RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM – 602 105

RAJALAKSHMI
ENGINEERING COLLEGE

CS23332

DATABASE MANAGEMENT SYSTEMS

Laboratory Observation Note Book

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Year / Branch / Section : 2nd Year/ AIML / A

Register No. : 231501027

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CS23332 DATABASE MANAGEMENT SYSTEMS

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Ex.No.: 1		CREATION OF BASE TABLE AND DML OPERATIONS
Date:	24/7/24	

1) CREATE MY_EMPLOYEE TABLE WITH THE FOLLOWING STRUCTURE

```
CREATE TABLE MY_EMPLOYEE(
ID NUMBER(4) NOT NULL,
LAST_NAME
VARCHAR(25),
FIRST_NAME
VARCHAR(25),USERID
VARCHAR(25),
SALARY NUMBER(9,2)
);
```

2) ADD THE FIRST ROW AND SECOND ROWS DATA TO MY_EMPLOYEE TABLE FROMTHE SAMPLE TABLE

```
INSERT INTO
MY_EMPLOYEE(&ID,&LAST_NAME,&FIRST_NAME,&USERID,&SALARY
)
VALUES(1,"PATEL","RALPH","RPATEL",895
2,"DANCS","BETTY","BDANCS",860);
```

3) DISPLAY THE TABLE WITH VALUES

```
SELECT * FROM
MY_EMPLOYEE;
```

4) POPULATE THE NEXT TWO ROWS OF DATA FROM THE SAMPLE DATA. CONCATENATETHE FIRST LETTER OF THE FIRST_NAME WITH FIRST SEVEN LETTERS OF THE LAST_NAME TO PRODUCE USERID

```
UPDATE MY_EMPLOYEES
SET USERID = SUBSTR(FIRST_NAME,1,1) ||
SUBSTR(LAST_NAME,1,7)WHERE ID IN (3,4);
```

5) DELETE BETTY DANCS FROM

MY_EMPLOYEE DELETE FROM

MY_EMPLOYEE

```
WHERE FIRST_NAME = 'BETTY' AND LAST_NAME = 'DANCS';
```

6) EMPTY THE FOURTH ROW OF

THE EMP TABLEDELETE FROM

```
MY_EMPLOYEE
WHERE ID = 5;
```

ID	LAST_NAME	FIRST_NAME	VSERID	SALARY
1	Patel	Ralph	rpatel	895
2	Dancs	Betty	bdancs	1100
4	Newman	Chad	cnewman	750

7) MAKE THE DATA ADDITIONS

PERMANENTCOMMIT;

8) CHANGE THE LAST NAME OF EMPLOYEE 3 TO DREXLER

```
UPDATE  MY_EMPLOYEE
SET LAST_NAME =
“DREXLER”WHERE ID = 3;
```

9) CHANGE THE SALARY TO 1000 FOR ALL THE EMPLOYEES WITH A SALARY LESS THAN900.

```
UPDATE
MY_EMPLOYEESET
SALARY = 1000
WHERE SALARY<900;
```

EX.NO.: 2		DATA MANIPULATIONS
DATE :	26/07/24	

a) FIND OUT THE EMPLOYEE ID, NAMES, SALARIES OF ALL THE

EMPLOYEESSELECT EMPLOYEE_ID, FIRST_NAME, SALARY

FROM EMPLOYEES;

EMPLOYEE_ID	FIRST_NAME	SALARY
1	Justin	4900
2	Emma	5500
3	Robert	9000
4	Scarlett	8000
5	Chris	7500
6	Mark	7200
7	Chris	7800
8	Jeremy	3800
9	Tom	6000

b) LIST OUT THE EMPLOYEES WHO WORKS UNDER MANAGER 100

```
SELECT FIRST_NAME || ' ' || LAST_NAME AS NAME FROM EMPLOYEES  WHERE
MANAGER_ID
=100;
```

NAME
Cate Austin
Justin Beiber

2 rows returned in 0.04 seconds Download

c) FIND THE NAMES OF THE EMPLOYEES WHO HAVE A SALARY GREATER THAN OR EQUAL TO 4800

```
SELECT FIRST_NAME || ' ' || LAST_NAME AS NAME FROM EMPLOYEES
WHERE SALARY >= 4800;
```

NAME
Emma Stone
Brie Larson
Elizabeth Olsen
Cate Austin
Robert Downey
Karen Gillan
Sebastian Stan
Karl Austin
Chris Evans

d) LIST OUT THE EMPLOYEES WHOSE LAST NAME IS AUSTIN

```
SELECT FIRST_NAME || ' ' || LAST_NAME AS NAME FROM EMPLOYEES

WHERE LAST_NAME = 'AUSTIN';
```

NAME
Cate Austin
Karl Austin
Jeremy Austin
Chris Austin
Zoe Austin
Scarlett Austin

6 rows returned in 0.00 seconds Download

e) FIND THE NAMES OF THE EMPLOYEES WHO WORKS IN DEPARTMENTS 60,70 AND 80

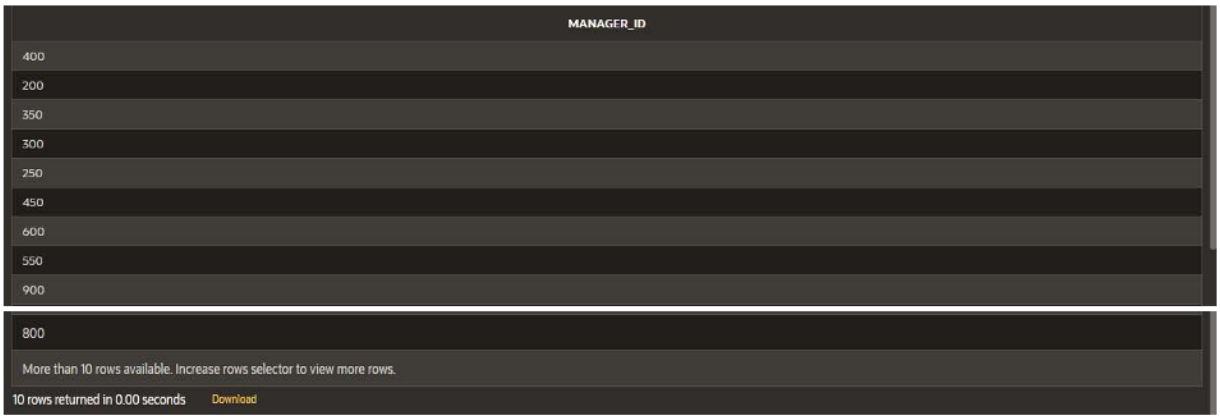
```
SELECT FIRST_NAME || ' ' || LAST_NAME AS NAME FROM

 EMPLOYEES
WHERE DEPARTMENT_ID IN (60,70,80);
```

NAME
Chadwick Boseman
Jeremy Austin
Tessa Thompson
Zoe Austin
Pom Klementieff

5 rows returned in 0.01 seconds Download

f) DISPLAY THE UNIQUE MANAGER_ID.

SELECT DISTINCT(MANAGER_ID) FROM EMPLOYEES;



MANAGER_ID
400
200
350
300
250
450
600
550
900
800

More than 10 rows available. Increase rows selector to view more rows.

10 rows returned in 0.00 seconds Download

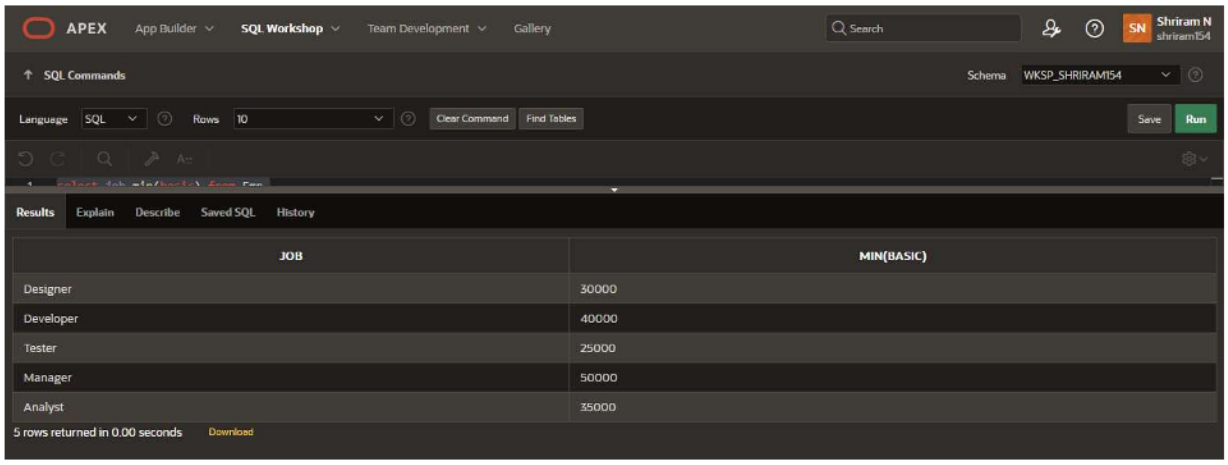
(a) INSERT FIVE RECORDS AND CALCULATE GROSSPAY AND NETPAY.

INSERT INTO EMP (EMPNO, EMPNAME, JOB, BASIC, DA, HRA, PF, GROSSPAY, NETPAY)VALUES (
101, 'JOHN DOE', 'MANAGER', 50000, 15000, 20000, 6000,0,0 ,

```
102, 'JANE SMITH', 'DEVELOPER', 40000, 12000, 16000, 4800,0,0   ,
103, 'ALICE JOHNSON', 'ANALYST', 35000, 10500, 14000, 4200,0,0   ,
104, 'BOB BROWN', 'DESIGNER', 30000, 9000, 12000, 3600,0,0  ,
105, 'CHARLIE DAVIS', 'TESTER', 25000, 7500, 10000, 3000,0,0
)

UPDATE EMP
SET GROSSPAY =
BASIC+DA+HRAWHERE
GROSSPAY = 0;

UPDATE EMP
SET NETPAY =
GROSSPAY - PFWHERE
NETPAY = 0;
```

(b) DISPLAY THE EMPLOYEES WHOSE BASIC IS LOWEST IN

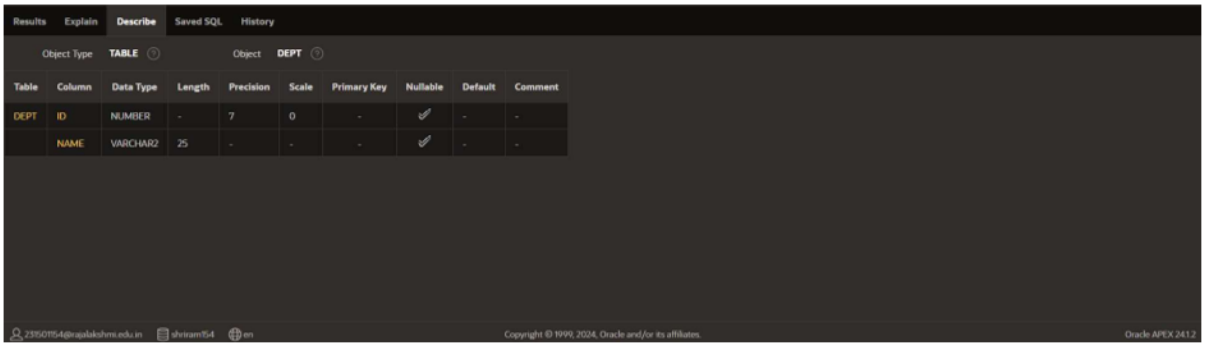
EACH DEPARTMENT.SELECT JOB,MIN(BASIC) FROM EMP
GROUP BY JOB;



1. CREATE THE DEPT TABLE BASED ON THE DEPARTMENT FOLLOWING THE TABLE INSTANCECHART BELOW. CONFIRM THAT THE TABLE IS CREATED.

   CREATE TABLE DEPT(

```
    ID NUMBER(7),
    NAME
    VARCHAR(25)
);

DESC DEPT;
```



2) CREATE THE EMP1 TABLE BASED ON THE FOLLOWING INSTANCE CHART. CONFIRM THAT THE TABLEIS CREATED.

```
CREATE    TABLE
   EMP1(          ID
   NUMBER(7),
   FIRST_NAME
   VARCHAR(25),
   LAST_NAME
   VARCHAR(25),
   DEPT_ID NUMBER(7)
);

DESC EMP1;
```

3) MODIFY THE EMP1 TABLE TO ALLOW FOR LONGER EMPLOYEE LAST NAMES. CONFIRM THEMODIFICATION.(HINT: INCREASE THE SIZE TO

50)

```
ALTER TABLE EMP1
MODIFY LAST_NAME VARCHAR(50);
```

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.

```
CREATE TABLE
   EMPLOYEES2(ID
   NUMBER(10),
   FIRST_NAME
   VARCHAR(50),
   LAST_NAME
   VARCHAR(50), SALARY
   NUMBER(10), DEPT_ID
   NUMBER(10)
);
```

5) DROP THE EMP1

```
TABLE.DROP TABLE

EMP1;
```

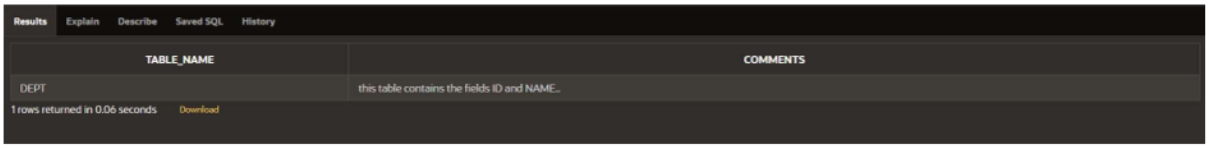
6) RENAME THE EMPLOYEES2 TABLE AS EMP1.

```
ALTER TABLE EMPLOYEES2 RENAME TO EMP1;
```

7) ADD A COMMENT ON DEPT AND EMP1 TABLES. CONFIRM THE MODIFICATION BY DESCRIBINGTHE TABLE.

```
COMMENT ON TABLE DEPT IS 'THIS TABLE CONTAINS THE FIELDS ID

AND NAME..';SELECT TABLE_NAME, COMMENTS
```

```
FROM USER_TAB_COMMENTS
WHERE TABLE_NAME = 'DEPT';
```



Results | Explain | Describe | Saved SQL | History

TABLE_NAME	COMMENTS
DEPT	this table contains the fields ID and NAME..

1 rows returned in 0.06 seconds Download

```
COMMENT ON TABLE EMP1 IS 'THIS TABLE CONTAINS THE FIELDS ID,FIRST
NAME,LASTNAME,SALARY,DEPT_ID..';

SELECT TABLE_NAME, COMMENTS
FROM USER_TAB_COMMENTS
WHERE TABLE_NAME = 'EMP1';
```

Results | Explain | Describe | Saved SQL | History

TABLE_NAME	COMMENTS
EMP1	this table contains the fields ID,first name,last name,salary,DEPT_id..

1 rows returned in 0.04 seconds Download

8) DROP THE FIRST_NAME COLUMN FROM THE EMP TABLE AND CONFIRM IT.

```
ALTER TABLE EMP1
DROP COLUMN FIRST_NAME;
```

Results | Explain | Describe | Saved SQL | History

Object Type TABLE Object EMP1

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
EMP1	ID	NUMBER	-	10	0	-	✓	-	-
	LAST_NAME	VARCHAR2	50	-	-	-	✓	-	-
	SALARY	NUMBER	-	10	0	-	✓	-	-
	DEPT_ID	NUMBER	-	10	0	-	✓	-	-

EX.NO.: 3		WRITING BASIC SQL SELECT STATEMENTS
DATE :	30/07/2024	

FIND THE SOLUTION FOR THE FOLLOWING:

TRUE OR FALSE

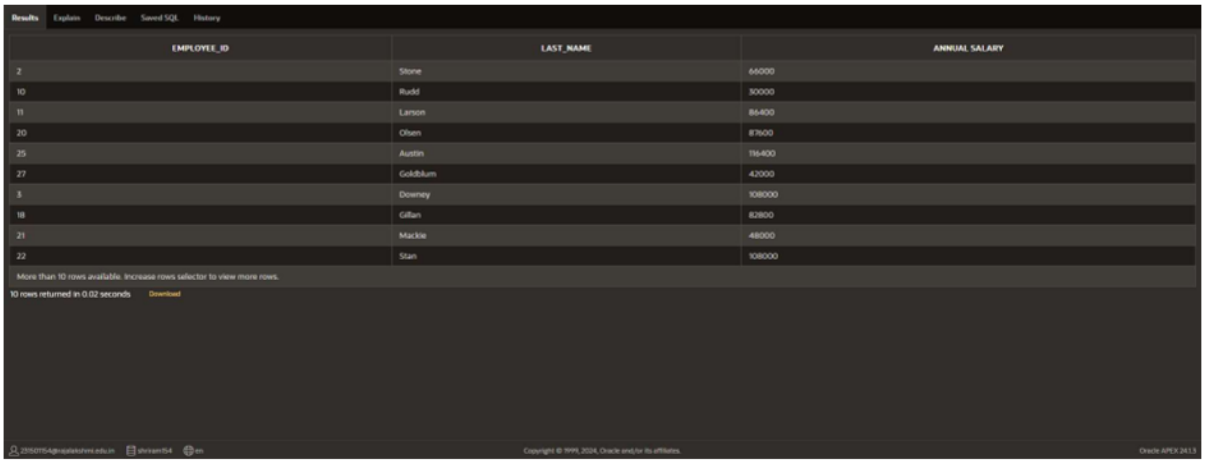
1. THE FOLLOWING STATEMENT EXECUTES SUCCESSFULLY.

IDENTIFY THE ERRORS
SELECT EMPLOYEE_ID,
LAST_NAMESAL*12 ANNUAL
SALARY
FROM
EMPLOYEES;

FALSE

THE COLUMNS IN SELECT STATEMENT SHOULD BE SEPARATED BY COMMAS AND THE COLUMN ALIAS SHOULDBE GIVEN BY USING A KEYWORD “AS”

SELECT EMPLOYEE_ID, LAST_NAME, SALARY*12 AS "ANNUAL SALARY"FROM EMPLOYEES;



2) SHOW THE STRUCTURE OF DEPARTMENTS THE TABLE. SELECT ALL THE DATA FROM IT.

DESC EMPLOYEES;

Results | Explain | **Describe** | Saved SQL | History

Object Type **TABLE** Object **EMPLOYEES**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
EMPLOYEES	EMPLOYEE_ID	NUMBER	-	6	0	1	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	✓	-	-
	LAST_NAME	VARCHAR2	25	-	-	-	-	-	-
	EMAIL	VARCHAR2	25	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	20	-	-	-	✓	-	-
	HIRE_DATE	DATE	7	-	-	-	-	-	-
	JOB_ID	VARCHAR2	10	-	-	-	-	-	-
	SALARY	NUMBER	-	8	2	-	✓	-	-
	COMMISSION_PCT	NUMBER	-	2	2	-	✓	-	-
	MANAGER_ID	NUMBER	-	6	0	-	✓	-	-
	DEPARTMENT_ID	NUMBER	-	4	0	-	✓	-	-

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3. CREATE A QUERY TO DISPLAY THE LAST NAME, JOB CODE, HIRE DATE, AND EMPLOYEE NUMBER FOREACH EMPLOYEE, WITH EMPLOYEE NUMBER APPEARING FIRST.

SELECT EMPLOYEE_ID , JOB_ID , LAST_NAME , HIRE_DATE FROM EMPLOYEES;

Results | Explain | Describe | Saved SQL | History

EMPLOYEE_ID	JOB_ID	LAST_NAME	HIRE_DATE
2	#es002	Stone	11/05/1990
10	#pr010	Rudd	04/06/1969
11	#bl011	Larson	10/01/1989
20	#we020	Olsen	07/16/1986
25	#cb025	Austin	05/14/1969
27	#jg027	Goldblum	10/22/1950
3	#rd003	Downey	04/04/1965
18	#kg018	Gillen	11/28/19[illegible]7
21	#am021	Mackie	09/23/1978
22	#ss022	Stan	08/13/1982

More than 10 rows available. Increase rows selector to view more rows.

10 rows returned in 0.01 seconds Download

4) PROVIDE AN ALIAS STARTDATE FOR THE

HIRE DATE. SELECT HIRE_DATE AS

"STARTDATE" FROM EMPLOYEES;

5) CREATE A QUERY TO DISPLAY UNIQUE JOB CODES FROM

THE EMPLOYEE TABLE.SELECT DISTINCT(JOB_ID) FROM

EMPLOYEES;

6) DISPLAY THE LAST NAME CONCATENATED WITH THE JOB ID , SEPARATED BY A COMMA AND SPACE,AND NAME THE COLUMN EMPLOYEE AND TITLE.

SELECT LAST_NAME || ' ' || ',' || ' ' || JOB_ID AS "EMPLOYEE AND TITLE" FROM EMPLOYEES;

7. CREATE A QUERY TO DISPLAY ALL THE DATA FROM THE EMPLOYEES TABLE. SEPARATE EACH COLUMN BYA COMMA. NAME THE COLUMN THE_OUTPUT.

```
SELECT EMPLOYEE_ID || ' , ' || FIRST_NAME || ' , ' || LAST_NAME || ' , ' || EMAIL || ' , ' ||
PHONE_NUMBER || ' ,' || HIRE_DATE || ' , ' || JOB_ID || ' , ' || SALARY || ' , ' ||
COMMISSION_PCT || ' , ' || MANAGER_ID || ' , ' || DEPARTMENT_ID AS "THE_OUTPUT"
FROM EMPLOYEES;
```

EX.NO.: 4		WORKING WITH CONSTRAINTS
DATE :	02-08-2024	

1) ADD A TABLE-LEVEL PRIMARY KEY CONSTRAINT TO THE EMP TABLE ON THE ID COLUMN.THECONSTRAINT SHOULD BE NAMED AT CREATION. NAME THE CONSTRAINT MY_EMP_ID_PK.

```
ALTER TABLE EMP1
ADD CONSTRAINT MY_EMP_ID_PK PRIMARY KEY(ID);
```

2) CREATE A PRIMAY KEY CONSTRAINT TO THE DEPT TABLE USING THE ID COLUM. THE CONSTRAINTSHOULD BE NAMED AT CREATION. NAME THE CONSTRAINT MY_DEPT_ID_PK.

```
ALTER TABLE DEPT
ADD CONSTRAINT MY_DEPT_ID_PK PRIMARY KEY(ID);
```

3) ADD A COLUMN DEPT_ID TO THE EMP TABLE. ADD A FOREIGN KEY REFERENCE ON THE EMP TABLETHAT ENSURES THAT THE EMPLOYEE IS NOT ASSIGNED TO NONEXISTENT DEPARMENT. NAME THE CONSTRAINT MY_EMP_DEPT_ID_FK.

```
ALTER TABLE EMP
ADD DEPT_ID  NUMBE(10);

ALTER TABLE EMP
ADD CONSTRAINT MY_EMP_DEPT_ID_FK FOREIGN KEY(DEPT_ID) REFERENCES
DEPT(ID);
```

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 COMMISSIONVALUE IS GREATER THAN ZERO.

```
ALTER TABLE EMP
```

```
ADD COMMISSION NUMBER(2,2);

ALTER TABLE EMP
ADD CONSTRAINT COMMISSION_GT_ZERO CHECK(COMMISSION > 0);
```

EX.NO.: 5		CREATING VIEWS
DATE :	07/08/2024	

1) CREATE A VIEW CALLED EMPLOYEE_VU BASED ON THE EMPLOYEE NUMBERS, EMPLOYEE NAMES AND DEPARTMENT NUMBERS FROM THE EMPLOYEES TABLE. CHANGE THE HEADING FORTHE EMPLOYEE NAME TO EMPLOYEE.

```
CREATE VIEW EMPLOYEE_VU AS
SELECT EMPLOYEE_ID , FIRST_NAME || ' ' || LAST_NAME AS "EMPLOYEE",
DEPARTMENT_IDFROM EMPLOYEES;
```

2) DISPLAY THE CONTENTS OF THE

EMPLOYEES_VU VIEW.SELECT * FROM

EMPLOYEE_VU;

Results | Explain | Describe | Saved SQL | History

EMPLOYEE_ID	EMPLOYEE	DEPARTMENT_ID
1	Justin Beiber	10
2	Emma Stone	15
3	Robert Downey	40
4	Scarlett Austin	45
5	Chris Evans	55
6	Mark Ruffalo	40
7	Chris Hemsworth	65
8	Jeremy Austin	70
9	Tom Holland	50

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3) SELECT THE VIEW NAME AND TEXT FROM THE USER_VIEWS DATA

DICTIONARY VIEWS.SELECT VIEW_NAME, TEXT
FROM USER_VIEWS
WHERE VIEW_NAME = 'EMPLOYEE_VU';

VIEW_NAME	TEXT
EMPLOYEE_VU	select employee_id , first_name || ' ' || last_name as "EMPLOYEE", department_id from employees

1 rows returned in 0.04 seconds Download

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4) USING YOUR EMPLOYEES_VU VIEW, ENTER A QUERY TO DISPLAY ALL EMPLOYEES NAMES ANDDEPARTMENT.

```
SELECT EMPLOYEE, DEPARTMENT_ID
```

```
FROM EMPLOYEE_VU;
```

EMPLOYEE	DEPARTMENT_ID
Emma Stone	15
Paul Rudd	30
Brie Larson	95
Elizabeth Olsen	90
Cate Austin	55
Jeff Goldblum	75
Robert Downey	40
Karen Gillan	95
Anthony Mackie	30
Sebastian Stan	75

More than 10 rows available. Increase rows selector to view more rows.

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 VIEWCOLUMNS EMPNO, EMPLOYEE AND DEPTNO. DO NOT ALLOW AN EMPLOYEE TO BE REASSIGNED TO ANOTHER DEPARTMENT THROUGH THE VIEW.

```
CREATE VIEW DEPT50 AS
SELECT EMPLOYEE_ID AS
    EMPNO,EMPLOYEE AS
    EMPLOYEE,
    DEPARTMENT_ID AS
    DEPTNO
FROM EMPLOYEE_VU
WHERE DEPARTMENT_ID
= 50WITH READ ONLY;
```

EMPNO	EMPLOYEE	DEPTNO
9	Tom Holland	50
15	Chris Austin	50
23	Benedict Cumberbatch	50

3 rows returned in 0.01 seconds Download

6) DISPLAY THE STRUCTURE AND CONTENTS OF THE DEPT50 VIEW.

```
DESC DEPT50;
```

Results Explain Describe Saved SQL History

Object Type VIEW Object DEPT50

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPT50	EMPNO	NUMBER	-	6	0	-	-	-	-
	EMPLOYEE	VARCHAR2	46	-	-	-	✓	-	-
	DEPTNO	NUMBER	-	4	0	-	✓	-	-

7) ATTEMPT TO REASSIGN MATOS TO DEPARTMENT 80.

```
UPDATE EMPLOYEES
SET DEPARTMENT_ID = 80
WHERE FIRST_NAME =
'MATOS';
```

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.

```
CREATE VIEW SALARY_VU AS
SELECT E.LAST_NAME AS
      EMPLOYEE,D.DEPT_NAME
      AS DEPARTMENT, E.SALARY
      AS SALARY, J.GRADE_LEVEL
      AS GRADE
FROM EMPLOYEES
EJOIN DEPARTMENT
D
ON E.DEPARTMENT_ID =
D.DEPT_IDJOIN JOB_GRADE J
ON E.SALARY BETWEEN J.LOWEST_SAL AND J.HIGHEST_SAL;
```

Results | Explain | Describe | Saved SQL | History

EMPLOYEE	DEPARTMENT	SALARY	GRADE
Austin	manager	6800	3
Bautista	HR	6500	3
Holland	manager	6000	3
Mackie	accounts manager	4000	2
Goldblum	HR	3500	2
Goldblum	HR	3500	4
Rudd	accounts manager	2500	2
Rudd	accounts manager	2500	4

8 rows returned in 0.00 seconds Download

EX.NO.: 6		RESTRICTING AND SORTING DATA
DATE :	14/08/24	

1) CREATE A QUERY TO DISPLAY THE LAST NAME AND SALARY OF EMPLOYEES EARNING MORE THAN12000.

```
SELECT SALARY , LAST_NAME FROM
EMPLOYEESWHERE SALARY > 12000;
```

SALARY	LAST_NAME
13500	Austin
13500	Austin
13500	Austin
13500	Austin
13500	Austin
13500	Austin

6 rows returned in 0.01 seconds Download

2) CREATE A QUERY TO DISPLAY THE EMPLOYEE LAST NAME AND DEPARTMENT NUMBER FOR EMPLOYEENUMBER 176.

```
SELECT LAST_NAME , DEPARTMENT_ID
FROM EMPLOYEESWHERE EMPLOYEE_ID =
176;
```

LAST_NAME	DEPARTMENT_ID
Evans	55

1 rows returned in 0.00 seconds Download

3) CREATE A QUERY TO DISPLAY THE LAST NAME AND SALARY OF EMPLOYEES WHOSE SALARY IS NOT INTHE RANGE OF 5000 AND 12000.

```
SELECT LAST_NAME , SALARY FROM
EMPLOYEES WHERE SALARY NOT
BETWEEN 5000 AND 12000;
```

LAST_NAME	SALARY
Rudd	2500
Austin	13500
Goldblum	3500
Mackie	4000
Austin	13500
Beiber	4900
Austin	13500
Austin	13500
Austin	13500

Klementieff	1100
Austin	13500
Cooper	4500

12 rows returned in 0.00 seconds Download

4) DISPLAY THE EMPLOYEE LAST NAME, JOB ID, AND START DATE OF EMPLOYEES HIRED BETWEENFEBRUARY 20,1998 AND MAY 1,1998.ORDER THE QUERY IN ASCENDING ORDER BY START DATE.(HINTS: BETWEEN)

```
SELECT LAST_NAME, JOB_ID, HIRE_DATE FROM
EMPLOYEES WHERE HIRE_DATE BETWEEN '02-20-
1998' AND '05-01-1998';
```

LAST_NAME	JOB_ID	HIRE_DATE
Evans	#ce005	04/01/1998

1 rows returned in 0.00 seconds Download

5) DISPLAY THE LAST NAME AND DEPARTMENT NUMBER OF ALL EMPLOYEES IN DEPARTMENTS 20 AND50 IN ALPHABETICAL ORDER BY NAME.

```
SELECT LAST_NAME, DEPARTMENT_ID
FROM EMPLOYEESWHERE DEPARTMENT_ID
= 20 OR DEPARTMENT_ID = 50 ORDER BY
LAST_NAME;
```

LAST_NAME	DEPARTMENT_ID
Austin	50
Cumberbatch	50
Holland	50

3 rows returned in 0.04 seconds Download

6) DISPLAY THE LAST NAME AND SALARY OF ALL EMPLOYEES WHO EARN BETWEEN 5000 AND 12000AND ARE IN DEPARTMENTS 20 AND 50 IN ALPHABETICAL ORDER BY NAME. LABEL THE COLUMNS EMPLOYEE, MONTHLY SALARY RESPECTIVELY.

```
SELECT LAST_NAME AS "EMPLOYEE" , SALARY AS "MONTHLY SALARY"
FROM EMPLOYEESWHERE DEPARTMENT_ID IN (20,50) AND SALARY
BETWEEN 5000 AND 12000
ORDER BY LAST_NAME;
```

EMPLOYEE	MONTHLY SALARY
Cumberbatch	8200
Holland	6000

2 rows returned in 0.04 seconds Download

7) DISPLAY THE LAST NAME AND HIRE DATE OF EVERY EMPLOYEE WHO WAS HIRED IN 1994.SELECT LAST_NAME, HIRE_DATE FROM EMPLOYEES

```
WHERE HIRE_DATE LIKE '%1994%';
```

LAST_NAME	HIRE_DATE
Evans	05/07/1994

1 rows returned in 0.00 seconds Download

8) DISPLAY THE LAST NAME AND JOB TITLE OF ALL EMPLOYEES WHO DO NOT HAVE A MANAGER

```
SELECT E.LAST_NAME, D.DEPT_NAME FROM
EMPLOYEES EJOIN DEPARTMENT D
ON E.DEPARTMENT_ID =
D.DEPT_ID WHERE
NOT(DEPT_NAME = 'MANAGER');
```

LAST_NAME	DEPT_NAME
Rudd	accounts manager
Olsen	ethical hacker
Austin	data analyst
Goldblum	HR
Mackie	accounts manager
Slam	HR
Evans	data analyst
Bautista	HR

8 rows returned in 0.03 seconds Download

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)

```
SELECT LAST_NAME,SALARY,COMMISSION_PCT
FROM EMPLOYEESWHERE COMMISSION_PCT IS
NOT NULL
ORDER BY SALARY,COMMISSION_PCT DESC;
```

LAST_NAME	SALARY	COMMISSION_PCT
Klementieff	1100	.1
Rudd	2500	.16
Goldblum	3500	.15
Mackie	4000	.15
Cooper	4500	.15
Beiber	4900	.1
Thompson	5200	.12
Stone	5500	.15
Holland	6000	.15
Bautista	6500	.15

10) DISPLAY THE LAST NAME OF ALL EMPLOYEES WHERE THE THIRD LETTER OF THE

NAME IS A.

```
SELECT LAST_NAME FROM
EMPLOYEESWHERE
LAST_NAME LIKE '_A%';
```

Results | Explain | Describe | Saved SQL | History

LAST_NAME
Stan
Evans
charles

3 rows returned in 0.00 seconds Download

11) DISPLAY THE LAST NAME OF ALL EMPLOYEES WHO HAVE AN A AND AN E IN THEIR LAST NAME.

```
SELECT LAST_NAME FROM EMPLOYEES
WHERE LAST_NAME LIKE '%A%' AND LAST_NAME LIKE '%E%';
```

LAST_NAME
Mackie
Boseman
Cumberbatch
charles

4 rows returned in 0.00 seconds Download

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/.

```
SELECT E.LAST_NAME,E.SALARY,D.DEPT_NAME FROM
EMPLOYEES EJOIN DEPARTMENT D ON
E.DEPARTMENT_ID = D.DEPT_ID
WHERE (DEPT_NAME IN ('STOCK CLERK','SALES
REPRESENTATIVE')) AND (SALARY NOTIN(2500,3500,7000));
```

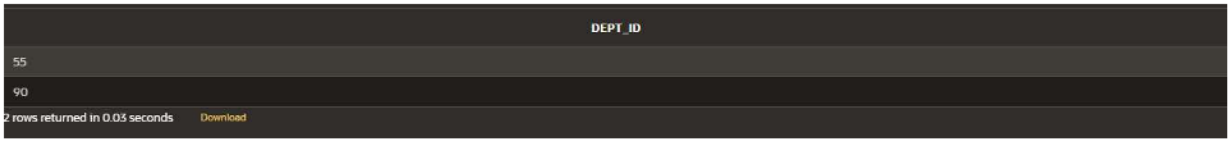
LAST_NAME	SALARY	DEPT_NAME
Olsen	7500	stock clerk

1 rows returned in 0.01 seconds Download

EX.NO.: 7		USING SET OPERATORS
DATE :	27/08/2024	

1) THE HR DEPARTMENT NEEDS A LIST OF DEPARTMENT IDS FOR DEPARTMENTS THAT DO NOT CONTAINTHE JOB ID ST_CLERK. USE SET OPERATORS TO CREATE THIS REPORT.

```
SELECT DEPT_ID FROM
DEPARTMENTMINUS
SELECT DEPARTMENT_ID FROM
EMPLOYEESWHERE JOB_ID =
'ST_CLERK';
```

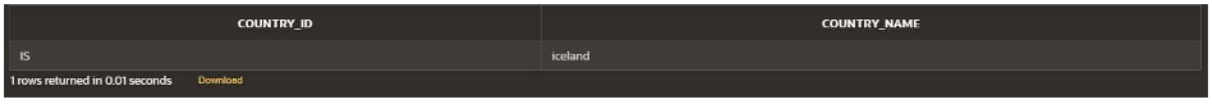


DEPT_ID
55
90

2 rows returned in 0.03 seconds Download

2) THE HR DEPARTMENT NEEDS A LIST OF COUNTRIES THAT HAVE NO DEPARTMENTS LOCATED IN THEM.DISPLAY THE COUNTRY ID AND THE NAME OF THE COUNTRIES. USE SET OPERATORS TO CREATETHIS REPORT.

```
SELECT C.COUNTRY_ID,
C.COUNTRY_NAMEFROM
COUNTRIES C
LEFT JOIN DEPARTMENT D ON C.COUNTRY_ID =
D.COUNTRY_IDWHERE D.COUNTRY_ID IS NULL;
```



COUNTRY_ID	COUNTRY_NAME
IS	iceland

1 rows returned in 0.01 seconds Download

3) PRODUCE A LIST OF JOBS FOR DEPARTMENTS 10, 50, AND 20, IN THAT ORDER. DISPLAY JOB ID ANDDEPARTMENT ID USING SET OPERATORS.

```
SELECT JOB_ID,
DEPARTMENT_IDFROM
```

```
EMPLOYEES
WHERE DEPARTMENT_ID IN (10,
50, 20)ORDER BY
DEPARTMENT_ID;
```

JOB_ID	DEPARTMENT_ID
ST_CLERK	10
#ca013	50
#bc023	50
ST_CLERK	50

4 rows returned in 0.01 seconds Download

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 DOINGTHEIR ORIGINAL JOB).

```
SELECT EMPLOYEE_ID,
JOB_IDFROM EMPLOYEES
INTERSECT
SELECT EMPLOYEE_ID,
JOB_IDFROM
JOB_HISTORY;
```

EMPLOYEE_ID	JOB_ID
2	#pr010
20	#bl011
30	#eo020
7	#cb025
1	ST_CLERK

5 rows returned in 0.01 seconds Download

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 DEPARTMENTSTABLE, REGARDLESS OF WHETHER OR NOT THEY HAVE EMPLOYEES WORKING IN THEM WRITE A COMPOUND QUERY TO ACCOMPLISH THIS.

```
SELECT LAST_NAME, DEPARTMENT_ID FROM
EMPLOYEESUNION
SELECT DEPT_NAME, DEPT_ID FROM DEPARTMENT;
```

LAST_NAME	DEPARTMENT_ID
Austin	25
Austin	45
Austin	50
Austin	55
Austin	60
Austin	70

More than 20 rows available. Increase rows selector to view more rows.

20 rows returned in 0.00 seconds Download

EX.NO.: 8		WORKING WITH MULTIPLE TABLES
DATE :	03/09/2024	

1) WRITE A QUERY TO DISPLAY THE LAST NAME, DEPARTMENT NUMBER, AND DEPARTMENT NAME FOR ALLEMPLOYEES.

```
SELECT E.LAST_NAME , E.DEPARTMENT_ID ,
D.DEPT_NAMEFROM EMPLOYEES E
JOIN DEPARTMENT D ON E.DEPARTMENT_ID = D.DEPT_ID;
```

LAST_NAME	DEPARTMENT_ID	DEPT_NAME
Rudd	30	accounts manager
Olsen	90	stock clerk
Austin	55	data analyst
Goldblum	75	HR
Mackie	30	accounts manager
Stan	75	HR
Evans	55	data analyst
Boseman	70	HR
Hiddleston	100	sales manager

2) CREATE A UNIQUE LISTING OF ALL JOBS THAT ARE IN DEPARTMENT 80. INCLUDE THE LOCATION OF THEDEPARTMENT IN THE OUTPUT.

```
SELECT
D.DEPT_NAME,D.LOCATION_I
DFROM DEPARTMENT D
JOIN EMPLOYEES E ON D.DEPT_ID =
E.DEPARTMENT_IDWHERE
DEPARTMENT_ID = 80;
```

DEPT_NAME	LOCATION_ID
Sales manager	10
IT support	13
admin manager	16
Sales manager	10
IT support	13
admin manager	16
Sales manager	10
IT support	13
admin manager	16

9 rows returned in 0.04 seconds Download

3) WRITE A QUERY TO DISPLAY THE EMPLOYEE LAST NAME, DEPARTMENT NAME, LOCATION ID, AND CITYOF ALL EMPLOYEES WHO EARN A COMMISSION

```
SELECT
E.LAST_NAME,D.DEPT_NAME,D.LOCATION_ID,
L.CITYFROM (DEPARTMENT D
INNER JOIN EMPLOYEES E ON D.DEPT_ID =
E.DEPARTMENT_IDINNER JOIN LOCATION L ON
D.LOCATION_ID = L.LOCATION_ID) WHERE
COMMISSION_PCT IS NOT NULL;
```

LAST_NAME	DEPT_NAME	LOCATION_ID	CITY
Rudd	accounts manager	7	melbourne
Austin	data analyst	10	Washington
Goldblum	HR	4	New York
Mackie	accounts manager	7	melbourne
Stan	HR	4	New York
Evans	data analyst	10	Washington
Boseman	HR	2	Atlanta

21 rows returned in 0.01 seconds Download

4) DISPLAY THE EMPLOYEE LAST NAME AND DEPARTMENT NAME FOR ALL EMPLOYEES WHO HAVE ANA(LOWERCASE) IN THEIR LAST NAMES.

```
SELECT
E.LAST_NAME,D.DEPT_NAME
FROM DEPARTMENT D
INNER JOIN EMPLOYEES E ON D.DEPT_ID =
E.DEPARTMENT_IDWHERE LAST_NAME LIKE
'%A%';
```

LAST_NAME	DEPT_NAME
Mackle	accounts manager
Stan	HR
Evans	data analyst
Boseman	HR
Holland	manager
Bautista	HR
Cumberbatch	manager
charles	Sales manager
charles	IT support

5) WRITE A QUERY TO DISPLAY THE LAST NAME, JOB, DEPARTMENT NUMBER, AND DEPARTMENT NAMEFOR ALL EMPLOYEES WHO WORK IN TORONTO.

```
SELECT
E.LAST_NAME,D.DEPT_NAME,E.DEPARTMEN
T_IDFROM (DEPARTMENT D
INNER JOIN EMPLOYEES E ON D.DEPT_ID =
E.DEPARTMENT_IDINNER JOIN LOCATION L ON
L.LOCATION_ID = D.LOCATION_ID) WHERE CITY =
'TORONTO';
```

LAST_NAME	DEPT_NAME	DEPARTMENT_ID
Boseman	HR	70
Austin	HR	70
Thompson	HR	70
Klementieff	IT support	80
roy	IT support	80
charles	IT support	80

6 rows returned in 0.01 seconds Download

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

```
SELECT LAST_NAME AS "EMPLOYEE",EMPLOYEE_ID AS
"EMP#",MANAGER_ID AS "MGR#" FROMEMPLOYEES;
```

Employee	Emp#	Mgr#
Stone	2	200
Rudd	10	250
Larson	11	400
Olsen	20	800
Austin	25	100
Goldblum	27	200
Downey	3	350
Gillan	18	600
Mackie	21	850

7) MODIFY LAB4_6.SQL TO DISPLAY ALL EMPLOYEES INCLUDING KING, WHO HAS NO MANAGER. ORDERTHE RESULTS BY THE EMPLOYEE NUMBER.

```
SELECT LAST_NAME AS "EMPLOYEE",EMPLOYEE_ID AS
"EMP#",MANAGER_ID AS "MGR#"FROM EMPLOYEES ORDER BY
EMPLOYEE_ID;
```

Employee	Emp#	Mgr#
Bieber	1	100
Stone	2	200
Downey	3	350
Austin	4	300
Ruffalo	6	250
Hemsworth	7	600
Austin	8	350
Holland	9	400
Rudd	10	250

8) CREATE A QUERY THAT DISPLAYS EMPLOYEE LAST NAMES, DEPARTMENT NUMBERS, AND ALL THEEMPLOYEES WHO WORK IN THE SAME DEPARTMENT AS A GIVEN EMPLOYEE. GIVE EACH COLUMNAN APPROPRIATE LABEL

```
SELECT E.LAST_NAME AS "EMPLOYEE",D.DEPT_NAME AS
"DEPARTMENT_NAME",E.DEPARTMENT_IDAS "DEPARTMENT_NO" FROM
EMPLOYEES E
INNER JOIN DEPARTMENT D ON E.DEPARTMENT_ID = D.DEPT_ID;
```

Employee	department_name	department_no
Rudd	accounts manager	30
Olsen	stock clerk	90
Austin	data analyst	55
Goldblum	HR	75
Mackie	accounts manager	30
Stan	HR	75
Evans	data analyst	55
Boseman	HR	70
Hiddleston	sales manager	100

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

```
DESC JOB_GRADE;

SELECT E.FIRST_NAME || ' ' || LAST_NAME AS
"EMPLOYEE",D.DEPT_NAME,E.SALARY,G.GRADE_LEVEL AS"GRADE"
FROM (EMPLOYEES E
INNER JOIN DEPARTMENT D ON E.DEPARTMENT_ID = D.DEPT_ID
INNER JOIN JOB_GRADE G ON E.DEPARTMENT_ID = G.DEPARTMENT_ID);
```

Employee	DEPT_NAME	SALARY	GRADE
Elizabeth Olsen	stock clerk	7300	3
Cate Austin	data analyst	13500	4
Chris Evans	data analyst	7500	4
Jeff Goldblum	HR	3500	2
Sebastian Stan	HR	9000	2
Dave Bautista	HR	6500	2

6 rows returned in 0.01 seconds Download

10) CREATE A QUERY TO DISPLAY THE NAME AND HIRE DATE OF ANY EMPLOYEE HIRED AFTER EMPLOYEEDAVIES.

```
SELECT LAST_NAME,HIRE_DATE FROM
EMPLOYEESWHERE HIRE_DATE > '05-03-
1986';
```

LAST_NAME	HIRE_DATE
Stone	11/06/1990
Larson	10/01/1989
Olsen	02/16/1989
Gillan	11/28/1987
Evans	05/07/1994
Beiber	09/21/1996
Holland	06/01/1996
roy	02/23/1991
charles	09/18/1993

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.

```
SELECT LAST_NAME AS "EMPLOYEE",HIRE_DATE AS "EMPLOYEE HIRED" FROM EMPLOYEES;
```

employee	employee hired
Stone	11/06/1990
Rudd	04/06/1969
Larson	10/01/1989
Olsen	02/16/1989
Austin	05/14/1969
Goldblum	10/22/1952
Downey	04/04/1965
Gillan	11/28/1987
Mackie	09/23/1978

Ex.No.: 9		SUB QUERIES
Date:	10/09/2024	

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 (EXCLUDINGZLOTKEY).

```
SELECT LAST_NAME,
HIRE_DATEFROM
EMPLOYEES
WHERE DEPARTMENT_ID =
   ALL(SELECT
   DEPARTMENT_ID FROM
   EMPLOYEES
   WHERE LAST_NAME = 'ZLOTKEY'
)
AND LAST_NAME != 'ZLOTKEY';
```

LAST_NAME	HIRE_DATE
Doe	08/10/1995
Elba	09/06/1972
charles	09/18/1993

3 rows returned in 0.01 seconds Download

2) CREATE A REPORT THAT DISPLAYS THE EMPLOYEE NUMBER, LAST NAME, AND SALARY OF ALLEMPLOYEES WHO EARN MORE THAN THE AVERAGE SALARY. SORT THE RESULTS IN ORDER OF ASCENDING SALARY.

```
SELECT EMPLOYEE_ID, LAST_NAME, SALARY
FROM EMPLOYEES
```

```
WHERE SALARY > (
   SELECT AVG(SALARY)
   FROM EMPLOYEES
)
ORDER BY SALARY ASC;
```

EMPLOYEE_ID	LAST_NAME	SALARY
7	Hemsworth	7800
16	Diesel	8000
12	Boseman	8000
23	Carlos	8200
41	charles	8900
22	Stan	9000
3	Downey	9000
8	Wilson	13500
25	Austin	13500

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3) WRITE A QUERY THAT DISPLAYS THE EMPLOYEE NUMBER AND LAST NAME OF ALL EMPLOYEES WHOWORK IN A DEPARTMENT WITH ANY EMPLOYEE WHOSE LAST NAME CONTAINS A U.

```
SELECT EMPLOYEE_ID, LAST_NAME
FROM EMPLOYEES
WHERE DEPARTMENT_ID IN (
   SELECT DEPARTMENT_ID
   FROM EMPLOYEES
   WHERE LAST_NAME LIKE '%A%' AND LAST_NAME LIKE '%U%');
```

EMPLOYEE_ID	LAST_NAME
3	Downey
6	Ruffalo
30	Waititi
27	Goldblum
22	Stan
17	Bautista
25	Abu
176	Morris
23	andru

9 rows returned in 0.01 seconds Download

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4) THE HR DEPARTMENT NEEDS A REPORT THAT DISPLAYS THE LAST NAME, DEPARTMENT NUMBER, ANDJOB ID OF ALL EMPLOYEES WHOSE DEPARTMENT LOCATION ID IS 1700.

```
SELECT E.LAST_NAME, E.DEPARTMENT_ID, E.JOB_ID
```

```
FROM EMPLOYEES E
INNER JOIN DEPARTMENT D ON E.DEPARTMENT_ID =
D.DEPT_IDWHERE E.DEPARTMENT_ID IN (
   SELECT
   DEPT_ID FROM
   DEPARTMENT
   WHERE LOCATION_ID = 1700);
```

LAST_NAME	DEPARTMENT_ID	JOB_ID
Abu	55	#cb025
Morris	55	#ce005
andru	55	#bc023

3 rows returned in 0.02 seconds Download

5) CREATE A REPORT FOR HR THAT DISPLAYS THE LAST NAME AND SALARY OF EVERY EMPLOYEE WHOREPORTS TO KING.

```
SELECT E.LAST_NAME,
E.SALARYFROM
EMPLOYEES E
WHERE E.MANAGER_ID
   IN (SELECT
   D.MANAGER_ID FROM
   DEPARTMENT D
   WHERE D.MANAGER_NAME = 'KING');
```

LAST_NAME	SALARY
Zlotkey	7200
Hiddleston	6500
Holland	6000
Austin	13500
Austen	5500
Goldblum	3500

6 rows returned in 0.01 seconds Download

6) CREATE A REPORT FOR HR THAT DISPLAYS THE DEPARTMENT NUMBER, LAST NAME, AND JOB ID FOREVERY EMPLOYEE IN THE EXECUTIVE DEPARTMENT.

```
SELECT E.DEPARTMENT_ID, E.LAST_NAME,
E.JOB_IDFROM EMPLOYEES E
JOIN DEPARTMENT D ON E.DEPARTMENT_ID
= D.DEPT_IDWHERE D.DEPT_NAME =
'EXECUTIVE';
```

DEPARTMENT_ID	LAST_NAME	JOB_ID
75	Goldblum	ST_CLERK
75	Stan	#ss022
25	Austin	#ka028
75	Bautista	#db017
25	Diesel	#vd016

5 rows returned in 0.02 seconds Download

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 WITHANY EMPLOYEE WHOSE LAST NAME CONTAINS A U.

```
SELECT E.EMPLOYEE_ID, E.LAST_NAME,
E.SALARYFROM EMPLOYEES E
WHERE E.SALARY > (
   SELECT
   AVG(SALARY)FROM
   EMPLOYEES
)
AND E.DEPARTMENT_ID
   IN ( SELECT
   X.DEPARTMENT_ID
   FROM EMPLOYEES X
   WHERE X.LAST_NAME LIKE '%A%' AND X.LAST_NAME LIKE '%U%'
);
```

EMPLOYEE_ID	LAST_NAME	SALARY
3	Downey	9000
22	Stan	9000
25	Abu	13500
23	andru	8200

4 rows returned in 0.01 seconds Download

EX.NO.: 10		AGGREGATING DATA USING GROUP FUNCTIONS
DATE :	20/09/2024	

FIND THE SOLUTION FOR THE FOLLOWING:

DETERMINE THE VALIDITY OF THE FOLLOWING THREE STATEMENTS. CIRCLE EITHER TRUE OR FALSE.

1. GROUP FUNCTIONS WORK ACROSS MANY ROWS TO PRODUCE ONE RESULTPER 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 GROUPCALCULATION. 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 TOTHE NEAREST WHOLE NUMBER

```
SELECT ROUND(MAX(SALARY)) AS MAXIMUM, ROUND(MIN(SALARY)) AS MINIMUM,
ROUND(SUM(SALARY)) AS SUM, ROUND(AVG(SALARY)) AS AVERAGE
FROM EMPLOYEES;
```

MAXIMUM	MINIMUM	SUM	AVERAGE
13500	1100	254300	7706

1 rows returned in 0.02 seconds Download

5) MODIFY THE ABOVE QUERY TO DISPLAY THE MINIMUM, MAXIMUM, SUM, AND AVERAGE SALARYFOR EACH JOB TYPE.

```
SELECT ROUND(MAX(SALARY)) AS MAXIMUM, ROUND(MIN(SALARY)) AS MINIMUM,
ROUND(SUM(SALARY)) AS SUM, ROUND(AVG(SALARY)) AS AVERAGE
FROM
EMPLOYEES
JOIN
```

```
DEPARTMENT
ON DEPARTMENT.DEPT_ID =
EMPLOYEES.DEPARTMENT_IDGROUP BY
DEPT_NAME;
```

MAXIMUM	MINIMUM	SUM	AVERAGE
4000	2500	6500	3250
13500	13500	13500	13500
7800	4500	12300	6150
13500	5200	26700	8900
7000	1100	8100	4050
6500	5500	12000	6000
13500	6000	19500	9750
13500	13500	13500	13500
13500	3500	40500	8100

6) WRITE A QUERY TO DISPLAY THE NUMBER OF PEOPLE WITH THE SAME JOB. GENERALIZE THEQUERY SO THAT
THE USER IN THE HR DEPARTMENT IS PROMPTED FOR A JOB TITLE.

```
SELECT D.DEPT_NAME , COUNT(*) AS
NUMBEROFEMPLOYEESFROM EMPLOYEES E
JOIN DEPARTMENT D ON E.DEPARTMENT_ID =
D.DEPT_IDGROUP BY D.DEPT_NAME;
```

DEPT_NAME	NUMBEROFEMPLOYEES
accounts manager	2
IT support	1
admin manager	2
HR	3
stock clerk	2
sales manager	2
manager	2
developer	1
executive	5
data analyst	3

10 rows returned in 0.01 seconds Download

7) DETERMINE THE NUMBER OF MANAGERS WITHOUT LISTING THEM. LABEL THE COLUMN NUMBEROF MANAGERS

```
SELECT COUNT(DISTINCT MANAGER_ID) AS "NUMBER OF MANAGERS"
FROM EMPLOYEES
WHERE MANAGER_ID IS NOT NULL;
```

Number of Managers
15

1 rows returned in 0.01 seconds Download

8) FIND THE DIFFERENCE BETWEEN THE HIGHEST AND LOWEST SALARIES. LABEL THE COLUMNDIFFERENCE.

```
SELECT MAX(SALARY) - MIN(SALARY) AS
"DIFFERENCE"FROM EMPLOYEES;
```

DIFFERENCE
12400

1 rows returned in 0.01 seconds Download

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 ANYGROUPS WHERE THE MINIMUM SALARY IS $6,000 OR LESS. SORT THE OUTPUT IN DESCENDING ORDEROF SALARY.

```
SELECT MANAGER_ID, MIN(SALARY) AS "LOWEST SALARY"
FROM EMPLOYEES
WHERE MANAGER_ID IS NOT NULL
GROUP BY MANAGER_ID
HAVING MIN(SALARY) > 6000
ORDER BY "LOWEST SALARY" DESC;
```

MANAGER_ID	Lowest Salary
350	8000
150	7700
500	7500
800	7300
600	6900
550	6500

6 rows returned in 0.01 seconds Download

10) CREATE A QUERY TO DISPLAY THE TOTAL NUMBER OF EMPLOYEES AND, OF THAT TOTAL, THENUMBER OF EMPLOYEES HIRED IN 1995, 1996, 1997, AND 1998. CREATE APPROPRIATE

COLUMN HEADINGS.

```
SELECT EXTRACT(YEAR FROM HIRE_DATE) AS "YEARLY WISE EMPLOYMENT",
COUNT(*)FROM EMPLOYEES
GROUP BY EXTRACT(YEAR FROM HIRE_DATE)
HAVING EXTRACT(YEAR FROM HIRE_DATE) IN (1995, 1996, 1997, 1998);
```

yearly wise employment	COUNT(*)
1996	2
1995	1

2 rows returned in 0.01 seconds Download

11) CREATE A MATRIX QUERY TO DISPLAY THE JOB, THE SALARY FOR THAT JOB BASED ON DEPARTMENTNUMBER, AND THE TOTAL SALARY FOR THAT JOB, FOR DEPARTMENTS 20, 50, 80, AND 90, GIVING EACH COLUMN AN APPROPRIATE HEADING.

```
SELECT D.DEPT_NAME ,
SUM(E.SALARY)FROM
EMPLOYEES E
JOIN DEPARTMENT D ON E.DEPARTMENT_ID =
D.DEPT_IDWHERE DEPARTMENT_ID IN
(20,50,80,90)
GROUP BY D.DEPT_NAME;
```

DEPT_NAME	SUM(E.SALARY)
stock clerk	8100
manager	19500

2 rows returned in 0.02 seconds Download

12) WRITE A QUERY TO DISPLAY EACH DEPARTMENT‘S NAME, LOCATION, NUMBER OF EMPLOYEES,AND THE
AVERAGE SALARY FOR ALL THE EMPLOYEES IN THAT DEPARTMENT. LABEL THE COLUMN NAME-LOCATION,
NUMBER OF PEOPLE, AND SALARY RESPECTIVELY. ROUND THE AVERAGE SALARY TO TWO DECIMALPLACES.

```
SELECT D.DEPT_NAME AS "NAME", D.LOCATION_ID AS "LOCATION",
COUNT(E.DEPARTMENT_ID) AS "NUMBER OF PEOPLE",
```

```
ROUND(AVG(E.SALARY), 2) AS"SALARY"
FROM DEPARTMENT D
JOIN EMPLOYEES E ON D.DEPT_ID = E.DEPARTMENT_ID
```

GROUP BY D.DEPT_NAME, D.LOCATION_ID;

Name	Location	Number of People	Salary
sales manager	7	2	6000
data analyst	1700	3	9733.33
stock clerk	19	2	4050
HR	2	3	8900
admin manager	16	2	6150
manager	10	2	9750
accounts manager	7	2	3250
executive	4	3	6333.33
developer	1	1	13500
executive	10	2	10750

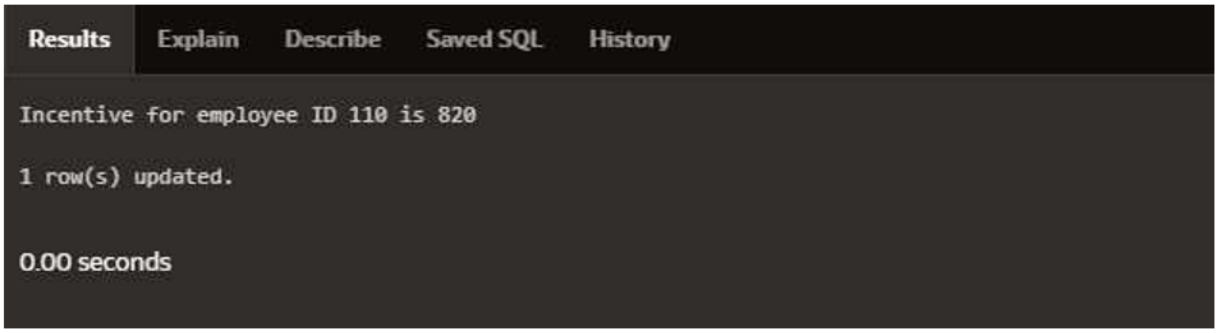
More than 10 rows available. Increase rows selector to view more rows.

10 rows returned in 0.03 seconds Download

EX.NO.: 11		PL SQL PROGRAMS
DATE :	24/09/2024	

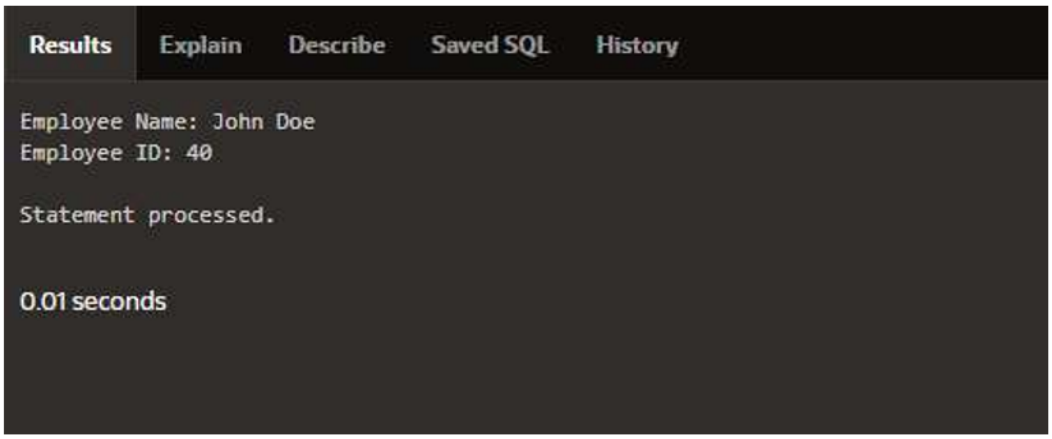
PROGRAM 1
WRITE A PL/SQL BLOCK TO CALCULATE THE INCENTIVE OF AN EMPLOYEE WHOSE ID IS 110.

```
DECLARE
  PL_EMP_ID EMPLOYEES.EMPLOYEE_ID%TYPE
  := 110;PL_SALARY EMPLOYEES.SALARY%TYPE;
  PL_INCENTIVE
NUMBER;BEGIN
  SELECT SALARY INTO
  PL_SALARYFROM
  EMPLOYEES
  WHERE EMPLOYEE_ID = PL_EMP_ID;

  PL_INCENTIVE := PL_SALARY

  * 0.10;UPDATE EMPLOYEES
  SET INCENTIVE = PL_INCENTIVE
  WHERE EMPLOYEE_ID =
  PL_EMP_ID;

  DBMS_OUTPUT.PUT_LINE('INCENTIVE FOR EMPLOYEE ID ' || PL_EMP_ID ||
' IS ' ||PL_INCENTIVE);

  COMMIT;
END;
```



PROGRAM 2
WRITE A PL/SQL BLOCK TO SHOW AN INVALID CASE-INSENSITIVE REFERENCE TO A QUOTEDAND WITHOUT QUOTED USER-DEFINED IDENTIFIER.

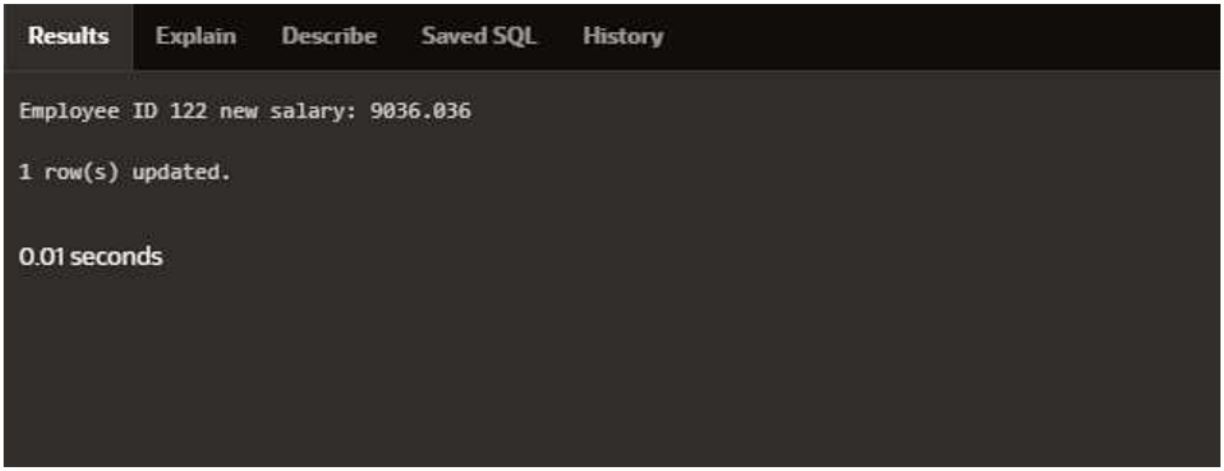
```
DECLARE
  EMPLOYEENAME VARCHAR2(100);
  "EMPLOYEEID"  NUMBER;
BEGIN
  EMPLOYEENAME := 'JOHN
  DOE';"EMPLOYEEID" := 40;

  DBMS_OUTPUT.PUT_LINE('EMPLOYEE NAME: ' ||
  EMPLOYEENAME);DBMS_OUTPUT.PUT_LINE('EMPLOYEE ID: ' ||
  "EMPLOYEEID");
END;
```



PROGRAM 3

WRITE A PL/SQL BLOCK TO ADJUST THE SALARY OF THE EMPLOYEE WHOSE ID 122.SAMPLE TABLE: EMPLOYEES

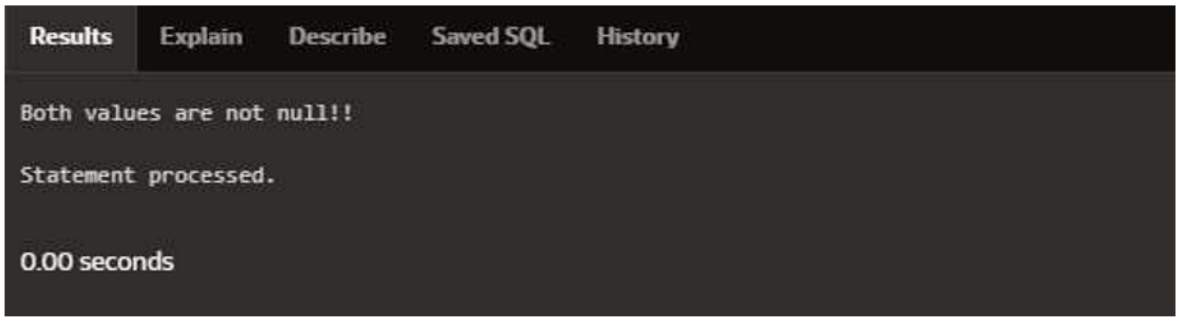
```
DECLARE
   V_EMPLOYEE_ID NUMBER :=
   122;V_SALARY   NUMBER;
   V_NEW_SALARY  NUMBER;
   V_INCREASE_PERCENTAGE NUMBER
:= 0.40;BEGIN
   SELECT SALARY INTO
   V_SALARYFROM
   EMPLOYEES
   WHERE EMPLOYEE_ID = V_EMPLOYEE_ID;

   V_NEW_SALARY := V_SALARY + (V_SALARY *

   V_INCREASE_PERCENTAGE / 100);UPDATE EMPLOYEES
   SET SALARY = V_NEW_SALARY
   WHERE EMPLOYEE_ID = V_EMPLOYEE_ID;

   DBMS_OUTPUT.PUT_LINE('EMPLOYEE ID ' || V_EMPLOYEE_ID || ' NEW
SALARY: ' ||V_NEW_SALARY);
END;
```


Results
Explain
Describe
Saved SQL
History
Employee ID 122 new salary: 9036.036
1 row(s) updated.
0.01 seconds

PROGRAM 4

WRITE A PL/SQL BLOCK TO CREATE A PROCEDURE USING THE "IS [NOT] NULL OPERATOR" ANDSHOW AND OPERATOR RETURNS TRUE IF AND ONLY IF BOTH OPERANDS ARE TRUE.

```
CREATE OR REPLACE PROCEDURE
CHECK_NULLIS
   VALUE1 NUMBER :=
   10; VALUE2 NUMBER
   := NULL;
BEGIN
   IF VALUE1 IS NOT NULL AND VALUE2 IS NULL THEN
      DBMS_OUTPUT.PUT_LINE('BOTH VALUES ARE NOT
      NULL!!');
   ELSE
      DBMS_OUTPUT.PUT_LINE('NULL VALUE
   FOUND');END IF;
END;


BEGIN
   CHECK_NU
LL;END;
```



PROGRAM 5

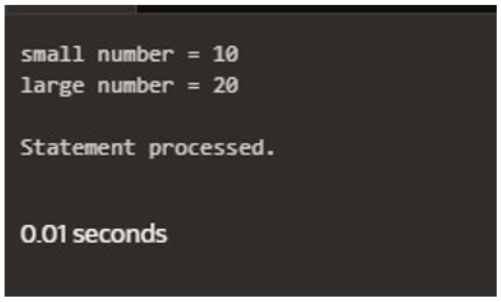
WRITE A PL/SQL BLOCK TO DESCRIBE THE USAGE OF LIKE OPERATOR INCLUDING WILDCARDCHARACTERS AND ESCAPE CHARACTER.

```
DECLARE

V_EMPLOYEENAME
EMPLOYEES.FIRST_NAME%TYPE;
V_EMPLOYEEID NUMBER := 122;

BEGIN

SELECT FIRST_NAME INTO
V_EMPLOYEENAMEFROM
EMPLOYEES
WHERE FIRST_NAME LIKE '%E%' AND EMPLOYEE_ID =

V_EMPLOYEEID;

DBMS_OUTPUT.PUT_LINE(V_EMPLOYEENAME);

END;
```

PROGRAM 6

WRITE A PL/SQL PROGRAM TO ARRANGE THE NUMBER OF TWO VARIABLE IN SUCH A WAY THAT THE SMALL NUMBER WILL STORE IN NUM_SMALL VARIABLE AND LARGE NUMBER WILL STORE IN NUM_LARGEVARIABLE.

```
DECLARE
AB NUMBER :=10;
CD NUMBER :=20;
NUM_SMALL
NUMBER;
NUM_LARGE
NUMBER;BEGIN
IF AB>CD THEN
NUM_SMALL
:=CD;
NUM_LARGE
:=AB;ELSE
NUM_SMALL
:=AB;
NUM_LARGE
:=CD;END IF;
DBMS_OUTPUT.PUT_LINE('SMALL NUMBER =
'||NUM_SMALL);DBMS_OUTPUT.PUT_LINE('LARGE
NUMBER = '||NUM_LARGE); END;
```



PROGRAM 7

WRITE A PL/SQL PROCEDURE TO CALCULATE THE INCENTIVE ON A TARGET ACHIEVED AND DISPLAY THEMESSAGE EITHER THE RECORD UPDATED OR NOT.

```
CREATE OR REPLACE PROCEDURE
CALCULATE_INCENTIVE(P_EMP_ID
EMPLOYEES.EMPLOYEE_ID%TYPE, P_TARGET
NUMBER)
IS
   V_INCENTIVE  NUMBER(7,2);
   V_SALARY
   EMPLOYEES.SALARY%TYPE;
BEGIN
   SELECT SALARY INTO
   V_SALARYFROM
   EMPLOYEES
   WHERE EMPLOYEE_ID = P_EMP_ID;

   IF P_TARGET >= 100000 THEN
      V_INCENTIVE := V_SALARY
      * 0.1;
      DBMS_OUTPUT.PUT_LINE('INCENTIVE OF ' || V_INCENTIVE || ' CALCULATED FOR
EMPLOYEE ID ' ||P_EMP_ID);
   ELSE
      DBMS_OUTPUT.PUT_LINE('NO INCENTIVE FOR EMPLOYEE ID ' ||
   P_EMP_ID);END IF;
END;
```

```
Incentive of 750 calculated for employee ID 176

Statement processed.


0.02 seconds
```

PROGRAM 8

WRITE A PL/SQL PROCEDURE TO CALCULATE INCENTIVE ACHIEVED ACCORDING TO THE SPECIFIC SALELIMIT.

```
CREATE OR REPLACE PROCEDURE INCENTIVE_SALE(P_EMP_ID
EMPLOYEES.EMPLOYEE_ID%TYPE,P_SALES NUMBER)
IS
   V_INCENTIVE
NUMBER(7,2);BEGIN
   IF P_SALES > 100000 THEN
      V_INCENTIVE := P_SALES *
      0.1;
   ELSIF P_SALES BETWEEN 50000 AND
      100000 THENV_INCENTIVE := P_SALES *
      0.05;
   ELSE
      V_INCENTIVE :=
   0;END IF;

   DBMS_OUTPUT.PUT_LINE('INCENTIVE FOR EMPLOYEE ID ' || P_EMP_ID || ' IS: ' ||
V_INCENTIVE);END;
```

```
BEGIN
   INCENTIVE_SALE(122,5000
00);END;
```

```
Incentive for employee ID 122 is: 50000

Statement processed.

0.01 seconds
```

PROGRAM 9

WRITE A PL/SQL PROGRAM TO COUNT NUMBER OF EMPLOYEES IN DEPARTMENT 50 AND CHECKWHETHER THIS DEPARTMENT HAVE ANY VACANCIES OR NOT. THERE ARE 45 VACANCIES IN THIS DEPARTMENT.

```
DECLARE
NO_OF_EMP NUMBER;
VACANCIES
NUMBER:=45;BEGIN
SELECT COUNT(*) INTO NO_OF_EMP FROM EMPLOYEES WHERE
DEPARTMENT_ID=50;IF NO_OF_EMP<VACANCIES THEN
DBMS_OUTPUT.PUT_LINE('VACANCIES ARE
AVAILABLE');ELSE
DBMS_OUTPUT.PUT_LINE('VACANCIES ARE NOT
AVAILABLE');END IF;
END;
```

```
vacancies are available

Statement processed.

0.01 seconds
```

PROGRAM 10

WRITE A PL/SQL PROGRAM TO COUNT NUMBER OF EMPLOYEES IN A SPECIFIC DEPARTMENT AND CHECK WHETHER THIS DEPARTMENT HAVE ANY VACANCIES OR NOT. IF ANY VACANCIES, HOW MANYVACANCIES ARE IN THAT DEPARTMENT.

```
DECLARE
   V_DEPARTMENT_ID NUMBER
   := 55;V_EMP_COUNT
   NUMBER; V_VACANCIES
   NUMBER := 50;
BEGIN
   SELECT COUNT(*) INTO
   V_EMP_COUNTFROM
   EMPLOYEES
   WHERE DEPARTMENT_ID = V_DEPARTMENT_ID;

   IF V_EMP_COUNT < V_VACANCIES THEN
      DBMS_OUTPUT.PUT_LINE('VACANCIES AVAILABLE: ' || (V_VACANCIES -
   V_EMP_COUNT));ELSE
      DBMS_OUTPUT.PUT_LINE('NO VACANCIES
   AVAILABLE.');END IF;
END;
```

```
Vacancies available: 47

Statement processed.


0.01 seconds
```

PROGRAM 11

WRITE A PL/SQL PROGRAM TO DISPLAY THE EMPLOYEE IDS, NAMES, JOB TITLES, HIRE DATES, ANDSALARIES OF ALL EMPLOYEES.

```
BEGIN
   FOR I IN (SELECT EMPLOYEE_ID, FIRST_NAME || ' ' || LAST_NAME AS NAME,
JOB_ID, HIRE_DATE,SALARY FROM EMPLOYEES)
   LOOP
      DBMS_OUTPUT.PUT_LINE('ID: ' || I.EMPLOYEE_ID || ', NAME: ' || I.NAME || ', JOB: ' ||
      I.JOB_ID
|| ', HIRE DATE: ' || I.HIRE_DATE || ', SALARY: ' ||
   I.SALARY);END LOOP;
END;
```

```
ID: 2, Name: Emma Austen, Job: ST_CLERK, Hire Date: 11/06/1990, Salary: 5500
ID: 10, Name: Paul Rudd, Job: #pr010, Hire Date: 04/06/1969, Salary: 2500
ID: 11, Name: Brie Zlotkey, Job: #bl011, Hire Date: 10/01/1989, Salary: 7200
ID: 20, Name: Elizabeth Olsen, Job: #eo020, Hire Date: 02/16/1989, Salary: 7300
ID: 25, Name: Cate Abu, Job: #cb025, Hire Date: 05/14/1969, Salary: 13500
ID: 27, Name: Jeff Goldblum, Job: ST_CLERK, Hire Date: 10/22/1952, Salary: 3500
ID: 122, Name: Robert Downey, Job: #rd003, Hire Date: 04/04/1965, Salary: 9036.04
ID: 18, Name: Karen Gillan, Job: #kg018, Hire Date: 11/28/1987, Salary: 6900
ID: 21, Name: Anthony Mackie, Job: ST_CLERK, Hire Date: 09/23/1978, Salary: 4000
ID: 22, Name: Sebastian Stan, Job: #ss022, Hire Date: 08/13/1982, Salary: 9000
ID: 28, Name: Karl Austin, Job: #ka028, Hire Date: 06/07/1972, Salary: 13500
ID: 176, Name: Chris Morris, Job: #ce005, Hire Date: 05/07/1994, Salary: 7500
ID: 6, Name: Mark Ruffalo, Job: #mr006, Hire Date: 11/22/1967, Salary: 7200
ID: 12, Name: Chadwick Boseman, Job: #cb012, Hire Date: 11/29/1976, Salary: 8000
ID: 24, Name: Tom Hiddleston, Job: #th024, Hire Date: 02/09/1981, Salary: 6500
ID: 1, Name: Justin Beiber, Job: ST_CLERK, Hire Date: 09/21/1996, Salary: 4900
ID: 8, Name: Jeremy Wilson, Job: #ja008, Hire Date: 01/07/1971, Salary: 13500
ID: 7, Name: Chris Hemsworth, Job: #ch007, Hire Date: 08/11/1983, Salary: 7800
ID: 9, Name: Tom Holland, Job: ST_CLERK, Hire Date: 06/01/1996, Salary: 6000
ID: 13, Name: Chris Austin, Job: #ca013, Hire Date: 06/21/1979, Salary: 13500
ID: 17, Name: Dave Bautista, Job: #db017, Hire Date: 01/18/1969, Salary: 6500
ID: 26, Name: Tessa Thompson, Job: ST_CLERK, Hire Date: 10/03/1983, Salary: 5200
ID: 14, Name: Zoe Austin, Job: #za014, Hire Date: 06/19/1978, Salary: 13500
ID: 19, Name: Pom Davies, Job: #pk019, Hire Date: 05/03/1986, Salary: 1100
ID: 42, Name: Matos roy, Job: #mr042, Hire Date: 02/23/1991, Salary: 7000
ID: 4, Name: Scarlett Austin, Job: #sa004, Hire Date: 11/22/1984, Salary: 13500
ID: 15, Name: Bradley Hook, Job: ST_CLERK, Hire Date: 01/05/1975, Salary: 4500
ID: 16, Name: Vin Diesel, Job: #vd016, Hire Date: 07/18/1967, Salary: 8000
ID: 110, Name: Benedict andru, Job: #bc023, Hire Date: 07/19/1976, Salary: 8200
ID: 30, Name: Taika Waititi, Job: #tw030, Hire Date: 08/16/1975, Salary: 7700
ID: 40, Name: John Doe , Job:   #jd040 , Hire Date: 08/10/1995, Salary: 6000
ID: 29, Name: Idris Elba, Job: #ie029, Hire Date: 09/06/1972, Salary: 7400
ID: 41, Name: Matos charles, Job: #mc041, Hire Date: 09/18/1993, Salary: 8900

Statement processed.
```

PROGRAM 12

WRITE A PL/SQL PROGRAM TO DISPLAY THE EMPLOYEE IDS, NAMES, AND DEPARTMENT NAMES OFALL EMPLOYEES.

```
BEGIN
   FOR I IN (SELECT E.EMPLOYEE_ID, E.FIRST_NAME || ' ' || E.LAST_NAME AS NAME,
            D.DEPT_NAMEFROM EMPLOYEES E
            JOIN DEPARTMENT D ON E.EMPLOYEE_ID = D.DEPT_ID) LOOP
      DBMS_OUTPUT.PUT_LINE('ID: ' || I.EMPLOYEE_ID || ', NAME: ' || I.NAME || ',
      DEPARTMENT: ' ||
I.DEPT_NAM
   E);END
   LOOP;
END;
```

```
ID: 25, Name: Cate Abu, Department: executive
ID: 15, Name: Bradley Hook, Department: sales manager
ID: 30, Name: Taika Waititi, Department: accounts manager

Statement processed.


0.03 seconds
```

PROGRAM 13

WRITE A PL/SQL PROGRAM TO DISPLAY THE JOB IDS, TITLES, AND MINIMUM SALARIES OF ALL JOBS.

```
BEGIN
   FOR REC IN (SELECT E.EMPLOYEE_ID, D.DEPT_NAME, MIN(SALARY) AS
MIN_SALARY FROMEMPLOYEES
   E JOIN DEPARTMENT D
   ON E.EMPLOYEE_ID = D.DEPT_ID
   GROUP BY E.EMPLOYEE_ID ,
   D.DEPT_NAME)LOOP
      DBMS_OUTPUT.PUT_LINE('JOB ID: ' || REC.EMPLOYEE_ID || ', TITLE: ' ||
REC.DEPT_NAME || ',MIN SALARY: ' || REC.MIN_SALARY);
   END
LOOP;END;
```

```
Job ID: 30, Title: accounts manager, Min Salary: 7700
Job ID: 25, Title: executive, Min Salary: 13500
Job ID: 15, Title: sales manager, Min Salary: 4500

Statement processed.

0.05 seconds
```

WRITE A PL/SQL PROGRAM TO DISPLAY THE JOB IDS, TITLES, AND MINIMUM SALARIES OF ALL JOBS.

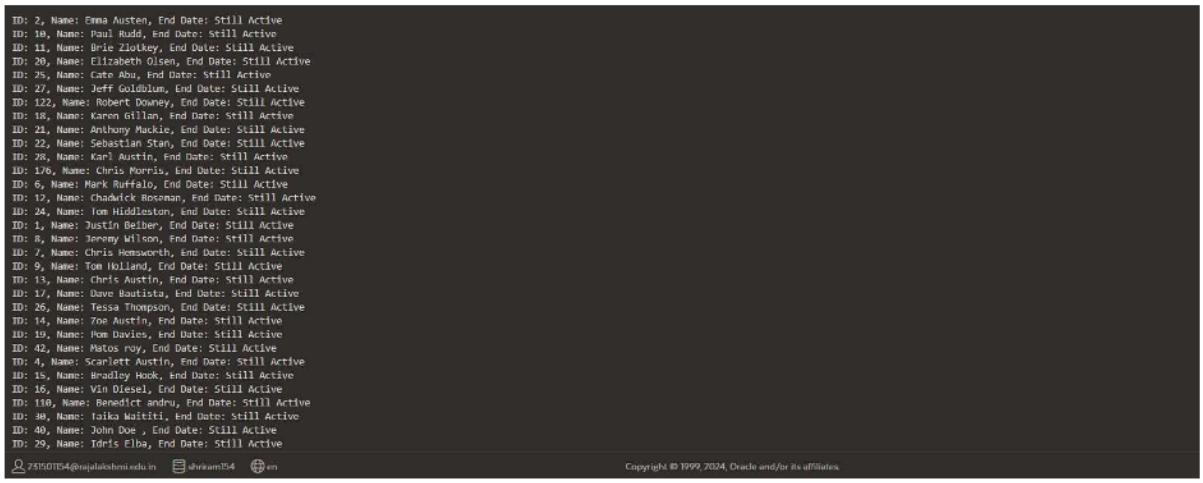
```
BEGIN
   FOR REC IN (SELECT E.EMPLOYEE_ID, D.DEPT_NAME, MIN(SALARY) AS
MIN_SALARY FROMEMPLOYEES
   E JOIN DEPARTMENT D
   ON E.EMPLOYEE_ID = D.DEPT_ID
   GROUP BY E.EMPLOYEE_ID ,
   D.DEPT_NAME)LOOP
      DBMS_OUTPUT.PUT_LINE('JOB ID: ' || REC.EMPLOYEE_ID || ', TITLE: ' ||
REC.DEPT_NAME || ',MIN SALARY: ' || REC.MIN_SALARY);
   END
LOOP;END;
```

PROGRAM 14
WRITE A PL/SQL PROGRAM TO DISPLAY THE EMPLOYEE IDS, NAMES, AND JOB HISTORY START DATESOF ALL EMPLOYEES.

```
BEGIN
   FOR REC IN (SELECT EMPLOYEE_ID, FIRST_NAME || ' ' || LAST_NAME AS
            NAME, HIRE_DATEFROM EMPLOYEES) LOOP
      DBMS_OUTPUT.PUT_LINE('ID: ' || REC.EMPLOYEE_ID || ', NAME: ' || REC.NAME || ', START
      DATE: '
||
   REC.HIRE_D
   ATE);END
   LOOP;
END;
```

PROGRAM 15
WRITE A PL/SQL PROGRAM TO DISPLAY THE EMPLOYEE IDS, NAMES, AND JOB HISTORY END DATESOF ALL EMPLOYEES.

```
BEGIN
  FOR REC IN (SELECT EMPLOYEE_ID, FIRST_NAME || ' ' || LAST_NAME AS NAME,
        END_DATEFROM EMPLOYEES)
  LOOP
    DBMS_OUTPUT.PUT_LINE('ID: ' ||
                REC.EMPLOYEE_ID ||', NAME: ' ||
                REC.NAME ||
                ', END DATE: ' ||
                NVL(TO_CHAR(REC.END_DATE, 'YYYY-MM-DD'), 'STILL ACTIVE'));
  END LOOP;
END;
```

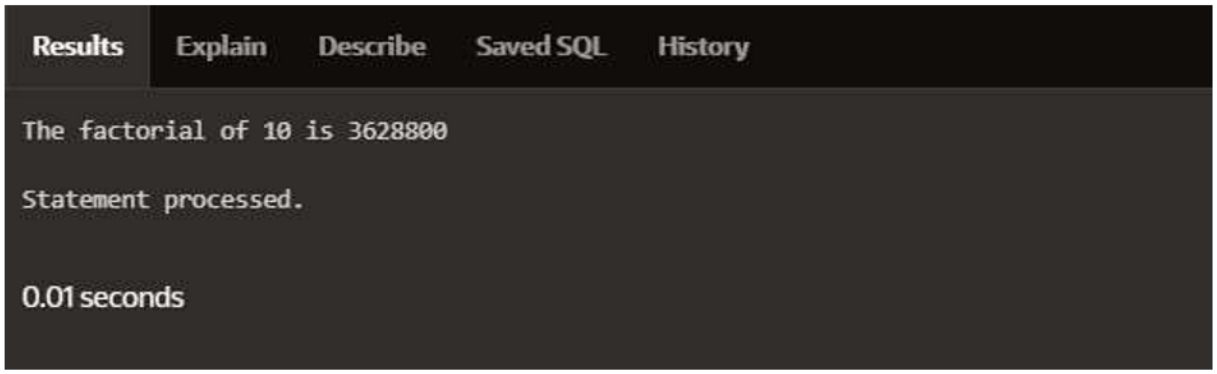


EX.NO.: 12		PL SQL PROGRAMS
DATE :	1/10/2024	

PROGRAM 1

FACTORIAL OF A NUMBER USING FUNCTION

```
DECLARE
   N NUMBER := 10;
   RESULT NUMBER;

   FUNCTION ITFACT(NUM NUMBER) RETURN
      NUMBER ISFACT NUMBER := 1;
   BEGIN
      FOR I IN 1..NUM LOOP
         FACT :=
      FACT * I;
      END LOOP;
      RETURN
   FACT;END;

BEGIN
   RESULT := ITFACT(N);
   DBMS_OUTPUT.PUT_LINE('THE FACTORIAL OF ' || N || ' IS ' ||
RESULT);END;
```



PROGRAM 2

WRITE A PL/SQL PROGRAM USING PROCEDURES IN,INOUT,OUT PARAMETERS TO RETRIEVE THE CORRESPONDING BOOK INFORMATION IN LIBRARY

```
CREATE OR REPLACE PROCEDURE book_info(
   p_book_id IN NUMBER,
   p_author OUT VARCHAR2,
   p_title OUT VARCHAR2,
   p_published_date OUT DATE
) AS
BEGIN
   SELECT author, title, published_date
   INTO p_author, p_title, p_published_date
   FROM books
   WHERE book_id = p_book_id;

EXCEPTION
   WHEN NO_DATA_FOUND THEN
      p_author := NULL;
      p_title := NULL;
      p_published_date := NULL;
   WHEN OTHERS THEN
      RAISE;
END book_info;

DECLARE
   v_author VARCHAR2(100);
   v_title VARCHAR2(100);
   v_published_date DATE;
   v_book_id NUMBER := 1;
BEGIN
   book_info(v_book_id, v_author, v_title, v_published_date);

   IF v_author IS NOT NULL THEN
      DBMS_OUTPUT.PUT_LINE('Book ID: ' || v_book_id);
      DBMS_OUTPUT.PUT_LINE('Author: ' || v_author);
      DBMS_OUTPUT.PUT_LINE('Title: ' || v_title);
      DBMS_OUTPUT.PUT_LINE('Published Date: ' || TO_CHAR(v_published_date, 'YYYY-
MM-DD'));
   ELSE
      DBMS_OUTPUT.PUT_LINE('No book found with ID: ' || v_book_id);
   END IF;
END;
```

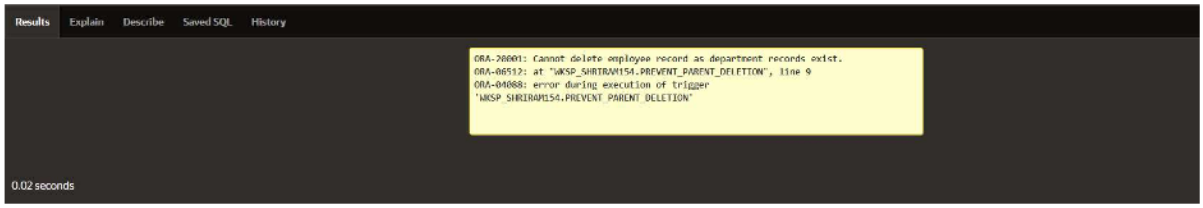
```
Book ID: 1
Author: William Shaespeare
Title: Hamlet
Published Date: 1590-12-12

Statement processed.


0.02 seconds
```

EX.NO.: 13		WORKING WITH TRIGGERS
DATE :	8/10/2024	

PROGRAM 1
WRITE A CODE IN PL/SQL TO DEVELOP A TRIGGER THAT ENFORCES REFERENTIAL INTEGRITY BYPREVENTING THE DELETION OF A PARENT RECORD IF CHILD RECORDS EXIST.

```
CREATE OR REPLACE TRIGGER
PREVENT_PARENT_DELETIONBEFORE DELETE ON
EMPLOYEES
FOR EACH ROW
DECLARE
   PL_DEPT_COUNT
NUMBER;BEGIN
   SELECT COUNT(*)
   INTO
   PL_DEPT_COUNT
   FROM
   DEPARTMENT
   WHERE DEPT_ID =
   :OLD.EMPLOYEE_ID;IF
   PL_DEPT_COUNT > 0 THEN
      RAISE_APPLICATION_ERROR(-20001, 'CANNOT DELETE EMPLOYEE
RECORD ASDEPARTMENT RECORDS EXIST.');
   END IF;
END;
```

```
DELETE FROM
EMPLOYEESWHERE
EMPLOYEE_ID = 70;
```

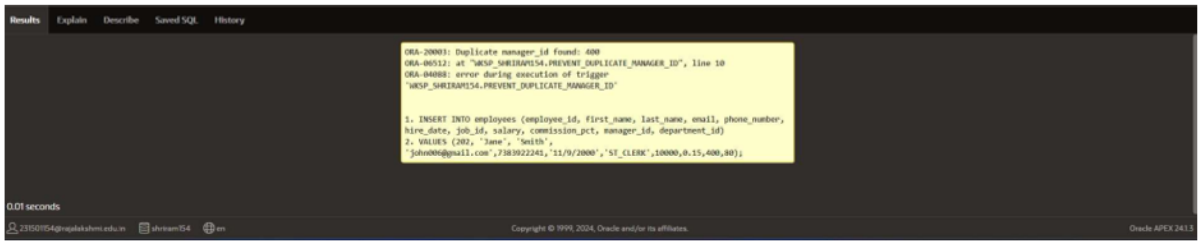


PROGRAM 2

WRITE A CODE IN PL/SQL TO CREATE A TRIGGER THAT CHECKS FOR DUPLICATE VALUES IN A SPECIFICCOLUMN AND RAISES AN EXCEPTION IF FOUND.

```
CREATE OR REPLACE TRIGGER
PREVENT_DUPLICATE_MANAGER_IDBEFORE INSERT OR
UPDATE ON EMPLOYEES
FOR EACH ROW
DECLARE
   PL_COUNT
NUMBER;BEGIN
   SELECT COUNT(*)
   INTO PL_COUNT
   FROM
   EMPLOYEES
   WHERE            MANAGER_ID           =
   :NEW.MANAGER_IDAND EMPLOYEE_ID
   != :NEW.EMPLOYEE_ID;IF PL_COUNT >
   0 THEN
      RAISE_APPLICATION_ERROR(-20003, 'DUPLICATE MANAGER_ID FOUND: ' ||
:NEW.MANAGER_I
   D);END IF;
END;
```

```
INSERT INTO EMPLOYEES (EMPLOYEE_ID, FIRST_NAME, LAST_NAME, EMAIL,
PHONE_NUMBER,HIRE_DATE, JOB_ID, SALARY, COMMISSION_PCT, MANAGER_ID,
DEPARTMENT_ID)
VALUES (202, 'JANE', 'SMITH',
'JOHN006@GMAIL.COM',7383922241,'11/9/2000','ST_CLERK',10000,0.15,400,80);
```

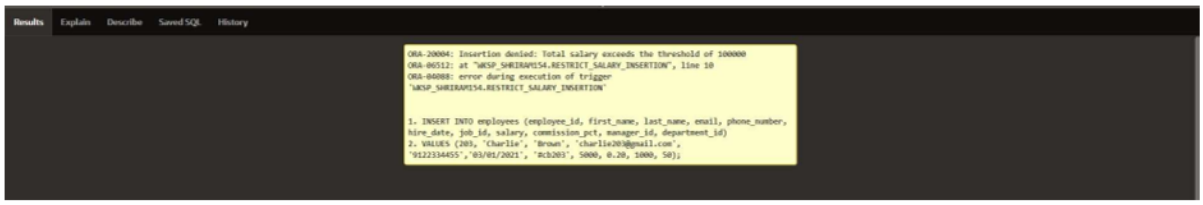


PROGRAM 3

WRITE A CODE IN PL/SQL TO CREATE A TRIGGER THAT RESTRICTS THE INSERTION OF NEW ROWS IF THETOTAL OF A COLUMN'S VALUES EXCEEDS A CERTAIN THRESHOLD.

```
CREATE OR REPLACE TRIGGER
RESTRICT_SALARY_INSERTIONBEFORE INSERT ON
EMPLOYEES
FOR EACH ROW
DECLARE
   TOTAL_SALARY NUMBER;
   THRESHOLD NUMBER :=
   100000;
BEGIN

   SELECT
   SUM(SALARY)INTO
   TOTAL_SALARY
   FROM EMPLOYEES;
   IF (TOTAL_SALARY + :NEW.SALARY) > THRESHOLD THEN
      RAISE_APPLICATION_ERROR(-20004, 'INSERTION DENIED: TOTAL SALARY
EXCEEDS THETHRESHOLD OF ' || THRESHOLD);
   END IF;
END;
```

```
INSERT INTO EMPLOYEES (EMPLOYEE_ID, FIRST_NAME, LAST_NAME, EMAIL,
PHONE_NUMBER,HIRE_DATE, JOB_ID, SALARY, COMMISSION_PCT, MANAGER_ID,
DEPARTMENT_ID)
VALUES (203, 'CHARLIE', 'BROWN', 'CHARLIE203@GMAIL.COM',
'9122334455','03/01/2021','#CB203', 5000, 0.20, 1000, 50);
```



PROGRAM 4

WRITE A CODE IN PL/SQL TO DESIGN A TRIGGER THAT CAPTURES CHANGES MADE TO SPECIFICCOLUMNS AND LOGS THEM IN AN AUDIT TABLE.

```
CREATE OR REPLACE TRIGGER
AUDIT_CHANGESAFTER UPDATE OF SALARY,
JOB_ID ON EMPLOYEESFOR EACH ROW
BEGIN
  IF :OLD.SALARY != :NEW.SALARY OR :OLD.JOB_ID != :NEW.JOB_ID
    THENINSERT INTO EMPLOYEE_AUDIT (
      EMPLOYEE_ID,
      OLD_SALARY,
      NEW_SALARY,
      OLD_JOB_TITLE,
      NEW_JOB_TITLE,
      CHANGE_TIMESTA
      MP,CHANGED_BY
    ) VALUES (
      :OLD.EMPLOYEE_ID,
      :OLD.SALARY,
      :NEW.SALARY,
      :OLD.JOB_ID,
      :NEW.JOB_ID,
      SYSTIMESTAMP,
      USER
    );
  END IF;
END;


UPDATE EMPLOYEES
SET SALARY = 55000, JOB_ID =
'ST_CLERK'WHERE EMPLOYEE_ID =
176;


SELECT * FROM EMPLOYEE_AUDIT;
```

AUDIT_ID	EMPLOYEE_ID	OLD_SALARY	NEW_SALARY	OLD_JOB_ID	NEW_JOB_ID	CHANGE_TIMESTAMP	CHANGED_BY
1	20	50000	55000	manager	manager	15-OCT-24 10.00.00.000000 AM	admin
2	122	60000	65000	Manager	Manager	15-OCT-24 10.15.00.000000 AM	admin
5	27	45000	47000	Analyst	Senior Analyst	15-OCT-24 10.30.00.000000 AM	user1
22	176	7500	55000	#ee005	ST_CLERK	16-OCT-24 04.25.06.252580 PM	APEX_PUBLIC_USER
3	9	70000	75000	Senior Developer	Lead Developer	15-OCT-24 10.45.00.000000 AM	user2
4	4	80000	85000	Team Lead	Project Manager	15-OCT-24 11.00.00.000000 AM	admin

6 rows returned in 0.00 seconds Download

PROGRAM 5

WRITE A CODE IN PL/SQL TO IMPLEMENT A TRIGGER THAT RECORDS USER ACTIVITY (INSERTS, UPDATES,DELETES) IN AN AUDIT LOG FOR A GIVEN SET OF TABLES.

```
CREATE OR REPLACE TRIGGER
TRG_AUDIT_EMPLOYEES AFTER INSERT OR UPDATE
OR DELETE ON EMPLOYEESFOR EACH ROW
DECLARE
    V_OLD_VALUES
        CLOB;
    V_NEW_VALUES
        CLOB;
BEGIN
  IF INSERTING THEN
    V_OLD_VALUES := NULL;
    V_NEW_VALUES := 'EMPLOYEE_ID: ' ||
            :NEW.EMPLOYEE_ID || ', ' ||'FIRST_NAME: ' ||
            :NEW.FIRST_NAME || ', ' ||
            'SALARY: ' || :NEW.SALARY;

    INSERT INTO AUDIT_LOG (ACTION, TABLE_NAME, RECORD_ID, CHANGED_BY,
    NEW_VALUES)VALUES ('INSERT', 'EMPLOYEES', :NEW.EMPLOYEE_ID, USER,
    V_NEW_VALUES);

  ELSIF UPDATING THEN
    V_OLD_VALUES := 'EMPLOYEE_ID: ' ||
            :OLD.EMPLOYEE_ID || ', ' ||'FIRST_NAME: ' ||
            :OLD.FIRST_NAME || ', ' ||
            'SALARY: ' || :OLD.SALARY;
    V_NEW_VALUES := 'EMPLOYEE_ID: ' ||
            :NEW.EMPLOYEE_ID || ', ' ||'FIRST_NAME: ' ||
            :NEW.FIRST_NAME || ', ' ||
            'SALARY: ' || :NEW.SALARY;

    INSERT INTO AUDIT_LOG (ACTION, TABLE_NAME, RECORD_ID,
CHANGED_BY, OLD_VALUES,NEW_VALUES)
    VALUES ('UPDATE', 'EMPLOYEES', :NEW.EMPLOYEE_ID, USER,
V_OLD_VALUES,V_NEW_VALUES);

  ELSIF DELETING THEN
    V_OLD_VALUES := 'EMPLOYEE_ID: ' ||
            :OLD.EMPLOYEE_ID || ', ' ||'FIRST_NAME: ' ||
```

```
                :OLD.FIRST_NAME || ', ' ||
                'SALARY: ' ||
        :OLD.SALARY;V_NEW_VALUES
        := NULL;

        INSERT INTO AUDIT_LOG (ACTION, TABLE_NAME, RECORD_ID,
        CHANGED_BY, OLD_VALUES)VALUES ('DELETE', 'EMPLOYEES',
        :OLD.EMPLOYEE_ID, USER, V_OLD_VALUES);
    END IF;
            END
TRG_AUDIT_EMPLOYEES;
```

```
INSERT INTO EMPLOYEES (EMPLOYEE_ID, FIRST_NAME,
SALARY)VALUES (3, 'BALL', 50000);
```

Results | Explain | Describe | Saved SQL | History

```
1 row(s) inserted.

0.12 seconds
```

```
UPDATE
EMPLOYEESSET
SALARY = 55000
WHERE EMPLOYEE_ID = 3;
```

```
1 row(s) updated.

0.06 seconds
```

```
DELETE FROM
EMPLOYEESWHERE
EMPLOYEE_ID = 3;
```

```
SELECT * FROM AUDIT_LOG;
```

AUDIT_ID	ACTION	TABLE_NAME	RECORD_ID	CHANGED_BY	CHANGE_TIMESTAMP	OLD_VALUES	NEW_VALUES
1	INSERT	employees	3	APEX_PUBLIC_USER	16-OCT-24 04.39.17.957308 PM	-	employee_id: 3, first_name: Ball, salary: 50000
3	DELETE	employees	3	APEX_PUBLIC_USER	16-OCT-24 04.41.49.077471 PM	employee_id: 3, first_name: Ball, salary: 55000	-
2	UPDATE	employees	3	APEX_PUBLIC_USER	16-OCT-24 04.40.03.193035 PM	employee_id: 3, first_name: Ball, salary: 50000	employee_id: 3, first_name: Ball, salary: 55000

3 rows returned in 0.00 seconds Download

PROGRAM 6

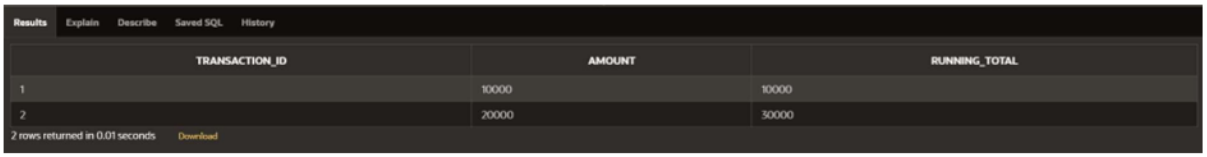
WRITE A CODE IN PL/SQL TO IMPLEMENT A TRIGGER THAT AUTOMATICALLY CALCULATES AND UPDATESA RUNNING TOTAL COLUMN FOR A TABLE WHENEVER NEW ROWS ARE INSERTED.

```
CREATE TABLE TRANSACTIONS (
   TRANSACTION_ID NUMBER PRIMARY
   KEY,AMOUNT NUMBER,
   RUNNING_TOTAL NUMBER
);

CREATE OR REPLACE TRIGGER
UPDATE_RUNNING_TOTALFOR INSERT ON
TRANSACTIONS
COMPOUND TRIGGER

   TYPE AMOUNT_ARRAY IS TABLE OF NUMBER INDEX BY PLS_INTEGER;
          NEW_AMOUNTS
         AMOUNT_ARRAY;

   BEFORE EACH ROW IS
   BEGIN
      NEW_AMOUNTS(:NEW.TRANSACTION_ID) :=
   :NEW.AMOUNT;END BEFORE EACH ROW;

   AFTER STATEMENT IS
   BEGIN
      DECLARE
         V_TOTAL
      NUMBER;BEGIN
         SELECT
         NVL(MAX(RUNNING_TOTAL), 0)
         INTO V_TOTAL
       FROM TRANSACTIONS;

         FOR I IN NEW_AMOUNTS.FIRST .. NEW_AMOUNTS.LAST
            LOOPV_TOTAL := V_TOTAL + NEW_AMOUNTS(I);
            UPDATE TRANSACTIONS
            SET RUNNING_TOTAL =
            V_TOTALWHERE
            TRANSACTION_ID = I;
         END LOOP;
      END;
```

```
    END AFTER STATEMENT;

END UPDATE_RUNNING_TOTAL;


INSERT INTO TRANSACTIONS (TRANSACTION_ID, AMOUNT)
```

```
VALUES (1, 10000);
```

```
INSERT INTO TRANSACTIONS (TRANSACTION_ID,
AMOUNT)VALUES (2, 20000);
```



Results | Explain | Describe | Saved SQL | History

TRANSACTION_ID	AMOUNT	RUNNING_TOTAL
1	10000	10000
2	20000	30000

2 rows returned in 0.01 seconds Download

PROGRAM 7

WRITE A CODE IN PL/SQL TO CREATE A TRIGGER THAT VALIDATES THE AVAILABILITY OF ITEMS BEFOREALLOWING AN ORDER TO BE PLACED, CONSIDERING STOCK LEVELS AND PENDING ORDERS.

```
CREATE TABLE INVENTORY (
   ITEM_ID NUMBER PRIMARY
   KEY,
   ITEM_NAME
   VARCHAR2(100),
   STOCK_LEVEL NUMBER
);


CREATE TABLE ORDERS (
   ORDER_ID NUMBER PRIMARY
   KEY,ITEM_ID NUMBER,
   QUANTITY NUMBER,
   ORDER_STATUS
   VARCHAR2(20),
   CONSTRAINT FK_ITEM FOREIGN KEY (ITEM_ID) REFERENCES INVENTORY(ITEM_ID)
);




CREATE OR REPLACE TRIGGER
VALIDATE_STOCK_BEFORE_ORDERBEFORE INSERT ON
ORDERS
FOR EACH ROW
DECLARE
   V_STOCK_LEVEL NUMBER;
   V_PENDING_ORDERS
   NUMBER;
BEGIN
   SELECT
   STOCK_LEVELINTO
   V_STOCK_LEVEL
   FROM INVENTORY
   WHERE ITEM_ID =
   :NEW.ITEM_ID;SELECT
   NVL(SUM(QUANTITY), 0) INTO
   V_PENDING_ORDERS
```

```
    FROM ORDERS
    WHERE ITEM_ID =
      :NEW.ITEM_IDAND
      ORDER_STATUS =
      'PENDING';
    IF (:NEW.QUANTITY + V_PENDING_ORDERS) > V_STOCK_LEVEL THEN
       RAISE_APPLICATION_ERROR(-20001, 'INSUFFICIENT STOCK FOR ITEM: ' ||
       :NEW.ITEM_ID);
    END IF;
END;
```

INSERT INTO ORDERS (ORDER_ID, ITEM_ID, QUANTITY, ORDER_STATUS)VALUES (1, 101, 5, 'PENDING');

```
1 row(s) inserted.

0.03 seconds
```

INSERT INTO ORDERS (ORDER_ID, ITEM_ID, QUANTITY, ORDER_STATUS)VALUES (2, 103, 20, 'PENDING');

```
ORA-20001: Insufficient stock for item: 103
ORA-06512: at "WKSP_SHRIRAM154.VALIDATE_STOCK_BEFORE_ORDER", line 15
ORA-04088: error during execution of trigger
'WKSP_SHRIRAM154.VALIDATE_STOCK_BEFORE_ORDER'


1. INSERT INTO orders (order_id, item_id, quantity, order_status)
2. VALUES (2, 103, 20, 'Pending');
```

ITEM_ID	ITEM_NAME	STOCK_LEVEL
101	hp_laptop	10
102	keyboard	20
103	mouse	15

3 rows returned in 0.01 seconds Download

ORDER_ID	ITEM_ID	QUANTITY	ORDER_STATUS
1	101	5	Pending

1 rows returned in 0.01 seconds Download

Ex.No.: 14		MONGO DB
Date:	18/10/2024	

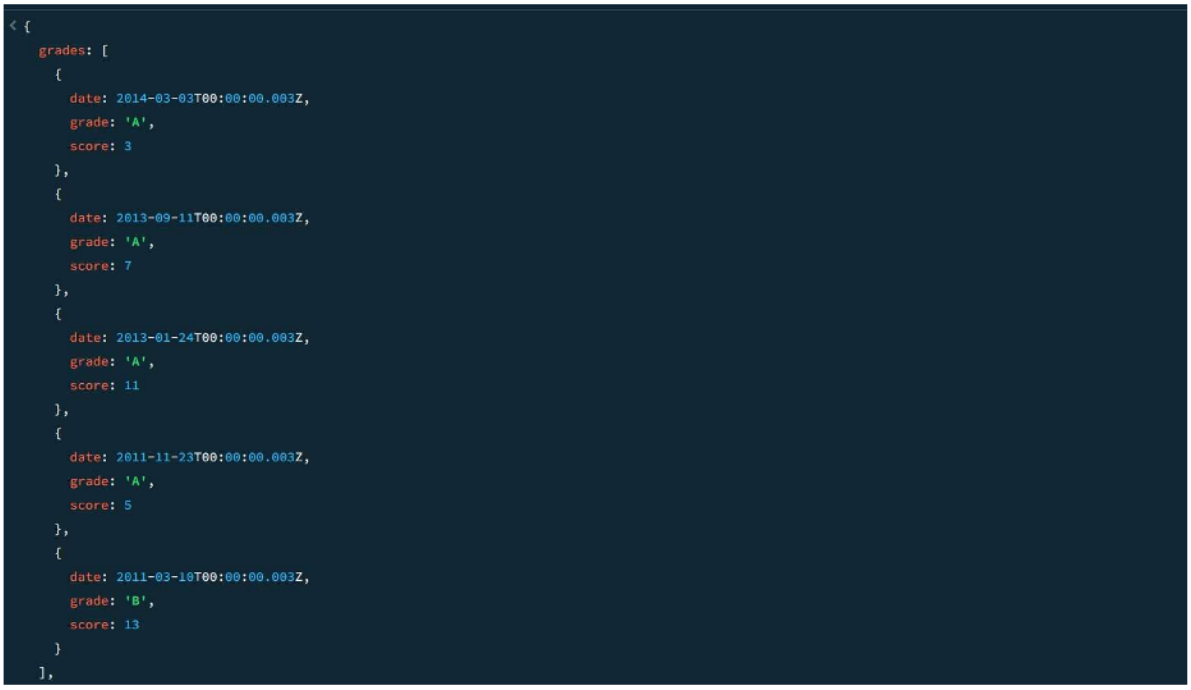
1. WRITE A MONGODB QUERY TO FIND THE RESTAURANT ID, NAME, BOROUGH AND CUISINE FOR THOSERESTAURANTS WHICH PREPARED DISH EXCEPT 'AMERICAN' AND 'CHINEES' OR RESTAURANT'S NAME BEGINS WITH LETTER 'WIL'.

```
DB.RESTAURANTS.FIND(
 {
  $OR: [
   { CUISINE: { $NIN: ["AMERICAN", "CHINEES"] } },
   { NAME: { $REGEX: /^WIL/I } }
  ]
 },
 {
  RESTAURANT_ID: 1,
  NAME: 1,
  BOROUGH: 1,
  CUISINE: 1,
  _ID: 0
 }
);
```

```
>_MONGOSH
< {
    borough: 'Bronx',
    cuisine: 'Bakery',
    name: 'Morris Park Bake Shop',
    restaurant_id: '30075445'
  }
  {
    borough: 'Bronx',
    cuisine: 'Bakery',
    name: 'Morris Park Bake Shop',
    restaurant_id: 30075445
  }
  {
    borough: 'Bronx',
    cuisine: 'Italian',
    name: 'Pasta Palace',
    restaurant_id: 30075446
  }
  {
    borough: 'Manhattan',
    cuisine: 'Chinese',
    name: 'Dragon Wok',
    restaurant_id: 30075447
  }
```

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..

```
DB.RESTAURANTS.FIND(
 {
  GRADES: {
   $ELEMMATC
    H: {GRADE:
    "A", SCORE:
    11
   }
  }
 },
 {
  RESTAURANT_ID: 1,
  NAME: 1,
  GRADES: 1,
  _ID: 0
 }
);
```



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 9ON AN ISODATE "2014-08-11T00:00:00Z".

```
DB.RESTAURANTS.FIND(
 {
  "GRADES.1": {
   $ELEMMATC
    H: {GRADE:
    "A", SCORE:
    9
   }
  }
 },
 {
  RESTAURANT_ID: 1,
  NAME: 1,
  GRADES: 1,
  _ID: 0
 }
);
```

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 WHICHIS MORE THAN 42 AND UPTO 52..

```
DB.RESTAURANTS.FIND(
 {
  "ADDRESS.COORD.1": { $GT: 42, $LTE: 52 }
 },
 {
  RESTAURANT_ID: 1,
  NAME: 1,
  ADDRESS: 1,
  _ID: 0
 }
);
```

5. WRITE A MONGODB QUERY TO ARRANGE THE NAME OF THE RESTAURANTS IN ASCENDING ORDERALONG WITH ALL THE COLUMNS.

```
DB.RESTAURANTS.FIND().SORT({

NAME: 1 });SAMPLE OUTPUT:-
{
 _ID:
 OBJECTID('671B5E6D56EC9972CA8F5DC4'
 ),ADDRESS: {
  BUILDING:
  5566,COORD:
  [
   -73.867377,
   40.854047
  ],
  STREET: '28TH
  AVENUE',ZIPCODE:
  10490
 },
 BOROUGH:
 'BRONX',
 CUISINE: 'BBQ',
 GRADES: [
  {
   DATE: 2014-03-03T00:00:00.028Z,
   GRADE:
   'A',
   SCORE:
   10
  },
  {
   DATE: 2013-09-11T00:00:00.028Z,
   GRADE:
   'A',
   SCORE: 7
  },
  {
   DATE: 2013-01-24T00:00:00.028Z,
   GRADE:
   'A',
   SCORE:
   11
  },
  {
```

```
  DATE: 2011-11-23T00:00:00.028Z,
  GRADE:
  'A',
  SCORE: 9
},
{
  DATE: 2011-03-10T00:00:00.028Z,
  GRADE: 'B',
```

```
    SCORE: 15
   }
  ],
  NAME: 'BBQ HAVEN',
  RESTAURANT_ID:
  30075473
}


{
  _ID:
  OBJECTID('671B5DAB56EC9972CA8F5DB0'
  ),ADDRESS: {
    BUILDING:
    5566,COORD:
    [
     -73.859377,
     40.850047
    ],
    STREET: '8TH
    AVENUE',ZIPCODE:
    10470
  },
  BOROUGH:
  'MANHATTAN',
  CUISINE: 'FRENCH',
  GRADES: [
   {
    DATE: 2014-03-03T00:00:00.008Z,
    GRADE:
    'A',
    SCORE: 7
   },
   {
    DATE: 2013-09-11T00:00:00.008Z,
    GRADE:
    'A',
    SCORE: 9
   },
   {
    DATE: 2013-01-24T00:00:00.008Z,
    GRADE:
    'A',
    SCORE:
    10
   },
   {
```

```
  DATE: 2011-11-23T00:00:00.008Z,
  GRADE:
  'B',
  SCORE:
  15
},
{
  DATE: 2011-03-10T00:00:00.008Z,
```

```
    GRADE:
    'A',
    SCORE: 6
   }
  ],
  NAME: 'BISTRO
  BELLE',
  RESTAURANT_ID:
  30075453
}
```

6. WRITE A MONGODB QUERY TO ARRANGE THE NAME OF THE RESTAURANTS IN DESCENDING ALONGWITH ALL THE COLUMNS.

```
DB.RESTAURANTS.FIND().SORT({ NAME: -1 });
```

SAMPLE OUTPUT

```
{
  _ID:
  OBJECTID('671B5E9456EC9972CA8F5DC8'
  ),ADDRESS: {
    BUILDING:
    9900,COORD:
    [
      -73.868977,
      40.854847
    ],
    STREET: '32ND
    AVENUE',ZIPCODE:
    10494
  },
  BOROUGH:
  'MANHATTAN',
  CUISINE: 'RUSSIAN',
  GRADES: [
   {
    DATE: 2014-03-03T00:00:00.032Z,
    GRADE:
    'A',
    SCORE:
    10
```

```
},
{
  DATE: 2013-09-11T00:00:00.032Z,
  GRADE:
  'B',
  SCORE: 5
},
{
```

```
    DATE: 2013-01-24T00:00:00.032Z,
    GRADE:
    'A',
    SCORE: 9
   },
   {
    DATE: 2011-11-23T00:00:00.032Z,
    GRADE:
    'A',
    SCORE: 8
   },
   {
    DATE: 2011-03-10T00:00:00.032Z,
    GRADE:
    'A',
    SCORE:
    11
   }
  ],
  NAME: "TSAR'S
  TABLE",
  RESTAURANT_ID:
  30075477
}


{
  _ID:
  OBJECTID('671B5E6D56EC9972CA8F5DBE'
  ),ADDRESS: {
    BUILDING:
    9900,COORD:
    [
     -73.864977,
     40.852847
    ],
    STREET: '22ND
    AVENUE',ZIPCODE:
    10484
  },
  BOROUGH:
  'BRONX',
  CUISINE:
  'ITALIAN',
  GRADES: [
   {
```

```
  DATE: 2014-03-03T00:00:00.022Z,
  GRADE:
  'A',
  SCORE: 8
},
{
  DATE: 2013-09-11T00:00:00.022Z,
  GRADE:
  'B',
  SCORE: 5
},
```

```
    {
      DATE: 2013-01-24T00:00:00.022Z,
      GRADE:
      'A',
      SCORE:
      12
    },
    {
      DATE: 2011-11-23T00:00:00.022Z,
      GRADE:
      'A',
      SCORE: 9
    },
    {
      DATE: 2011-03-10T00:00:00.022Z,
      GRADE:
      'A',
      SCORE:
      14
    }
  ],
  NAME: 'TRATTORIA
  BELLA',
  RESTAURANT_ID:
  30075467
}
```

7. WRITE A MONGODB QUERY TO ARRANGE THE NAME OF THE CUISINE IN ASCENDING ORDER AND FORTHAT SAME CUISINE BOROUGH SHOULD BE IN DESCENDING ORDER.

```
DB.RESTAURANTS.FIND().SORT({ CUISINE: 1,

BOROUGH: -1 });SAMPLE OUTPUT:-

{
  _ID:
  OBJECTID('671B5D549D3D63480E0A64E9'),
  ADDRESS: {
    BUILDING:
    2233,COORD:
    [
```

```
    -73.858177,
    40.849447
  ],
  STREET: '5TH
  AVENUE',ZIPCODE:
  10467
},
BOROUGH:
'BRONX', CUISINE:
'AMERICAN',
```

```
  GRADES: [
   {
    DATE: 2014-03-03T00:00:00.005Z,
    GRADE:
    'A',
    SCORE:
    10
   },
   {
    DATE: 2013-09-11T00:00:00.005Z,
    GRADE:
    'A',
    SCORE: 6
   },
   {
    DATE: 2013-01-24T00:00:00.005Z,
    GRADE:
    'B',
    SCORE:
    12
   },
   {
    DATE: 2011-11-23T00:00:00.005Z,
    GRADE:
    'A',
    SCORE: 9
   },
   {
    DATE: 2011-03-10T00:00:00.005Z,
    GRADE:
    'A',
    SCORE:
    14
   }
  ],
  NAME: 'BURGER
  BISTRO',
  RESTAURANT_ID:
  30075450
}

{
  _ID:
  OBJECTID('671B5E6D56EC9972CA8F5DC4'
  ),ADDRESS: {
    BUILDING:
    5566,COORD:
```

```
  [
    -73.867377,
    40.854047
  ],
  STREET: '28TH
  AVENUE',ZIPCODE:
  10490
},
BOROUGH:
'BRONX',
CUISINE: 'BBQ',
```

```
  GRADES: [
   {
    DATE: 2014-03-03T00:00:00.028Z,
    GRADE:
    'A',
    SCORE:
    10
   },
   {
    DATE: 2013-09-11T00:00:00.028Z,
    GRADE:
    'A',
    SCORE: 7
   },
   {
    DATE: 2013-01-24T00:00:00.028Z,
    GRADE:
    'A',
    SCORE:
    11
   },
   {
    DATE: 2011-11-23T00:00:00.028Z,
    GRADE:
    'A',
    SCORE: 9
   },
   {
    DATE: 2011-03-10T00:00:00.028Z,
    GRADE:
    'B',
    SCORE:
    15
   }
  ],
  NAME: 'BBQ HAVEN',
  RESTAURANT_ID:
  30075473
}
```

8. WRITE A MONGODB QUERY TO KNOW WHETHER ALL THE ADDRESSES CONTAINS THE STREET OR NOT.

```
DB.RESTAURANTS.FIND(
  {
    "ADDRESS.STREET": { $EXISTS: FALSE }
  }
);
```

```
> db.restaurants.find(
    {
      "address.street": { $exists: false }
    }
  );
<
Customers >
```

9. WRITE A MONGODB QUERY WHICH WILL SELECT ALL DOCUMENTS IN THE RESTAURANTS COLLECTIONWHERE THE COORD FIELD VALUE IS DOUBLE.

```
DB.RESTAURANTS.FIND(
 {
  "ADDRESS.COORD": { $TYPE: "DOUBLE" }
 }
);
```

SAMPLE OUTPUT:-

```
{
 _ID:
 OBJECTID('671B92D339EC8A9BC8B6588B')
 ,ADDRESS: {
  BUILDING:
  '1007',COORD:
  [
   -73.856077,
   40.848447
  ],
  STREET: 'MORRIS
  PARK AVE',ZIPCODE:
  '10462'
 },
 BOROUGH:
 'BRONX',
 CUISINE:
 'BAKERY',
```

```
GRADES: [
 {
  DATE: 2014-03-03T00:00:00.000Z,
```

```
    GRADE:
    'A',
    SCORE: 2
   },
   {
    DATE: 2013-09-11T00:00:00.000Z,
    GRADE:
    'A',
    SCORE: 6
   },
   {
    DATE: 2013-01-24T00:00:00.000Z,
    GRADE:
    'A',
    SCORE:
    10
   },
   {
    DATE: 2011-11-23T00:00:00.000Z,
    GRADE:
    'A',
    SCORE: 9
   },
   {
    DATE: 2011-03-10T00:00:00.000Z,
    GRADE:
    'B',
    SCORE:
    14
   }
  ],
  NAME: 'MORRIS PARK BAKE
  SHOP',RESTAURANT_ID:
  '30075445'
}

{
  _ID:
  OBJECTID('671B5D549D3D63480E0A64E5'),
  ADDRESS: {
   BUILDING:
   1234,COORD:
   [
    -73.856577,
    40.848647
   ],
   STREET: '1ST
```

```
  AVENUE',ZIPCODE:
  10463
},
BOROUGH:
'BRONX',
CUISINE:
'ITALIAN',
GRADES: [
 {
  DATE: 2014-03-03T00:00:00.001Z,
```

```
    GRADE:
    'A',
    SCORE: 5
   },
   {
    DATE: 2013-09-11T00:00:00.001Z,
    GRADE:
    'A',
    SCORE: 8
   },
   {
    DATE: 2013-01-24T00:00:00.001Z,
    GRADE:
    'B',
    SCORE:
    12
   },
   {
    DATE: 2011-11-23T00:00:00.001Z,
    GRADE:
    'A',
    SCORE: 7
   },
   {
    DATE: 2011-03-10T00:00:00.001Z,
    GRADE:
    'A',
    SCORE:
    15
   }
  ],
  NAME: 'PASTA
  PALACE',
  RESTAURANT_ID:
  30075446
}
```

10. WRITE A MONGODB QUERY WHICH WILL SELECT THE RESTAURANT ID, NAME AND GRADES FORTHOSE RESTAURANTS WHICH RETURNS 0 AS A REMAINDER AFTER DIVIDING THE SCORE BY 7.

```
DB.RESTAURANTS.FIND(
 {
  "GRADES.SCORE": { $MOD: [7, 0] }
 },
 {
```

```
    RESTAURANT_ID: 1,
    NAME: 1,
    GRADES: 1,
    _ID: 0
  }
);
```

SAMPLE OUTPUT:-


```
{
 GRADES: [
  {
   DATE: 2014-03-03T00:00:00.000Z,
   GRADE:
   'A',
   SCORE: 2
  },
  {
   DATE: 2013-09-11T00:00:00.000Z,
   GRADE:
   'A',
   SCORE: 6
  },
  {
   DATE: 2013-01-24T00:00:00.000Z,
   GRADE:
   'A',
   SCORE:
   10
  },
  {
   DATE: 2011-11-23T00:00:00.000Z,
   GRADE:
   'A',
   SCORE: 9
  },
  {
   DATE: 2011-03-10T00:00:00.000Z,
   GRADE:
   'B',
   SCORE:
   14
  }
 ],
 NAME: 'MORRIS PARK BAKE
 SHOP',RESTAURANT_ID:
 '30075445'
}

{
 GRADES: [
  {
```

```
  DATE: 2014-03-03T00:00:00.001Z,
  GRADE:
  'A',
  SCORE: 5
},
{
```

```
    DATE: 2013-09-11T00:00:00.001Z,
    GRADE:
    'A',
    SCORE: 8
   },
   {
    DATE: 2013-01-24T00:00:00.001Z,
    GRADE:
    'B',
    SCORE:
    12
   },
   {
    DATE: 2011-11-23T00:00:00.001Z,
    GRADE:
    'A',
    SCORE: 7
   },
   {
    DATE: 2011-03-10T00:00:00.001Z,
    GRADE:
    'A',
    SCORE:
    15
   }
  ],
  NAME: 'PASTA
  PALACE',
  RESTAURANT_ID:
  30075446
}
```

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 ITSNAME.

```
DB.RESTAURANTS.FIND(
 {
  NAME: { $REGEX: /MON/I }
 },
 {
  NAME: 1,
  BOROUGH: 1,
  "ADDRESS.COORD.0": 1, //
```

```
    LONGITUDE
    "ADDRESS.COORD.1": 1, //
    LATITUDE CUISINE: 1,
    _ID: 0
  }
);
```

12. WRITE A MONGODB QUERY TO FIND THE RESTAURANT NAME, BOROUGH, LONGITUDE AND LATITUDEAND CUISINE FOR THOSE RESTAURANTS WHICH CONTAIN 'MAD' AS FIRST THREE LETTERS OF ITS NAME.

```
DB.RESTAURANTS.FIND(
 {
  NAME: { $REGEX: /^MAD/I }
 },
 {
  NAME: 1,
  BOROUGH: 1,
  "ADDRESS.COORD.0": 1, //
  LONGITUDE
  "ADDRESS.COORD.1": 1, //
  LATITUDE CUISINE: 1,
  _ID: 0
 }
);
```

13. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE AT LEAST ONE GRADE WITH ASCORE OF LESS THAN 5.

```
DB.RESTAURANTS.FIND(
 {
  "GRADES.SCORE": { $LT: 5 }
 }
);
```

SAMPLE OUTPUT:-

```
{
 _ID:
 OBJECTID('671B92D339EC8A9BC8B6588B')
 ,ADDRESS: {
  BUILDING: '1007',
```

```
  COORD: [
    -73.856077,
    40.848447
  ],
  STREET: 'MORRIS
  PARK AVE',ZIPCODE:
  '10462'
},
BOROUGH:
'BRONX',
CUISINE:
'BAKERY',
GRADES: [
 {
   DATE: 2014-03-03T00:00:00.000Z,
   GRADE:
   'A',
   SCORE: 2
 },
 {
   DATE: 2013-09-11T00:00:00.000Z,
   GRADE:
   'A',
   SCORE: 6
 },
 {
   DATE: 2013-01-24T00:00:00.000Z,
   GRADE:
   'A',
   SCORE:
   10
 },
 {
   DATE: 2011-11-23T00:00:00.000Z,
   GRADE:
   'A',
   SCORE: 9
 },
 {
   DATE: 2011-03-10T00:00:00.000Z,
   GRADE:
   'B',
   SCORE:
   14
 }
],
NAME: 'MORRIS PARK BAKE
```

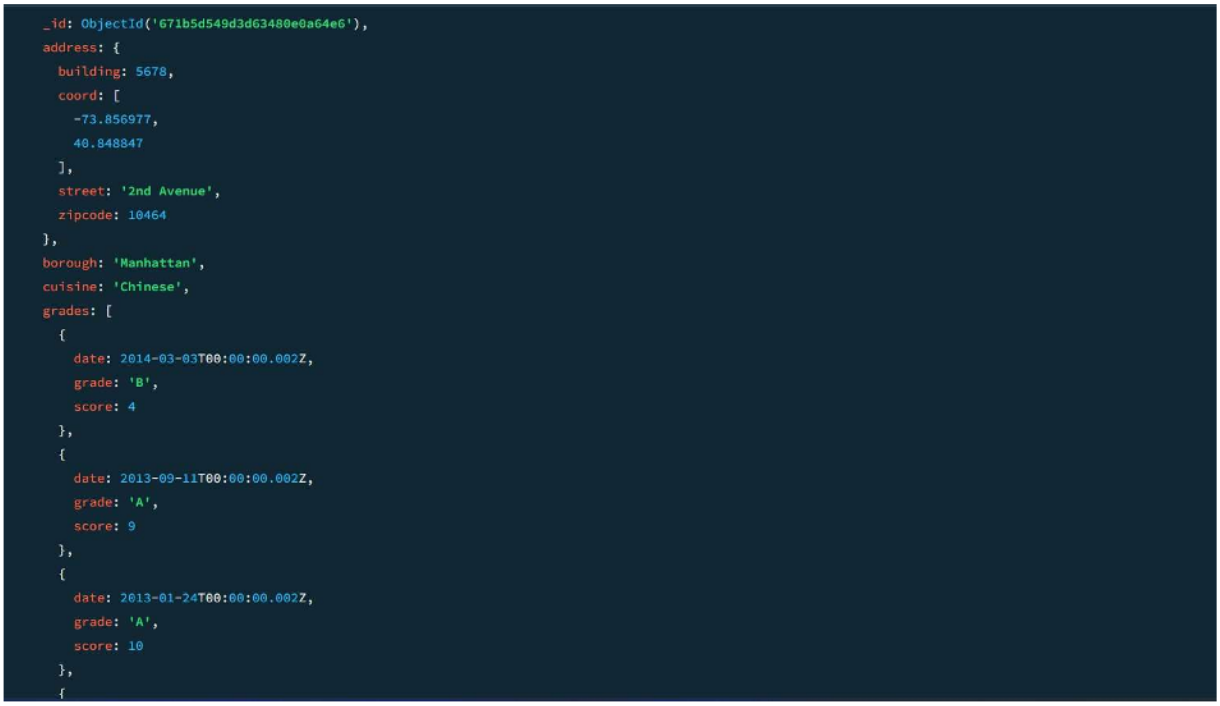
```
  SHOP',RESTAURANT_ID:
  '30075445'
}


{
  _ID:
  OBJECTID('671B5D549D3D63480E0A64E6'),
  ADDRESS: {
```

```
  BUILDING:
  5678,COORD:
  [
    -73.856977,
    40.848847
  ],
  STREET: '2ND
  AVENUE',ZIPCODE:
  10464
},
BOROUGH:
'MANHATTAN',
CUISINE: 'CHINESE',
GRADES: [
  {
    DATE: 2014-03-03T00:00:00.002Z,
    GRADE:
    'B',
    SCORE: 4
  },
  {
    DATE: 2013-09-11T00:00:00.002Z,
    GRADE:
    'A',
    SCORE: 9
  },
  {
    DATE: 2013-01-24T00:00:00.002Z,
    GRADE:
    'A',
    SCORE:
    10
  },
  {
    DATE: 2011-11-23T00:00:00.002Z,
    GRADE:
    'A',
    SCORE: 8
  },
  {
    DATE: 2011-03-10T00:00:00.002Z,
    GRADE:
    'B',
    SCORE:
    16
  }
],
```

```
  NAME: 'DRAGON
  WOK',
  RESTAURANT_ID:
  30075447
}
```

14. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE AT LEAST ONE GRADE WITH ASCORE OF LESS THAN 5 AND THAT ARE LOCATED IN THE BOROUGH OF MANHATTAN.

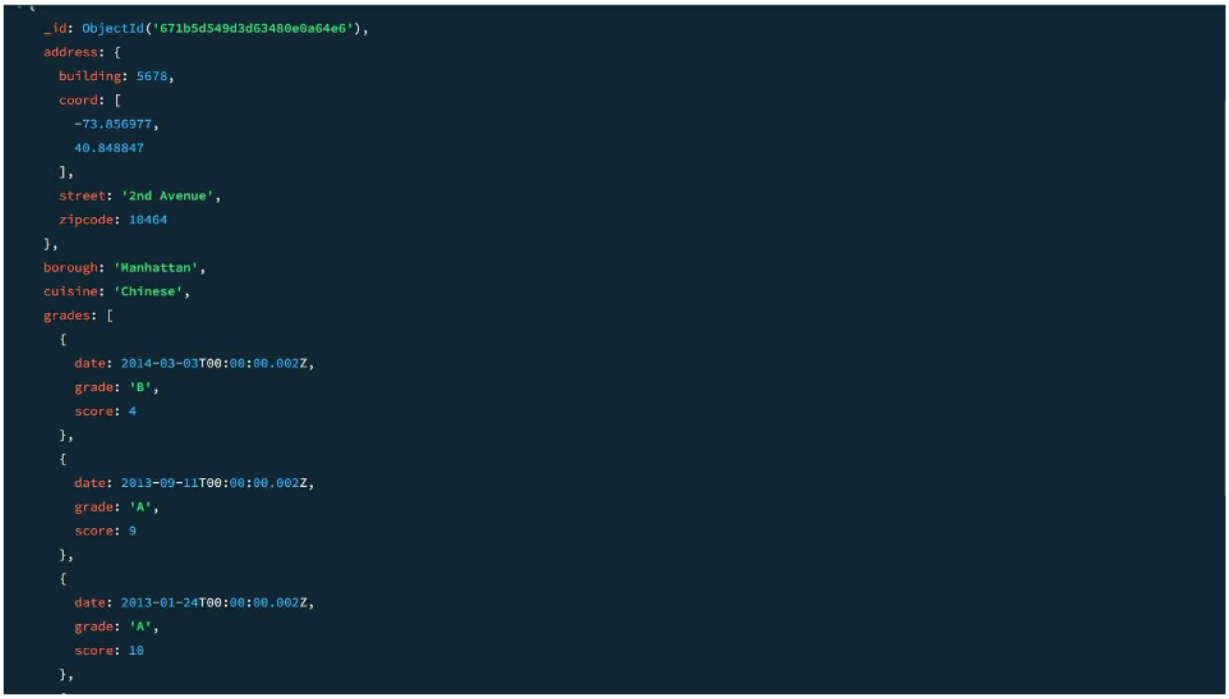
```
DB.RESTAURANTS.FIND(
 {
  "GRADES.SCORE": {
  $LT: 5 },BOROUGH:
  "MANHATTAN"
 }
);
```



```
_id: ObjectId('671b5d549d3d63480e0a64e6'),
address: {
  building: 5678,
  coord: [
    -73.856977,
    40.848847
  ],
  street: '2nd Avenue',
  zipcode: 10464
},
borough: 'Manhattan',
cuisine: 'Chinese',
grades: [
  {
    date: 2014-03-03T00:00:00.002Z,
    grade: 'B',
    score: 4
  },
  {
    date: 2013-09-11T00:00:00.002Z,
    grade: 'A',
    score: 9
  },
  {
    date: 2013-01-24T00:00:00.002Z,
    grade: 'A',
    score: 10
  },
  {
```

15. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE AT LEAST ONE GRADE WITH ASCORE OF LESS THAN 5 AND THAT ARE LOCATED IN THE BOROUGH OF MANHATTAN OR BROOKLYN.

```
DB.RESTAURANTS.FIND(
 {
  "GRADES.SCORE": { $LT: 5 },
  BOROUGH: { $IN: ["MANHATTAN", "BROOKLYN"] }
 }
);
```



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, ANDTHEIR CUISINE IS NOT AMERICAN.

```
DB.RESTAURANTS.FIND(
 {
  "GRADES.SCORE": { $LT: 5 },
  BOROUGH: { $IN: ["MANHATTAN",
  "BROOKLYN"] },CUISINE: { $NE:
  "AMERICAN" }
 }
);
```

```
_id: ObjectId('671b5d549d3d63480e0a64e6'),
address: {
  building: 5678,
  coord: [
    -73.856977,
    40.848847
  ],
  street: '2nd Avenue',
  zipcode: 10464
},
borough: 'Manhattan',
cuisine: 'Chinese',
grades: [
  {
    date: 2014-03-03T00:00:00.002Z,
    grade: 'B',
    score: 4
  },
  {
    date: 2013-09-11T00:00:00.002Z,
    grade: 'A',
    score: 9
  },
  {
    date: 2013-01-24T00:00:00.002Z,
    grade: 'A',
    score: 10
  },
  {
```


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, ANDTHEIR CUISINE IS NOT AMERICAN OR CHINESE.

```
DB.RESTAURANTS.FIND(
 {
  "GRADES.SCORE": { $LT: 5 },
  BOROUGH: { $IN: ["MANHATTAN",
  "BROOKLYN"] },CUISINE: { $NIN:
  ["AMERICAN", "CHINESE"] }
 }
);
```

18. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE A GRADE WITH A SCORE OF 2 ANDA GRADE WITH A SCORE OF 6.

```
DB.RESTAURANTS.FIND(
 {
  GRADES: {
   $ALL: [
    { $ELEMMATCH: { SCORE: 2 } },
```

```
      { $ELEMMATCH: { SCORE: 6 } }
    ]
   }
  }
);
```

SAMPLE OUTPUT:-

```
{
 _ID:
 OBJECTID('671B92D339EC8A9BC8B6588B')
 ,ADDRESS: {
  BUILDING:
  '1007',COORD:
  [
   -73.856077,
   40.848447
  ],
  STREET: 'MORRIS
  PARK AVE',ZIPCODE:
  '10462'
 },
 BOROUGH:
 'BRONX',
 CUISINE:
 'BAKERY',
 GRADES: [
  {
   DATE: 2014-03-03T00:00:00.000Z,
   GRADE:
   'A',
   SCORE: 2
  },
  {
   DATE: 2013-09-11T00:00:00.000Z,
   GRADE:
   'A',
   SCORE: 6
  },
  {
   DATE: 2013-01-24T00:00:00.000Z,
   GRADE:
   'A',
   SCORE:
   10
  },
  {
```

```
  DATE: 2011-11-23T00:00:00.000Z,
  GRADE:
  'A',
  SCORE: 9
},
{
  DATE: 2011-03-10T00:00:00.000Z,
```

```
    GRADE:
    'B',
    SCORE:
    14
   }
  ],
  NAME: 'MORRIS PARK BAKE
  SHOP',RESTAURANT_ID:
  '30075445'
}


{
  _ID:
  OBJECTID('671B5C5F9D3D63480E0A64E4')
  ,ADDRESS: {
   BUILDING:
   1007,COORD:
   [
    -73.856077,
    40.848447
   ],
   STREET: 'MORRIS
   PARK AVE',ZIPCODE:
   10462
  },
  BOROUGH:
  'BRONX',
  CUISINE:
  'BAKERY',
  GRADES: [
   {
    DATE: 2014-03-03T00:00:00.000Z,
    GRADE:
    'A',
    SCORE: 2
   },
   {
    DATE: 2013-09-11T00:00:00.000Z,
    GRADE:
    'A',
    SCORE: 6
   },
   {
    DATE: 2013-01-24T00:00:00.000Z,
    GRADE:
```

```
  'A',
  SCORE:
  10
},
{
  DATE: 2011-11-23T00:00:00.000Z,
  GRADE:
  'A',
  SCORE: 9
},
{
```

```
    DATE: 2011-03-10T00:00:00.000Z,
    GRADE:
    'B',
    SCORE:
    14
   }
  ],
  NAME: 'MORRIS PARK BAKE
  SHOP',RESTAURANT_ID:
  30075445
}
```

19. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE A GRADE WITH A SCORE OF 2 ANDA GRADE WITH A SCORE OF 6 AND ARE LOCATED IN THE BOROUGH OF MANHATTAN.

```
DB.RESTAURANTS.FIND(
 {
  BOROUGH:
  "MANHATTAN",
  GRADES: {
   $ALL: [
    { $ELEMMATCH: { SCORE: 2 } },
    { $ELEMMATCH: { SCORE: 6 } }
   ]
  }
 }
);
```

20. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE A GRADE WITH A SCORE OF 2 ANDA GRADE WITH A SCORE OF 6 AND ARE LOCATED IN THE BOROUGH OF MANHATTAN OR BROOKLYN.

```
DB.RESTAURANTS.FIND(
 {
  BOROUGH: { $IN: ["MANHATTAN",
```

```
"BROOKLYN"] },GRADES: {
  $ALL: [
    { $ELEMMATCH: { SCORE: 2 } },
```

```
      { $ELEMMATCH: { SCORE: 6 } }
    ]
   }
  }
);
```

21. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE A GRADE WITH A SCORE OF 2 ANDA GRADE WITH A SCORE OF 6 AND ARE LOCATED IN THE BOROUGH OF MANHATTAN OR BROOKLYN, AND THEIR CUISINE IS NOT AMERICAN.

```
DB.RESTAURANTS.FIND(
 {
  BOROUGH: { $IN: ["MANHATTAN",
  "BROOKLYN"] },GRADES: {
   $ALL: [
    { $ELEMMATCH: { SCORE: 2 } },
    { $ELEMMATCH: { SCORE: 6 } }
   ]
  },
  CUISINE: { $NE: "AMERICAN" }
 }
);
```

22. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE A GRADE WITH A SCORE OF 2 ANDA GRADE WITH A SCORE OF 6 AND ARE LOCATED IN THE BOROUGH OF MANHATTAN OR BROOKLYN, AND THEIR CUISINE IS NOT AMERICAN OR CHINESE.

```
DB.RESTAURANTS.FIND(
 {
  BOROUGH: { $IN: ["MANHATTAN",
  "BROOKLYN"] },GRADES: {
   $ALL: [
    { $ELEMMATCH: { SCORE: 2 } },
    { $ELEMMATCH: { SCORE: 6 } }
   ]
  },
  CUISINE: { $NIN: ["AMERICAN", "CHINESE"] }
 }
);
```

23. WRITE A MONGODB QUERY TO FIND THE RESTAURANTS THAT HAVE A GRADE WITH A SCORE OF 2 ORA GRADE WITH A SCORE OF 6.

```
DB.RESTAURANTS.FIND(
 {
  $OR: [
   { "GRADES.SCORE": 2 },
   { "GRADES.SCORE": 6 }
  ]
 }
);
```

SAMPLE OUTPUT:-

```
{
 _ID:
 OBJECTID('671B5D549D3D63480E0A64E9'),
 ADDRESS: {
  BUILDING:
  2233,COORD:
  [
   -73.858177,
   40.849447
  ],
  STREET: '5TH
  AVENUE',ZIPCODE:
  10467
 },
 BOROUGH:
 'BRONX', CUISINE:
 'AMERICAN',
 GRADES: [
  {
   DATE: 2014-03-03T00:00:00.005Z,
   GRADE:
   'A',
   SCORE:
   10
  },
  {
   DATE: 2013-09-11T00:00:00.005Z,
   GRADE:
   'A',
```

```
  SCORE: 6
},
{
  DATE: 2013-01-24T00:00:00.005Z,
```

```
    GRADE:
    'B',
    SCORE:
    12
   },
   {
    DATE: 2011-11-23T00:00:00.005Z,
    GRADE:
    'A',
    SCORE: 9
   },
   {
    DATE: 2011-03-10T00:00:00.005Z,
    GRADE:
    'A',
    SCORE:
    14
   }
  ],
  NAME: 'BURGER
  BISTRO',
  RESTAURANT_ID:
  30075450
}

{
  _ID:
  OBJECTID('671B5DAB56EC9972CA8F5DA
  F'),ADDRESS: {
   BUILDING:
   4455,COORD:
   [
    -73.858977,
    40.849847
   ],
   STREET: '7TH
   AVENUE',ZIPCODE:
   10469
  },
  BOROUGH:
  'BRONX',
  CUISINE: 'THAI',
  GRADES: [
   {
    DATE: 2014-03-03T00:00:00.007Z,
    GRADE:
```

```
  'A',
  SCORE: 9
},
{
  DATE: 2013-09-11T00:00:00.007Z,
  GRADE:
  'B',
  SCORE: 6
},
{
  DATE: 2013-01-24T00:00:00.007Z,
```

```
    GRADE:
    'A',
    SCORE:
    12
   },
   {
    DATE: 2011-11-23T00:00:00.007Z,
    GRADE:
    'A',
    SCORE: 8
   },
   {
    DATE: 2011-03-10T00:00:00.007Z,
    GRADE:
    'B',
    SCORE:
    14
   }
  ],
  NAME: 'THAI DELIGHT',
  RESTAURANT_ID:
  30075452
}
```

MOVIES COLLECTION

1.FIND ALL MOVIES WITH FULL INFORMATION FROM THE 'MOVIES' COLLECTION THATRELEASED IN THE YEAR 1893.

```
DB.MOVIES.FIND({ YEAR: 1893 });
```

2. FIND ALL MOVIES WITH FULL INFORMATION FROM THE 'MOVIES' COLLECTIONTHAT HAVE A RUNTIME GREATER THAN 120 MINUTES.

```
DB.MOVIES.FIND({ RUNTIME: { $GT:

120 } });
```

SAMPLE OUTPUT:-

```
{
 _ID: OBJECTID('573A1390F29313CAABCD42EC'),
 PLOT: 'AN ASTRONAUT STRANDED ON MARS MUST
 SURVIVE ALONE.',GENRES: [
  'SCI-FI',
  'DRAM
  A'
 ],
 RUNTIME:
 135,CAST: [
  'MATT DAMON',
  'JESSICA
  CHASTAIN'
 ],
 POSTER: 'HTTPS://M.MEDIA-
 AMAZON.COM/IMAGES/POSTER4.JPG',TITLE: 'MARS
 ALONE',
 FULLPLOT: 'AN ASTRONAUT, LEFT ALONE ON MARS, STRUGGLES TO
```

SURVIVE WITH
LIMITED RESOURCES WHILE AWAITING
RESCUE.',LANGUAGES: [

```
  'ENGLISH'
],
RELEASED: 2015-10-02T00:00:00.000Z,
DIRECTORS: [
  'RIDLEY
  SCOTT'
],
RATED: 'PG-
13',AWARDS:
{ WINS: 8,
  NOMINATIONS: 6,
  TEXT: '8 WINS & 6 NOMINATIONS.'
},
LASTUPDATED: '2021-08-09 17:22:30.000000000',
YEAR:
2015,
IMDB: {
RATING:
8,
  VOTES: 25650,
  ID: 443
},
COUNTRIE
  S: ['USA'
],
TYPE:
'MOVIE',
TOMATOES:
{ VIEWER: {
    RATING: 4.5,
    NUMREVIEWS: 2201,
    METER: 93
  },
  FRESH: 18,
  CRITIC: {
  RATING:
  8.5,
```

```
    NUMREVIEWS: 25,
    METER: 96
  },
```

```
    ROTTEN: 1,
    LASTUPDATED: 2021-07-19T21:20:55.000Z
  }
}
```

3. FIND ALL MOVIES WITH FULL INFORMATION FROM THE 'MOVIES' COLLECTIONTHAT HAVE "SHORT" GENRE.

```
DB.MOVIES.FIND({ GENRES:

"SHORT" });SAMPLE OUTPUT:-

{
  _ID: OBJECTID('573A1390F29313CAABCD42E8'),
  PLOT: 'A GROUP OF BANDITS STAGE A BRAZEN TRAIN HOLD-UP, ONLY
  TO FIND A
DETERMINED POSSE HOT ON THEIR
  HEELS.',GENRES: [
    'SHORT',
    'WESTE
    RN'
  ],
  RUNTIME:
  11,CAST: [
    'A.C. ABADIE',
    "GILBERT M. 'BRONCHO BILLY'
    ANDERSON","GEORGE BARNES',
    'JUSTUS D. BARNES'
  ],
  POSTER: 'HTTPS://M.MEDIA-
AMAZON.COM/IMAGES/M/MV5BMTU3NJE5NZYTYTYYNS00MDVMLWIWYJG
TMMYWYWIXZDYYNZU2XKEYXKFQCGDEQXVYNZQZNZQXNZI@._V1_SY1
000_SX677_AL_.JPG',
  TITLE: 'THE GREAT TRAIN ROBBERY',
  FULLPLOT: "AMONG THE EARLIEST EXISTING FILMS IN
AMERICAN CINEMA - NOTABLE AS THE FIRST FILM THAT
PRESENTED A NARRATIVE STORY TO TELL - IT DEPICTS A GROUP
```

OF COWBOY OUTLAWS WHO HOLD UP A TRAIN AND ROB THE

PASSENGERS. THEY ARE THEN PURSUED BY A SHERIFF'S POSSE.
SEVERALSCENES HAVE COLOR INCLUDED - ALL HAND TINTED.",
LANGUAGE
S: [
'ENGLISH'
],
RELEASED: 1903-12-01T00:00:00.000Z,
DIRECTORS: [
'EDWIN S.
PORTER'
],
RATED: 'TV-
G',AWARDS:
{ WINS: 1,
NOMINATIONS: 0,
TEXT: '1 WIN.'
},
LASTUPDATED: '2015-08-13 00:27:59.177000000',
YEAR: 1903,
IMDB: {
RATING:
7.4,
VOTES: 9847,
ID: 439
},
COUNTRIE
S: ['USA'
],
TYPE:
'MOVIE',
TOMATOES:
{ VIEWER: {
RATING: 3.7,
NUMREVIEWS: 2559,
METER: 75
},
FRESH: 6,

CRITIC: {
RATING:
7.6,

```
    NUMREVIEWS: 6,
    METER: 100
  },
  ROTTEN: 0,
  LASTUPDATED: 2015-08-08T19:16:10.000Z
 }
}
```

4. RETRIEVE ALL MOVIES FROM THE 'MOVIES' COLLECTION THAT WERE DIRECTED BY "WILLIAM K.L. DICKSON" AND INCLUDE COMPLETE INFORMATION FOR EACHMOVIE.

```
DB.MOVIES.FIND({ DIRECTORS: "WILLIAM K.L. DICKSON" });
```

6. RETRIEVE ALL MOVIES FROM THE 'MOVIES' COLLECTION THAT WERE RELEASEDIN THE USA AND INCLUDE COMPLETE INFORMATION FOR EACH MOVIE.

```
DB.MOVIES.FIND({ COUNTRIES: "USA" });
```

7. RETRIEVE ALL MOVIES FROM THE 'MOVIES' COLLECTION THAT HAVE COMPLETEINFORMATION AND ARE RATED AS "UNRATED".

```
DB.MOVIES.FIND({ RATED: "UNRATED" });
```

8. RETRIEVE ALL MOVIES FROM THE 'MOVIES' COLLECTION THAT HAVE COMPLETEINFORMATION AND HAVE RECEIVED MORE THAN 1000 VOTES ON IMDB.

```
DB.MOVIES.FIND({ "IMDB.VOTES": { $GT: 1000 } });
```

```
{
  _id: ObjectId('573a1390f29313caabcd42e8'),
  plot: 'A group of bandits stage a brazen train hold-up, only to find a determined posse hot on their heels.',
  genres: [
    'Short',
    'Western'
  ],
  runtime: 11,
  cast: [
    'A.C. Abadie',
    "Gilbert M. 'Broncho Billy' Anderson",
    'George Barnes',
    'Justus D. Barnes'
  ],
  poster: 'https://m.media-amazon.com/images/M/MV5BMTU3NjE5NzYtYTYyNS00MDVmLWIwYjgtMmYwYWIxZDYyNzU2XkEyXkFqcGdeQXVyNzQzNzQxNzI@._V1_SY1000
  title: 'The Great Train Robbery',
  fullplot: "Among the earliest existing films in American cinema - notable as the first film that presented a narrative story to tell - i
  languages: [
    'English'
  ],
  released: 1903-12-01T00:00:00.000Z,
  directors: [
    'Edwin S. Porter'
  ],
```

9. RETRIEVE ALL MOVIES FROM THE 'MOVIES' COLLECTION THAT HAVE COMPLETEINFORMATION AND HAVE AN IMDB RATING HIGHER THAN 7.

```
DB.MOVIES.FIND({ "IMDB.RATING": { $GT: 7 } });
```

10. RETRIEVE ALL MOVIES FROM THE 'MOVIES' COLLECTION THAT HAVE COMPLETE INFORMATION AND HAVE A VIEWER RATING HIGHER THAN 4 ONTOMATOES.

```
DB.MOVIES.FIND({ "TOMATOES.VIEWER.RATING": { $GT: 4 } });
```

```
> db.movies.find({ "tomatoes.viewer.rating": { $gt: 4 } });
< {
    _id: ObjectId('573a1390f29313caabcd42ea'),
    plot: 'A chef tries to open a restaurant amidst a series of challenges.',
    genres: [
      'Drama',
      'Comedy'
    ],
    runtime: 120,
    cast: [
      'Emma Stone',
      'Chris Pratt',
      'Anna Kendrick'
    ],
    poster: 'https://m.media-amazon.com/images/poster2.jpg',
    title: 'The Culinary Dream',
    fullplot: "A chef's journey to make his dream restaurant come true, overcoming family and financial obstacles.",
    languages: [
      'English',
      'French'
    ],
    released: 2015-02-12T00:00:00.000Z,
    directors: [
      'Samantha Jones'
    ],
    rated: 'PG-13',
    awards: {
      wins: 1,
```

11. RETRIEVE ALL MOVIES FROM THE 'MOVIES' COLLECTION THAT HAVE RECEIVEDAN AWARD.

```
DB.MOVIES.FIND({ "AWARDS.WINS": { $GT: 0 } });
```

```
> db.movies.find({ "awards.wins": { $gt: 0 } });
< {
    _id: ObjectId('573a1390f29313caabcd42e8'),
    plot: 'A group of bandits stage a brazen train hold-up, only to find a determined posse hot on their heels.',
    genres: [
      'Short',
      'Western'
    ],
    runtime: 11,
    cast: [
      'A.C. Abadie',
      "Gilbert M. 'Broncho Billy' Anderson",
      'George Barnes',
      'Justus D. Barnes'
    ],
    poster: 'https://m.media-amazon.com/images/M/MV5BMTU3NjE5NzYtYTYyNS00MDVmLWIwYjgtMmYwYWIxZDYyNzU2XkEyXkFqcGdeQXVyNzQzNzQxNzI@._V1_SY1000
    title: 'The Great Train Robbery',
    fullplot: "Among the earliest existing films in American cinema - notable as the first film that presented a narrative story to tell - i
    languages: [
      'English'
    ],
    released: 1903-12-01T00:00:00.000Z,
    directors: [
      'Edwin S. Porter'
    ],
    rated: 'TV-G',
    awards: {
      wins: 1,
```

12. 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.

```
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
```

```
    }
);
```

```
>_MONGOSH
{
  _id: ObjectId('573a1390f29313caabcd42e9'),
  genres: [
    'Adventure',
    'Fantasy'
  ],
  runtime: 95,
  cast: [
    'Ethan Hawke',
    'Jane Doe',
    'Mark Strong'
  ],
  title: 'The Amulet Quest',
  languages: [
    'English'
  ],
  released: 2008-07-15T00:00:00.000Z,
  directors: [
    'John Smith'
  ],
  awards: {
    wins: 2,
    nominations: 1,
    text: '2 wins & 1 nomination.'
  },
  year: 2008,
  countries: [
    'USA'
```

13. 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".

```
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
  }
);
```

14. RETRIEVE ALL MOVIES WITH TITLE, LANGUAGES, RELEASED, DIRECTORS, WRITERS, COUNTRIES FROM THE 'MOVIES' COLLECTION IN MONGODB THATRELEASED ON MAY 9, 1893.

```
DB.MOVIES.FIND(
  { RELEASED: ISODATE("1893-05-09T00:00:00Z") },
  {
    TITLE: 1,
    LANGUAGES: 1,
    RELEASED: 1,
    DIRECTORS: 1,
    WRITERS: 1,
    COUNTRIES: 1
  }
);
```

14. RETRIEVE ALL MOVIES WITH TITLE, LANGUAGES, RELEASED, DIRECTORS, WRITERS, COUNTRIES FROM THE 'MOVIES' COLLECTION IN MONGODB THAT HAVE AWORD "SCENE" IN THE TITLE.

```
DB.MOVIES.FIND(
  { TITLE: { $REGEX: /SCENE/I } },
  {
    TITLE: 1,
    LANGUAGES: 1,
```

```
        RELEASED: 1,
        DIRECTORS: 1,
        WRITERS: 1,
        COUNTRIES: 1
    }
);
```

EX.NO.: 15		OTHER DATABASE OBJECTS
DATE:	25/10/2024	

1) CREATE A SEQUENCE TO BE USED WITH THE PRIMARY KEY COLUMN OF THE DEPT TABLE. THESEQUENCE SHOULD START AT 200 AND HAVE A MAXIMUM VALUE OF 1000. HAVE YOUR SEQUENCE INCREMENT BY TEN NUMBERS. NAME THE SEQUENCE DEPT_ID_SEQ.

```
CREATE SEQUENCE DEPT_ID_SEQ
START WITH 200
INCREMENT BY 10
MAXVALUE 1000
NOCACHE
NOCYCLE;
```

2. WRITE A QUERY IN A SCRIPT TO DISPLAY THE FOLLOWING INFORMATION ABOUT YOUR SEQUENCES:SEQUENCE NAME, MAXIMUM VALUE, INCREMENT SIZE, AND LAST NUMBER

```
SELECT SEQUENCE_NAME,
    MAX_VALUE,
    INCREMENT_BY,
    LAST_NUMBER
FROM USER_SEQUENCES;
```

Results | Explain | Describe | Saved SQL | History

SEQUENCE_NAME	MAX_VALUE	INCREMENT_BY	LAST_NUMBER
DEPT_ID_SEQ	1000	10	200
ISEQ$$_323104505	9999999999999999999999999999	1	41
ISEQ$$_323114704	9999999999999999999999999999	1	21

3 rows returned in 0.03 seconds Download

3 WRITE A SCRIPT TO INSERT TWO ROWS INTO THE DEPT TABLE. NAME YOUR SCRIPT LAB12_3.SQL. BESURE 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.

```
INSERT INTO DEPT (DEPT_ID, DEPT_NAME)
```

```
VALUES (DEPT_ID_SEQ.NEXTVAL,
'EDUCATION');


INSERT INTO DEPT (DEPT_ID, DEPT_NAME)
```

```
values (dept_id_seq.nextval, 'administration');

select * from dept
where dept_name in ('education', 'administration');
```

DEPT_ID	DEPT_NAME
210	Administration
200	Education

2 rows returned in 0.04 seconds Download

4. create a non unique index on the foreign key column (department_id) in the employees table.

```
create index employees_department_id_idxon
employees (department_id);
```

5. display the indexes and uniqueness that exist in the data dictionary for the emp table.

```
select index_name, uniquenessfrom
user_indexes
where table_name = 'employees';
```

INDEX_NAME	UNIQUENESS
EMPLOYEES_DEPARTMENT_ID_IDX	NONUNIQUE
SYS_C0016368072S	UNIQUE

2 rows returned in 0.05 seconds Download

Ex.no.: 16		CONTROLLING USER ACCESS
Date:	01/11/2024	

1. WHAT PRIVILEGE SHOULD A USER BE GIVEN TO LOG ON TO THE ORACLE SERVER? IS THIS A SYSTEMOR AN OBJECT PRIVILEGE?

THE PRIVILEGE A USER SHOULD BE GIVEN TO LOG ON TO THE ORACLE SERVER IS THE CREATESESSION PRIVILEGE.

TYPE OF PRIVILEGE: THIS IS A SYSTEM

PRIVILEGE.GRANT CREATE SESSION TO

USERNAME;

2. WHAT PRIVILEGE SHOULD A USER BE GIVEN TO CREATE TABLES?

THE USER NEEDS THE CREATE TABLE PRIVILEGE.
THE CREATE TABLE PRIVILEGE ALLOWS THE USER TO CREATE NEW TABLES IN THEIR OWN SCHEMA.

GRANT CREATE TABLE TO USERNAME;

3. IF YOU CREATE A TABLE, WHO CAN PASS ALONG PRIVILEGES TO OTHER USERS ON YOUR TABLE?

WHEN YOU CREATE A TABLE, ONLY YOU AS THE TABLE OWNER (OR A USER WITH THE ADMIN OPTIONOR GRANT ANY PRIVILEGE SYSTEM PRIVILEGE) CAN GRANT PRIVILEGES ON YOUR TABLE TO OTHERUSERS.

GRANT SELECT ON YOUR_TABLE TO OTHER_USER;

4. YOU ARE THE DBA. YOU ARE CREATING MANY USERS WHO REQUIRE THE SAME SYSTEMPRIVILEGES. WHAT SHOULD YOU USE TO MAKE YOUR JOB EASIER?

AS A DBA, TO SIMPLIFY THE PROCESS OF GRANTING THE SAME SYSTEM PRIVILEGES TO MULTIPLEUSERS, YOU SHOULD USE ROLES.

```
CREATE ROLE MY_ROLE;

GRANT CREATE SESSION TO
MY_ROLE;GRANT CREATE TABLE TO
MY_ROLE;

GRANT MY_ROLE TO
USER1;GRANT MY_ROLE
TO USER2;
```

5. WHAT COMMAND DO YOU USE TO CHANGE YOUR PASSWORD?

```
ALTER USER USERNAME IDENTIFIED BY NEW_PASSWORD;
```

6. GRANT ANOTHER USER ACCESS TO YOUR DEPARTMENTS TABLE. HAVE THE USER GRANT YOUQUERY ACCESS TO HIS OR HER DEPARTMENTS TABLE.

GRANT ACCESS TO YOUR `DEPARTMENTS` TABLE

```
GRANT SELECT ON YOUR_USERNAME.DEPARTMENTS TO OTHER_USER;
```

GRANT QUERY ACCESS TO OTHER USER'S `DEPARTMENTS` TABLE

```
GRANT SELECT ON OTHER_USER.DEPARTMENTS TO YOUR_USERNAME;
```

7. QUERY ALL THE ROWS IN YOUR DEPARTMENTS TABLE.

```
SELECT * FROM DEPARTMENT;
```

Results | Explain | Describe | Saved SQL | History

DEPT_ID	DEPT_NAME	MANAGER_ID	LOCATION_ID	COUNTRY_ID	MANAGER_NAME
70	HR	800	2	IND	don
25	executive	400	10	AFG	king
50	manager	200	10	US	king
80	stock clerk	150	19	UK	riyaan
45	IT support	400	13	IS	bell
15	sales manager	250	7	AFG	root

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.

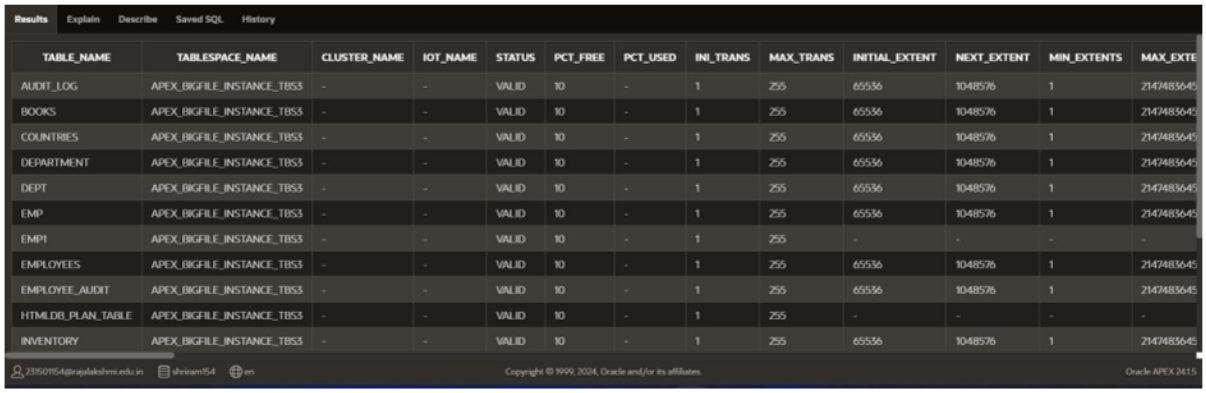
```
INSERT INTO DEPARTMENT(DEPT_ID,
DEPT_NAME,MANAGER_ID,LOCATION_ID,COUNTRY_ID,MANAGE
R_NAME)VALUES (500, 'EDUCATION',300,12,'BAN','BALL');

INSERT INTO DEPARTMENT(DEPT_ID,
DEPT_NAME,MANAGER_ID,LOCATION_ID,COUNTRY_ID,MANAGE
R_NAME)VALUES (510, 'HUMAN
RESOURCES',150,10,'AUS','JOHN');


SELECT * FROM DEPARTMENT;
```

Results | Explain | Describe | Saved SQL | History

DEPT_ID	DEPT_NAME	MANAGER_ID	LOCATION_ID	COUNTRY_ID	MANAGER_NAME
510	Human Resources	150	10	AUS	john
500	Education	300	12	BAN	ball

9. QUERY THE USER_TABLES DATA DICTIONARY TO SEE INFORMATION ABOUT THE TABLES THAT YOUOWN.

```
SELECT * FROM USER_TABLES;
```



Results | Explain | Describe | Saved SQL | History

TABLE_NAME	TABLESPACE_NAME	CLUSTER_NAME	IOT_NAME	STATUS	PCT_FREE	PCT_USED	INI_TRANS	MAX_TRANS	INITIAL_EXTENT	NEXT_EXTENT	MIN_EXTENTS	MAX_EXTE
AUDIT_LOG	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
BOOKS	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
COUNTRIES	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
DEPARTMENT	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
DEPT	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMP	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMP1	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	-	-	-	-
EMPLOYEES	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMPLOYEE_AUDIT	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
HTMLDB_PLAN_TABLE	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	-	-	-	-
INVENTORY	APEX_BIGFILE_INSTANCE_TBS3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645

10. REVOKE THE SELECT PRIVILEGE ON YOUR TABLE FROM THE OTHER TEAM.

```
REVOKE SELECT ON TEAM1_USER.DEPARTMENTS FROM OTHER_USER;
```

11. REMOVE THE ROW YOU INSERTED INTO THE DEPARTMENTS TABLE IN STEP 8 AND SAVE THECHANGES.

```
DELETE FROM DEPARTMENT
WHERE DEPT_ID IN (500, 510);
```