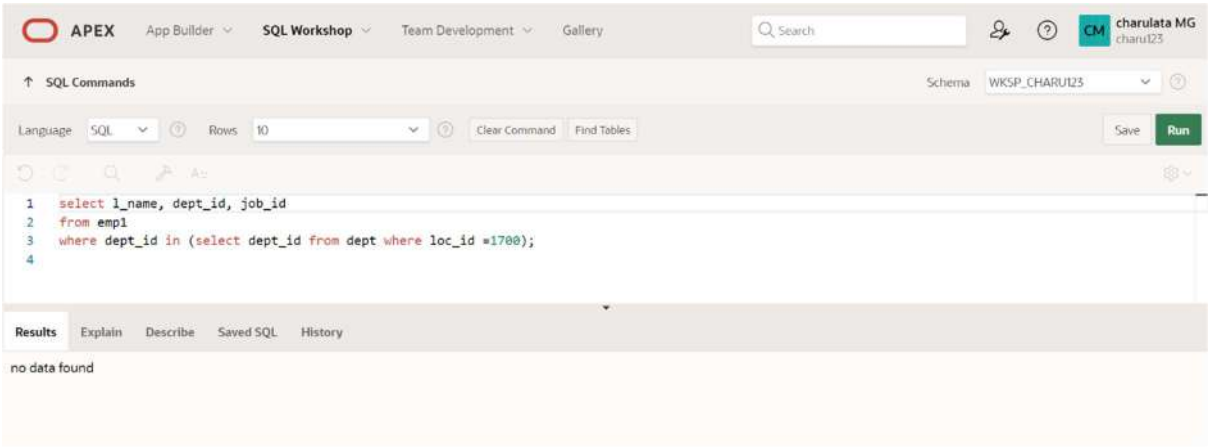


4. The HR department needs a report that displays the last name, department number, and job ID of all employees whose department location ID is 1700.

QUERY:

```
select l_name, dept_id, job_id
from emp1
where dept_id in (select dept_id from dept where loc_id =1700);
```

OUTPUT:

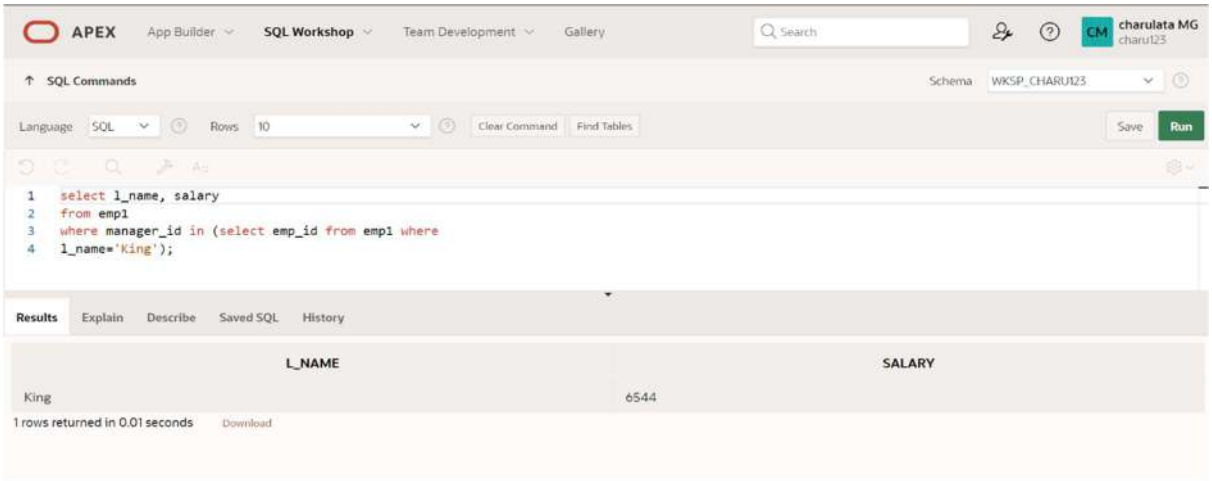


5. Create a report for HR that displays the last name and salary of every employee who reports to King.

QUERY:

```
select l_name, salary
from emp1
where manager_id in (select emp_id from emp1 where
l_name='King');
```

OUTPUT:

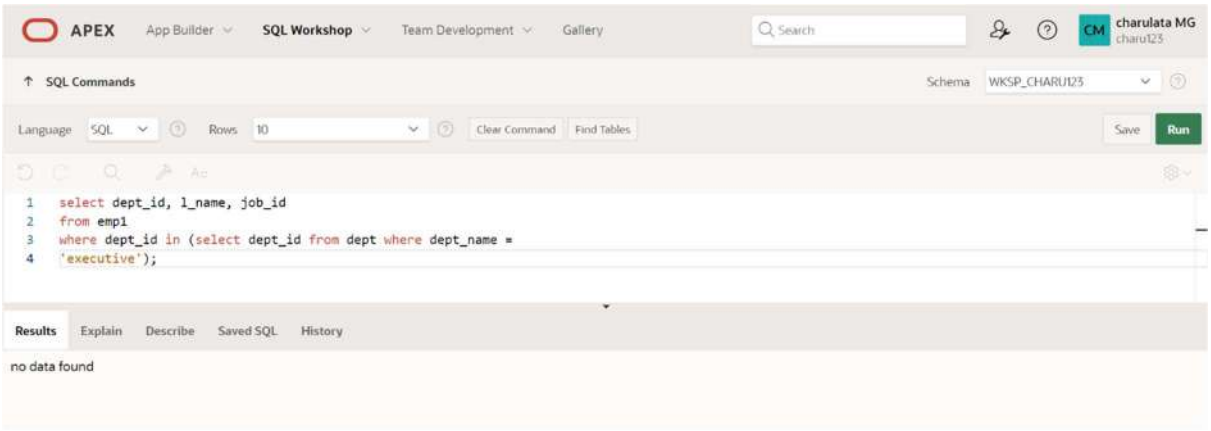


6. Create a report for HR that displays the department number, last name, and job ID for every employee in the Executive department.

QUERY:

```
select dept_id, l_name, job_id
from emp1
where dept_id in (select dept_id from dept where dept_name =
'executive');
```

OUTPUT:

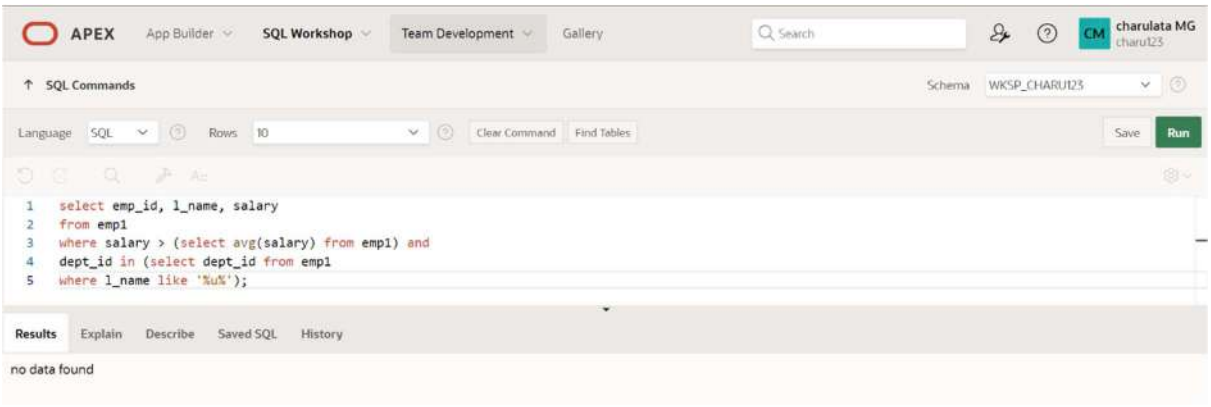


7. Modify the query 3 to display the employee number, last name, and salary of all employees who earn more than the average salary and who work in a department with any employee whose last name contains a u.

QUERY:

```
select emp_id, l_name, salary
from emp1
where salary > (select avg(salary) from emp1) and
dept_id in (select dept_id from emp1
where l_name like '%u%');
```

OUTPUT:



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

RESULT:

USING THE SET OPERATORS

EX.NO:10 DATE:

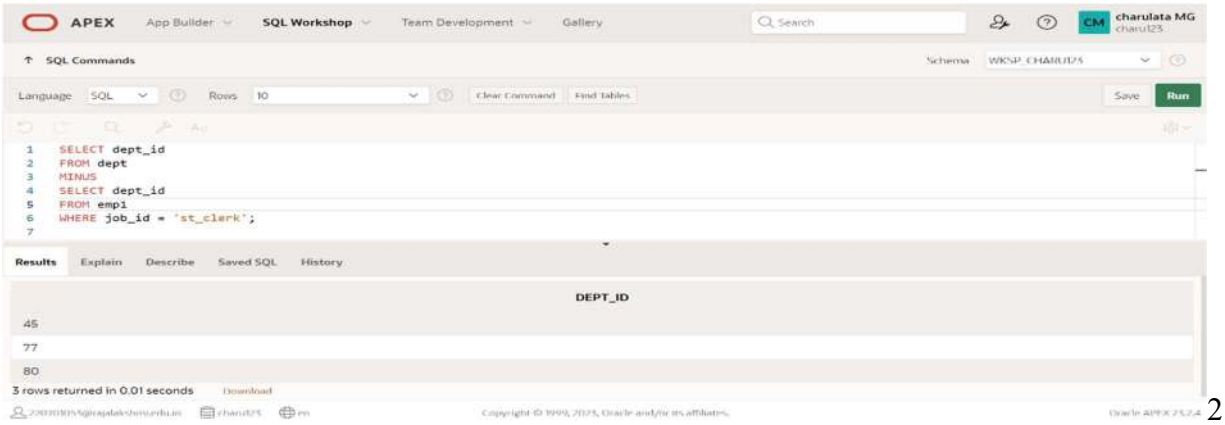
Find the Solution for the following:

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 dept_id
FROM dept
MINUS
SELECT dept_id
FROM emp1
WHERE job_id = 'st_clerk';
```

OUTPUT:



2.HR 2.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 countries
MINUS SELECT l.country_id,c.country_name FROM locations l, countries c
WHERE l.country_id = c.country_id
```

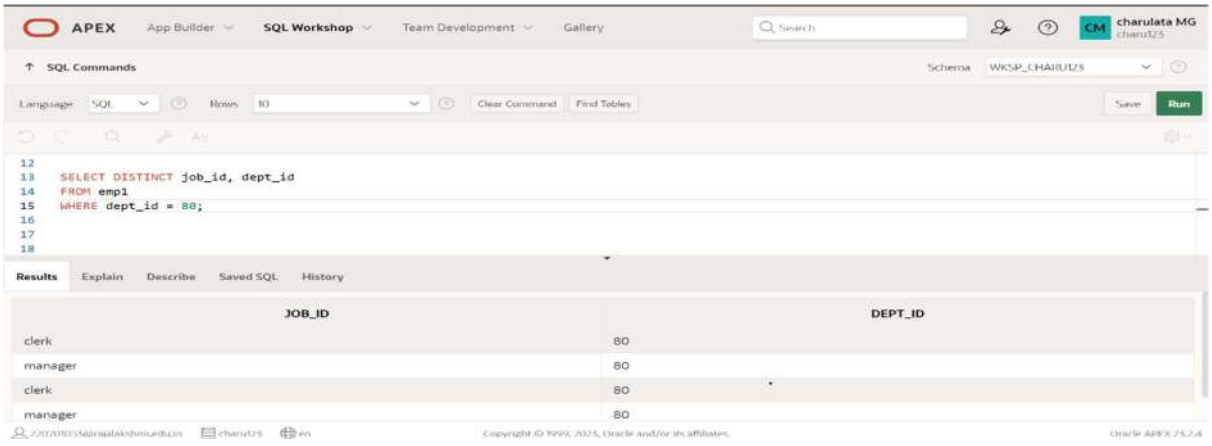
OUTPUT:

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, dept_id
FROM emp1
WHERE dept_id = 597

UNION ALL

SELECT DISTINCT job_id, dept_id
FROM emp1
WHERE dept_id = 80

UNION ALL

SELECT DISTINCT job_id, dept_id
FROM emp1
WHERE dept_id = 80;
```

OUTPUT:

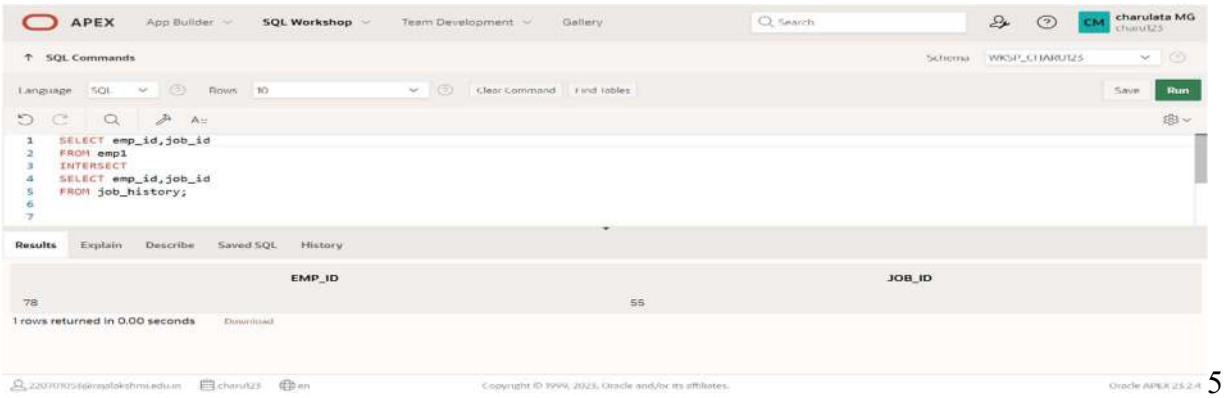


4. Create a report that lists the employee IDs and job IDs of those employees who currently have a job title that is the same as their job title when they were initially hired by the company (that is, they changed jobs but have now gone back to doing their original job).

QUERY:

```
SELECT emp_id,job_id
FROM emp1
INTERSECT
SELECT emp_id,job_id
FROM job_history;
```

OUTPUT:



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

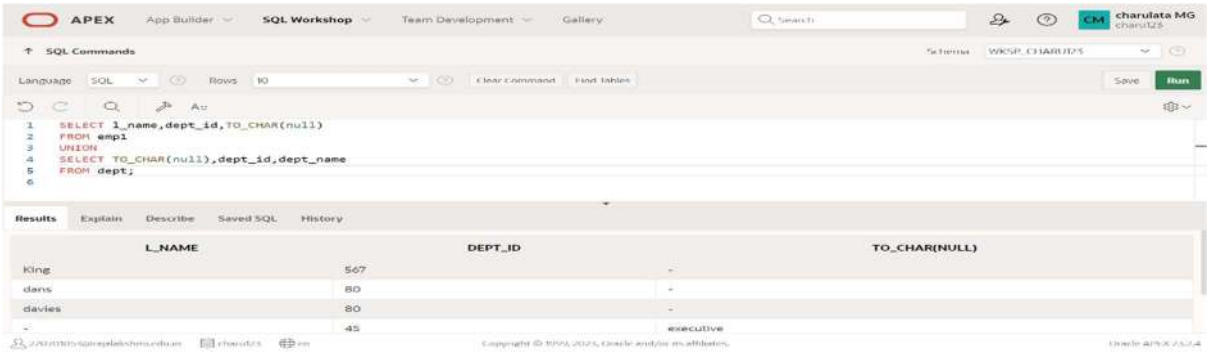
- Last name and department ID of all the employees from the EMPLOYEES table, regardless of whether or not they belong to a department.

- 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 l_name,dept_id,TO_CHAR(null)
FROM emp1
UNION
SELECT TO_CHAR(null),dept_id,dept_name
FROM dept;
```

OUTPUT:



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

RESULT:

EXERCISE-11 CREATING VIEWS

EX.NO:10 **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 emp_id,l_name employee,dept_id from emp1;

OUTPUT:

2.Display the contents of the EMPLOYEES_VU view.

QUERY:

select *from employees_vu;

OUTPUT:

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

QUERY:

select view_name,text from user_views;

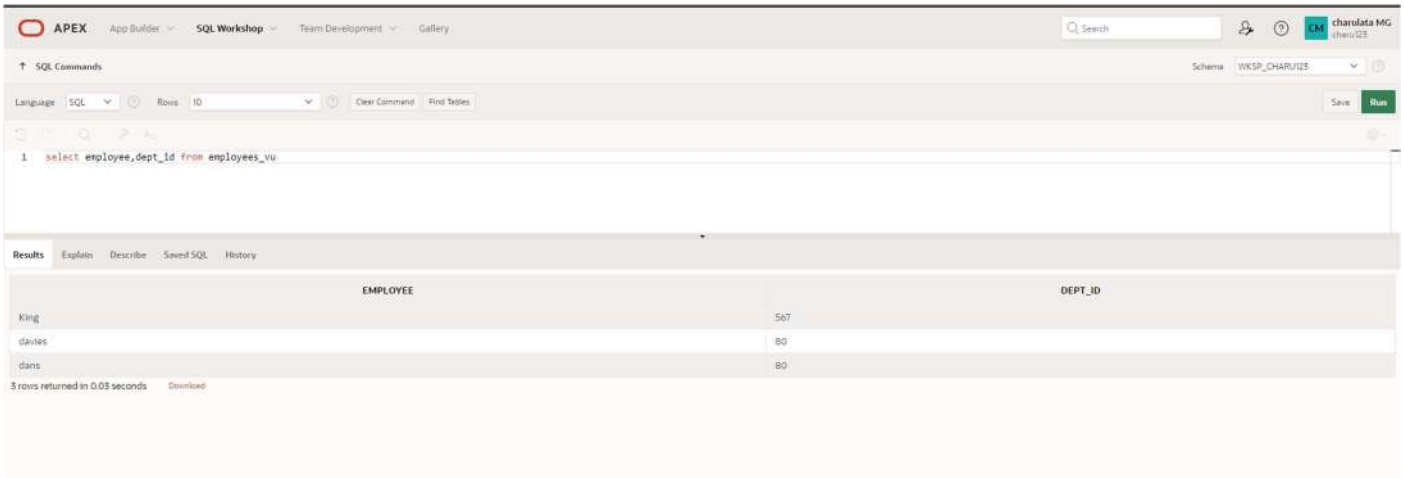
OUTPUT:

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

QUERY:

select employee,dept_id from employees_vu;

OUTPUT:



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 emp_id empno,l_name employee,dept_id dept_no from emp1 where dept_id=50 with check option constraint emp_dept_50;

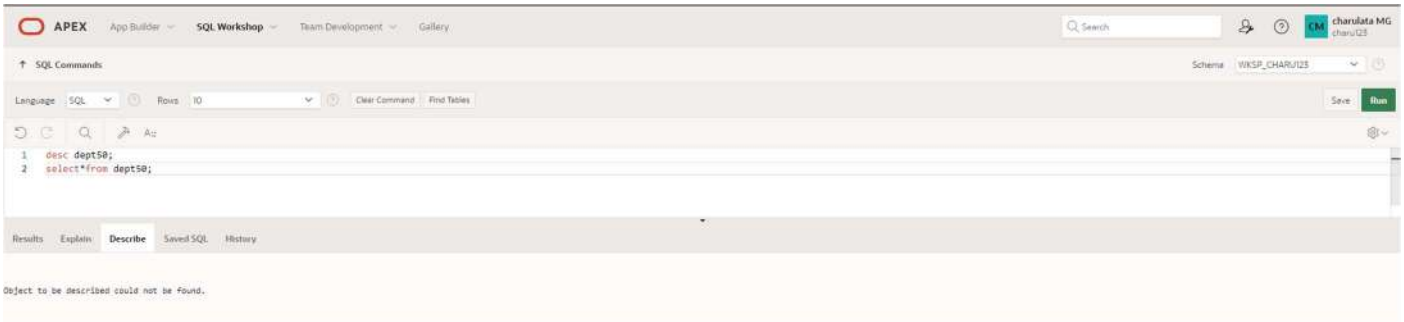
OUTPUT:

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

QUERY:

desc dept50;
select*from dept50;

OUTPUT:

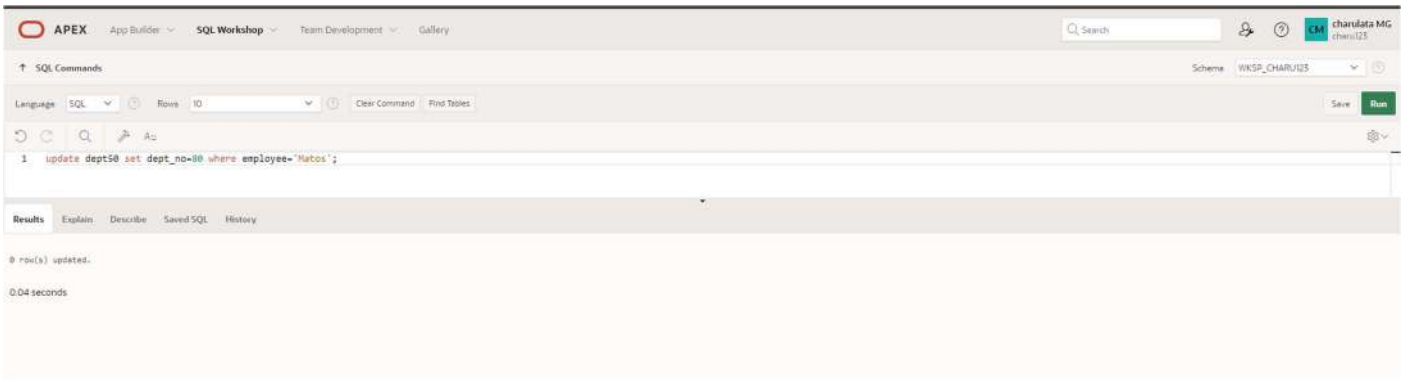


7. Attempt to reassign Matos to department 80.

QUERY:

update dept50 set dept_no=80 where employee='Matos';

OUTPUT:



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.l_name "Employee",d.dept_name"Department",e.salary "salary",j.grade_level "Grades" from emp1 e,dept d,jb_grade j where e.dept_id=d.dept_id and e.salary between j.low_sal and j.high_sal;

OUTPUT:

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

RESULT:

EXERCISE 12

Intro to Constraints; NOT NULL and UNIQUE Constraints

Exp no: Date:

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	pk				No	
name						
date_opened					No	
address					No	
city					No	
zip_postal_code						
phone						
email	uk					
manager_id						
emergency_contact						

TYPE is key type

Nullable targets optionality

pk – primary key,uk-Unique key, fk- foreign key

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. For example these constraints may prohibit deletion of a table or some row when insertion, updation or deletion is executed. Type of constraints:

· PRIMARY KEY Constraint

· UNIQUE Constraint

· FOREIGN KEY Constraint

· CHECK Constraint with condition applied on the column/columns (they work at row level)

· NOT NULL Constraint (implemented at row level using special CHECK Constraint having condition IS NOT NULL for single column)

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.

· If word CONSTRAINT is used in a CREATE TABLE statement, I must specify constraint name. Also, that is why, Table level constraint must be user-named.

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.

· Handling production issues may be faster with user-named constraints

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

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),

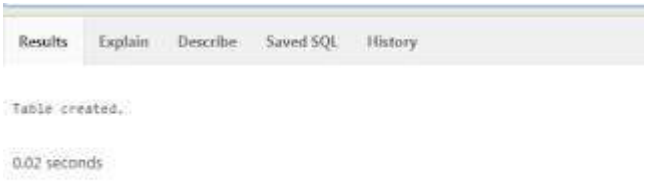
email VARCHAR2(75) CONSTRAINT f_gln_email_uk UNIQUE,

manager_id NUMBER(6,0),

emergency_contact VARCHAR2(20)

);

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



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.

QUERY:

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

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) - 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),

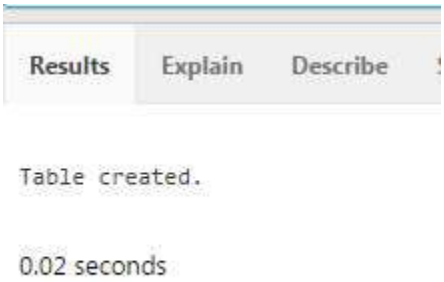
license_tag_number NUMBER(10,0) CONSTRAINT anl_l_tag_num_uk UNIQUE,

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'));

SELECT * FROM animals;

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.

ALTER TABLE animals

MODIFY (adoption_id   NUMBER(5,0) CONSTRAINT anl_adopt_id_fk REFERENCES adoptions(id) ENABLE);

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:

ALTER TABLE animals

ADD CONSTRAINT anl_adopt_id_fk FOREIGN KEY (adoption_id)

REFERENCES adoptions (id) ENABLE ;

Gives:

SELECT delete_rule

FROM user_constraints

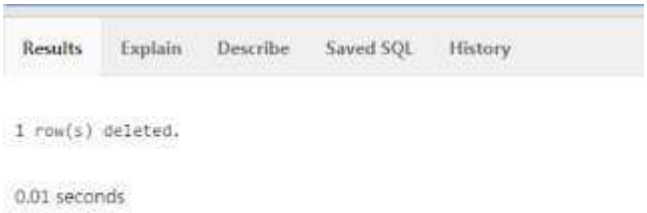
WHERE LOWER(table_name) = 'animals' AND constraint_type = 'R';

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 ;



SELECT * FROM animals;

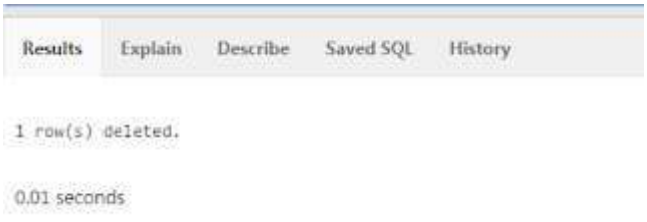
Value in animals.adoption_id where 500 adoptions.id from parent was referred is now set to NULL;

a. ON DELETE CASCADE

ALTER TABLE animals

ADD CONSTRAINT anl_adopt_id_fk FOREIGN KEY (adoption_id)

REFERENCES adoptions(id) ON DELETE CASCADE ENABLE ;



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.

· I cannot call functions that are not deterministic e.g. CURRENT_DATE, CURRENT_TIMESTAMP, DBTIMEZONE, LOCALTIMESTAMP, SESSIONTIMEZONE, SYSDATE, SYSTIMESTAMP, UID, USER, and USERENV

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

RESULT:

EXERCISE 13
Creating Views

Exp no: Date

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?

```
SELECT * FROM view_d_songs ;
```

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.

```
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';
```

```
SELECT owner, table_name, column_name, updatable,insertable, deletable

FROM user_updatable_columns WHERE LOWER(table_name) = 'copy_d_clients';
```

Use the same syntax but change table_name of the other tables.

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;
```

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

```
DELETE FROM read_copy_d_cds

WHERE year = '2001';
```

10.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 restricted if it contains

Modify restricted if it contains

INSERT restricted if it contains

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?

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

3 Reasons To Believe The Singularity Is Near as per Greg Satell on Forbes:

- We're Going Beyond Moore's Law
- Robots Are Doing Human Jobs
- We're Editing Genes

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  AS

SELECT title, artist

FROM 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_id
FROM(SELECT dpt.department_id, MAX(NVL(emp.salary,0)) max_dpt_sal

FROM departments dpt LEFT OUTER JOIN employees emp ON dpt.department_id = emp.department_id

GROUP BY dpt.department_id) dptmx LEFT OUTER JOIN employees empm ON dptmx.department_id = empm.department_id

WHERE 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

What is an index and what is it used for?

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?

For primary/unique keys: Although unique index can be created manually, but preferred should be by using unique/primary constraint in the table. So, it means that 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 PUBLIC 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	

RESULT:

EXERCISE-14
OTHER DATABASE OBJECTS

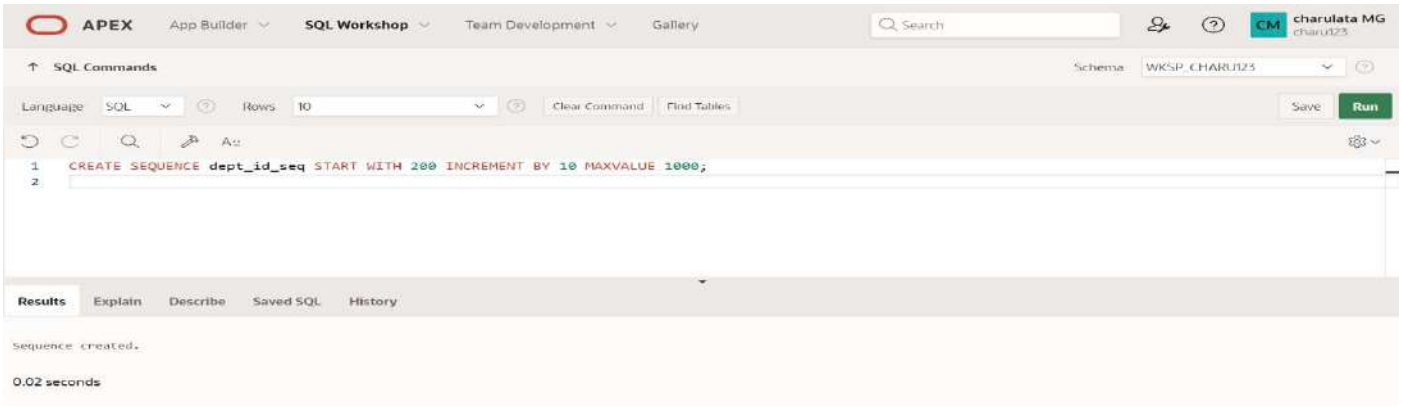
Ex no: Date:

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:

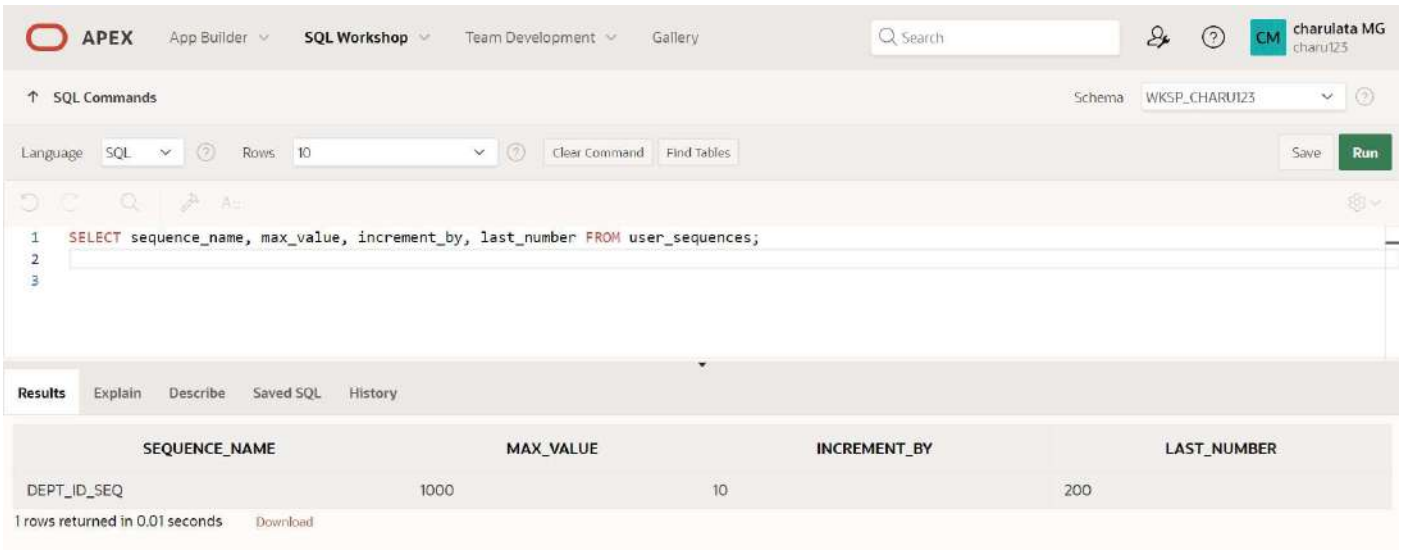


2. Write a query in a script to display the following information about your sequences: sequence name, maximum value, increment size, and last number

Query:

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

Output:

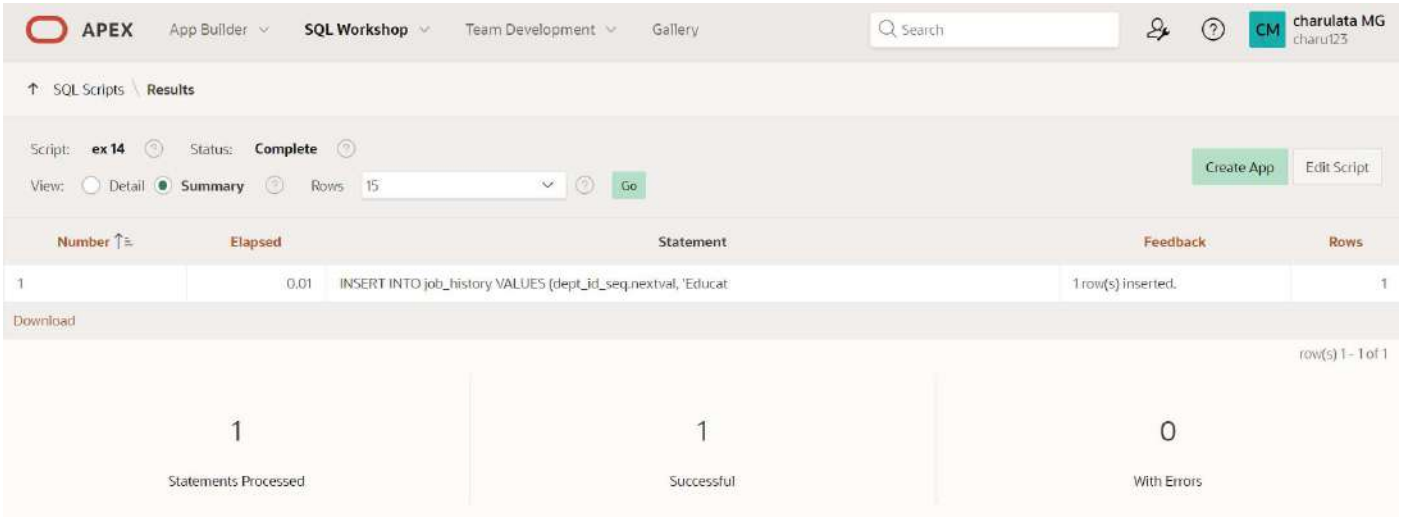


3.Write a script to insert two rows into the DEPT table. Name your script lab12_3.sql. Be sure to use the sequence that you created for the ID column. Add two departments named Education and Administration. Confirm your additions. Run the commands in your script.

Query:

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

Output:

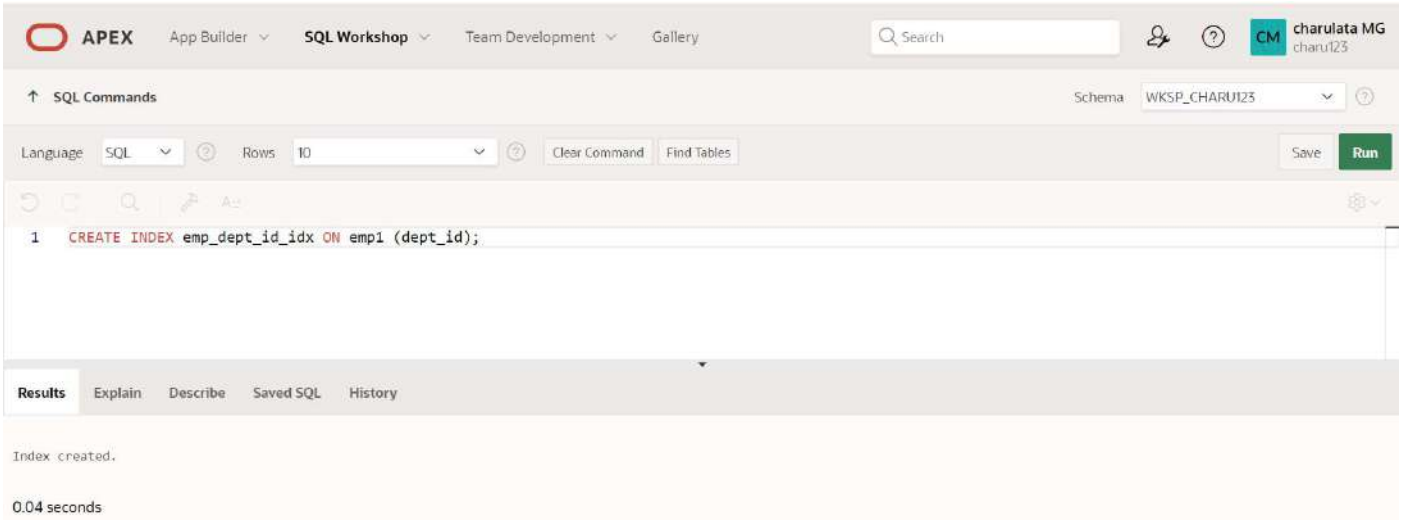


4. Create a nonunique index on the foreign key column (DEPT_ID) in the EMP table.

Query:

CREATE INDEX emp_dept_id_idx ON emp1 (dept_id);

Output:



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:

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

RESULT:

EXERCISE-15 Controlling User Access

Ex no: Date:

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

Query:
The CREATE SESSION system privilege

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

Query:
The CREATE TABLE privilege

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

Query:
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?

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

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

Query:
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.

Query:
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.

Query:
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.

Query:
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.

Query :
SELECT table_name FROM user_tables;

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

Query:
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.

Query:
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;
Evaluation Procedure
Marks
awarded
Practice Evaluation
(5)
Viva(5)
Total (10)
Faculty Signature
COMMIT;

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

RESULT:

PL/SQL

Ex no: Date:

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 emp1
  WHERE emp_id = 110;
DBMS_OUTPUT.PUT_LINE('Incentive  = ' || TO_CHAR(incentive));
END;
/
```

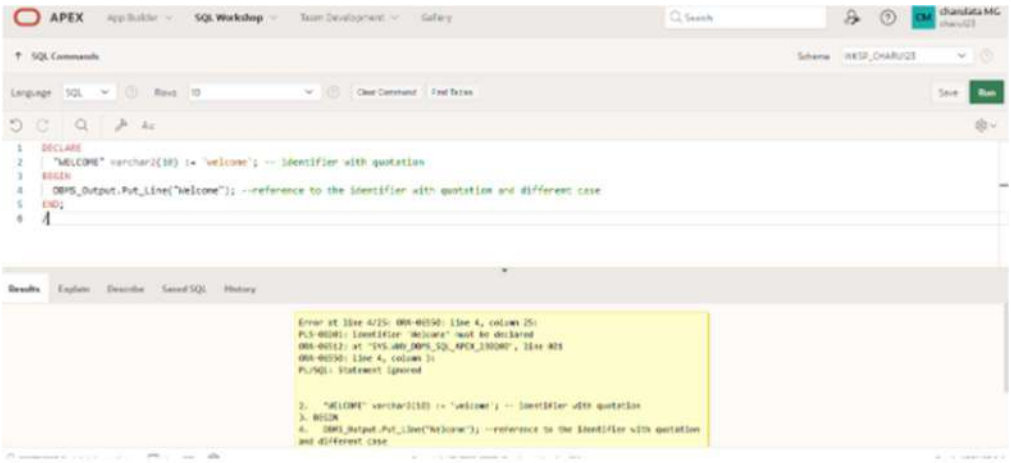
Output:

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'; -- identifier with quotation
BEGIN
  DBMS_Output.Put_Line("Welcome"); --reference to the identifier with quotation and different case
END;
/
```

Output:

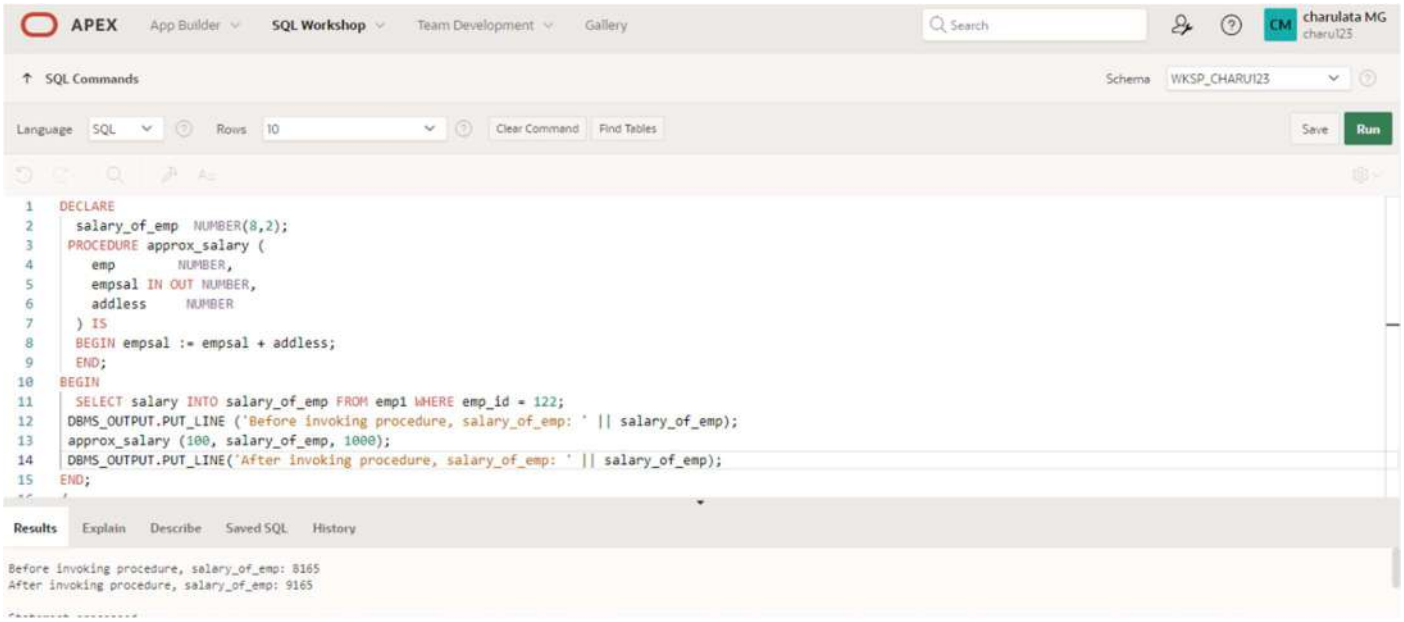


3.Write a PL/SQL block to adjust the salary of the employee whose ID 122. Sample table: employees

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 emp1 WHERE emp_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:

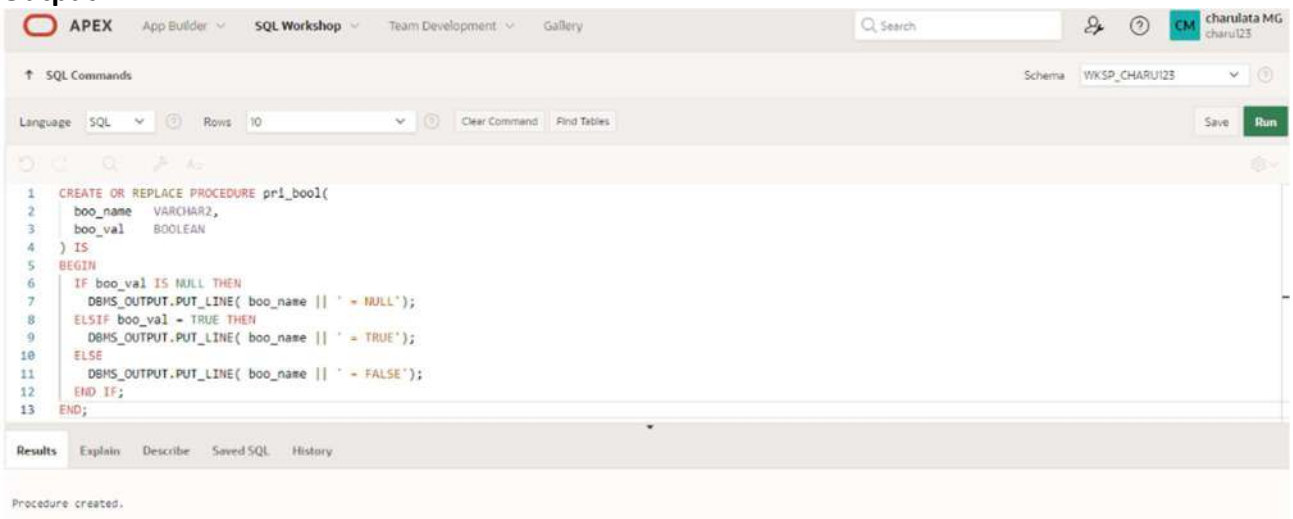


4.Write a PL/SQL block to create a procedure using the "IS [NOT] NULL Operator" and show AND operator returns TRUE if and only if both operands are TRUE.

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:

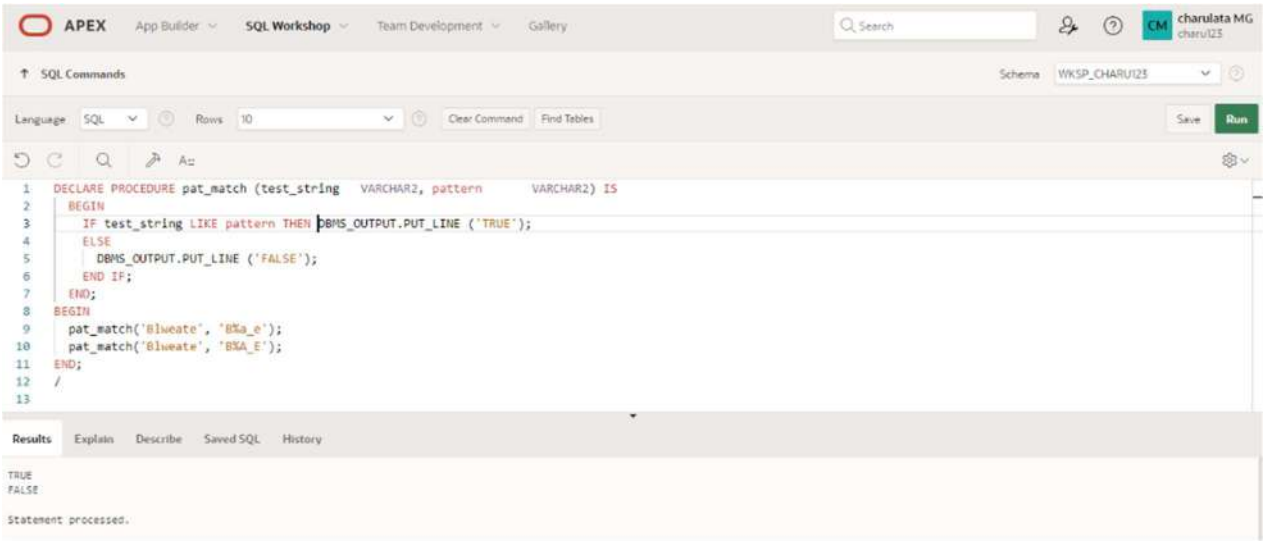


5. Write a PL/SQL block to describe the usage of LIKE operator including wildcard characters and escape character.

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:



6.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:

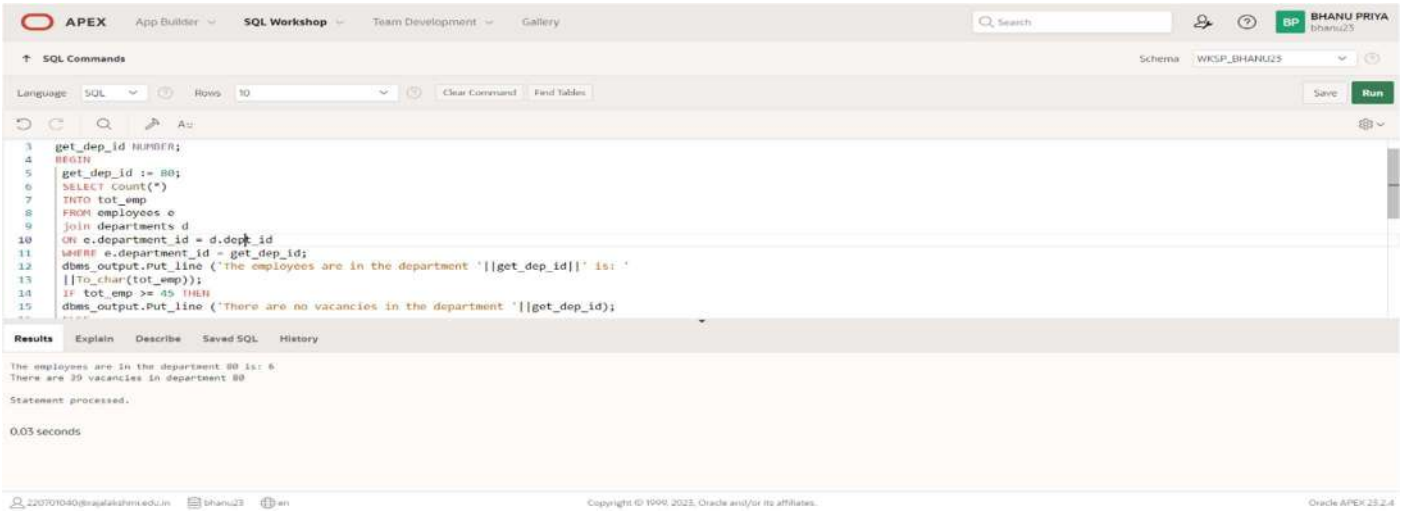
```
SET SERVEROUTPUT ON DECLARE tot_emp NUMBER;

 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:



7. 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:

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.dept_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);

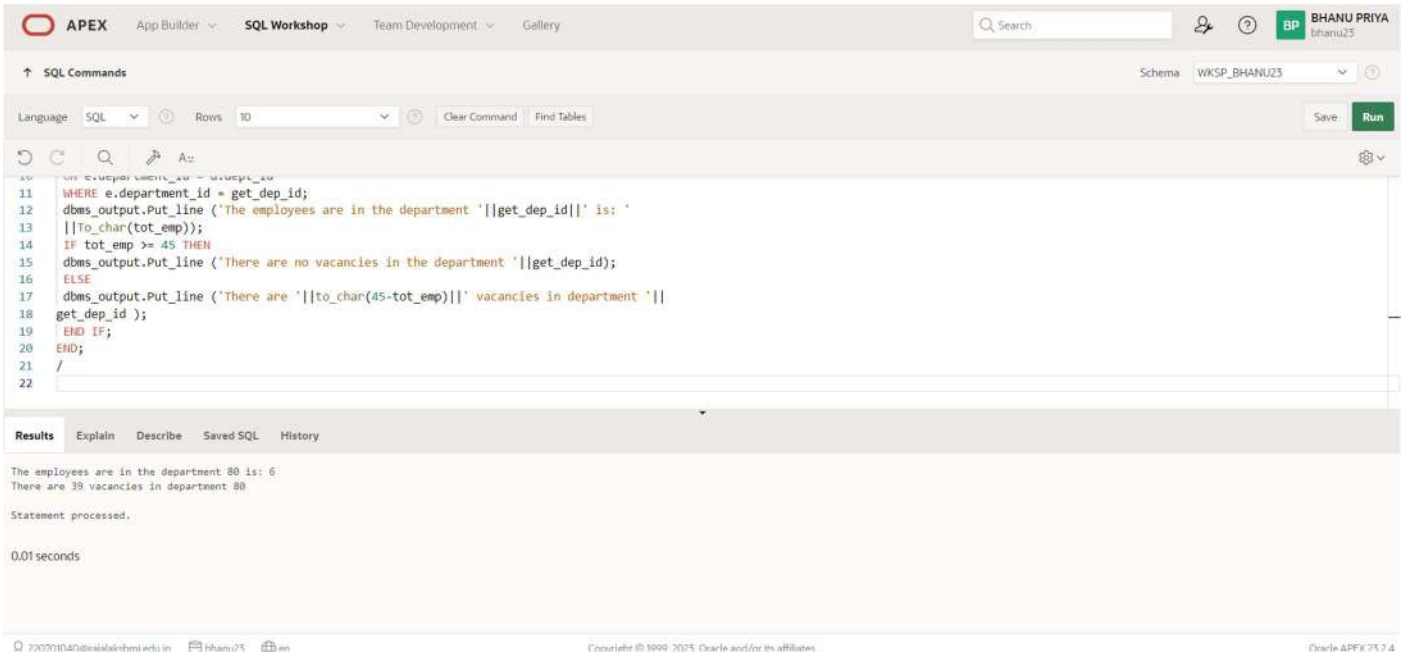
ELSE dbms_output.Put_line ('There are '||to_char(45-tot_emp)||' vacancies in department '|| get_dep_id);

END IF;

END;

/

Output:



8. 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;

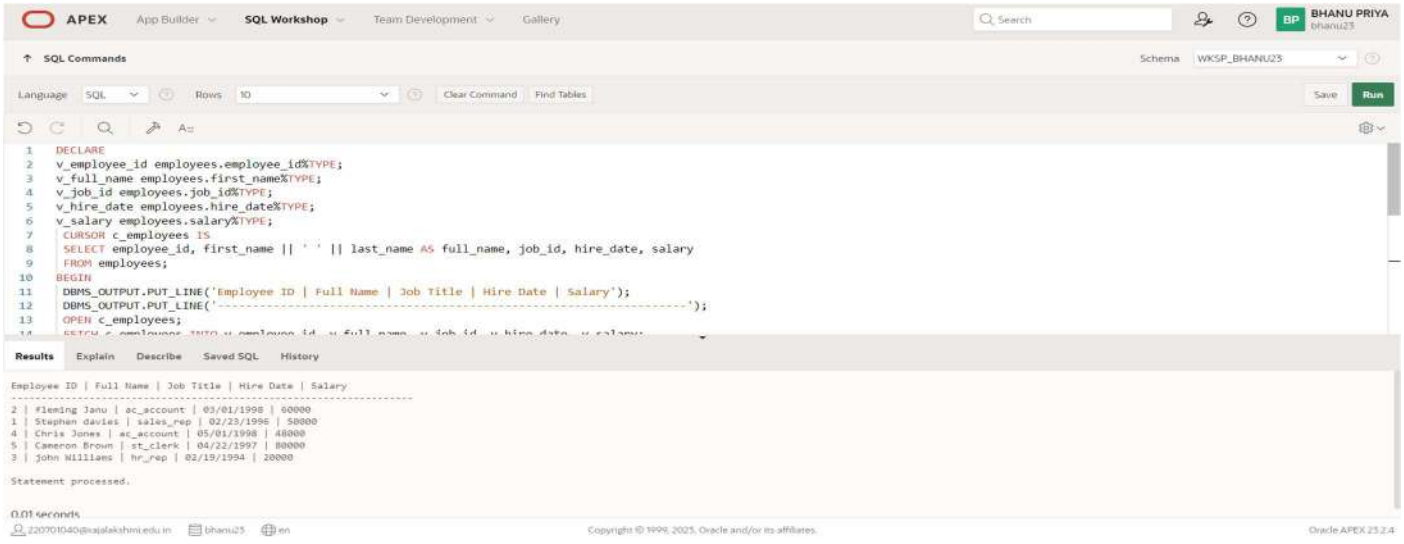
END LOOP;

CLOSE c_employees;

END;

/

Output:



9.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;

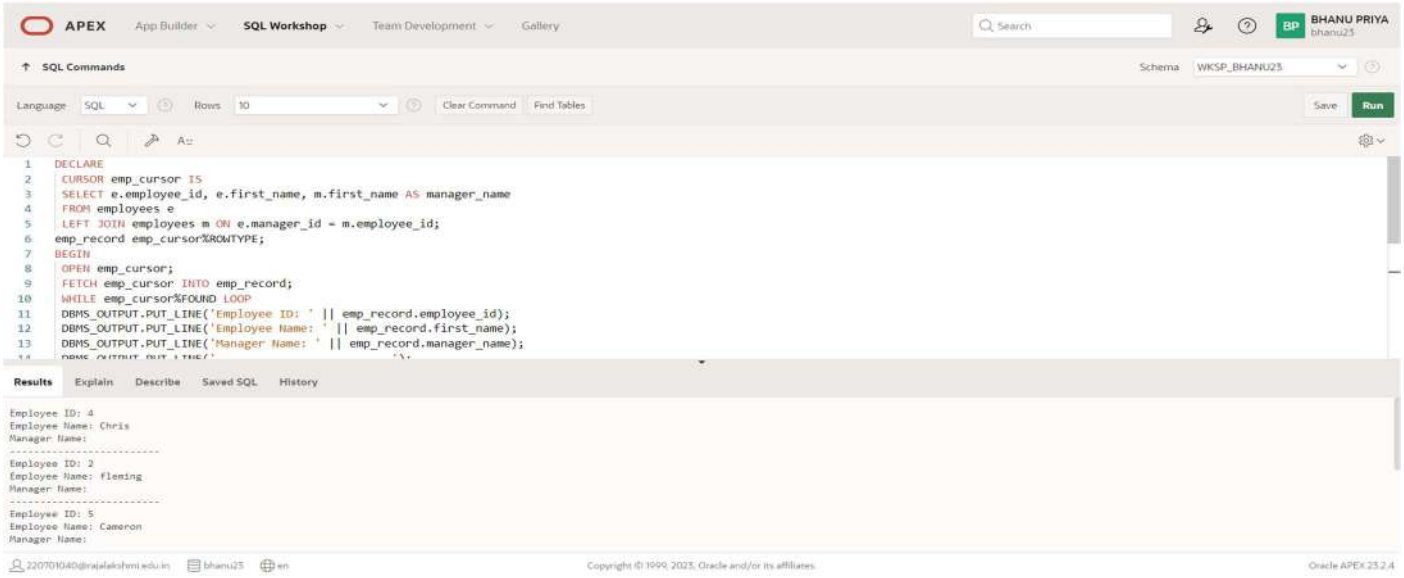
END LOOP;

CLOSE emp_cursor;

END;

/

Output:



10. 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; j

ob_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);

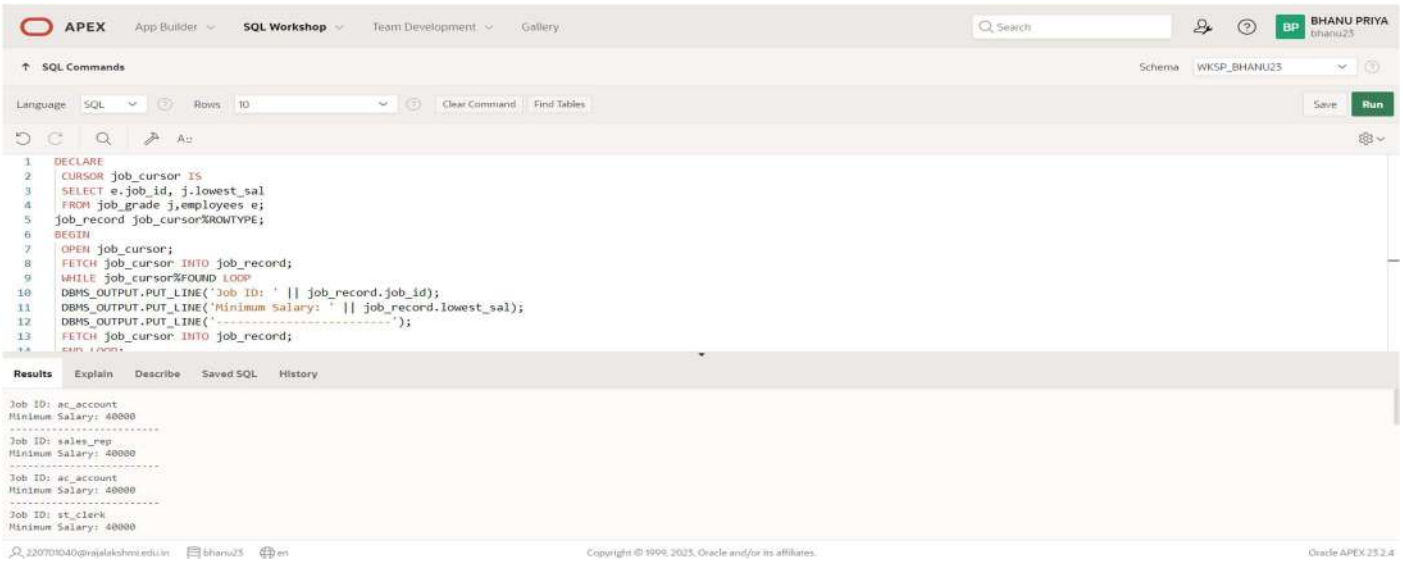
DBMS_OUTPUT.PUT_LINE('-------------------------'); FETCH job_cursor INTO job_record;

END LOOP;

CLOSE job_cursor;

END;

Output:



11. Write a PL/SQL program to display the employee IDs, names, and job history start 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;

END;

/

Output:

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

Query:

DECLARE v_employee_id employees.employee_id%TYPE;

v_first_name employees.last_name%TYPE;

v_end_date job_history.end_date%TYPE;

CURSOR c_employees IS SELECT e.employee_id, e.first_name, jh.end_date FROM employees e JOIN job_history jh ON e.employee_id = jh.employee_id;

BEGIN OPEN c_employees;

FETCH c_employees INTO v_employee_id, v_first_name, v_end_date;

WHILE c_employees%FOUND LOOP

DBMS_OUTPUT.PUT_LINE('Employee ID: ' || v_employee_id);

DBMS_OUTPUT.PUT_LINE('Employee Name: ' || v_first_name);

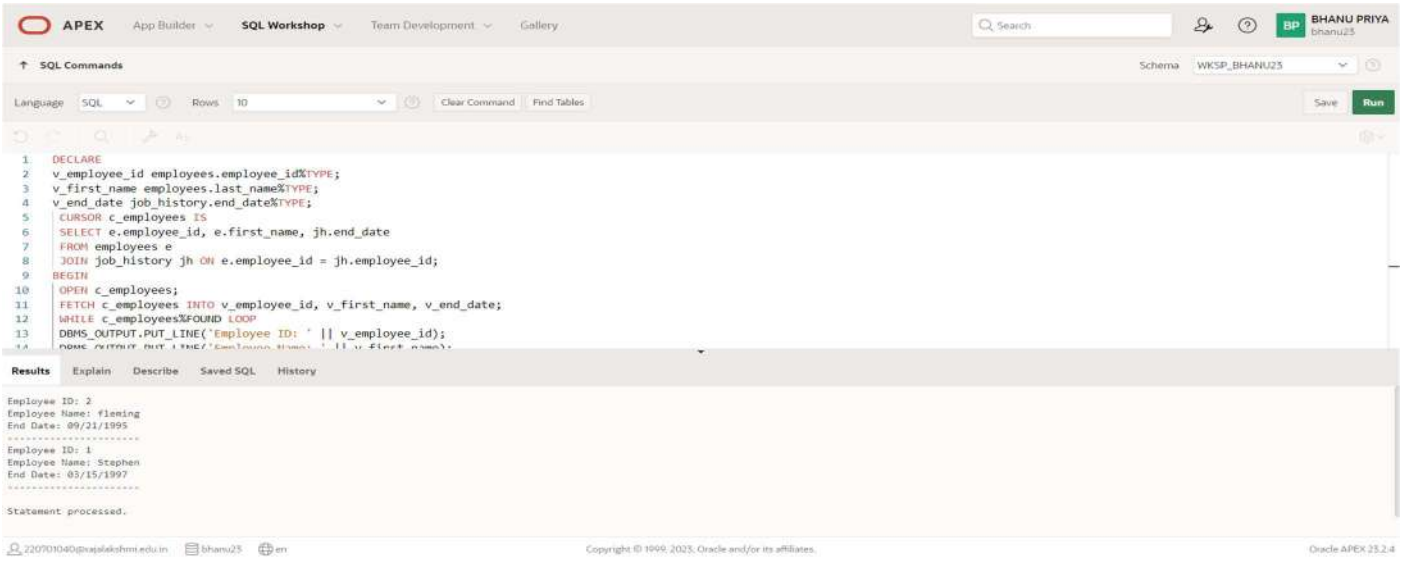
DBMS_OUTPUT.PUT_LINE('End Date: ' || v_end_date);

DBMS_OUTPUT.PUT_LINE('----------'); FETCH c_employees INTO v_employee_id, v_first_name, v_end_date; END LOOP;

CLOSE c_employees;

END;

Output:



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

RESULT:

PROCEDURES AND FUNCTIONS

EX_NO: 17 DATE:

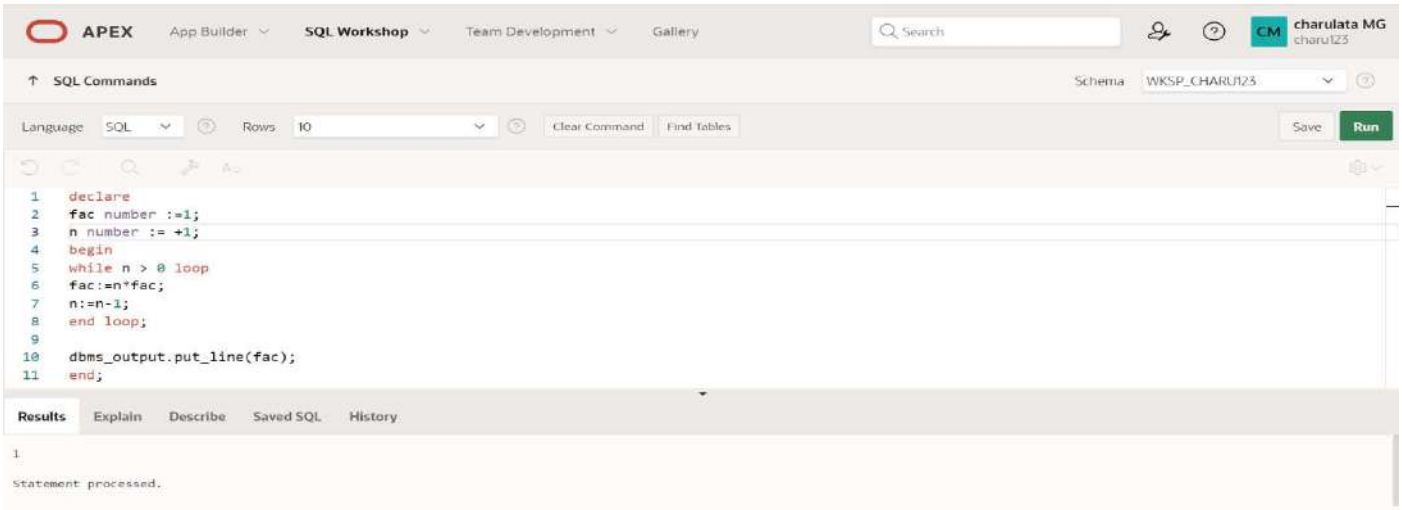
1.Factorial of a number using function.

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:



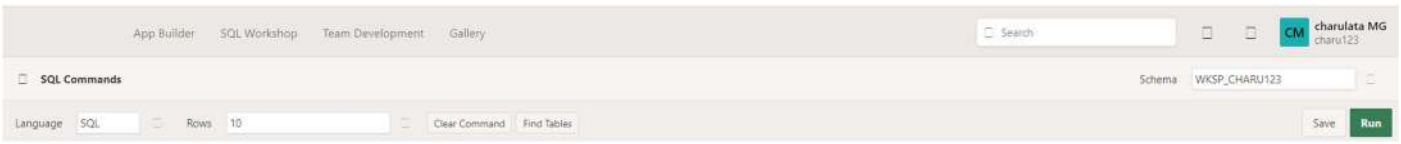
2. Write a PL/SQL program using Procedures IN,INOUT,OUT parameters to retrieve the corresponding book information in library.

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:



```
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;
```


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

RESULT:

TRIGGER

EX_NO: 18 DATE:

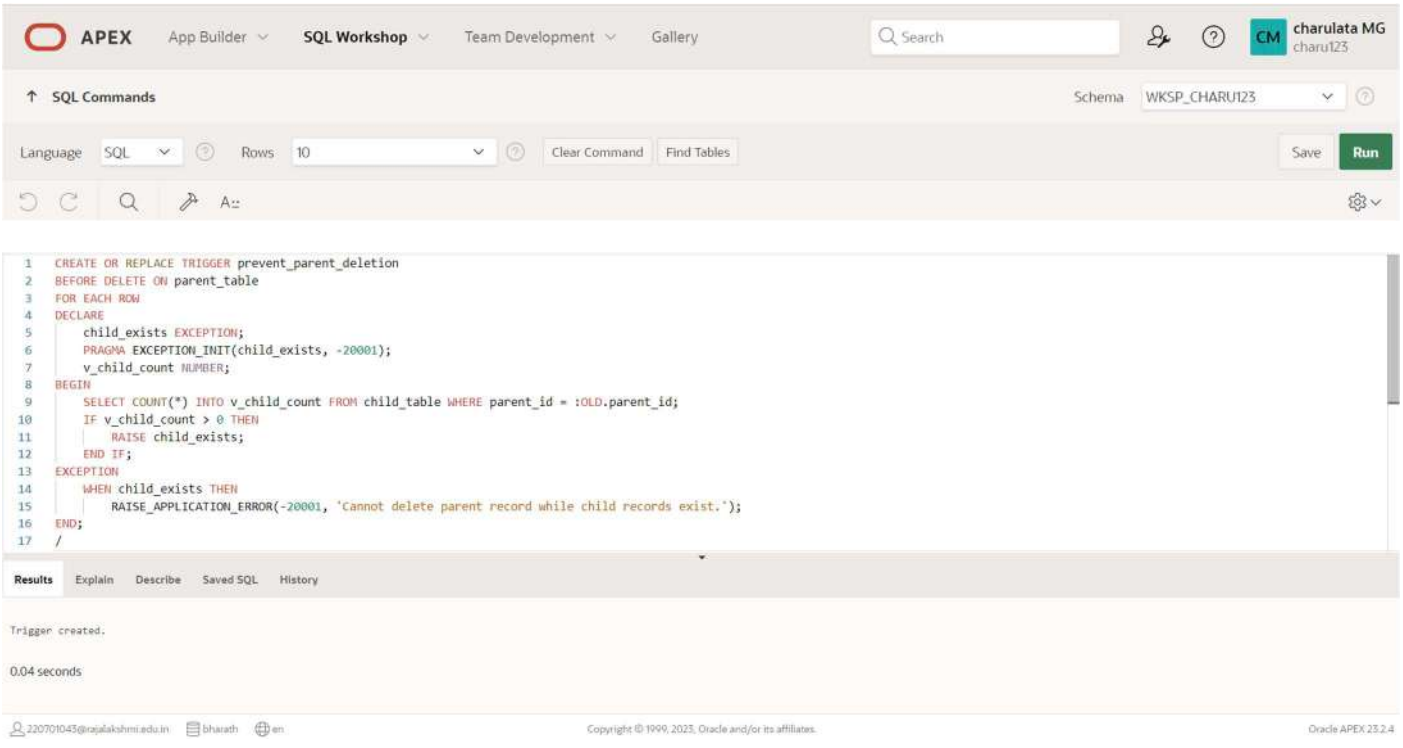
1.Write a code in PL/SQL to develop a trigger that enforces referential integrity by

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 &gt; 0 THEN
RAISE child_exists;
END IF;
EXCEPTION
WHEN child_exists THEN
RAISE_APPLICATION_ERROR(-20001, &#39;Cannot delete parent record while child records
exist.&#39;);
END;
```

OUTPUT:

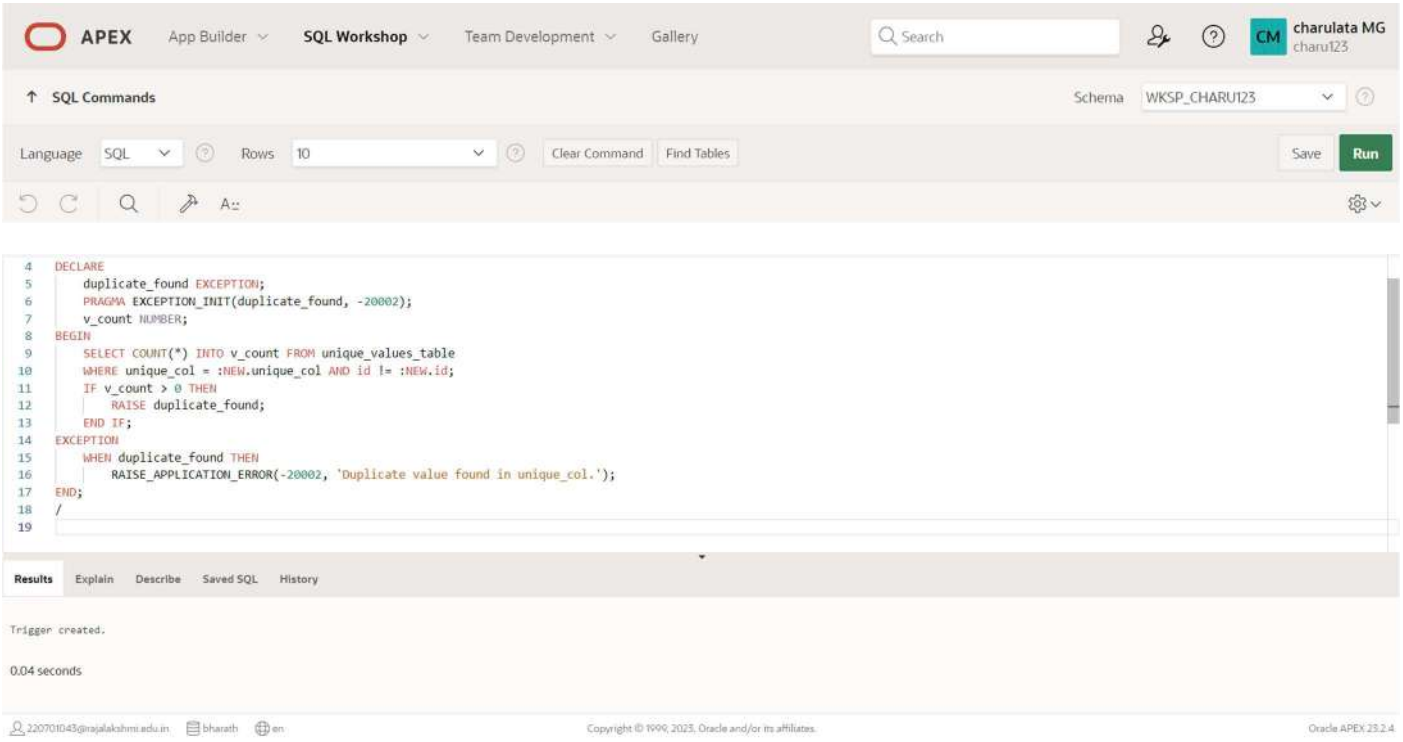

APEX
App Builder
SQL Workshop
Team Development
Gallery
Search
CM
charulata MG
charu123
SQL Commands
Schema
WKSP_CHARU123
Language
SQL
Rows
10
Clear Command
Find Tables
Save
Run
CREATE OR REPLACE TRIGGER prevent_parent_deletion
BEFORE DELETE ON parent_table
FOR EACH ROW
DECLARE
child_exists EXCEPTION;
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;
/
Results
Explain
Describe
Saved SQL
History
Trigger created.
0.04 seconds
220701043@rajalakshmi.edu.in
bharath
en
Copyright © 1999, 2023, Oracle and/or its affiliates.
Oracle APEX 23.2.4

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 &amp;gt; 0 THEN
RAISE duplicate_found;
END IF;
EXCEPTION
WHEN duplicate_found THEN
RAISE_APPLICATION_ERROR(-20002, &amp;#39;Duplicate value found in unique_col.&amp;#39;);
END;
```

OUTPUT:

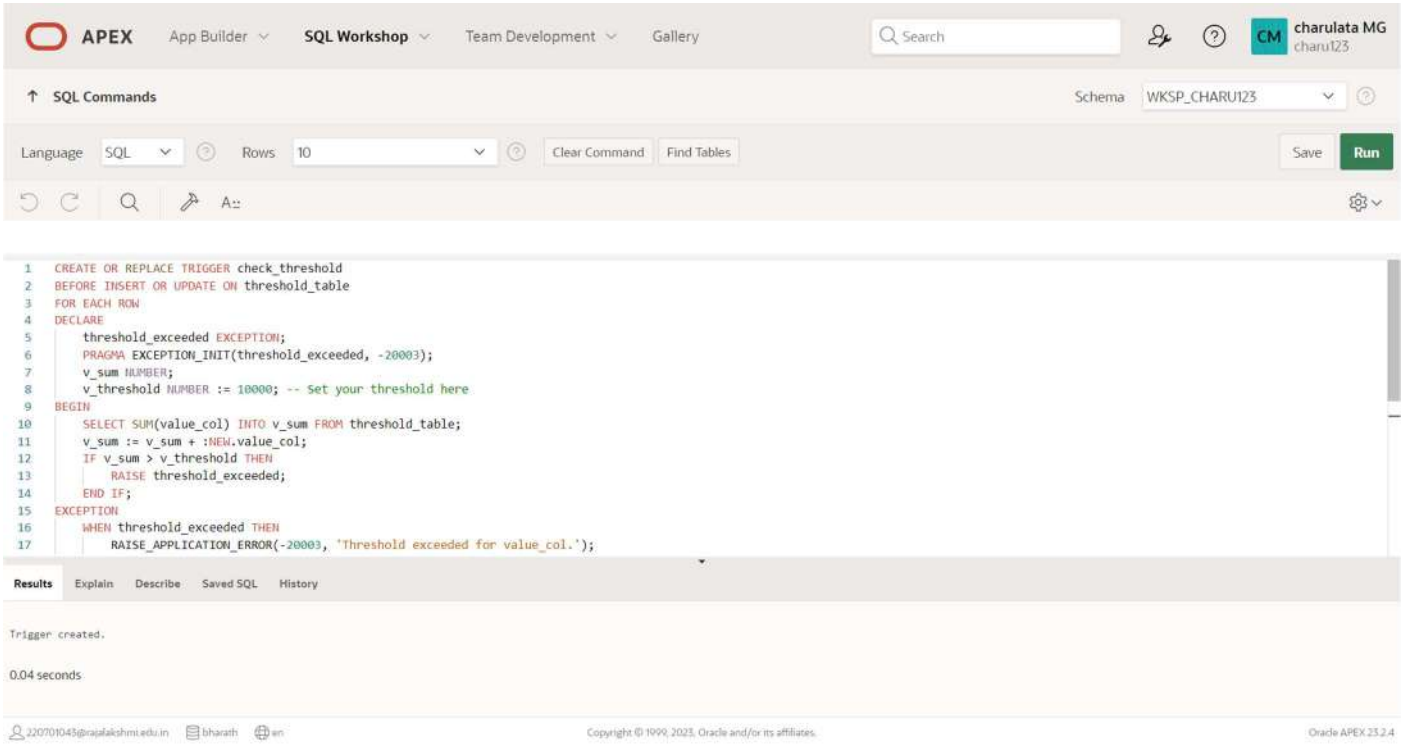

APEX
App Builder
SQL Workshop
Team Development
Gallery
Search
CM
charulata MG
charu123
SQL Commands
Schema
WKSP_CHARU123
Language
SQL
Rows
10
Clear Command
Find Tables
Save
Run
DECLARE
duplicate_found EXCEPTION;
PRAGMA EXCEPTION_INIT(duplicate_found, -20002);
v_count NUMBER;
BEGIN
SELECT COUNT(*) INTO 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;
/
Results
Explain
Describe
Saved SQL
History
Trigger created.
0.04 seconds
220701043@rajalakshmi.edu.in
bharath
en
Copyright © 1999, 2023, Oracle and/or its affiliates.
Oracle APEX 23.2.4

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 &gt; v_threshold THEN
RAISE threshold_exceeded;
END IF;
EXCEPTION
WHEN threshold_exceeded THEN
RAISE_APPLICATION_ERROR(-20003, &#39;Threshold exceeded for value_col.&#39;);
END;
```

OUTPUT:

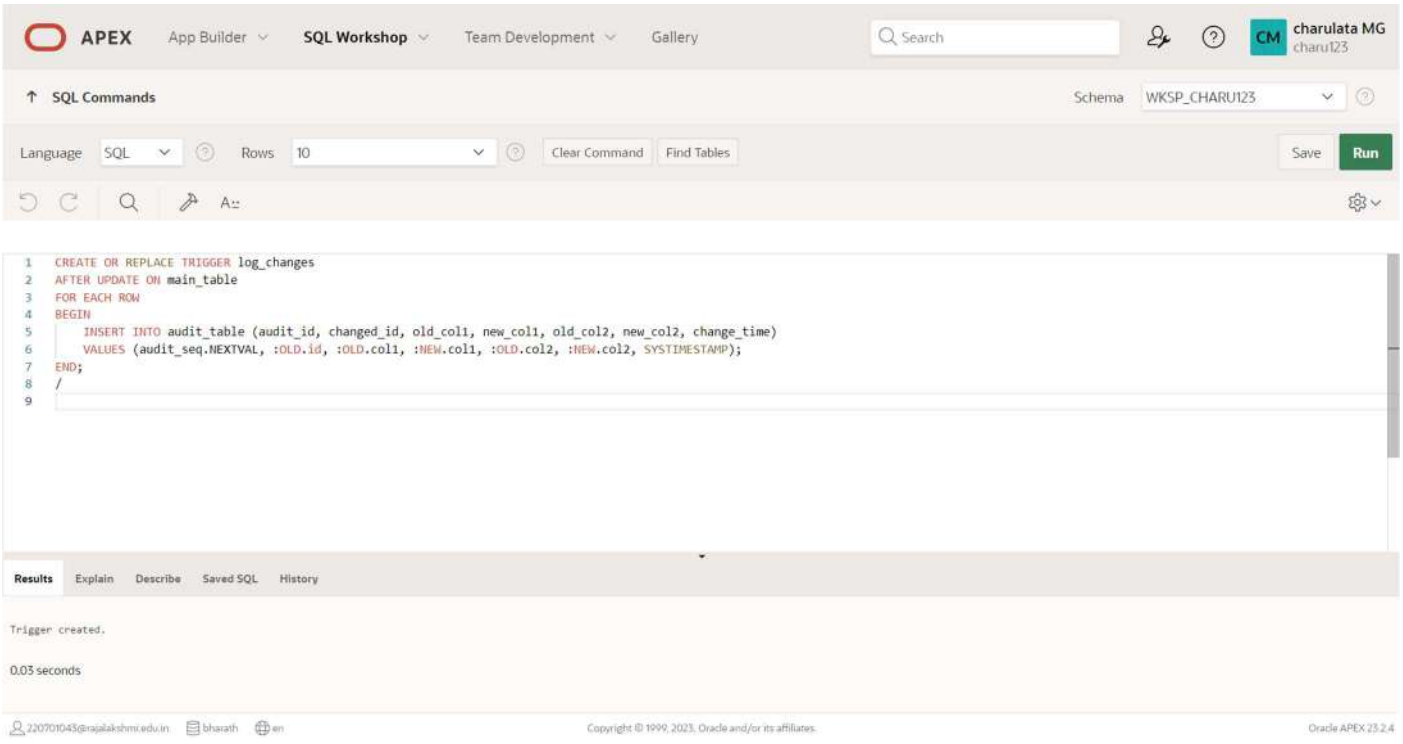

APEX
App Builder
SQL Workshop
Team Development
Gallery
Search
CM
charulata MG
charu123
SQL Commands
Schema
WKSP_CHARU123
Language
SQL
Rows
10
Clear Command
Find Tables
Save
Run
CREATE OR REPLACE TRIGGER check_threshold
BEFORE INSERT OR UPDATE ON threshold_table
FOR EACH ROW
DECLARE
threshold_exceeded 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.');
Results
Explain
Describe
Saved SQL
History
Trigger created.
0.04 seconds
bharath
Copyright © 1999, 2023, Oracle and/or its affiliates.
Oracle APEX 23.2.4

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:



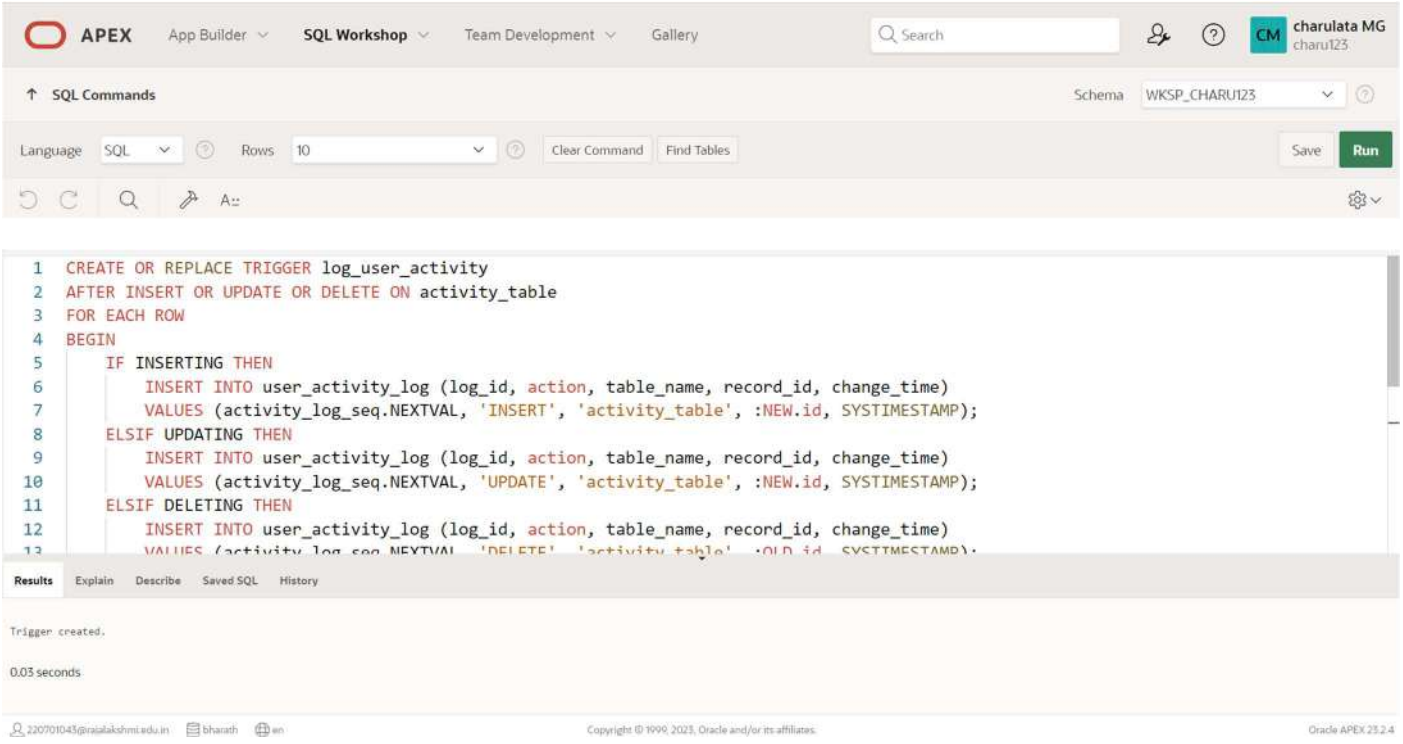
5. Write a code in PL/SQL to implement a trigger that records user activity (inserts,

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, &#39;INSERT&#39;, &#39;activity_table&#39;, :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, &#39;UPDATE&#39;, &#39;activity_table&#39;, :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, &#39;DELETE&#39;, &#39;activity_table&#39;, :OLD.id,
SYSTIMESTAMP);

END IF;

END;
```

OUTPUT:


APEX
App Builder
SQL Workshop
Team Development
Gallery
Search
charulata MG
charu123
SQL Commands
Schema
WKSP_CHARU123
Language
SQL
Rows
10
Clear Command
Find Tables
Save
Run
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)
Results
Explain
Describe
Saved SQL
History
Trigger created.
0.03 seconds
220701043@rajalakshmi.edu.in
bharath
en
Copyright © 1999, 2023, Oracle and/or its affiliates.
Oracle APEX 23.2.4

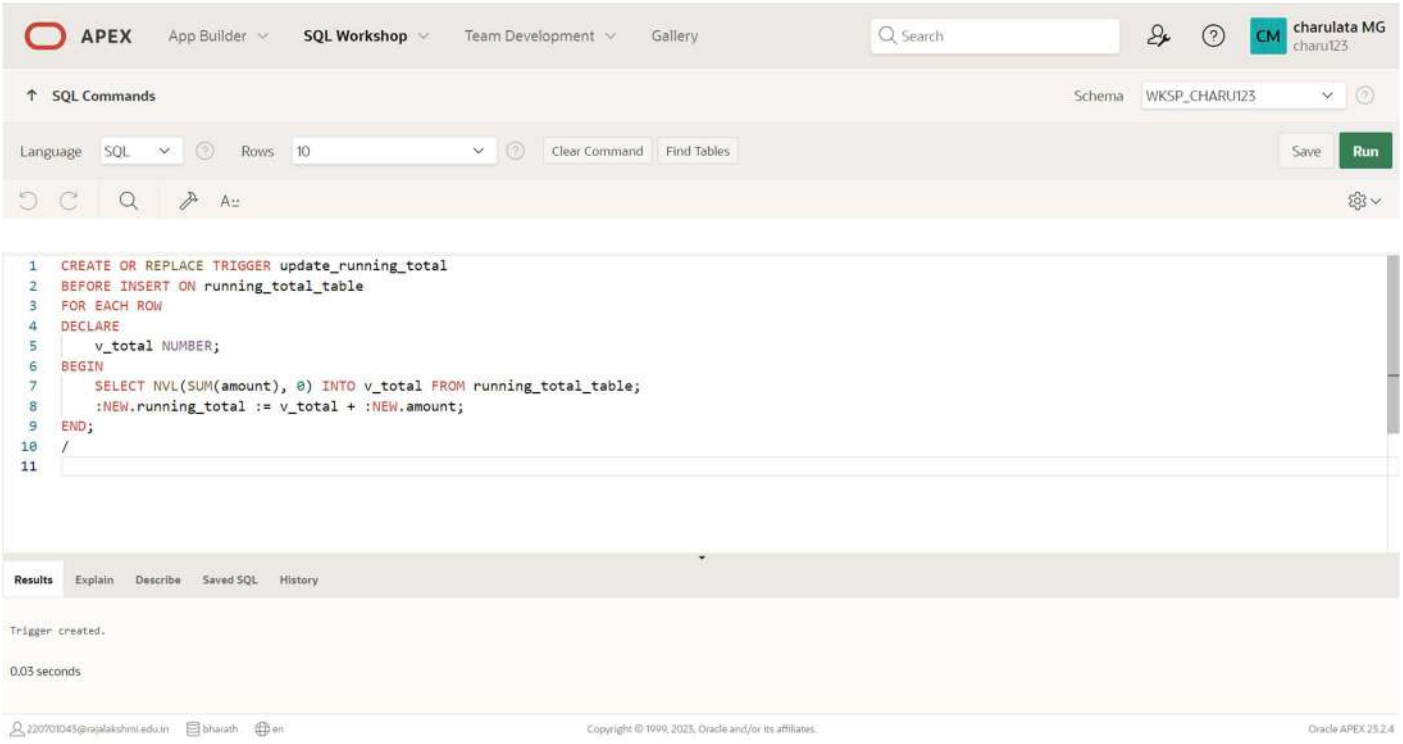
6.Write a code in PL/SQL to implement a trigger that automatically calculates and

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:

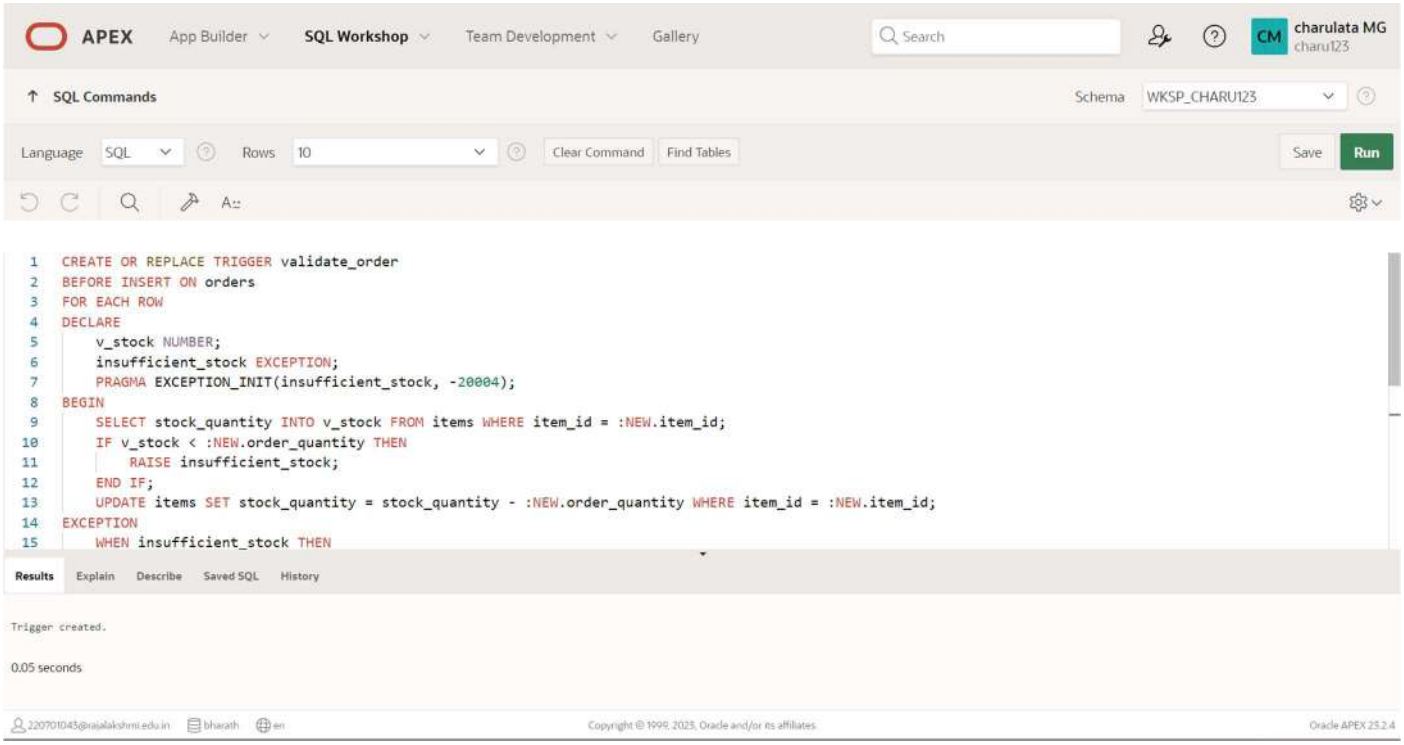


7. Write a code in PL/SQL to create a trigger that validates the availability of items before allowing an order to be placed, considering stock levels and pending orders

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 &amp;lt; :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, &amp;#39;Insufficient stock for the item.&amp;#39;);
END;
```

OUTPUT:



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

RESULT:

MONGO DB

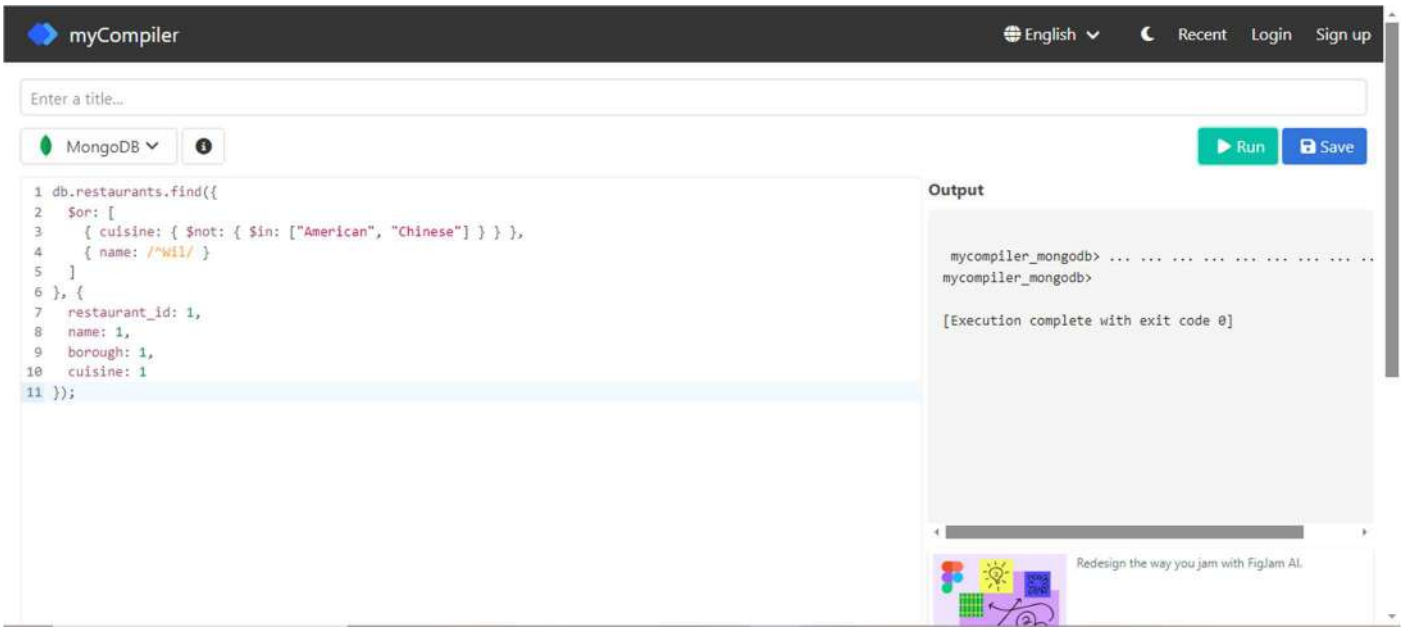
EX_NO: 19 **DATE:**

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:



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 });

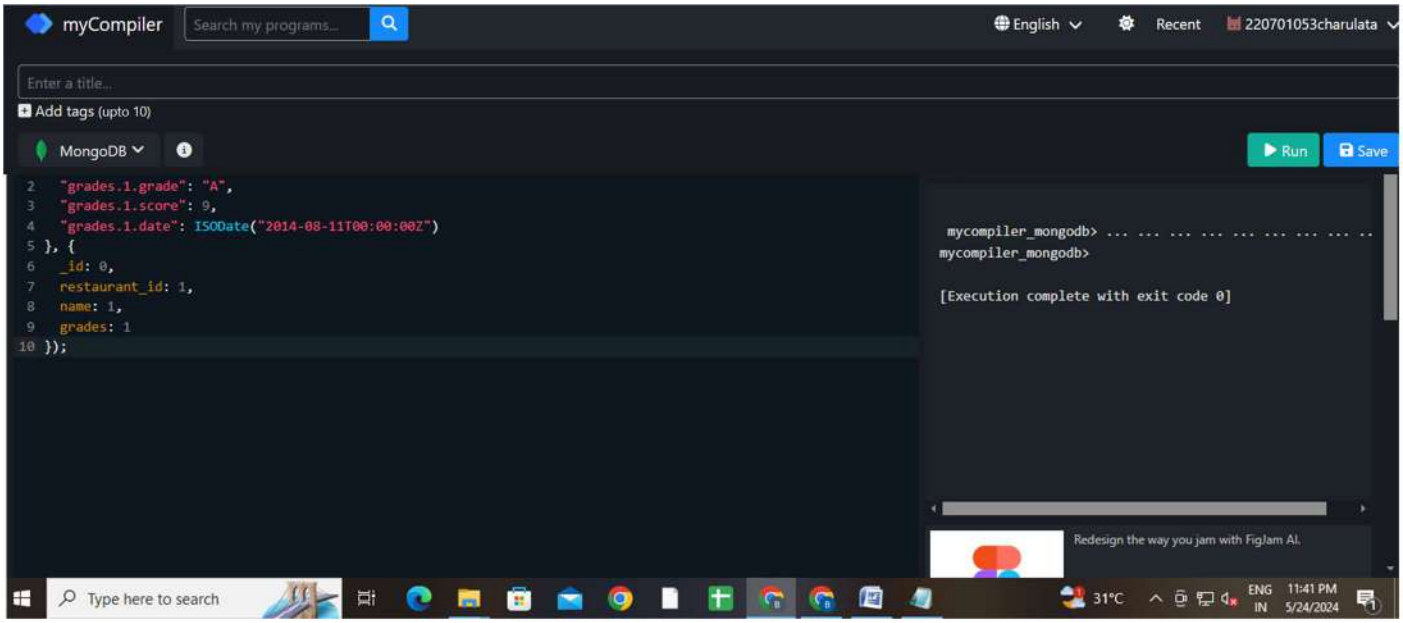
OUTPUT:

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("2014-08-1T00:00:00Z") },{ restaurant_id: 1, name: 1, grades: 1 });

OUTPUT:

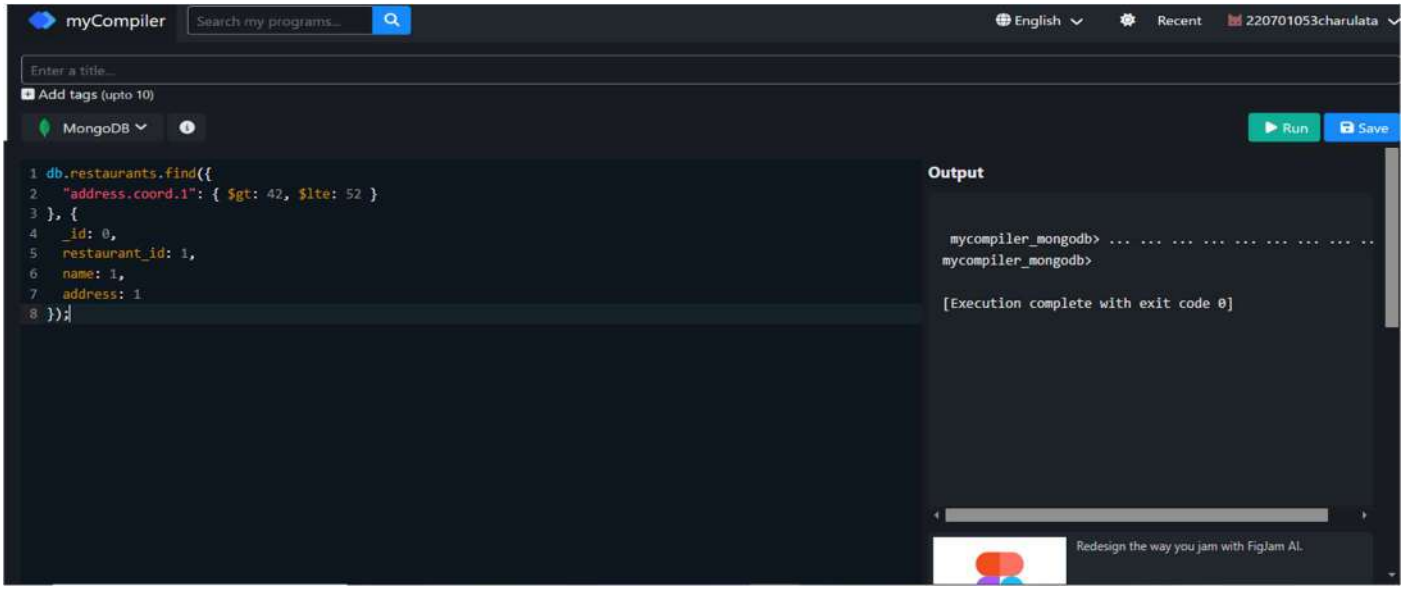


4.) Write a MongoDB query to find the restaurant Id, name, address and geographical location for those restaurants where 2nd element of coord array contains a value which is more than 42 and upto 52

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:

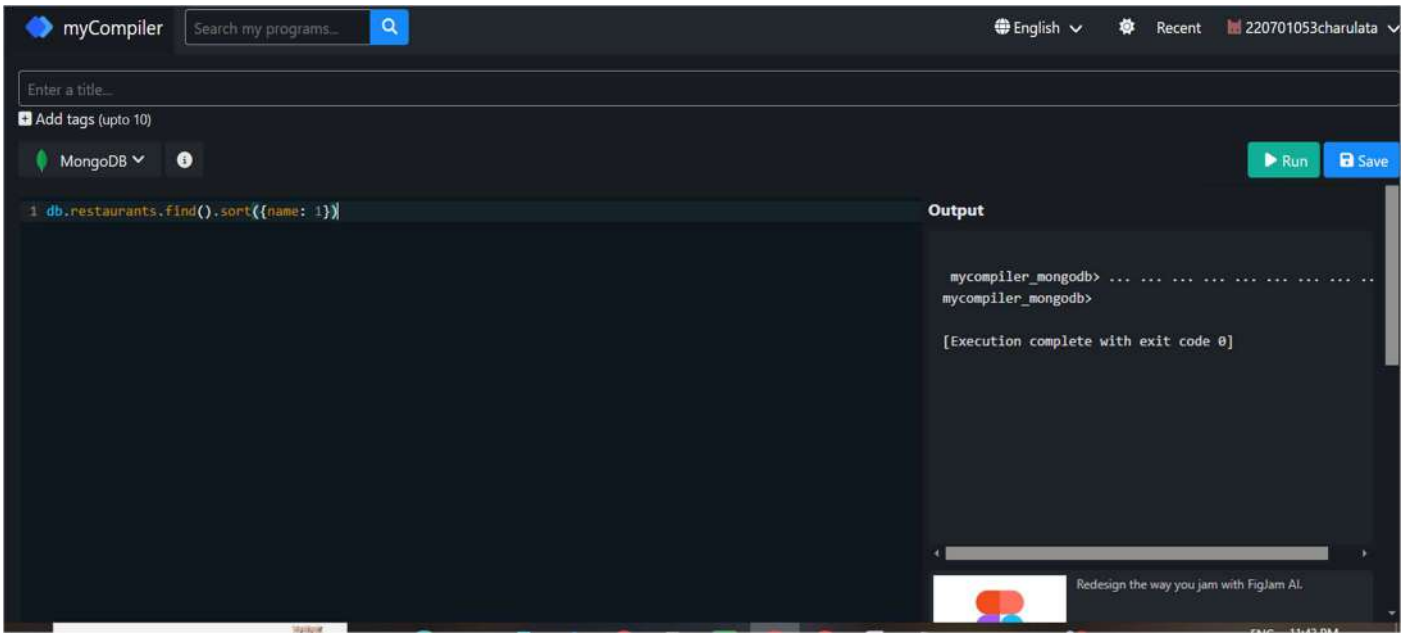


5.) Write a MongoDB query to arrange the name of the restaurants in ascending order along with all the columns.

QUERY:

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

OUTPUT:

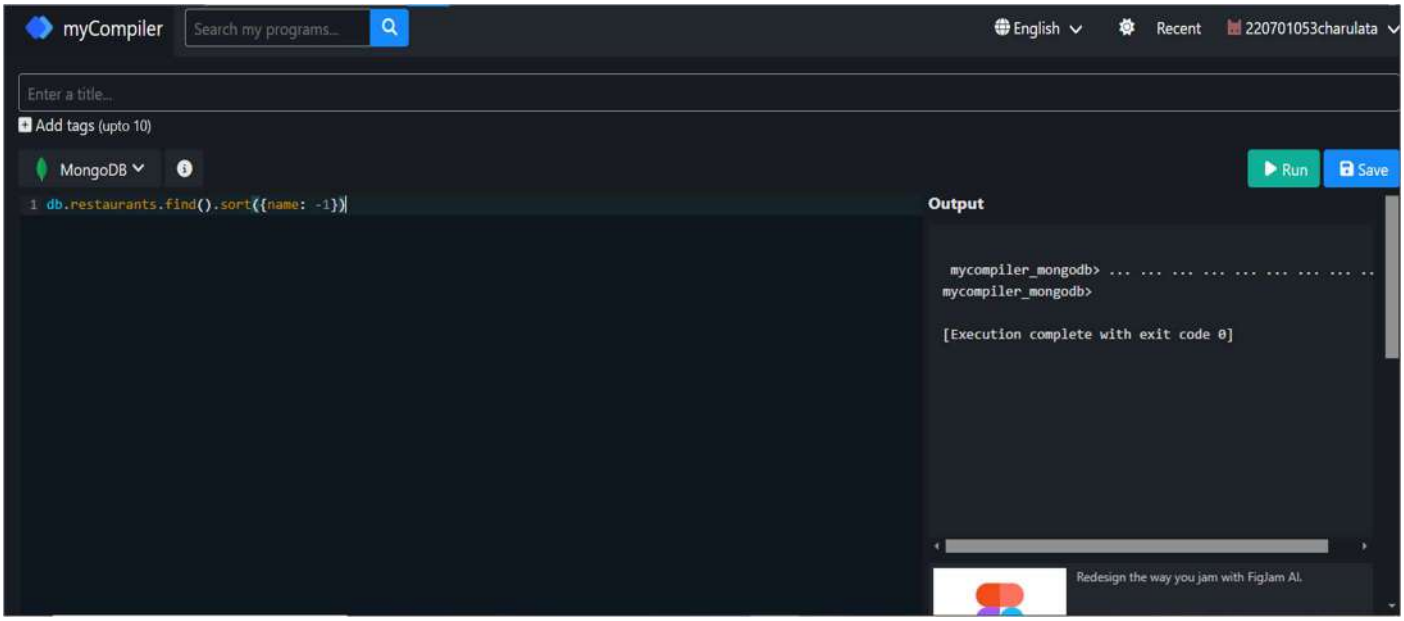


6.) Write a MongoDB query to arrange the name of the restaurants in descending along with all the columns.

QUERY:

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

OUTPUT:

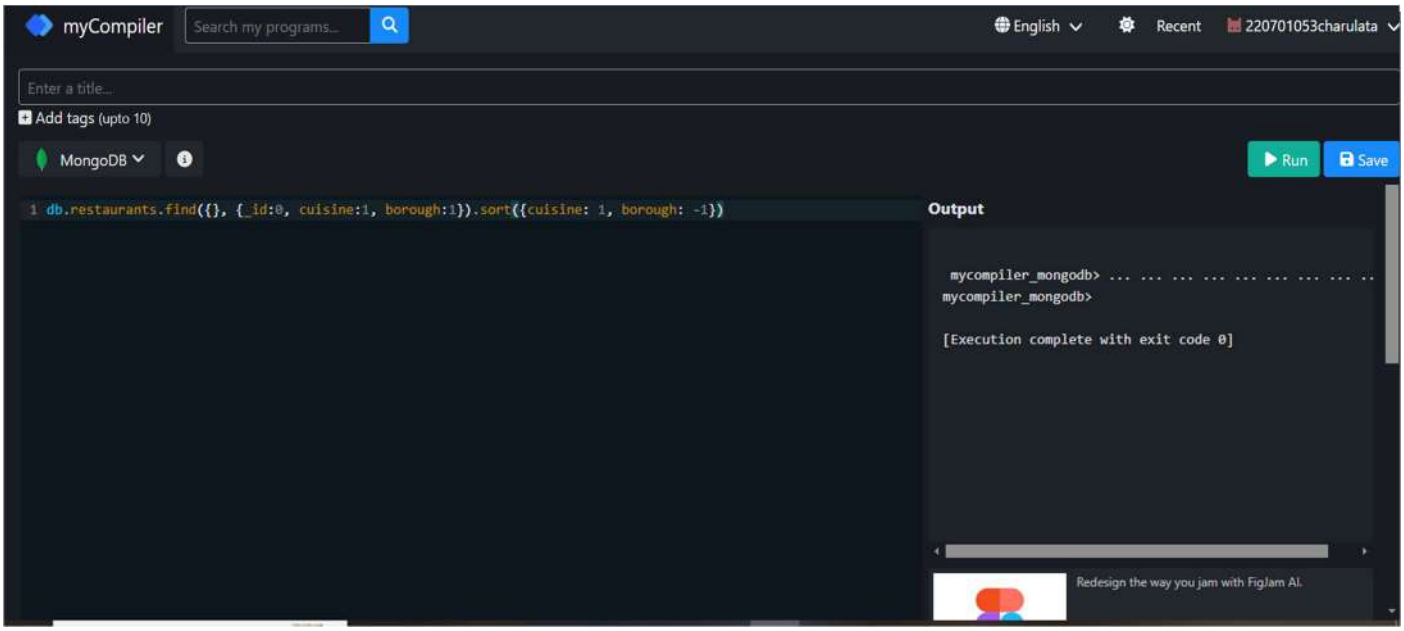


7.) Write a MongoDB query to arranged the name of the cuisine in ascending order and for that same cuisine borough should be in descending order.

QUERY:

db.restaurants.find({}, { _id: 0 }).sort({ cuisine: 1, borough: -1 })

OUTPUT:

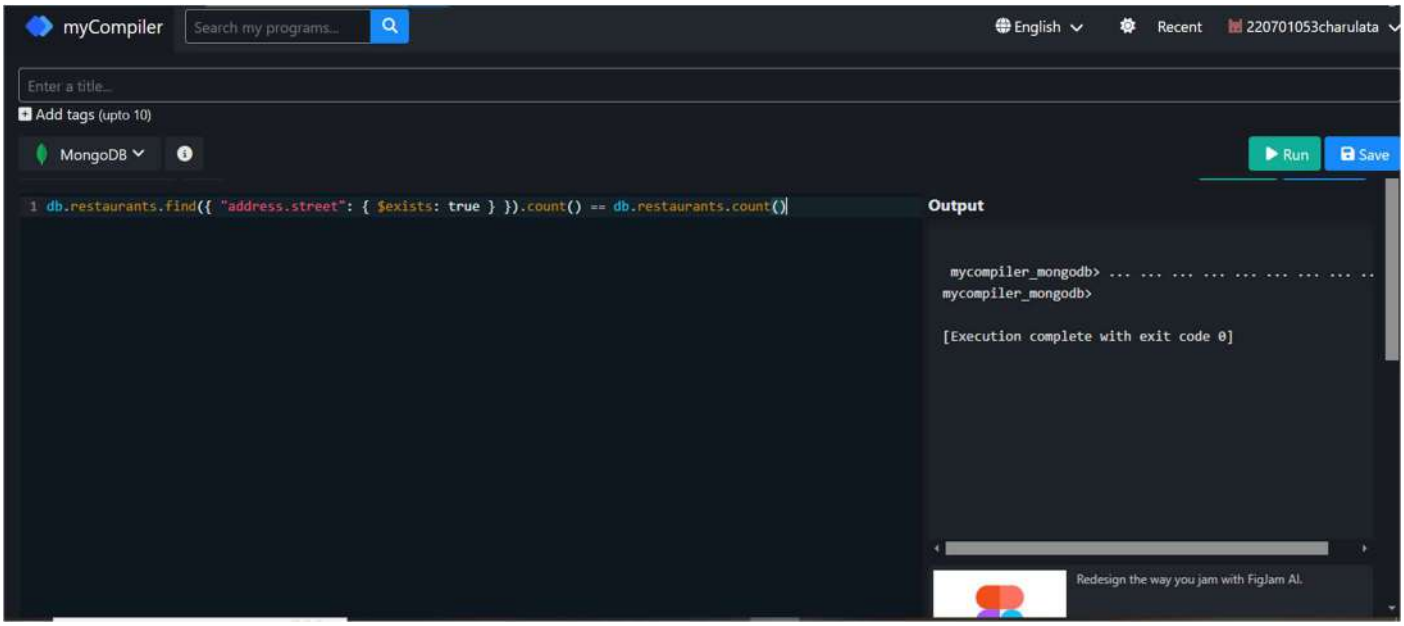


8.) Write a MongoDB query to know whether all the addresses contains the street or not.

QUERY:

db.restaurants.find({ "address.street": { $exists: true, $ne: "" } })

OUTPUT:

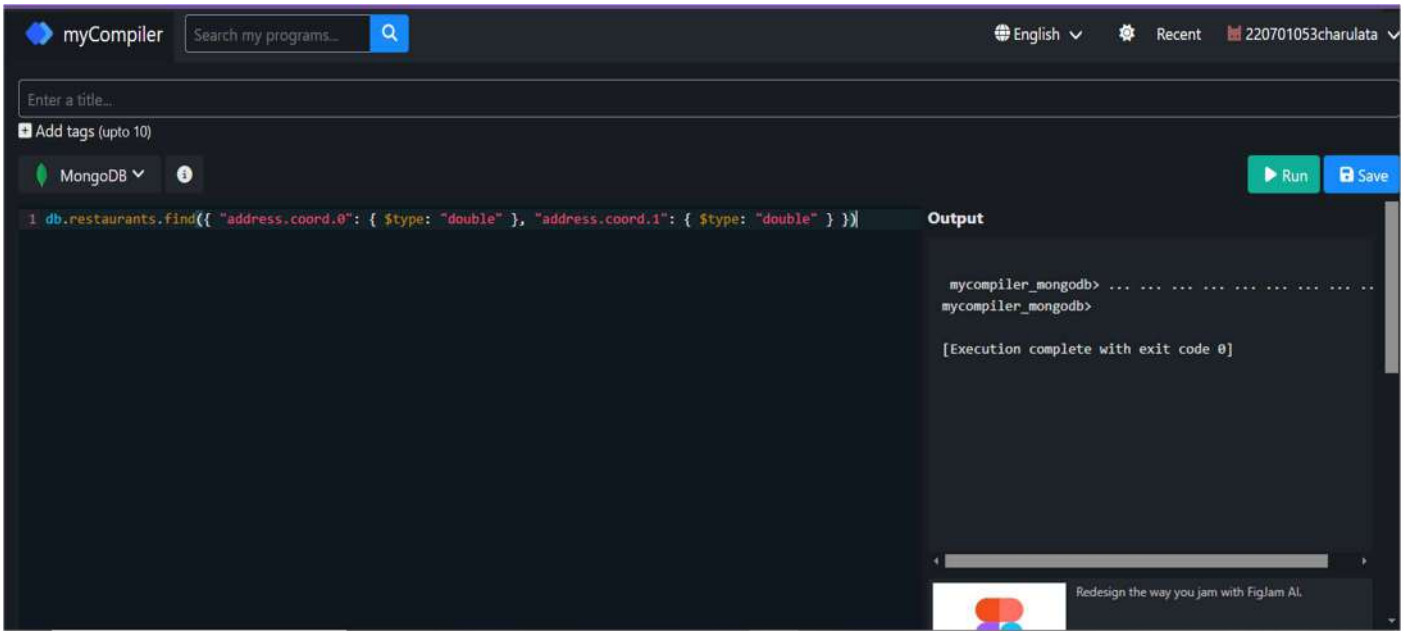


9.) Write a MongoDB query which will select all documents in the restaurants collection where the coord field value is Double.

QUERY:

db.restaurants.find({ "address.coord": { $elemMatch: { $type: "double" } } })

OUTPUT:

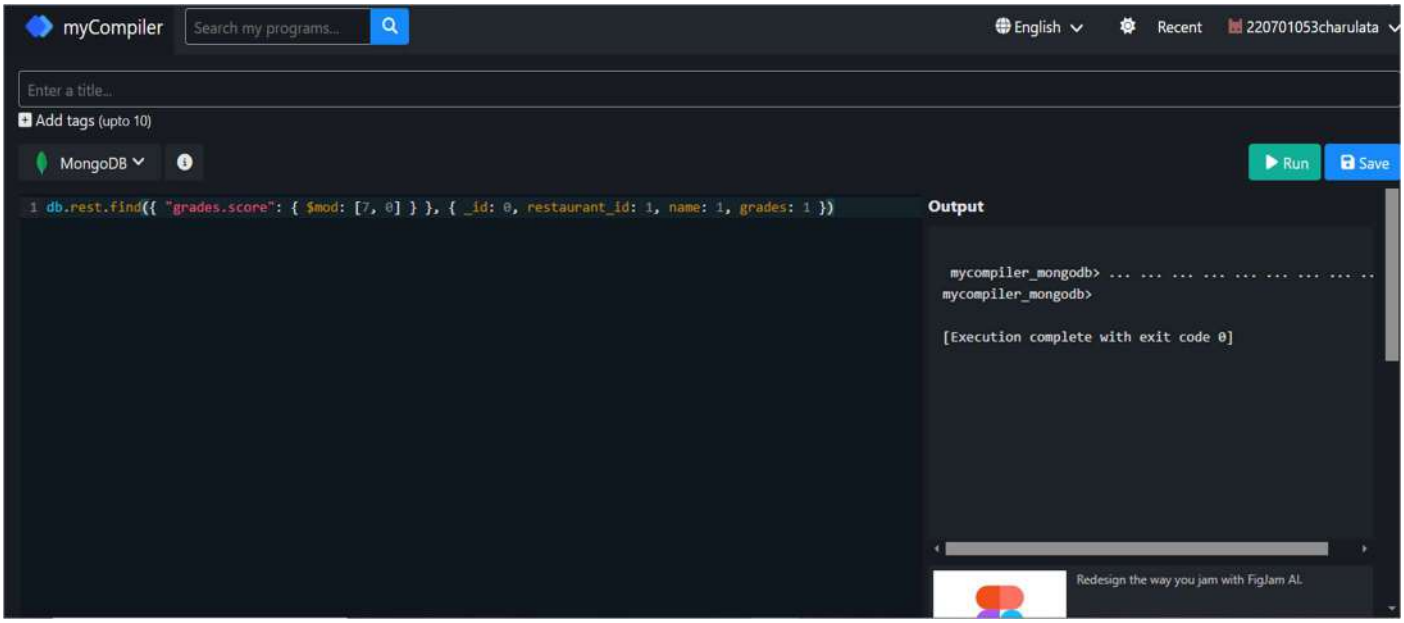


10. Write a MongoDB query which will select the restaurant Id, name and grades for those restaurants which returns 0 as a remainder after dividing the score by 7.

QUERY:

db.restaurants.find({ "grades.score": { $mod: [7, 0] } }, { restaurant_id: 1, name: 1, grades: 1 });

OUTPUT:

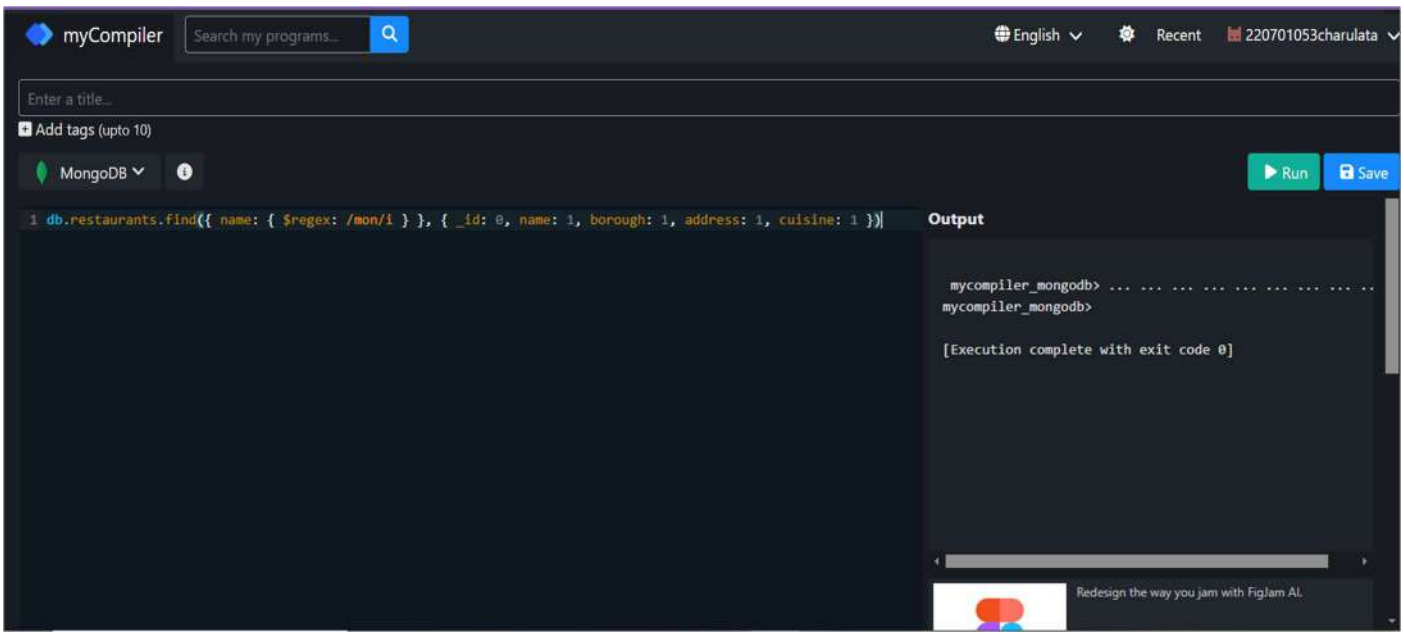


11. Write a MongoDB query to find the restaurant name, borough, longitude and attitude and cuisine for those restaurants which contains 'mon' as three letters somewhere in its name.

QUERY:

db.restaurants.find({ name: /mon/i }, { name: 1, borough: 1, "address.coord": 1, cuisine: 1 })

OUTPUT:

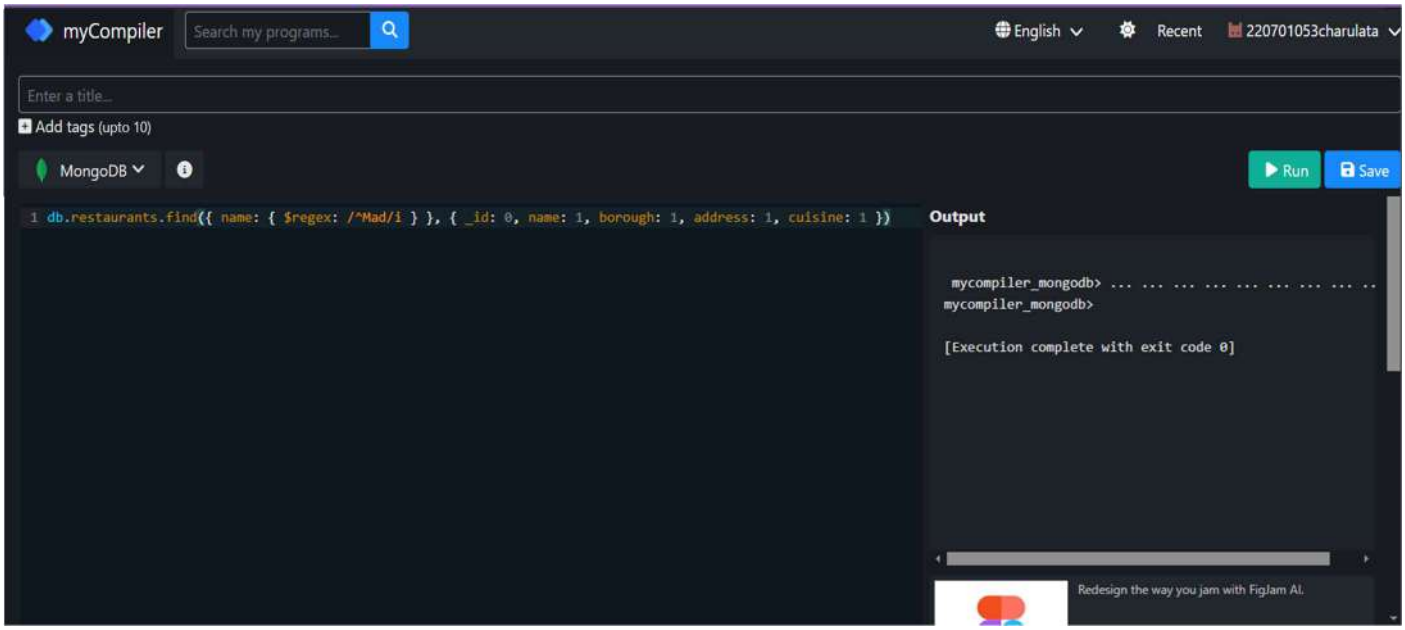


12. Write a MongoDB query to find the restaurant name, borough, longitude and latitude and cuisine for those restaurants which contain 'Mad' as first three letters of its name.

QUERY:

db.restaurants.find({ name: /^Mad/i }, { name: 1, borough: 1, "address.coord": 1, cuisine: 1 })

OUTPUT:

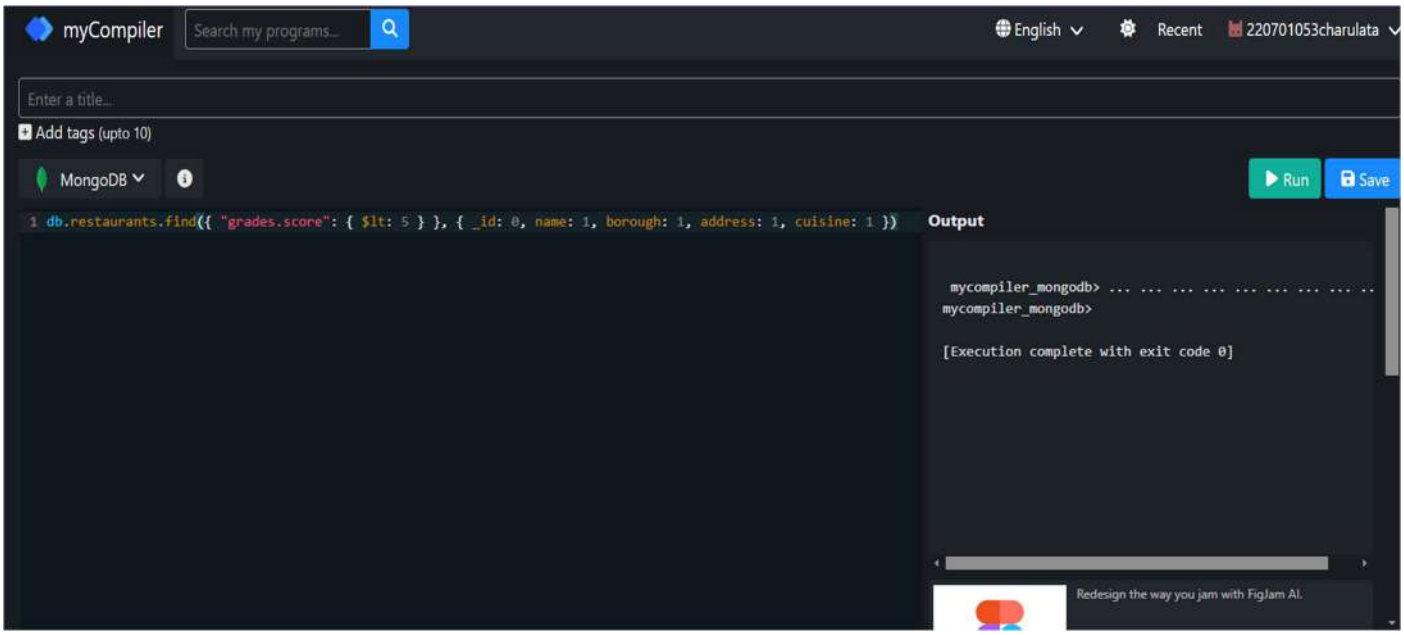


13. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5.

QUERY:

db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } } })

OUTPUT:

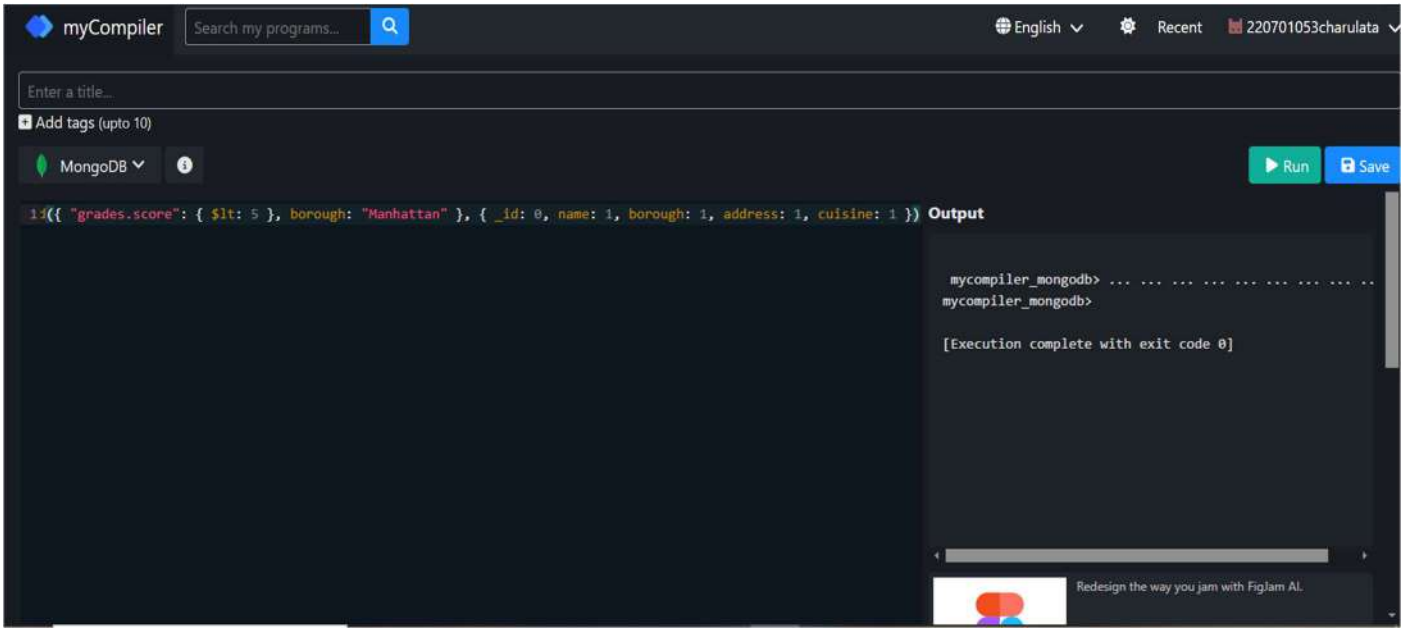


14. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5 and that are located in the borough of Manhattan.

QUERY:

db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } }, "borough": "Manhattan" })

OUTPUT:

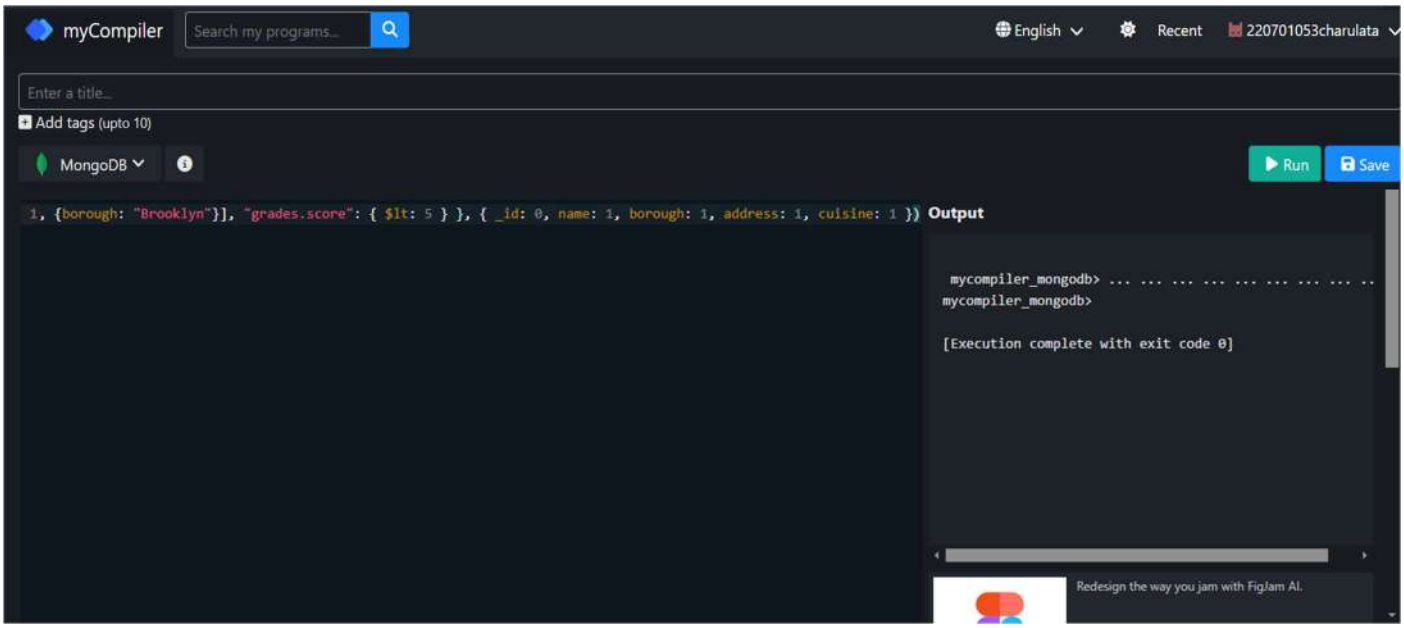


15.Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5 and that are located in the borough of Manhattan or Brooklyn.

QUERY:

db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } }, $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }] })

OUTPUT:

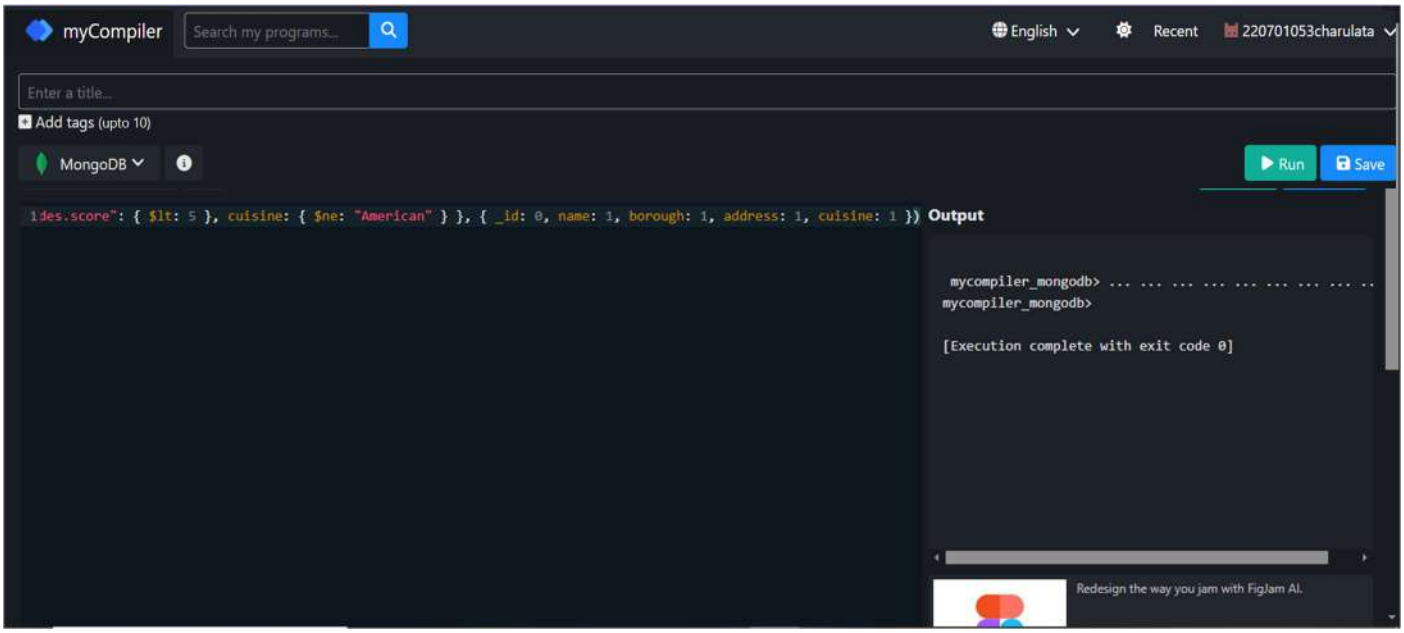


16. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5 and that are located in the borough of Manhattan or Brooklyn, and their cuisine is not American.

QUERY:

db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } }, $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }], "cuisine": { $ne: "American" } })

OUTPUT:

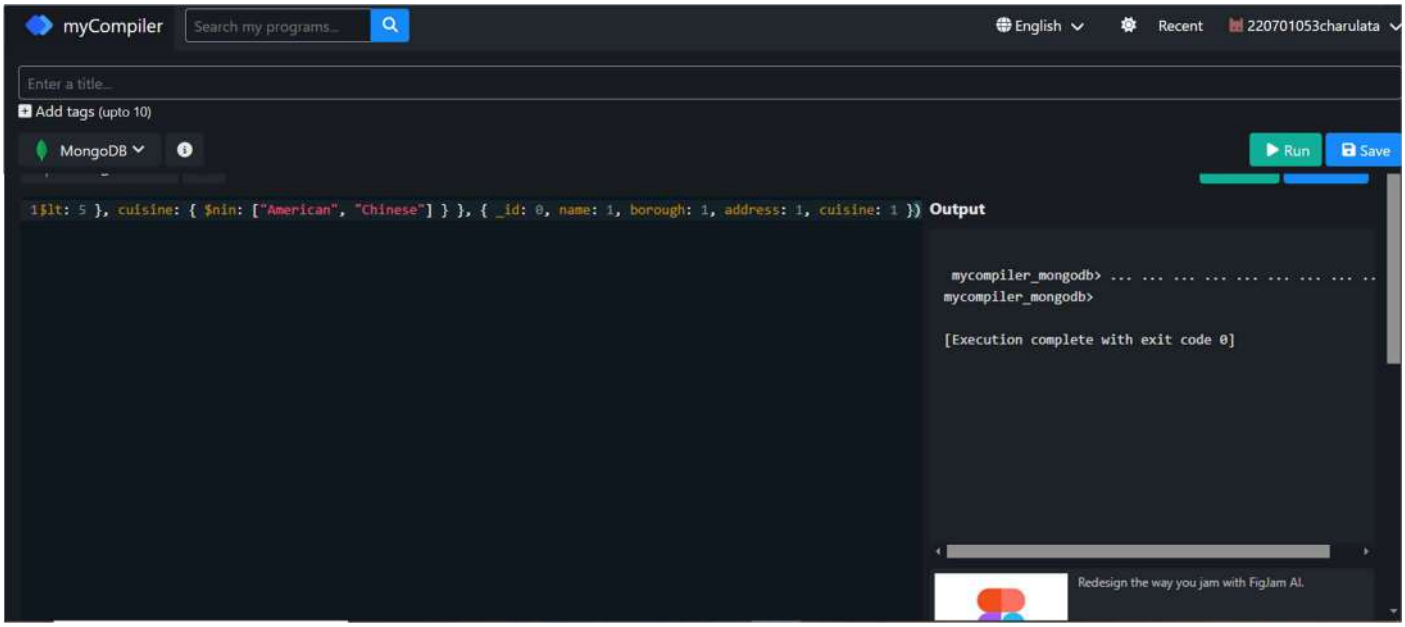


17. Write a MongoDB query to find the restaurants that have at least one grade with a score of less than 5 and that are located in the borough of Manhattan or Brooklyn, and their cuisine is not American or Chinese.

QUERY:

db.restaurants.find({ "grades": { $elemMatch: { "score": { $lt: 5 } } }, $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }], "cuisine": { $nin: ["American", "Chinese"] } })

OUTPUT:

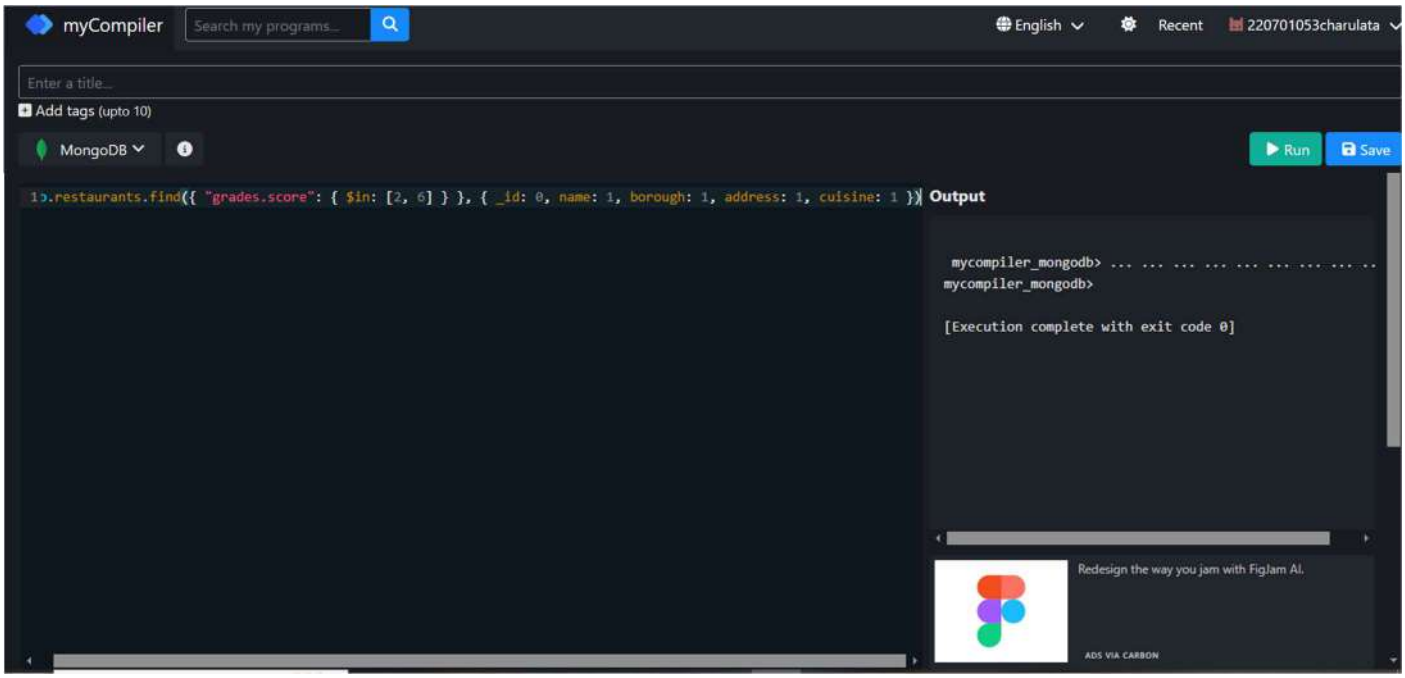


18. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6.

QUERY:

db.restaurants.find({ $and: [{ "grades.grade": "A", "grades.score": 2 }, { "grades.grade": "A", "grades.score": 6 }] })

OUTPUT:

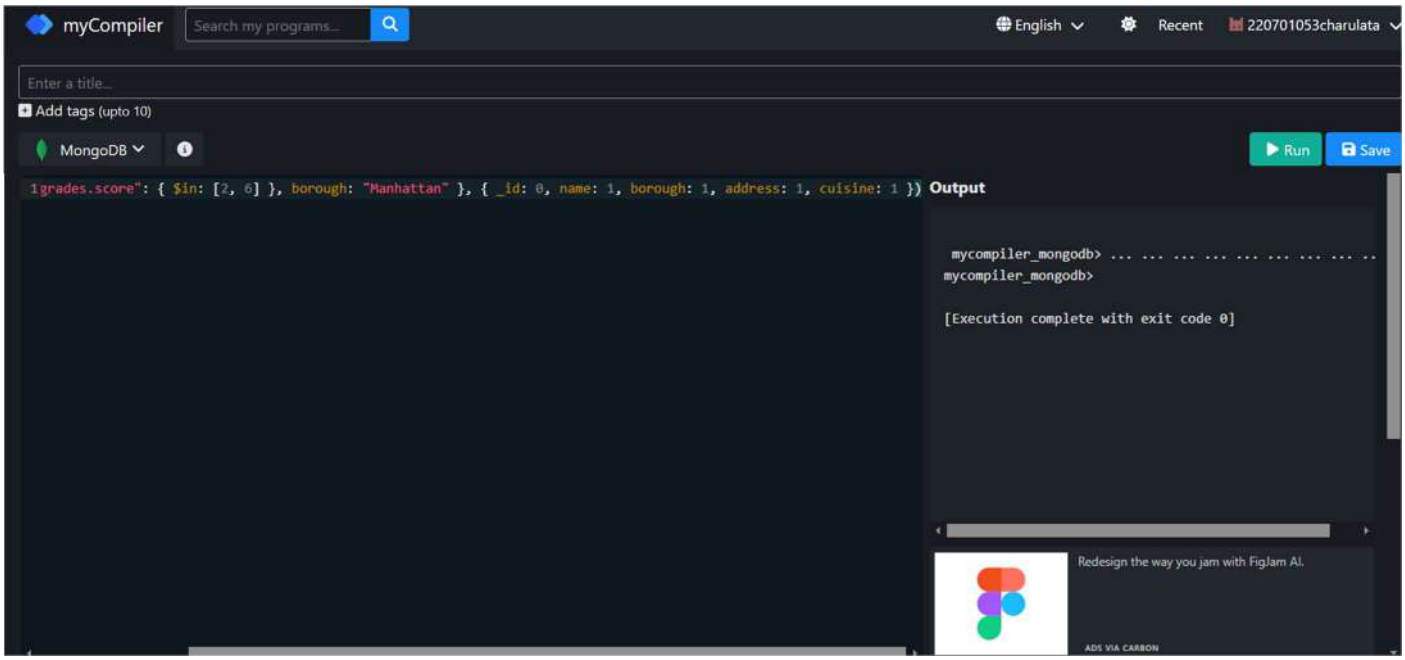


19. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6 and are located in the borough of Manhattan.

QUERY:

db.restaurants.find({ $and: [{ "grades.grade": "A", "grades.score": 2 }, { "grades.grade": "A", "grades.score": 6 }], "borough": "Manhattan" })

OUTPUT:

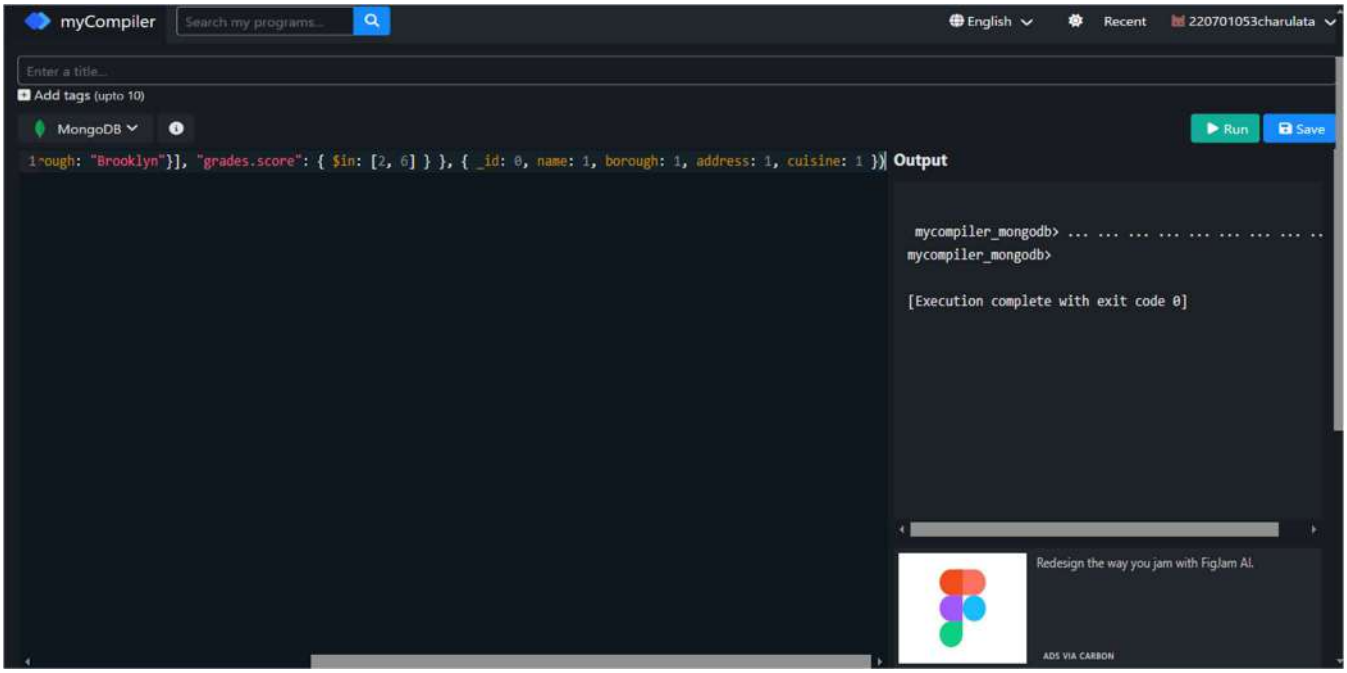


20. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6 and are located in the borough of Manhattan or Brooklyn.

QUERY:

db.restaurants.find({ $and: [{ "grades.grade": "A", "grades.score": 2 }, { "grades.grade": "A", "grades.score": 6 }], $or: [{ "borough": "Manhattan" }, { "borough": "Brooklyn" }] })

OUTPUT:

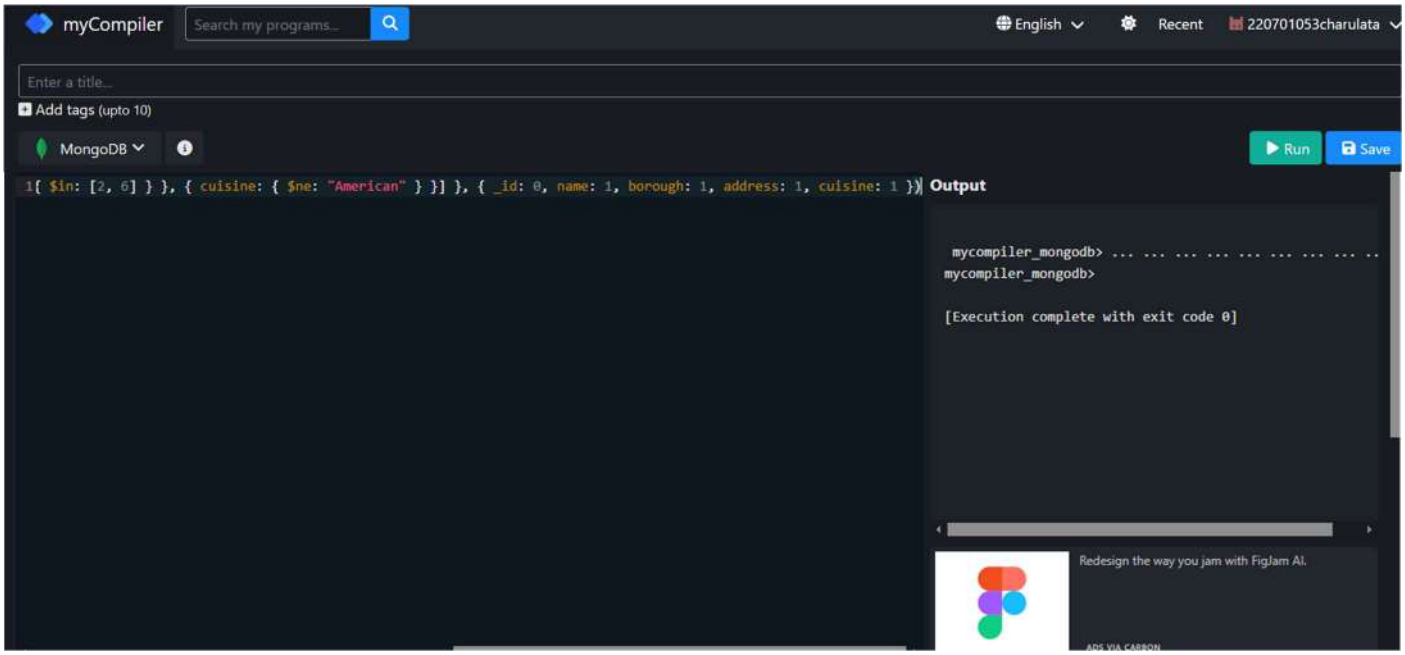


21. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6 and are located in the borough of Manhattan or Brooklyn, and their cuisine is not American.

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:

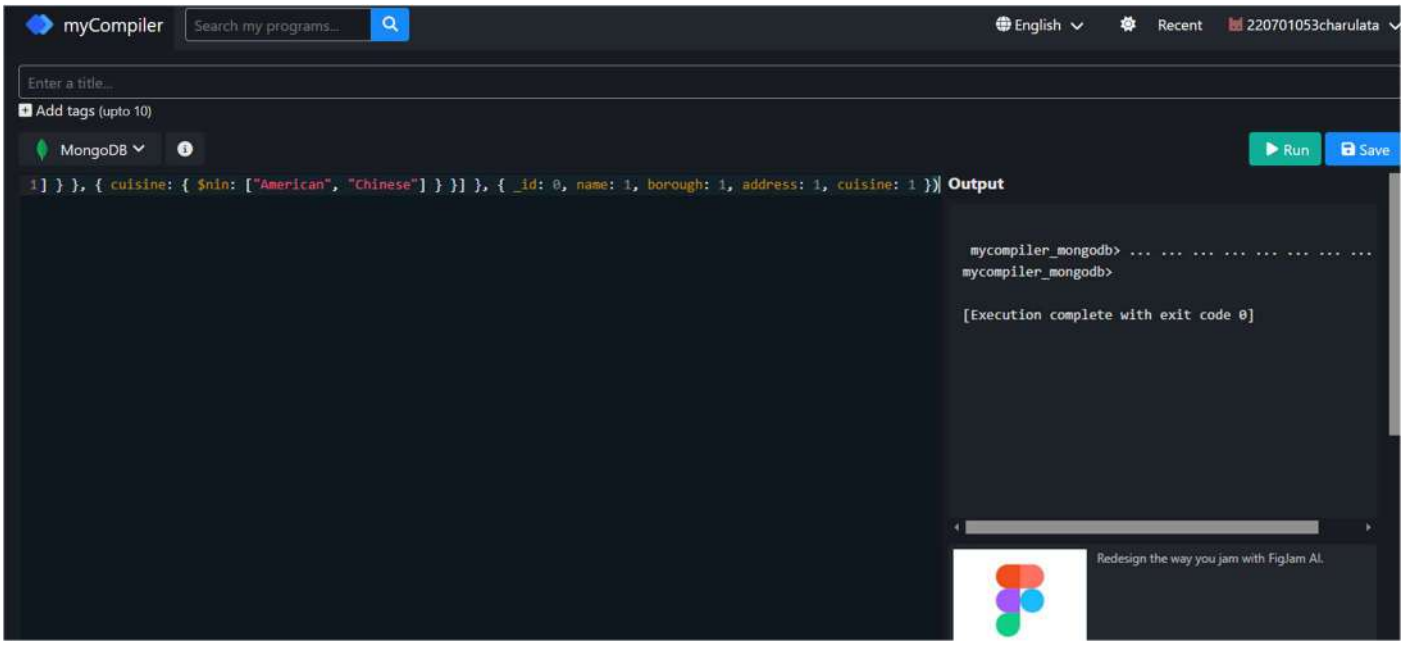


22. Write a MongoDB query to find the restaurants that have a grade with a score of 2 and a grade with a score of 6 and are located in the borough of Manhattan or Brooklyn, and their cuisine is not American or Chinese.

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:

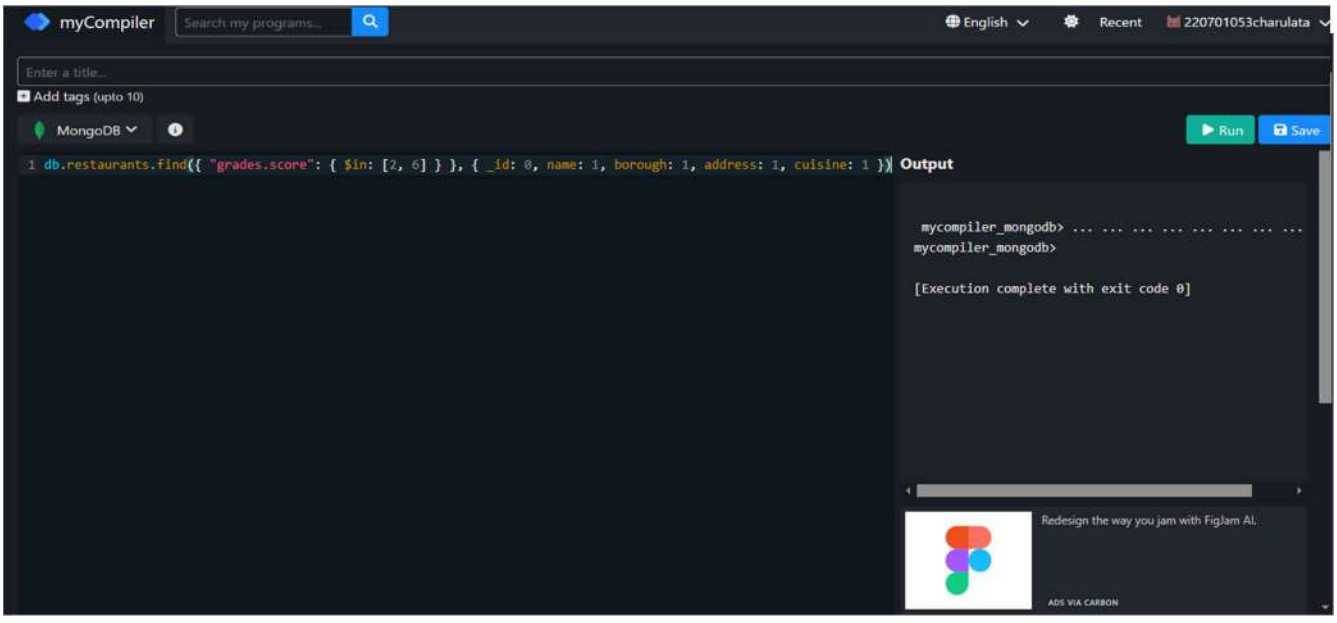


23. Write a MongoDB query to find the restaurants that have a grade with a score of 2 or a grade with a score of 6.

QUERY:

db.restaurants.find({ $or: [{ "grades.score": 2 }, { "grades.score": 6 }] })

OUTPUT:



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

RESULT:

MONGO DB

EX_NO: 20 **DATE:**

1.)Find all movies with full information from the 'movies' collection that released in the year 1893.

QUERY:

```
db.movies.find({ year: 1893 })
```

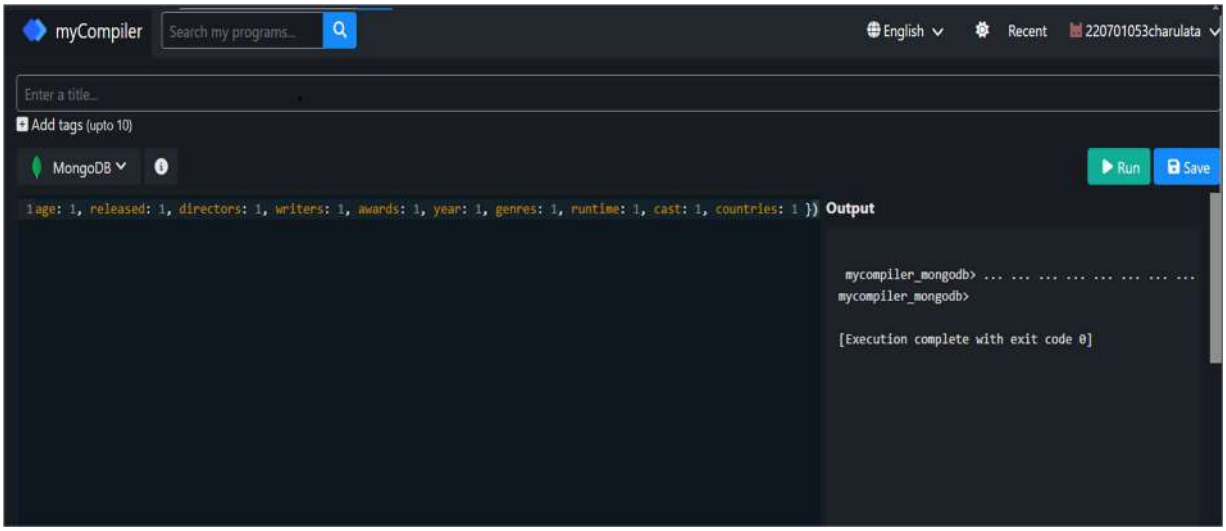
OUTPUT:

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:



3.)Find all movies with full information from the 'movies' collection that have "Short" genre.

QUERY:

```
db.movies.find({ genres: 'Short' })
```

OUTPUT:

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:

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' })
```

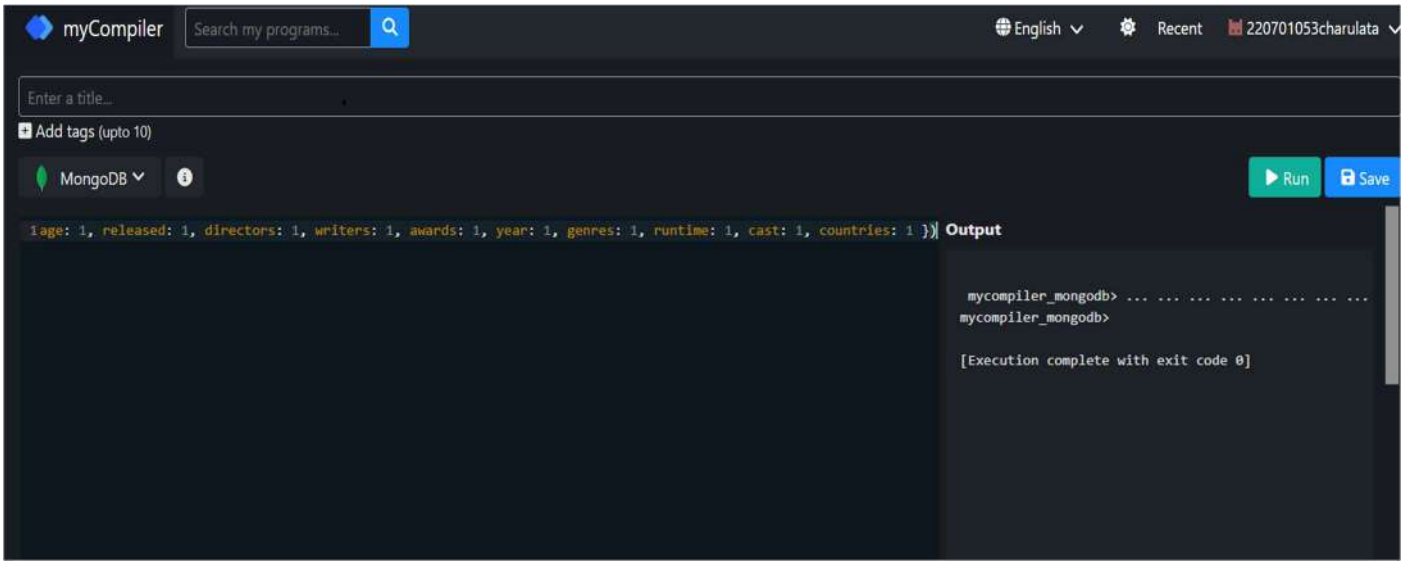
OUTPUT:

6.)Retrieve all movies from the 'movies' collection that have complete information and are rated as "UNRATED".

QUERY:

```
db.movies.find({ rated: 'UNRATED' })
```

OUTPUT:



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:

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 } })
```

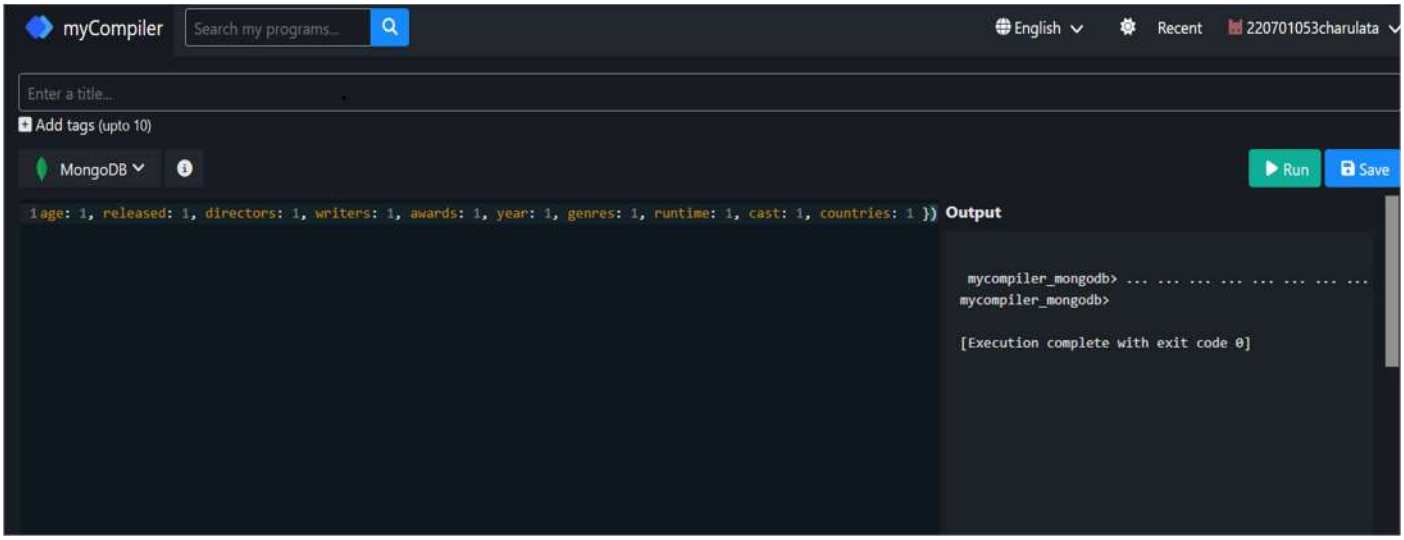
OUTPUT:

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:



10.)Retrieve all movies from the 'movies' collection that have received an award.

QUERY:

```
db.movies.find({ 'awards.wins': { $gt: 0 } })
```

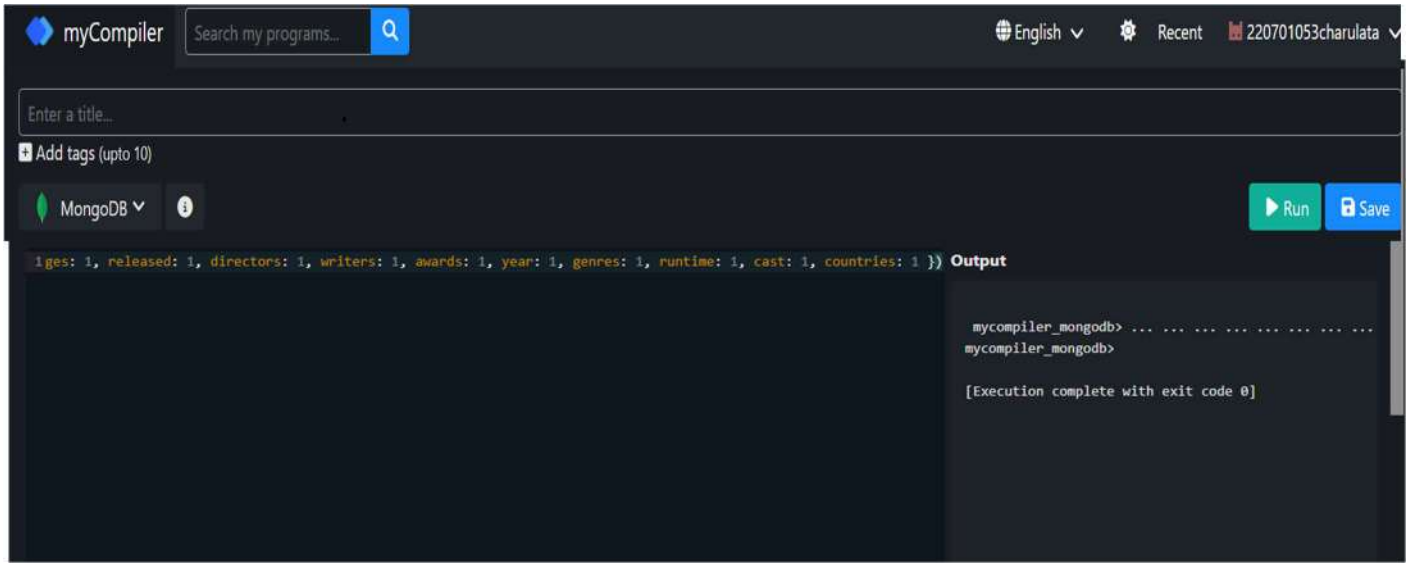
OUTPUT:

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:



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:

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:

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:

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

RESULT: