

**RAJALAKSHMI ENGINEERING COLLEGE**  
**RAJALAKSHMI NAGAR, THANDALAM – 602 105**



**RAJALAKSHMI  
ENGINEERING COLLEGE**

**CS23332**  
**DATABASE MANAGEMENT SYSTEMS**

**Laboratory Observation Note Book**

Name : ASWIN J  
.....

Year / Branch / Section : 2<sup>nd</sup> Year/ AIML / A

Register No. : 231501026

Semester : 3<sup>rd</sup> Semester

Academic Year : 2024-2025

## **CS23332 DATABASE MANAGEMENT SYSTEMS**

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<b>Ex.No.: 1</b>	
<b>Date:</b>	24/7/24

## **CREATION OF BASE TABLE AND DML OPERATIONS**

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)
```

```
);
```

Object Type	Name	Object Name	Owner	MY_EMPLOYEE				
Name	Column	Data Type	Length	Precision	Scale	Nullable	Default	Comment
MY_EMPLOYEE	ID	NUMBER	4	0		✓		
	LAST_NAME	VARCHAR2	25			✓		
	FIRST_NAME	VARCHAR2	25			✓		
	USERID	VARCHAR2	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;
```

ID	LAST_NAME	FIRST_NAME	USERID	SALARY
1	Dancs	Betty	Betdan	800
4	Wentz	David	Davidwentz	700
5	Hirel	Kyle	Kylehirel	900
6	Wrt	Ben	Benwrt	1000
7	Raporter	Adeleye	Adeleyeraporter	900

Execution time: 0.00 seconds. [Download](#)

- 4) POPULATE THE NEXT TWO ROWS OF DATA FROM THE SAMPLE DATA. CONCATENATE THE 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';
```

ID	LAST_NAME	FIRST_NAME	USERID	SALARY
1	Dancs	Betty	Betdan	800
3	Wrt	Ben	Benwrt	1000
4	Wentz	David	Davidwentz	700
5	Raporter	Adeleye	Adeleyeraporter	900

Execution time: 0.00 seconds. [Download](#)

- 6) EMPTY THE FOURTH ROW OF

THE EMP TABLE [DELETE FROM](#)

MY\_EMPLOYEE  
WHERE ID = 5;

	LAST_NAME	FIRST_NAME	DISCND	SALARY
1	Koch	Ralph	0.00	600
2	Don	Dora	0.00	1000
3	Hessman	Chad	0.00	700

7) MAKE THE DATA ADDITIONS

PERMANENT**COMMIT**;

8) CHANGE THE LAST NAME OF EMPLOYEE 3 TO DREXLER

```
UPDATE MY_EMPLOYEE  
SET LAST_NAME =  
"DREXLER" WHERE ID = 3;
```

ID	LAST_NAME	FIRST_NAME	GRADE	SALARY
1	Tucker	Ralph	level1	900
2	Weller	Bob	level1	1000
3	Harrison	Carol	Chairman	900

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

9) CHANGE THE SALARY TO 1000 FOR ALL THE EMPLOYEES WITH A SALARY LESS THAN 900.

```
UPDATE  
MY_EMPLOYEE SET  
SALARY = 1000  
WHERE SALARY < 900;
```

ID	LAST_NAME	FIRST_NAME	GRADE	SALARY
1	Tucker	Ralph	level1	1000
2	Drexler	Bob	level1	1000
3	Harrison	Carol	Chairman	1000

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

<b>EX.NO.: 2</b>	
<b>DATE :</b>	26/07/24

## DATA MANIPULATIONS

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

EMPLOYEES

`SELECT 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 Bieber
2 rows returned in 0.04 seconds

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 ,`

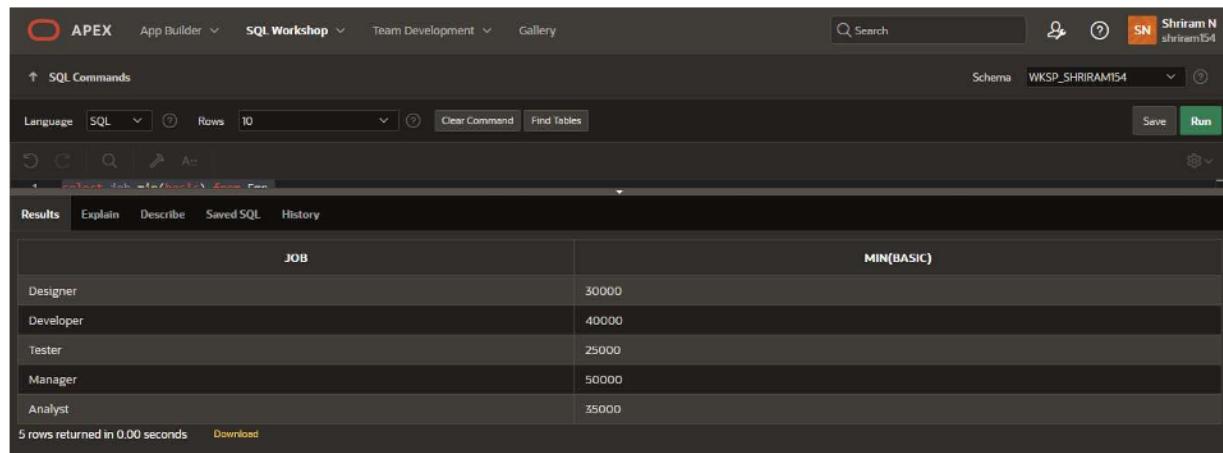
```
102, 'JANE SMITH', 'DEVELOPER', 40000, 12000, 16000, 4800,0,0 ,  
103, 'ALICE JOHNSON', 'ANALYST', 35000, 10500, 14000, 4200,0,0 ,  
104, 'BOB BROWN', 'DESIGNER', 30000, 9000, 12000, 3600,0,0 ,  
105, 'CHARLIE DAVIS', 'TESTER', 25000, 7500, 10000, 3000,0,0  
)
```

```
UPDATE EMP  
SET GROSSPAY =  
BASIC+DA+HRA  
WHERE  
GROSSPAY = 0;
```

```
UPDATE EMP  
SET NETPAY =  
GROSSPAY - PF  
WHERE  
NETPAY = 0;
```

(b) DISPLAY THE EMPLOYEES WHOSE BASIC IS LOWEST IN

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



JOB	MIN(BASIC)
Designer	30000
Developer	40000
Tester	25000
Manager	50000
Analyst	35000

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;**

DEPT									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPT	ID	NUMBER	-	7	0	-	✓	-	-
	NAME	VARCHAR2	25	-	-	-	✓	-	-

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

```

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

```

**DESC EMP1;**

EMP1									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
EMP1	ID	NUMBER	-	7	0	-	✓	-	-
	FIRST_NAME	VARCHAR2	25	-	-	-	✓	-	-
	LAST_NAME	VARCHAR2	25	-	-	-	✓	-	-
	DEPT_ID	NUMBER	-	7	0	-	✓	-	-

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

50)

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

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
EMP1	ID	NUMBER	-	7	0	-	✓	-	-
	FIRST_NAME	VARCHAR2	25	-	-	-	✓	-	-
	LAST_NAME	VARCHAR2	50	-	-	-	✓	-	-
	DEPT_ID	NUMBER	-	7	0	-	✓	-	-

23rdOHS-dataanalysisin  
shiranid54  
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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 COLOUMLNS.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		<a href="#">Download</a>			

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 <a href="#">Download</a>					

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	-	✓	-	-

<b>EX.NO.: 3</b>	<b>WRITING BASIC SQL SELECT STATEMENTS</b>
<b>DATE :</b> 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_NAME SAL*12 ANNUAL
SALARY
FROM
EMPLOYEES;
```

FALSE

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

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

EMPLOYEE_ID	LAST_NAME	ANNUAL SALARY
2	Stone	66000
10	Rudd	30000
11	Lamont	86400
20	Olsen	87600
25	Austin	116400
27	Goldblum	42000
5	Downey	108000
18	Gillan	82800
21	Mackie	48000
22	Stan	108000

More than 10 rows available. Increase rows selector to view more rows.  
10 rows returned in 0.02 seconds [Download](#)

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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	Stew002	Stone	01/05/1990
10	Appl010	Rudd	04/06/1989
11	Mkt011	Larson	10/01/1989
20	Res020	Olsen	09/16/1989
25	Itm025	Austin	05/14/1989
27	Appl027	Callahan	03/22/1990
3	Itm003	Downey	04/04/1985
19	Appl018	Gillen	11/28/1987
21	Res021	Mackie	09/23/1978
22	Itm022	Stan	08/13/1982

More than 10 rows available. Increase rows selector to view more rows.  
10 rows returned in 0.01 seconds - Detailed

4) PROVIDE AN ALIAS STARTDATE FOR THE  
HIRE DATE. SELECT HIRE\_DATE AS  
"STARTDATE" FROM EMPLOYEES;

Results	Explain	Describe	Show SQL	History
STARTDATE				
11/05/1990				
04/09/1969				
10/21/1969				
02/16/1989				
05/14/1969				
10/22/1952				
10/13/1965				
11/28/1987				
09/25/1976				
08/15/1962				

5) CREATE A QUERY TO DISPLAY UNIQUE JOB CODES FROM THE EMPLOYEE TABLE.  
SELECT DISTINCT(JOB\_ID) FROM EMPLOYEES;

Results	Explain	Describe	Saved SQL	History
JOB_ID				
#se005				
#am006				
#th024				
#rh009				
#se004				
#tw030				
#lg008				
#kg028				
#jo001				
#ch007				

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;
```

Results	Explain	Describe	Save SQL	History
EMPLOYEE AND TITLE				
Stone , #es002				
Rudd , #pr010				
Larson , #fh011				
Olsen , #eo020				
Austin , #ch025				
Goldblum , #tg027				
Downey , #rd008				
Gillan , #lg018				
Mackie , #am021				
Stan , #ss022				

7. CREATE A QUERY TO DISPLAY ALL THE DATA FROM THE EMPLOYEES TABLE. SEPARATE EACH COLUMN BY A 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;

```

THE_OUTPUT
2, Emma ,Stone ,emma002@gmail.com, 9840235751, 11/06/1990 ,#es002 ,5500 ,15 ,200 ,15
10, Paul ,Rudd ,paul010@gmail.com, 9840235751, 04/08/1969 ,#pr010 ,2500 ,16 ,250 ,30
11, Brie ,Larsen ,brie011@gmail.com, 9840235752 ,10/01/1989 ,#bl011 ,7200 ,18 ,400 ,35
20, Elizabeth ,Olson ,elizabeth020@gmail.com, 9840235753 ,02/16/1989 ,#eo020 ,7800 ,12 ,800 ,90
25, Cate ,Austin ,cate025@gmail.com, 9840237556 ,05/14/1984 ,#cb025 ,9700 ,11 ,100 ,95
27, Jeff ,Goldblum ,jeff027@gmail.com, 9840237558 ,10/22/1992 ,#jg027 ,1000 ,15 ,200 ,75
5, Robert ,Downey ,robert005@gmail.com, 9840235754 ,04/04/1965 ,#rd005 ,9000 ,2 ,350 ,40
18, Karen ,Gillan ,karen018@gmail.com, 9840237529 ,11/28/1987 ,#kg018 ,6900 ,16 ,600 ,95
21, Anthony ,Mackie ,anthony021@gmail.com, 9840237532 ,09/23/1978 ,#am021 ,4000 ,15 ,850 ,30
22, Sebastian ,Stan ,sebastian022@gmail.com, 9840237535 ,08/15/1982 ,#ss022 ,9000 ,14 ,550 ,75
More than 10 rows available. Increase rows selector to view more rows.
10 rows returned in 0.01 seconds <a href="#">Download</a>

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<b>EX.NO.: 4</b>	<b>WORKING WITH CONSTRAINTS</b>
<b>DATE :</b> 02-08-2024	

- 1) ADD A TABLE-LEVEL PRIMARY KEY CONSTRAINT TO THE EMP TABLE ON THE ID COLUMN. THE CONSTRAINT SHOULD BE NAMED AT CREATION. NAME THE CONSTRAINT MY\_EMP\_ID\_PK.

```
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 NUMBER(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);

<b>EX.NO.: 5</b>	
<b>DATE :</b>	07/08/2024

## CREATING VIEWS

- 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;
```

The screenshot shows a table with three columns: EMPLOYEE\_ID, EMPLOYEE, and DEPARTMENT\_ID. The data is as follows:

EMPLOYEE_ID	EMPLOYEE	DEPARTMENT_ID
1	Justin Bieber	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

At the bottom, there are navigation links: Results, Explain, Describe, Saved SQL, History, and a user icon. The status bar at the bottom right says "Oracle APEX 24.1.5".

- 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';
```

The screenshot shows a table with two columns: VIEW\_NAME and TEXT. The data is as follows:

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

At the bottom, it says "1 rows returned in 0.04 seconds" and has a "Download" link. The status bar at the bottom right says "Oracle APEX 24.1.5".

- 4) USING YOUR EMPLOYEES\_VU VIEW, ENTER A QUERY TO DISPLAY ALL EMPLOYEES NAMES AND DEPARTMENT.

SELECT EMPLOYEE, DEPARTMENT\_ID

FROM EMPLOYEE\_VU;

EMPLOYEE	DEPARTMENT_ID
Emma Stone	15
Paul Rudd	30
Irene Lewan	25
Elizabeth Olson	90
Cate Austin	55
Jeff Goldblum	75
Robert Downey	40
Karen Gillan	65
Anthony Modolo	50
Sebastian Stan	15

- 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
25	Benedict Cumberbatch	50

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

DESC DEPT50;

Object Type: VIEW Object: DEPT50									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPT50	EMPNO	NUMBER	-	6	0	-	-	-	-
	EMPLOYEE	VARCHAR2	45	-	-	-	✓	-	-
	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.DEPARTMENT_NAME  
AS DEPARTMENT, E.SALARY  
AS SALARY, J.GRADE_LEVEL  
AS GRADE  
FROM EMPLOYEES  
EJOIN DEPARTMENT  
D  
ON E.DEPARTMENT_ID =  
D.DEPARTMENT_IDJOIN JOB_GRADE J  
ON E.SALARY BETWEEN J.LOWEST_SAL AND J.HIGHEST_SAL;
```

EMPLOYEE	DEPARTMENT	SALARY	GRADE
Austin	manager	6800	5
Bautista	HR	6000	5
Holland	manager	6000	5
Mackie	accounts manager	4000	2
Goldsburgh	HR	3500	2
Goldsburgh	HR	3500	4
Rudd	accounts manager	2500	2
Rudd	accounts manager	2500	4

<b>EX.NO.: 6</b>	
<b>DATE :</b>	14/08/24

## RESTRICTING AND SORTING DATA

- 1) CREATE A QUERY TO DISPLAY THE LAST NAME AND SALARY OF EMPLOYEES EARNING MORE THAN 12000.

```
SELECT SALARY , LAST_NAME FROM
EMPLOYEES WHERE SALARY > 12000;
```

SALARY	LAST_NAME
13500	Austin

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

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

```
SELECT LAST_NAME , DEPARTMENT_ID
FROM EMPLOYEES WHERE 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 IN THE 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	12500
Bullock	4000
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 BETWEEN FEBRUARY 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 AND 50 IN ALPHABETICAL ORDER BY NAME.

```
SELECT LAST_NAME, DEPARTMENT_ID
FROM EMPLOYEES WHERE 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 12000 AND 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 EMPLOYEES WHERE 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
Stern	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 NULL, ORDER BY)

SELECT LAST\_NAME, SALARY, COMMISSION\_PCT FROM EMPLOYEES WHERE COMMISSION\_PCT IS NOT NULL ORDER BY SALARY, COMMISSION\_PCT DESC;

LAST_NAME	SALARY	COMMISSION_PCT
Klementeff	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

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

NAME IS A.

```
SELECT LAST_NAME FROM  
EMPLOYEES WHERE  
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	7300	stock clerk
1 rows returned in 0.01 seconds		
Download		

<b>EX.NO.: 7</b>	
<b>DATE :</b>	27/08/2024

## USING SET OPERATORS

- 1) THE HR DEPARTMENT NEEDS A LIST OF DEPARTMENT IDS FOR DEPARTMENTS THAT DO NOT CONTAIN THE JOB ID ST\_CLERK. USE SET OPERATORS TO CREATE THIS REPORT.

```
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 CREATE THIS 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 AND DEPARTMENT 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 DOING THEIR 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 DEPARTMENTS TABLE, 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](#)

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

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

```
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 THE DEPARTMENT 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 CITY OF 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
Mackie	accounts manager
Stan	HR
Evans	data analyst
Boseman	HR
Holland	manager
Bautista	HR
Cumberbatch	manager
charles	Sales manager
charles	IT support

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- 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.DEPARTMENT_ID
FROM (DEPARTMENT D
INNER JOIN EMPLOYEES E ON D.DEPT_ID =
E.DEPARTMENT_ID)INNER 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

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- 7) MODIFY LAB4\_6.SQL TO DISPLAY ALL EMPLOYEES INCLUDING KING, WHO HAS NO MANAGER. ORDER THE 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

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

```
SELECT E.LAST_NAME AS "EMPLOYEE",D.DEPARTMENT_NAME AS
"DEPARTMENT_NAME",E.DEPARTMENT_ID AS "DEPARTMENT_NO" FROM
EMPLOYEES E
INNER JOIN DEPARTMENT D ON E.DEPARTMENT_ID = D.DEPARTMENT_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
Bosman	HR	70
Hiddleston	sales manager	100

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- 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 EMPLOYEE DAVIES.

```
SELECT LAST_NAME,HIRE_DATE FROM  
EMPLOYEES WHERE 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

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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

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

- 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 WHO WORK 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	Waltti
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, AND JOB 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_ID WHERE 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

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

- 5) CREATE A REPORT FOR HR THAT DISPLAYS THE LAST NAME AND SALARY OF EVERY EMPLOYEE WHO REPORTS 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
Auster	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 FOR EVERY 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_ID WHERE 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 WITH ANY 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](#)

<b>EX.NO.: 10</b>	
<b>DATE :</b>	20/09/2024

## **AGGREGATING DATA USING GROUP FUNCTIONS**

### **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 RESULT PER GROUP. TRUE/FALSE - **TRUE**
2. GROUP FUNCTIONS INCLUDE NULLS IN CALCULATIONS. TRUE/FALSE - **FALSE**
3. THE WHERE CLAUSE RESTRICTS ROWS PRIOR TO INCLUSION IN A GROUP CALCULATION. TRUE/FALSE - **FALSE**
  
  
  
- 4) FIND THE HIGHEST, LOWEST, SUM, AND AVERAGE SALARY OF ALL EMPLOYEES. LABEL THE COLUMNS MAXIMUM, MINIMUM, SUM, AND AVERAGE, RESPECTIVELY. ROUND YOUR RESULTS TO THE NEAREST WHOLE NUMBER

**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
15500	100	254500	7706

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

- 5) MODIFY THE ABOVE QUERY TO DISPLAY THE MINIMUM, MAXIMUM, SUM, AND AVERAGE SALARY FOR 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

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Oracle APEX 24.1.3

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

```
SELECT D.DEPARTMENT_NAME , COUNT(*) AS
NUMBEROFEmployeesFROM EMPLOYEES E
JOIN DEPARTMENT D ON E.DEPARTMENT_ID =
D.DEPARTMENT_IDGROUP BY D.DEPARTMENT_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

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 <a href="#">Download</a>	

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

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

DIFERENCE	
12400	
1 rows returned in 0.01 seconds <a href="#">Download</a>	

9) CREATE A REPORT TO DISPLAY THE MANAGER NUMBER AND THE SALARY OF THE LOWEST-PAID EMPLOYEE FOR THAT MANAGER. EXCLUDE ANYONE WHOSE MANAGER IS NOT KNOWN. EXCLUDE ANY GROUPS WHERE THE MINIMUM SALARY IS \$6,000 OR LESS. SORT THE OUTPUT IN DESCENDING ORDER OF SALARY.

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, THE NUMBER 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 EACHCOLUMN 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](#)

<b>EX.NO.: 11</b>	
<b>DATE :</b>	24/09/2024

## **PL SQL PROGRAMS**

### **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;

```

Results	Explain	Describe	Saved SQL	History
Incentive for employee ID 110 is 820 1 row(s) updated.  0.00 seconds				

**PROGRAM 2**

**WRITE A PL/SQL BLOCK TO SHOW AN INVALID CASE-SENSITIVE  
REFERENCE TO A QUOTED AND WITHOUT QUOTED USER-DEFINED  
IDENTIFIER.**

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

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

Results	Explain	Describe	Saved SQL	History
Employee Name: John Doe Employee ID: 40  Statement processed.  0.01 seconds				

### **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_SALARY
  FROM 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.

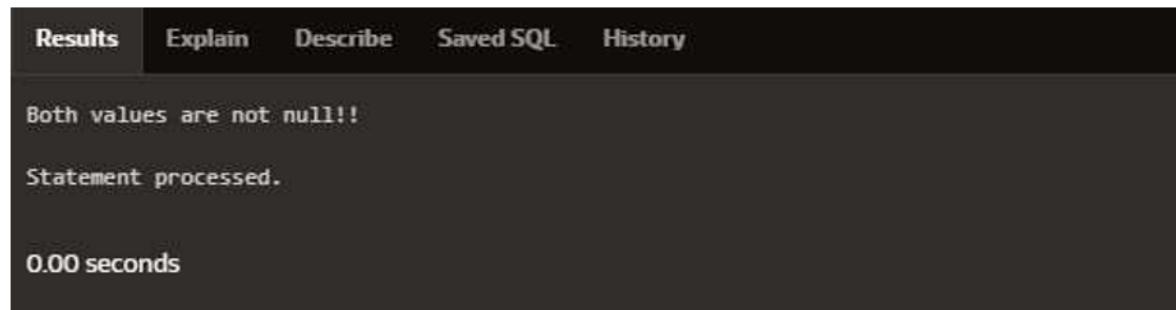
0.01 seconds
```

#### PROGRAM 4

WRITE A PL/SQL BLOCK TO CREATE A PROCEDURE USING THE "IS [NOT] NULL OPERATOR" AND SHOW 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;
```



The screenshot shows a database query interface with a toolbar at the top featuring 'Results' (selected), 'Explain', 'Describe', 'Saved SQL', and 'History'. The main area displays the following output:

```
Both values are not null!!
Statement processed.
0.00 seconds
```

## PROGRAM 5

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

DECLARE

```
V_EMPLOYEEENAME  
EMPLOYEES.FIRST_NAME%TYPE;  
V_EMPLOYEEID NUMBER := 122;
```

BEGIN

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

```
V_EMPLOYEEID;
```

```
DBMS_OUTPUT.PUT_LINE(V_EMPLOYEEENAME);
```

```
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\_LARGE VARIABLE.

```
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;
```

```
small number = 10
large number = 20
```

```
Statement processed.
```

```
0.01 seconds
```

## PROGRAM 7

WRITE A PL/SQL PROCEDURE TO CALCULATE THE INCENTIVE ON A TARGET ACHIEVED AND DISPLAY THEMMESSAGE 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 CHECK WHETHER 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 MANY VACANCIES ARE IN THAT DEPARTMENT.

```
DECLARE
    V_DEPARTMENT_ID NUMBER
    := 55;V_EMP_COUNT
    NUMBER; V_VACANCIES
    NUMBER := 50;
BEGIN
    SELECT COUNT(*) INTO
    V_EMP_COUNTRFROM
    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;
```

```
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, AND SALARIES 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: #b1011, 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 Bieber, 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 OF ALL 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 FROM EMPLOYEES
        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 FROM EMPLOYEES
    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
```

**PROGRAM 14**  
**WRITE A PL/SQL PROGRAM TO DISPLAY THE EMPLOYEE IDS, NAMES, AND JOB HISTORY START DATES OF 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;
```

```
ID: 2, Name: Emma Austin, Start Date: 11/06/1990
ID: 10, Name: Paul Rudd, Start Date: 04/06/1984
ID: 11, Name: Eric Zlotkow, Start Date: 10/01/1989
ID: 20, Name: Elizabeth Olsen, Start Date: 02/15/1989
ID: 25, Name: Cate Abc, Start Date: 05/14/1986
ID: 27, Name: Jeff Goldblum, Start Date: 10/22/1952
ID: 19, Name: Robert Downey, Start Date: 04/06/1975
ID: 21, Name: Karen Gillan, Start Date: 04/06/1987
ID: 23, Name: Jeremy Renner, Start Date: 04/23/1978
ID: 22, Name: Sebastian Stan, Start Date: 08/13/1982
ID: 28, Name: Karl Austin, Start Date: 08/09/1982
ID: 16, Name: Chris Morris, Start Date: 05/07/1994
ID: 6, Name: Mark Ruffalo, Start Date: 11/22/1967
ID: 12, Name: Chadwick Rosem, Start Date: 11/19/1976
ID: 24, Name: Tom Hiddleston, Start Date: 03/04/1981
ID: 31, Name: John Boyega, Start Date: 08/21/1992
ID: 8, Name: Jeremy Wilson, Start Date: 09/07/1971
ID: 7, Name: Chris Hemsworth, Start Date: 08/11/1983
ID: 9, Name: Tom Holland, Start Date: 06/06/1996
ID: 13, Name: Chris Austin, Start Date: 06/21/1979
ID: 17, Name: Dave Bautista, Start Date: 07/18/1969
ID: 26, Name: Tessa Thompson, Start Date: 10/05/1983
ID: 14, Name: Zoe Saldana, Start Date: 06/19/1978
ID: 30, Name: Benedict Cumberbatch, Start Date: 01/06/1976
ID: 42, Name: Mads roy, Start Date: 02/21/1991
ID: 4, Name: Scarlett Austin, Start Date: 11/22/1984
ID: 15, Name: Bradley Hook, Start Date: 02/05/1975
ID: 16, Name: Vin Diesel, Start Date: 07/07/1971
ID: 10, Name: Benedict andru, Start Date: 07/19/1970
ID: 39, Name: Taika Waititi, Start Date: 06/16/1975
ID: 48, Name: John Doe ., Start Date: 06/18/1995
ID: 29, Name: Idris Elba, Start Date: 09/06/1972
```

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## PROGRAM 15

WRITE A PL/SQL PROGRAM TO DISPLAY THE EMPLOYEE IDS, NAMES, AND JOB HISTORY END DATES OF 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;
```

```
ID: 2, Name: Emma Austin, End Date: Still Active
ID: 10, Name: Paul Rudd, End Date: Still Active
ID: 11, Name: Brie Zolikey, End Date: Still Active
ID: 20, Name: Elizabeth Olsen, End Date: Still Active
ID: 25, Name: Cate Abu, End Date: Still Active
ID: 27, Name: Jeff Goldblum, End Date: Still Active
ID: 122, Name: Robert Downey, End Date: Still Active
ID: 18, Name: Karen Gillan, End Date: Still Active
ID: 21, Name: Anthony Mackie, End Date: Still Active
ID: 22, Name: Sebastian Stan, End Date: Still Active
ID: 28, Name: Karl Austin, End Date: Still Active
ID: 176, Name: Chris Morris, End Date: Still Active
ID: 6, Name: Mark Ruffalo, End Date: Still Active
ID: 19, Name: Chadwick Rosman, End Date: Still Active
ID: 24, Name: Tom Hiddleston, End Date: Still Active
ID: 1, Name: Justin Belber, End Date: Still Active
ID: 8, Name: Jeremy Wilson, End Date: Still Active
ID: 7, Name: Chris Hemsworth, End Date: Still Active
ID: 9, Name: Tom Holland, End Date: Still Active
ID: 13, Name: Chris Austin, End Date: Still Active
ID: 17, Name: Dave Bautista, End Date: Still Active
ID: 26, Name: Tess Thompson, End Date: Still Active
ID: 14, Name: Zoe Austin, End Date: Still Active
ID: 19, Name: Pam Davies, End Date: Still Active
ID: 42, Name: Matroy, End Date: Still Active
ID: 4, Name: Scarlett Austin, End Date: Still Active
ID: 15, Name: Bradley Hook, End Date: Still Active
ID: 16, Name: Vin Diesel, End Date: Still Active
ID: 110, Name: Benedict Andru, End Date: Still Active
ID: 36, Name: Isika Waititi, End Date: Still Active
ID: 40, Name: John Doe, End Date: Still Active
ID: 29, Name: Idris Elba, End Date: Still Active
```

25150154@rajalakshmi.edu.in shivaram154

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<b>EX.NO.: 12</b>	
<b>DATE :</b>	1/10/2024

## PL SQL PROGRAMS

### 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;

```

Results	Explain	Describe	Saved SQL	History
The factorial of 10 is 3628800 Statement processed. 0.01 seconds				

## 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

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

### PROGRAM 1

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

```

CREATE OR REPLACE TRIGGER
PREVENT_PARENT_DELETION BEFORE 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 AS DEPARTMENT RECORDS EXIST.');
        END IF;
    END;

```

```

DELETE FROM
EMPLOYEES WHERE
EMPLOYEE_ID = 70;

```

The screenshot shows the Oracle SQL Developer interface with a query editor window. The query is:

```
DELETE FROM EMPLOYEES WHERE EMPLOYEE_ID = 70;
```

The results pane shows the following output:

```
Results Explain Describe Saved SQL History
```

ORA-20001: Cannot delete employee record as department records exist.  
ORA-06512: at "WKSP\_SHIRIRAM154.PREVENT\_PARENT\_DELETION", line 9  
ORA-04088: error during execution of trigger  
"WKSP\_SHIRIRAM154.PREVENT\_PARENT\_DELETION"

0.02 seconds

PROGRAM 2

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

```
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);
```

Results	Explain	Describe	Saved SQL	History
<pre>ORA-20001: Duplicate manager_id found: 400 ORA-00512: at "HRSP_SHIRIRAH154.PREVENT_DUPLICATE_MANAGER_ID", line 10 ORA-04085: error during execution of trigger "HRSP_SHIRIRAH154.PREVENT_DUPLICATE_MANAGER_ID"  1. INSERT INTO employees(employee_id, first_name, last_name, email, phone_number, hire_date, job_id, salary, commission_pct, manager_id, department_id) 2. VALUES (102, 'Jane', 'Smith', 'jsmith@sa11.com', '7383922241', '11/9/2000', 'ST_CLERK', 10000, 0.15, 400, 80)</pre>				
0.01 seconds				
23195154@nagulakshmi.edu.in  shirirah154				
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Oracle APEX 24.1				

### PROGRAM 3

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

```
CREATE OR REPLACE TRIGGER
RESTRICT_SALARY_INSERTION BEFORE 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 THE THRESHOLD 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);
```

The screenshot shows an Oracle SQL developer interface with a query editor and a results tab. The results tab displays an error message:

```
ORA-20004: Insertion denied: Total salary exceeds the threshold of 100000
ORA-00512: at "MSP.SHRIBRAV54.RESTRICT_SALARY_INSERTION", line 19
ORA-04080: error during execution of trigger
"MSP.SHRIBRAV54.RESTRICT_SALARY_INSERTION"
```

Below the error message, the SQL code for the insert operation is shown:

```
1. INSERT INTO employees (employee_id, first_name, last_name, email, phone_number,
hire_date, job_id, salary, commission_pct, manager_id, department_id)
2. 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 SPECIFIC COLUMNS AND LOGS THEM IN AN AUDIT TABLE.

```
CREATE OR REPLACE TRIGGER
AUDIT_CHANGES AFTER 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_TIMESTAMP
    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	IT_PROG	ST_OFRK	16-OCT-24 04:25:06.252580 PM	APPX_PUBLIC_USR
5	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 04.5917957508 PM	-	employee_id: 3, first_name: Ball, salary: 50000
3	DELETE	employees	3	APEX_PUBLIC_USER	16-OCT-24 04.4149.077471PM	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

## 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		
TRANSACTION_ID	AMOUNT	RUNNING_TOTAL
1	10000	10000
2	20000	30000
2 rows returned in 0.01 seconds <a href="#">Download</a>		

## PROGRAM 7

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

```
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_ORDER BEFORE INSERT ON
ORDERS
FOR EACH ROW
DECLARE
    V_STOCK_LEVEL NUMBER;
    V_PENDING_ORDERS
    NUMBER;
BEGIN
    SELECT
        STOCK_LEVEL INTO
        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

1 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](#)

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

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

**DB.RESTAURANTS.FIND(**

```
{
  $OR: [
    { CUISINE: { $NIN: ["AMERICAN", "CHINEES"] } },
    { NAME: { $REGEX: /^WIL/ } }
  ]
},
{
  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: {  
      $elemMatch:  
        H: {GRADE:  
          "A", SCORE:  
            11  
        }  
    },  
    {  
      RESTAURANT_ID: 1,  
      NAME: 1,  
      GRADES: 1,  
      _ID: 0  
    }  
);
```

```
< {  
  grades: [  
    {  
      date: 2014-03-03T00:00:00.003Z,  
      grade: 'A',  
      score: 3  
    },  
    {  
      date: 2013-09-11T00:00:00.003Z,  
      grade: 'A',  
      score: 7  
    },  
    {  
      date: 2013-01-24T00:00:00.003Z,  
      grade: 'A',  
      score: 11  
    },  
    {  
      date: 2011-11-23T00:00:00.003Z,  
      grade: 'A',  
      score: 5  
    },  
    {  
      date: 2011-03-10T00:00:00.003Z,  
      grade: 'B',  
      score: 13  
    }  
  ],  
}
```

**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": {  
      $elemMatch:  
        {  
          "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 ORDER ALONG 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 FOR THAT 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 COLLECTION WHERE 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'  
}  

```

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 LATITUDE AND 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 A SCORE 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: 2014-03-03T00:00:00Z,  
        grade: 'B',  
        score: 4  
    },  
    {  
        date: 2013-09-11T00:00:00Z,  
        grade: 'A',  
        score: 9  
    },  
    {  
        date: 2013-01-24T00:00:00Z,  
        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"] }  
};
```

```
_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
  }
]
```

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 AND A 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 AND A 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 AND A 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 AND A GRADE WITH A SCORE OF 6 AND ARE LOCATED IN THE BOROUGH OF MANHATTAN OR BROOKLYN, AND THEIR CUISINE IS NOT AMERICAN OR CHINESE.

```
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:  
            10  
        }  
    ]  
}
```

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 THAT RELEASED IN THE YEAR 1893.**

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

**2. FIND ALL MOVIES WITH FULL INFORMATION FROM THE 'MOVIES' COLLECTION THAT 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  
},  
COUNTRIES:  
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' COLLECTION THAT 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',  
  'WESTERN'  
  'R&B'  
,  
  RUNTIME:  
  11,CAST: [  
  'A.C. ABADIE',  
  "GILBERT M. 'BRONCHO BILLY'  
  ANDERSON",'GEORGE BARNES',  
  'JUSTUS D. BARNES'  
,  
  POSTER: 'HTTPS://M.MEDIA-  
AMAZON.COM/IMAGES/M/MV5BMTU3NJE5NZYTYYNS00MDVMLWIWYJG  
TMMYWYWIXDYYNZU2XKEYXKFQCGDEQXVYNQZNQXNZI@._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.  
SEVERAL SCENES 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  
},  
**COUNTRIES:**  
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" });
```

```
<  
  _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/MV5BMTU3NjESNzYtYTtyN500HDVmLWiwyjgtHwVvVWIxZDYyNzU2XkEyXkFqcGdeQKvYvNzQzNzQzI@_V1_SV1000_  
  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  
  languages: [  
    'English'  
,  
  released: 1903-12-01T00:00:00.000Z,  
  directors: [  
    'Edwin S.  
    ...  
  }>
```

#### 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 COMPLETE INFORMATION 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/MV5BMTU3NjE5NzYtYTYYNS00MDVmLWIwYgtMnYwYWIxZDYyNzU2XkEyXkFqcGdeQXVylzQzNzQxNzI@._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 - it depicts a gang of bandits robbing a passenger train of its gold cargo while the passengers sleep. The film was directed by Edwin S. Porter and was shot in a single continuous take of over ten minutes duration. It was the first feature-length motion picture ever made, and is considered a classic of early cinema. It is also the first film to have been registered with the Library of Congress.", 
  languages: [
    'English'
  ],
  released: 1903-12-01T00:00:00.000Z,
  directors: [
    'Edwin S. Porter'
  ],
}
```

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

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

```
> db.movies.find({ "imdb.rating": { $gt: 7 } });
< [
  {
    _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/MV5BMTU3NjE5NzYtYTYyNS00NDVmLWIwYjgtMmYwYWIxZDYyNzU2XkEyXkFqcGdeQXVyNzQzNzQxNzI@._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,

```

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

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: 128,
  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 RECEIVED AN 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.**

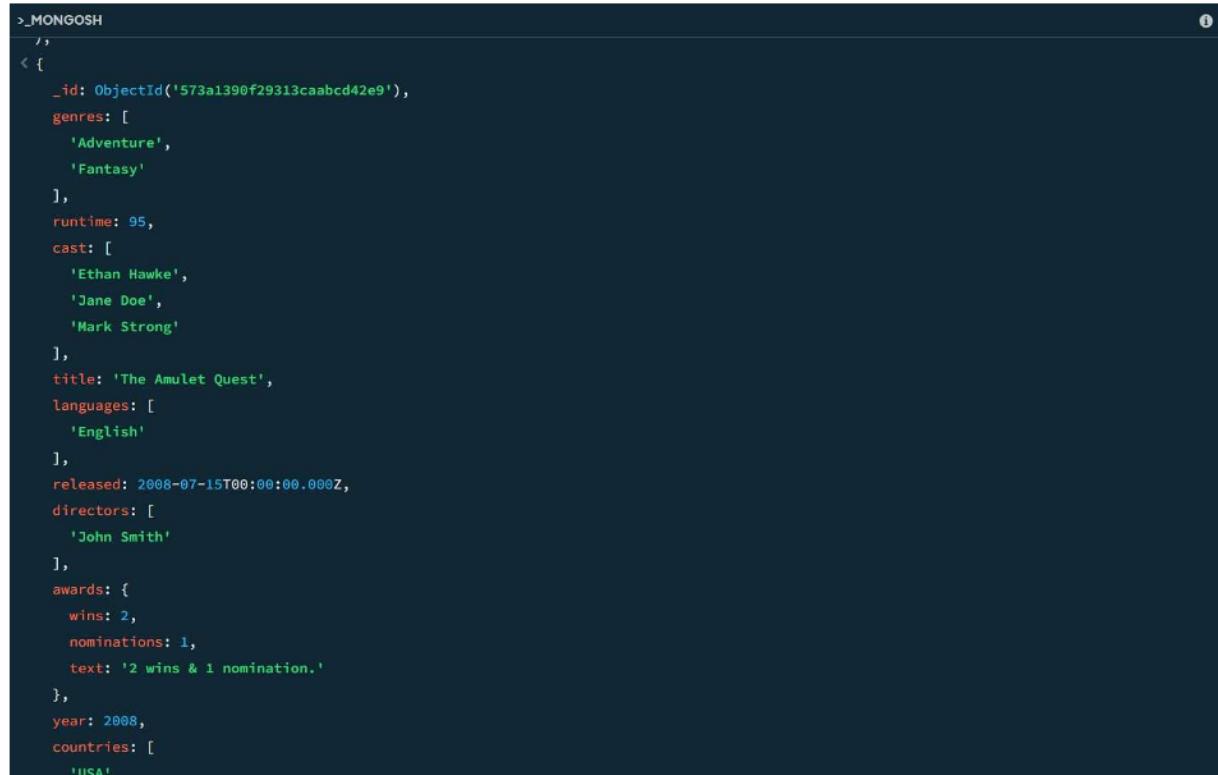
#### DB.MOVIES.FIND()

```

{ "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
}

```

```
    }
);
```



The screenshot shows a MongoDB shell session with the command `> MONGOSH`. The document being inserted is:

```
_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 THAT RELEASED 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 A WORD "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	
DATE: 25/10/2024	OTHER DATABASE OBJECTS

- 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	99999999999999999999	1	41	
ISEQ\$\$_323114704	99999999999999999999	1	21	

- 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 0.01 seconds [Download](#)

**4. create a non unique index on the foreign key column (department\_id) in the employees table.**

```

create index employees_department_id_idx
on employees (department_id);

```

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

```

select index_name, uniqueness
from user_indexes
where table_name = 'employees';

```

INDEX_NAME	UNIQUENESS
EMPLOYEES_DEPARTMENT_ID_IDX	NONUNIQUE
SYS_C00163680725	UNIQUE

2 rows returned in 0.05 seconds [Download](#)

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

**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	ryan
45	IT support	400	15	IS	bell
15	sales manager	750	7	AFG	root

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**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	bell

**9. QUERY THE USER\_TABLES DATA DICTIONARY TO SEE INFORMATION ABOUT THE TABLES THAT YOU OWN.**

`SELECT * FROM USER_TABLES;`

Results	Explain	Describe	Saved SQL	History								
TABLE_NAME	TABLESPACE_NAME	CLUSTER_NAME	IOT_NAME	STATUS	PCT_FREE	PCT_USED	INIT_TRANS	MAX_TRANS	INITIAL_EXTENT	NEXT_EXTENT	MIN_EXTENTS	MAX_EXTENT
AUDIT_LOG	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
BOOKS	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
COUNTRIES	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
DEPARTMENT	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
DEPT	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMP	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMP1	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	-	-	-	-
EMPLOYEES	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMPLOYEE_AUDIT	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
HTMLDB_PLAN_TABLE	APEX_BIGFILE_INSTANCE_TB\$3	-	-	VALID	10	-	1	255	-	-	-	-
INVENTORY	APEX_BIGFILE_INSTANCE_TB\$3	-	-	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);**