

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



**RAJALAKSHMI  
ENGINEERING COLLEGE**  
An AUTONOMOUS Institution  
Affiliated to ANNA UNIVERSITY, Chennai

**CS23332 - DATABASE MANAGEMENT  
SYSTEMS LAB**

**Laboratory Record Notebook**

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

Academic Year: **2023 - 2024**

# **CS23332 DATABASE MANAGEMENT SYSTEMS**

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<b>Ex.No.: 1</b>	<b>CREATION OF BASE TABLE AND DML OPERATIONS</b>
<b>Date:</b> 01/08/2024	

- 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		Table		Object		MY_EMPLOYEE			
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
MY_EMPLOYEE	ID	NUMBER	-	4	0	-	-	-	-
	LAST_NAME	VARCHAR	25	-	-	-	✓	-	-
	FIRST_NAME	VARCHAR	25	-	-	-	✓	-	-
	USERID	VARCHAR	25	-	-	-	✓	-	-
	SALARY	NUMBER	-	9	2	-	✓	-	-

- 2) Add the first row and second rows data to MY\_EMPLOYEE table from the 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
3	Dancs	Betty	bances	860
4	Hannan	Chad	Chneeman	750
1	Patel	Ralph	rpatel	895
2	Ben	Ben	BBen	1000
5	Roperbur	Anthony	amperbur	750

5 rows returned in 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 table`1

#### Delete from MY\_EMPLOYEE

Where FIRST\_NAME = ‘Betty’ and LAST\_NAME = ‘Dancs’;

ID	LAST_NAME	FIRST_NAME	USERID	SALARY
1	Patel	Ralph	rpatel	895
3	Ben	Ben	BBen	1000
4	Hannan	Chad	Chneeman	750
5	Roperbur	Anthony	amperbur	750

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

- 6) Empty the fourth row of the emp table

#### Delete from MY\_EMPLOYEE

Where ID = 5;

ID	LAST_NAME	FIRST_NAME	USERID	SALARY
1	Patel	Ralph	rpatel	895
3	Ben	Ben	BBen	1000
4	Hannan	Chad	Chneeman	750

- 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	USERID	SALARY
1	Patel	Ralph	rpatel	895
3	Drexler	Ben	bben	1000
4	Hinesman	Chad	CHinesman	790

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	USERID	SALARY
1	Patel	Ralph	rpatel	1000
3	Drexler	Ben	bben	1000
4	Hinesman	Chad	CHinesman	1000

3 rows returned in 0.00 seconds. [Download](#)

<b>Ex.No.: 2</b>	
<b>Date:</b>	08/08/2024

## **DATA MANIPULATIONS**

- a) Find out the employee id, names, salaries of all the employees

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
Hrie 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
Calle 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
Horn Klementeff

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

f) Display the unique Manager\_Id.

```
select DISTINCT(manager_id) from EMPLOYEES;
```

MANAGER_ID
400
700
350
800
250
450
600
500
900
000

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;
```

The screenshot shows the Oracle SQL Developer interface. The top navigation bar includes APEX, App Builder, SQL Workshop, Team Development, and Gallery. The right side shows the user 'Shriram N' and the schema 'WKSP\_SHRIRAMN'. The main area is titled 'SQL Commands' with a search bar and a 'Run' button. Below the toolbar, there are tabs for Language (SQL), Rows (10), Clear Command, Find Tables, Save, and Run. The results tab is selected, displaying a table with two columns: 'JOB' and 'MIN(BASIC)'. The data shows the minimum basic salary for each job: Designer (30000), Developer (40000), Tester (25000), Manager (50000), and Analyst (35000). At the bottom of the results pane, it says '5 rows returned in 0.00 seconds' and has a 'Download' link.

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;

Object Type: TABLE Object: DEPT									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPT	ID	NUMBER	-	7	0	-	✓	-	-
DEPT	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;

Object Type: TABLE Object: EMP1									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
EMP1	ID	NUMBER	-	7	0	-	✓	-	-
EMP1	FIRST_NAME	VARCHAR2	25	-	-	-	✓	-	-
EMP1	LAST_NAME	VARCHAR2	25	-	-	-	✓	-	-
EMP1	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			Y		
	FIRST_NAME	VARCHAR2	25				Y		
	LAST_NAME	VARCHAR2	20				Y		
	DEPT_ID	NUMBER	7	0			Y		

- 4) Create the EMPLOYEES2 table based on the structure of EMPLOYEES table. Include Only the Employee\_id, First\_name, Last\_name, Salary and Dept\_id coloumns.Name the columns Id, First\_name, Last\_name, salary and Dept\_id respectively.

```
create table EMPLOYEES2(
    ID Number(10),
    First_name varchar(50),
    Last_name varchar(50),
    Salary Number(10),
    Dept_id Number(10)
);
```

- 5) Drop the EMP1 table.

```
drop table EMP1;
```

- 6) Rename the EMPLOYEES2 table as EMP1.

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

- 7) Add a comment on DEPT and EMP1 tables. Confirm the modification by describing the 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';
```

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

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,lastname,salary,DEPT_id.
1 rows returned in 0.04 seconds				Download

8) Drop the First\_name column from the EMP table and confirm it.

```
ALTER TABLE EMP1  
drop column First_name;
```

Results	Explain	Describe	Saved SQL	History					
Object Type	TABLE	Object	EMP1						
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Multiset	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>Date:</b> 10/08/2024

## WRITING BASIC SQL SELECT STATEMENTS

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;
```

Handle	Lastname	Description	Serial No.	Actions
EMPLOYEE_ID	LAST_NAME		ANNUAL_SALARY	
2	Koch		48000	
3	Rudd		50000	
4	Lancaster		54450	
5	Oliver		57600	
6	Aubrey		60480	
7	Dickmann		62016	
8	Downey		68000	
9	Gilles		72000	
10	Mikkilineni		76000	
11	Stan		100000	

More than 10 rows available. Use the next/previous buttons to view more rows.  
10 rows returned in 0.02 seconds - 844ms

- 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 for each employee, with employee number appearing first.

select employee\_id , job\_id , last\_name , hire\_date from employees;

Results Explain Describe Saved SQL Filters

EMPLOYEE_ID	JOB_ID	LAST_NAME	HIRE_DATE
2	RESELL	Stone	11/06/1990
10	READE	Rudd	04/08/1995
11	LEADER	Lentz	10/01/1989
20	CLERK	Chen	03/15/1989
25	CLERK	Koch	05/14/1989
27	CLERK	Padmanabhan	11/12/1982
3	CLERK	Brennan	04/04/1983
4	CLERK	Giles	11/06/1987
21	CLERK	Mackie	08/28/1988
22	CLERK	Stan	08/10/1982

More than 10 rows available. Use scroll indicator to view more rows.  
10 rows returned in 0.01 seconds - borrowed

- 4) Provide an alias STARTDATE for the hire date.

select hire\_date as "STARTDATE" from employees;

Results	Explain	Describe	Send SQL	History
STAFFERS				
110567993				
144547959				
132975888				
02787989				
04747989				
101777992				
045047984				
110587997				
095227979				
08487982				
More than 10 rows available. Increase rows selector to view more rows.				
10 rows returned in 0.04 seconds <a href="#">Download</a>				
<a href="#">20000104@localhost</a> [innodb] [in] Copyright © 1995-2014, Oracle and/or its affiliates. Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Production				

5) Create a query to display unique job codes from the employee table.[select](#)

[distinct\(job\\_id\)](#) from employees;

Results	Explain	Describe	Send SQL	History
JOBLIST				
IT_Programmer				
IT_Prototype				
IT_Support				
IT_Visual_Artist				
IT_Video_Games				
IT_Wireless				
IT_World_Wide_Networks				
IT_World_Wide_Networks				
More than 10 rows available. Increase rows selector to view more rows.				
10 rows returned in 0.00 seconds <a href="#">Download</a>				
<a href="#">20000104@localhost</a> [innodb] [in] Copyright © 1995-2014, Oracle and/or its affiliates. Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Production				

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	Send SQL	History
EMPLOYEE AND TITLE				
Monia, #10022				
Rudd, #10110				
Lennart, #10011				
Oliver, #10000				
Audrey, #10025				
Giovanni, #10020				
Dorothy, #10004				
Samantha, #10005				
Mark, #10021				
Star, #10022				
More than 10 rows available. Increase rows selector to view more rows.				
10 rows returned in 0.00 seconds <a href="#">Download</a>				
<a href="#">20000104@localhost</a> [innodb] [in] Copyright © 1995-2014, Oracle and/or its affiliates. Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Production				

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 screenshot shows the Oracle SQL Developer interface with the 'Results' tab selected. The results pane displays the output of the query, which consists of 20 rows of employee data. Each row is a single cell containing the string 'THE\_OUTPUT' followed by a comma-separated list of employee details. The details include employee ID, first name, last name, email, phone number, hire date, job ID, salary, commission percentage, manager ID, and department ID. The results are presented in a table format with 20 rows and 1 column.

THE_OUTPUT
2, Enrico, Stone, emma000@gmail.com, 984022953, 11/05/1999, 446802, 5500, M, 200, 15
12, Paul, Rudd, paul27@gmail.com, 984322742, 03/04/1999, 446810, 2602, M, 200, 43
11, Lee, Lemon, brendt9@gmail.com, 984322592, 10/09/1999, 446811, 7209, W, 400, 35
20, Miles, B., Cleary, evan12345@gmail.com, 08/10/1994, 446812, 7600, M, 400, 10
25, Cliff, Austin, clifford0@gmail.com, 984322656, 06/01/1994, 446815, 9000, F, 300, 55
27, Jeff, Goldblum, jeffzigging@gmail.com, 984322708, 10/03/1994, 446817, 8000, M, 200, 76
8, Robert, Downey, robertd0@gmail.com, 984322749, 03/04/1990, 446818, 9000, M, 300, 49
16, Karen, Costa, karen000@gmail.com, 984322750, 11/05/1997, 446819, 4000, M, 400, 35
21, Anthony, Mackie, anthony000@gmail.com, 984322751, 07/03/1998, 446820, 8000, M, 300, 30
23, Sebastian, Stan, sebastian000@gmail.com, 984322753, 06/15/1987, 446822, 9000, M, 500, 15
More than 20 rows available. To see more, click the arrow icon.
20 rows returned in 0.01 seconds. Elapsed:

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Oracle Database 19c

<b>Ex.No.: 4</b>	<b>WORKING WITH CONSTRAINTS</b>
<b>Date:</b> 16/08/2024	

- 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> 23/08/2024	

## 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 for the employee name to EMPLOYEE.

```
create view EMPLOYEE_VU as
select employee_id , first_name || '' || last_name as "EMPLOYEE", department_id from
employees;
```

- 2) Display the contents of the EMPLOYEES\_VU view.

```
select * from EMPLOYEE_VU;
```

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

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- 3) Select the view name and text from the USER\_VIEWS data dictionary views.`select`

```
VIEW_NAME, TEXT
from USER_VIEWS
where VIEW_NAME = 'EMPLOYEE_VU';
```

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

1 rows returned in 0.04 seconds Download 2950545@oracle.com | shivam54 | en Copyright © 1999, 2024, Oracle and/or its affiliates. Oracle APEX 24.1.3

- 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	37
Keira Knightley	36
Frances O'Connor	37
Cate Blanchett	36
Jeff Bridges	75
Robert Downey Jr.	42
Karen Gillan	36
Anthony Mackie	30
Selena Gomez	75

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

```
CREATE VIEW DEPT50 AS
SELECT employee_id AS EMPNO,
       employee AS EMPLOYEE,
       department_id AS DEPTNO
  FROM EMPLOYEE_VU
 WHERE department_id = 50
 WITH READ ONLY;
```

DEPTNO	EMPLOYEE	DEPTNO
9	Tony Holland	50
10	Chris Austin	50
20	Benedict Cumberbatch	50

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

Desc dept50;

Results	Explain	Describe	Save SQL	History
Open Type	VFW	Dged	DEPT50	
Open Type: VFW    Dged: DEPT50				
Table	Column	Data Type	Length	Precision
DEPTNO	DEPTNO	NUMBER	-	6
DEPTNO	EMPLOYEE	VARCHAR2	45	-
DEPTNO	NUMBER	NUMBER	-	6

- 7) Attempt to reassign Matos to department 80.

```
UPDATE EMPLOYEES  
SET department_id = 80  
WHERE first_name = 'Matos';
```

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

```
CREATE VIEW SALARY_VU AS  
SELECT e.last_name AS Employee,  
       d.dept_name AS Department,  
       e.salary AS Salary, j.grade_level  
             AS Grade  
FROM EMPLOYEES e  
JOIN DEPARTMENT d  
ON e.department_id = d.dept_id  
JOIN JOB_GRADE j  
ON e.salary BETWEEN j.lowest_sal AND j.highest_sal;
```

EMPLOYEE				DEPARTMENT	SALARY	GRADE
Abhiram	Manager	5000	1			
Bardia	HR	6000	1			
Carlo	Manager	6000	1			
Matos	Accounts manager	4000	2			
Radha	HR	3000	2			
Salma	HR	3500	3			
Wael	Accounts manager	3000	2			
Yildiz	Accounts manager	2500	4			

<b>Ex.No.: 6</b>	<b>RESTRICTING AND SORTING DATA</b>
<b>Date:</b> 29/08/2024	

- 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
13500	Austin
14000	Austin
13500	Austin

6 rows returned in 0.01 seconds    Download

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

```
select last_name , department_id from employees
where employee_id = 176;
```

LAST_NAME	DEPARTMENT_ID
Evans	50

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
Goldbaum	3500
Musiker	11000
Austin	13500
Geller	4900
Austin	12500
Austin	13500
Austin	13500

Klementieff	1100
Austin	1090
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
Austin	42005	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	6000
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
Evers	05/07/1994

Brows 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
Chen	critical needs
Austin	data analyst
Goldbaum	HR
Madison	accounts manager
Stan	HR
Evers	data analyst
Boulton	HR

Brows 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
Klemensiek	100	3
Rudd	2500	10
Goldbaum	3500	15
Madison	4000	25
Casper	4500	35
Bleier	4900	1
Thompson	5200	10
Stone	5500	10
Holland	6000	15
Burke	7000	10

- 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	Save SQL	History
LAST_NAME				
Star				
Evans				
charles				
3 rows returned in 0.00 seconds				
<a href="#">Download</a>				

- 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%';
```

Results	Explain	Describe	Save SQL	History
LAST_NAME				
Marina				
Rousseau				
Cumberbatch				
Charles				
4 rows returned in 0.00 seconds				
<a href="#">Download</a>				

- 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 not
in(2500,3500,7000));
```

LAST_NAME	SALARY	DEPT_NAME
Oliver	7500	stock clerk
1 rows returned in 0.01 seconds		
<a href="#">Download</a>		

<b>Ex.No.: 7</b>	<b>USING SET OPERATORS</b>
<b>Date:</b> 30/08/2024	

- 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 department
minus
select department_id from employees
where job_id = 'ST_CLERK';
```

DEPT_ID
30
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_name
FROM countries c
LEFT JOIN department d ON c.country_id = d.country_id WHERE
d.country_id IS NULL;
```

COUNTRY_ID	COUNTRY_NAME
IS	Iceland

1 rows returned in 0.03 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_id
FROM employees
WHERE department_id IN (10, 50, 20)
ORDER BY department_id;
```

JOB_ID	DEPARTMENT_ID
ST_CLERK	10
#ca015	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_id
FROM employees INTERSECT
SELECT employee_id, job_id
FROM job_history;
```

EMPLOYEE_ID	JOB_ID
2	IPR010
20	PLUM
30	RE020
7	RE020
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 employees
UNION
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> 05/09/2024	

- 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_name
from employees e
join department d on e.department_id = d.dept_id;
```

LAST_NAME	DEPARTMENT_ID	DEPT_NAME
Rudd	30	accounts manager
Dixon	90	stock clerk
Austin	55	data analyst
Coldblum	75	HR
Mackie	30	accounts manager
Niles	75	HR
Evans	55	data analyst
Bosman	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_id
from department d
join employees e on d.dept_id = e.department_id
where department_id = 80;
```

	DEPT_NAME	LOCATION_ID
Sales manager		10
IT support		15
admin manager		16
Sales manager		10
IT support		15
admin manager		16
Sales manager		10
IT support		15
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.city
from department d
inner join employees e on d.dept_id = e.department_id
inner 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
Meeker	accounts manager	7	melbourne
Stan	HR	4	New York
Evens	data analyst	10	Washington
Bosman	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 an a(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_id
where 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 name for 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.department_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
Klemencic	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#" from
employees;
```

Employee	Emp#	Mgr#
Stone	2	200
Rudd	10	250
Larson	8	400
Oliver	20	800
Austin	22	100
Goldblum	27	200
Downey	3	350
Gilles	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#
Bekker	1	100
Stone	2	200
Downey	3	350
Austin	4	300
Rudd	6	250
Hartmann	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.dept_name as "department_name",e.department_id as
"department_no" from employees e
inner join department d on e.department_id = d.dept_id;
```

Employee	department_name	department_no
Rudd	accounts manager	30
Oliver	stock clerk	90
Austin	data analyst	56
Goldblum	HR	75
Mackie	accounts manager	40
Stan	HR	75
Inman	data analyst	56
Holloway	HR	70
Hilderman	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
Calem Austin	data analyst	18500	4
Chris Evans	data analyst	7500	4
Jeff Goldblum	HR	8500	7
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
Larsen	10/01/1989
Olsen	02/16/1989
Gillan	11/28/1987
Evans	05/03/1994
Heiter	04/23/1996
Holland	06/01/1996
Roy	02/23/1991
Charles	09/18/1993

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

```
SELECT last_name as "employee",hire_date as "employee hired" FROM employees;
```

employee	employee hired
Stone	11/05/1990
Rudd	04/04/1989
Larson	10/01/1989
Olsen	02/16/1989
Austin	05/14/1989
Goldblum	10/22/1982
Dowdney	04/04/1985
Gillan	11/28/1987
Mackie	09/23/1978

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<b>Ex.No.: 9</b>	
<b>Date:</b> 06/09/2024	<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 (excluding Zlotkey).

```
SELECT last_name, hire_date
FROM 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
Tire	09/05/1977
charles	09/08/1993

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

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

```
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	Harsworth	7800
16	Diesel	8000
17	Bosman	8100
23	Carles	8200
41	Charles	8400
22	Stan	9000
6	Downey	9100
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	Waldi
27	Goldblum
22	Stan
17	Bautista
25	Abu
176	Morris
23	andru

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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	50	ITSO25
Morris	50	40x005
Andra	50	ITSO28

3 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.salary
FROM 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	6000
Holland	6000
Austin	13200
Audem	5800
Goldblum	1500

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_id
FROM employees e
JOIN department d on e.department_id = d.dept_id
WHERE d.dept_name = 'executive';

```

DEPARTMENT_ID	LAST_NAME	JOB_ID
75	Goldbaum	ST_CLERK
75	Stetl	IT_PROG
25	Austin	IT_PROG
75	DeWitt	AD_BUYER
25	Diesel	IT_PROG

4 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.salary
FROM 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
5	Downey	9000
22	Stan	9000
29	Albu	18000
23	andru	8200

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

<b>Ex.No.: 10</b>	
<b>Date:</b> 12/09/2024	

## **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
13900	1100	254300	7706

3 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_id
group by dept_name;
```

MAXIMUM	MINIMUM	SUM	AVERAGE
4000	2500	6500	3250
13500	59500	18500	13500
7800	4500	12500	6250
13500	5200	28700	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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- 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.dept_name , COUNT(*) AS NumberOfEmployeesFROM Employees e
join department d on e.department_id = d.dept_idgroup by d.dept_name;
```

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

- 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	
6	
1 rows returned in 0.01 seconds	Download

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

```
select max(salary) - min(salary) as "DIFFERENCE" from
employees;
```

DIFFERENCE	
1400	
1 rows returned in 0.01 seconds	Download

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

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

MANAGER_ID	Lowest Salary
500	8000
600	7000
500	7500
800	7500
600	6900
500	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		?
1995		1

2 rows returned in 0.01 seconds    Download

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

```

select d.dept_name , sum(e.salary)
from employees e
join department d on e.department_id = d.dept_id
where
department_id in (20,50,80,90)
group by d.dept_name;

```

DEPT_NAME	SUM(SALARY)
clerk	1000
manager	9500

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	Y	2	6000
data analyst	X00	3	9755.55
stock clerk	Y9	1	4250
HR	Z	3	19000
admin manager	Y6	2	6500
manager	Y0	2	9500
research manager	Y	2	12500
researcher	4	5	6555.55
developer	1	1	15500
executive	10	2	10500

More than 10 rows available. Increase rows selector to view more rows.  
10 rows returned in 0.05 seconds. [Download](#)

Ex.No.: 11	
Date:	13/09/2024

## 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_salary
    FROM 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-insensitive reference to a quoted and without quoted user-defined identifier.

```
DECLARE
    employeeName VARCHAR2(100);
    "EmployeeID" NUMBER;
BEGIN
    employeeName := 'John Doe';
    "EmployeeID" := 40;

    DBMS_OUTPUT.PUT_LINE('Employee Name: ' || employeeName);
    DBMS_OUTPUT.PUT_LINE('Employee ID: ' || "EmployeeID");
END;
```

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_null;
END;
```

Results	Explain	Describe	Saved SQL	History
<pre>Both values are not null!!  Statement processed.  0.00 seconds</pre>				

## PROGRAM 5

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

```
declare
  v_employeename employees.first_name%type;
  v_employeeid NUMBER := 122;

begin
  select first_name into v_employeename
  from employees
  where first_name like '%e%' and employee_id = v_employeeid;

  DBMS_OUTPUT.PUT_LINE(v_employeename);

END;
```

## PROGRAM 6

Write a PL/SQL program to arrange the number of two variable in such a way that the small number will store in num\_small variable and large number will store in num\_largevariable.

```
declare
ab number :=10;
cd number :=20;
num_small number;
num_large number;
begin
if ab>cd then
num_small :=cd;
num_large :=ab;
else
num_small :=ab;
num_large :=cd;
end if;
dbms_output.put_line('small number ='||num_small);
dbms_output.put_line('large number ='||num_large); End;
```

```
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 themessage either the record updated or not.

```
create or replace procedure calculate_incentive(p_emp_id
employees.employee_id%type, p_target number)
is
    v_incentive number(7,2); v_salary
    employees.salary%type;
begin
    select salary into v_salary
    from 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 then
        v_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(122,500000);
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 manyvacancies are in that department.

```
declare
    v_department_id number := 55;
    v_emp_count number;
    v_vacancies number := 50;
begin
    select count(*) into v_emp_count
    from employees
    where department_id = v_department_id;

    if v_emp_count < v_vacancies then
        dbms_output.put_line('Vacancies available: ' || (v_vacancies - v_emp_count));
    else
        dbms_output.put_line('No vacancies available.');
    end if;
end;
```

```
Vacancies available: 47
```

```
Statement processed.
```

```
0.01 seconds
```

## PROGRAM 11

Write a PL/SQL program to display the employee IDs, names, job titles, hire dates, 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: 9036.84
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: 4800
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: 8800
ID: 24, Name: Tom Hiddleston, Job: #th024, Hire Date: 02/09/1981, Salary: 6500
ID: 1, Name: Justin Beiber, Job: ST_CLERK, Hire Date: 09/21/1996, Salary: 4900
ID: 8, Name: Jeremy Wilson, Job: #ja008, Hire Date: 01/07/1971, Salary: 13500
ID: 7, Name: Chris Hemsworth, Job: #ch007, Hire Date: 08/11/1983, Salary: 7800
ID: 9, Name: Tom Holland, Job: ST_CLERK, Hire Date: 06/01/1996, Salary: 6000
ID: 13, Name: Chris Austin, Job: #ca013, Hire Date: 06/21/1979, Salary: 13500
ID: 17, Name: Dave Bautista, Job: #db017, Hire Date: 01/18/1969, Salary: 6500
ID: 26, Name: Tessa Thompson, Job: ST_CLERK, Hire Date: 10/03/1983, Salary: 5200
ID: 14, Name: Zoe Austin, Job: #za014, Hire Date: 06/19/1978, Salary: 13500
ID: 19, Name: Pom Davies, Job: #pk019, Hire Date: 05/03/1986, Salary: 1100
ID: 42, Name: Matos roy, Job: #mr042, Hire Date: 02/23/1991, Salary: 7000
ID: 4, Name: Scarlett Austin, Job: #sa004, Hire Date: 11/22/1984, Salary: 13500
ID: 15, Name: Bradley Hook, Job: ST_CLERK, Hire Date: 01/05/1975, Salary: 4500
ID: 16, Name: Vin Diesel, Job: #vd016, Hire Date: 07/18/1967, Salary: 8000
ID: 110, Name: Benedict andru, Job: #bc023, Hire Date: 07/19/1976, Salary: 8200
ID: 38, 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_name from
    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_name);
  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: 39, 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: 7000
Job ID: 25, Title: executive, Min Salary: 13500
Job ID: 15, Title: sales manager, Min Salary: 4000
Statement processed.

0.025 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_date from
employees) loop
    dbms_output.put_line('ID: ' || rec.employee_id || ', Name: ' || rec.name || ', Start Date: '
|| rec.hire_date);
end loop;
end;
```

```
ID: 1, Name: Fenna Austin, Start Date: 11/05/1990
ID: 2, Name: Paul Rudd, Start Date: 04/06/2009
ID: 3, Name: Anna Kendrick, Start Date: 04/08/1990
ID: 4, Name: Kristen Bell, Start Date: 04/08/1990
ID: 5, Name: Cate Abbot, Start Date: 05/14/1998
ID: 6, Name: Jeff Goldblum, Start Date: 04/02/1962
ID: 7, Name: Robert Downey, Start Date: 06/04/1965
ID: 8, Name: Geren Miller, Start Date: 11/26/1997
ID: 9, Name: Anthony Mackie, Start Date: 09/22/1999
ID: 10, Name: Sebastian Stan, Start Date: 06/10/1982
ID: 11, Name: Karl Urban, Start Date: 06/07/1973
ID: 12, Name: Clark Gregg, Start Date: 06/12/1964
ID: 13, Name: Mark Ruffalo, Start Date: 11/22/1963
ID: 14, Name: Chadwick Boseman, Start Date: 11/28/1976
ID: 15, Name: Tom Hiddleston, Start Date: 03/09/1981
ID: 16, Name: Justin Timberlake, Start Date: 09/21/1996
ID: 17, Name: Jeremy Renner, Start Date: 01/09/1971
ID: 18, Name: Chris Hemsworth, Start Date: 06/31/1983
ID: 19, Name: Dan Holland, Start Date: 04/07/1990
ID: 20, Name: Zendaya, Start Date: 01/24/1999
ID: 21, Name: Jacob Batalon, Start Date: 04/07/1999
ID: 22, Name: Tom Holland, Start Date: 04/07/1999
ID: 23, Name: Tessa Thompson, Start Date: 10/03/1990
ID: 24, Name: Zoe Austin, Start Date: 06/10/1979
ID: 25, Name: Jon Favreau, Start Date: #N/A#/#N/A#
ID: 26, Name: Matt Ray, Start Date: 03/23/1995
ID: 27, Name: Scarlett Austin, Start Date: 11/22/1984
ID: 28, Name: Bradley Whitford, Start Date: 01/01/1971
ID: 29, Name: Cobie Smulders, Start Date: #N/A#/#N/A#
ID: 30, Name: Benedict Wong, Start Date: 05/16/1976
ID: 31, Name: Yalika Maitini, Start Date: 06/16/1976
ID: 32, Name: John Doe , Start Date: 06/18/1995
ID: 33, Name: Edita Coba, Start Date: #N/A#/#N/A#
```

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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;
```

```
20- 2, Name: Emma Austin, End Date: Still Active
20- 10, Name: Paul Rudd, End Date: Still Active
20- 15, Name: Dule Hill, End Date: Still Active
20- 20, Name: Elizabeth Olsen, End Date: Still Active
20- 25, Name: Edie Baskin, End Date: Still Active
20- 27, Name: Jeff Goldblum, End Date: Still Active
20- 122, Name: Robert Downey, End Date: Still Active
20- 16, Name: Karen Gillan, End Date: Still Active
20- 21, Name: Anthony Mackie, End Date: Still Active
20- 22, Name: Sebastian Stan, End Date: Still Active
20- 28, Name: Karen Gillan, End Date: Still Active
20- 116, Name: Chris Evans, End Date: Still Active
20- 6, Name: Mark Ruffalo, End Date: Still Active
20- 12, Name: Chadwick Boseman, End Date: Still Active
20- 29, Name: Tom Hiddleston, End Date: Still Active
20- 11, Name: Austin Stowell, End Date: Still Active
20- 8, Name: Kevin Feige, End Date: Still Active
20- 7, Name: Clark Gregg, End Date: Still Active
20- 9, Name: Tessa Thompson, End Date: Still Active
20- 13, Name: Idris Elba, End Date: Still Active
20- 17, Name: Chris Hemsworth, End Date: Still Active
20- 15, Name: Chris Evans, End Date: Still Active
20- 17, Name: Chris Evans, End Date: Still Active
20- 19, Name: Dave Bautista, End Date: Still Active
20- 26, Name: Tom Holland, End Date: Still Active
20- 18, Name: Clark Gregg, End Date: Still Active
20- 21, Name: Tessa Thompson, End Date: Still Active
20- 14, Name: Karen Gillan, End Date: Still Active
20- 23, Name: Benedict Cumberbatch, End Date: Still Active
20- 30, Name: Taika Waititi, End Date: Still Active
20- 40, Name: John Boyega, End Date: Still Active
20- 29, Name: Idris Elba, End Date: Still Active
```

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Ex.No.: 12	PL SQL PROGRAMS
Date: 19/09/2024	

## Program 1

### FACTORIAL OF A NUMBER USING FUNCTION

```

DECLARE
  n NUMBER := 10;
  result NUMBER;

  FUNCTION itfact(num NUMBER) RETURN NUMBER IS
    fact 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
<p>The factorial of 10 is 3628800</p> <p>Statement processed.</p> <p>0.01 seconds</p>				

## Program 2

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

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

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

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

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

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

Statement processed.

0.02 seconds

Ex.No.: 13	
Date: 20/09/2024	WORKING WITH TRIGGERS

### 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 the following details:

- Toolbar: Results, Explain, Describe, Saved SQL, History.
- SQL Editor: The command `DELETE FROM employees WHERE employee_id = 70;` is entered.
- Output Area: A yellow box highlights the error message:
 

```

00070001: Cannot delete employee record as department records exist.
00070001: at "HRSP$SRV$00000054.PREVNT_PARENT_DELETION", line 9
00070000: error during execution of trigger
"HRSP$SRV$00000054.PREVNT_PARENT_DELETION"
      
```
- Timing: 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_id
BEFORE 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_id
    AND employee_id != :NEW.employee_id; IF
    pl_count > 0 THEN
        RAISE_APPLICATION_ERROR(-20003, 'Duplicate manager_id found: ' ||
:NEW.manager_id);
    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);
```

The screenshot shows the Oracle SQL Developer interface with a query editor window. The query is an INSERT statement into the employees table. A yellow error message box is displayed, indicating an ORA-20003 error: "Duplicate manager\_id found: 400". The error details mention the trigger 'PREVENT\_DUPLICATE\_MANAGER\_ID' and the line number 18. The error code is 1055. The message also includes the SQL statement being executed. The status bar at the bottom shows the execution took 0.01 seconds.

### Program 3

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

```
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);
```



#### 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 employees
FOR 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,
      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	105	75000	55000	#e0025	ST_CLERK	15-OCT-24 04:25:00,252580 PM	APEX_PUBLIC_USER
3	9	70000	75000	Senior Developer	Lead Developer	15-OCT-24 10:45:00,000000 AM	user2
4	4	80000	85000	Team Lead	Project Manager	15-OCT-24 10:00:00,000000 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 employees
FOR 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 employees
SET salary = 55000
WHERE employee_id = 3;
```

1 row(s) updated.
0.06 seconds

```
DELETE FROM employees
WHERE 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 04.59.05PM	-	employee_id:3,first_name:Ball,salary:50000
3	DELETE	employees	3	APEX_PUBLIC_USER	16-OCT-24 04.41.49.05PM	employee_id:3,first_name:Ball,salary:50000	-
2	UPDATE	employees	3	APEX_PUBLIC_USER	16-OCT-24 04.40.05PM	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 updates a 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_total
FOR 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
    ISBEGIN
        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 LOOP
                v_total := v_total + new_amounts(i);
                UPDATE transactions
                SET running_total = v_total
                WHERE 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    [Download](#)

## 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_id
        AND 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_SHIRAM154.VALIDATE_STOCK_BEFORE_ORDER", line 15
ORA-04088: error during execution of trigger
'WKSP_SHIRAM154.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	Laptop	10
102	Keyboard	20
103	Mouse	5

1 rows returned in 0.03 seconds - [Detailed](#)

ORDER_ID	ITEM_ID	QUANTITY	ORDER_STATUS
1	101	5	Pending

1 rows inserted in 0.01 seconds - [Detailed](#)

Ex.No.: 14	
Date: 26/09/2024	MONGO DB

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/i } }
  ]
},
{
  restaurant_id: 1,
  name: 1,
  borough: 1,
  cuisine: 1,
  _id: 0
}
);
```

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

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

```
db.restaurants.find(  
  {  
    grades: {  
      $elemMatch: {  
        grade: "A",  
        score: 11  
      }  
    }  
  },  
  {  
    restaurant_id: 1,  
    name: 1,  
    grades: 1,  
    _id: 0  
  }  
)
```

```
< {  
  grades: [  
    {  
      date: 2014-03-03T00:00:00.000Z,  
      grade: 'A',  
      score: 3  
    },  
    {  
      date: 2013-09-11T00:00:00.000Z,  
      grade: 'A',  
      score: 7  
    },  
    {  
      date: 2013-01-24T00:00:00.000Z,  
      grade: 'A',  
      score: 11  
    },  
    {  
      date: 2011-11-23T00:00:00.000Z,  
      grade: 'A',  
      score: 5  
    },  
    {  
      date: 2011-03-10T00:00:00.000Z,  
      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: 2013-09-11T00:00:00.032Z,
      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'
}

{
    _id: ObjectId('671b5d549d3d63480e0a64e5'),
    address: {
        building: 1234,
        coord: [
            -73.856577,
            40.848647
        ],
        street: '1st Avenue',
        zipcode: 10463
    },
    borough: 'Bronx',
    cuisine: 'Italian',
    grades: [
        {
            date: 2014-03-03T00:00:00.001Z,
```

```

    grade: 'A',
    score: 5
},
{
  date: 2013-09-11T00:00:00.001Z,
  grade: 'A',
  score: 8
},
{
  date: 2013-01-24T00:00:00.001Z,
  grade: 'B',
  score: 12
},
{
  date: 2011-11-23T00:00:00.001Z,
  grade: 'A',
  score: 7
},
{
  date: 2011-03-10T00:00:00.001Z,
  grade: 'A',
  score: 15
}
],
name: 'Pasta Palace',
restaurant_id: 30075446
}

```

**10.** Write a MongoDB query which will select the restaurant Id, name and grades for those 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: 6  
        },  
        {  
            date: 2013-01-24T00:00:00.001Z,  
            grade: 'A',  
            score: 10  
        },  
        {  
            date: 2011-11-23T00:00:00.001Z,  
            grade: 'A',  
            score: 9  
        },  
        {  
            date: 2011-03-10T00:00:00.001Z,  
            grade: 'B',  
            score: 14  
        }  
    ],  
    name: 'Morris Park Bake Shop',  
    restaurant_id: '30075445'  
}
```

```

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 a score 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: [  
    -73.858977,  
    46.848847  
  ],  
  street: '2nd Avenue',  
  zipcode: 10464  
},  
borough: 'Manhattan',  
cuisine: 'Chinese',  
grades: [  
  {  
    date: 2014-03-03T00:00:00.000Z,  
    grade: 'B',  
    score: 4  
  },  
  {  
    date: 2013-09-11T00:00:00.000Z,  
    grade: 'A',  
    score: 9  
  },  
  {  
    date: 2013-01-24T00:00:00.000Z,  
    grade: 'A',  
    score: 10  
  },  
  {
```

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

```
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: 2014-03-03T00:00:00.000Z,
    grade: 'B',
    score: 4
  },
  {
    date: 2013-09-11T00:00:00.000Z,
    grade: 'A',
    score: 9
  },
  {
    date: 2013-01-24T00:00:00.000Z,
    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, and their cuisine is not American.

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

```
_id: ObjectId('671b5d549d3d62488e6a64e6'),
address: {
  building: 5478,
  coord: [
    -73.856977,
    40.848847
  ],
  street: '2nd Avenue',
  zipcode: 10464
},
borough: 'Manhattan',
cuisine: 'Chinese',
grades: [
  {
    date: 2014-03-03T00:00:00.000Z,
    grade: 'B',
    score: 4
  },
  {
    date: 2013-09-11T00:00:00.000Z,
    grade: 'A',
    score: 9
  },
  {
    date: 2013-01-24T00:00:00.000Z,
    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, and their 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 and a grade with a score of 6.

```
db.restaurants.find(
{
  grades: {
    $all: [
      { $elemMatch: { score: 2 } },
      { $elemMatch: { score: 6 } }
    ]
  }
});
```

```
        { $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 } }  
        ]  
    }  
};
```

```
        { $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 or a grade with a score of 6.**

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

```

**SAMPLE OUTPUT:-**

```
{
  _id: ObjectId('671b5d549d3d63480e0a64e9'),
  address: {
    building: 2233,
    coord: [
      -73.858177,
      40.849447
    ],
    street: '5th Avenue',
    zipcode: 10467
  },
  borough: 'Bronx',
  cuisine: 'American',
  grades: [
    {
      date: 2014-03-03T00:00:00.005Z,
      grade: 'A',
      score: 10
    },
    {
      date: 2013-09-11T00:00:00.005Z,
      grade: 'A',
      score: 6
    },
    {
      date: 2013-01-24T00:00:00.005Z,
      grade: 'B',
      score: 2
    }
  ]
}
```

```
        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('671b5dab56ec9972ca8f5daf'),
    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',
    'Drama'
  ],
  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: [  
    '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'  
  runtime: 11,  
  cast: [  
    'A.C. Abadie',  
    "Gilbert M. 'Broncho Billy' Anderson",  
    'George Barnes',  
    'Justus D. Barnes'  
  poster: 'https://m.media-amazon.com/images/M/MV5BMTU3NjE5NzYtYTYYyNS00MDVmLWIwYjtMmYWYWIxZDYyNzU2XkEyXkFqcGdeQXVyNzQzNzQxNzI@._V1_SY1000_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.",**

**languages:** [

**'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:** [

**'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 each movie.**

```
db.movies.find({ directors: "William K.L. Dickson" });
```

- 6. Retrieve all movies from the 'movies' collection that were released in the USA and include complete information for each movie.**

```
db.movies.find({ countries: "USA" });
```

```

<
  _id: ObjectId('573e3300f29313ca0ed42e8'),
  plot: 'A group of bandits stage a brazen train holdup, only to find a determined posse hot on their heels.',
  genres: [
    'Short',
    'Western'
  ],
  runtime: 11,
  cast: [
    'A.C. Abadie',
    'Gilbert M. 'Bronco Billy' Anderson',
    'George Barnes',
    'Dustus D. Barnes'
  ],
  poster: 'https://www.media-imdb.com/images/P/IMDb1000j5MxYbFTy8310PAwKlwYjgtWfrwCeZByNc0KhdyXhPqGde3KyRqgNeOheIU/_V1_S91000_',
  title: 'The Great Train Robbery',
  fullPlot: 'Hailed as the earliest existing film in American cinema - notable as the first film that presented a narrative story to tell - it',
  languages: [
    'English'
  ],
  released: 1896-03-01T00:00:00Z,
  directors: [

```

- 7. Retrieve all movies from the 'movies' collection that have complete information 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/MV5BMTU3NjESNaYtYTYYNS00RDVmLWIwYjgtMmYwYWIxZDYyNzU2XkEyXkFqcGdeQXVyNzQzNzQxNzI0LVE1_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 - is",
  languages: [
    'English'
  ],
  released: 1903-12-01T00:00:00Z,
  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/MV5BNTU3NjESNzYtYTYYH500MDVnLWJwYjgtNmYwYWIxZDYyNzU2XkEyXkFqcGdeQXVyNzQzNzQxNzI0LzV1_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 - is this short Western comedy-drama directed by Edwin S. Porter. It depicts a gang of bandits who plan to rob a train, but are foiled by a posse of lawmen who are hot on their heels. The film is notable for its use of the 'shot/reverse shot' technique, which was a breakthrough in film editing at the time. The film is also significant for being one of the first films to receive critical acclaim and commercial success, helping to establish the medium of cinema as a legitimate art form.",

    languages: [
      'English'
    ],
    released: 1903-12-01T00:00:00Z,
    directors: [
      'Edwin S. Porter'
    ],
    rated: 'TV-G',
    awards: {
      wins: 1,
      nominations: 0
    }
  }
]
```

**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('573a1398f29313caabcd42ea'),
  plot: 'A chef tries to open a restaurant amidst a series of challenges.',
  genres: [
    'Drama',
    'Comedy'
  ],
  runtime: 120,
  cast: [
    'Emma Stone',
    'Chris Pratt',
    'Anna Kendrick'
  ],
  poster: 'https://m.media-amazon.com/images/poster2.jpg',
  title: 'The Culinary Dream',
  fullplot: "A chef's journey to make his dream restaurant come true, overcoming family and financial obstacles.",
  languages: [
    'English',
    'French'
  ],
  released: 2015-02-12T00:00:00.000Z,
  directors: [
    'Samantha Jones'
  ],
  rated: 'PG-13',
  awards: {
    wins: 1,
```

## 11. Retrieve all movies from the 'movies' collection that have 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/I/WVSBKHTU3RjESkzYtYYyNSB8N0VmLWIVjgtMaYwVWIxZDYYNzU2XkEyXkFqcGdeQXVyNzQzNzQxNzI@._V1_SV1800",
  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 - is",
  languages: [
    'English'
  ],
  released: 1903-12-01T00:00:00.000Z,
  directors: [
    'Edwin S. Porter'
  ],
  rated: 'TV-G',
  awards: {
    wins: 1,

```

**12. Find all movies with title, languages, released, directors, writers, awards, year, genres, runtime, cast, countries from the 'movies' collection in MongoDB that have at least one nomination.**

```

db.movies.find(
  { "awards.nominations": { $gt: 0 } },
  {
    title: 1,
    languages: 1,
    released: 1,
    directors: 1,
    writers: 1,
    awards: 1,
    year: 1,
    genres: 1,
    runtime: 1,
    cast: 1,
    countries: 1
  }
)

```

```
    }
);
```

```
> MONGOSH
>
< {
  _id: ObjectId('573a1390f20313caabcd42e9'),
  genres: [
    'Adventure',
    'Fantasy'
  ],
  runtime: 95,
  cast: [
    'Ethan Hawke',
    'Jane Doe',
    'Mark Strong'
  ],
  title: 'The Amulet Quest',
  languages: [
    'English'
  ],
  released: 2008-07-15T00:00:00.000Z,
  directors: [
    'John Smith'
  ],
  awards: {
    wins: 2,
    nominations: 1,
    text: '2 wins & 1 nomination.'
  },
  year: 2008,
  countries: [
    'USA'
```

**13. Find all movies with title, languages, released, directors, writers, awards, year, genres, runtime, cast, countries from the 'movies' collection in MongoDB with cast including "Charles Kayser".**

```
db.movies.find(
  { cast: "Charles Kayser" },
  {
    title: 1,
    languages: 1,
    released: 1,
    directors: 1,
    writers: 1,
    awards: 1,
    year: 1,
```

```
    genres: 1,  
    runtime: 1,  
    cast: 1,  
    countries: 1  
}  
);
```

**14. Retrieve all movies with title, languages, released, directors,writers, countries from the 'movies' collection in MongoDB thatreleased on May 9, 1893.**

```
db.movies.find(  
  { released: ISODate("1893-05-09T00:00:00Z") },  
  {  
    title: 1,  
    languages: 1,  
    released: 1,  
    directors: 1,  
    writers: 1,  
    countries: 1  
}  
);
```

**14. Retrieve all movies with title, languages, released, directors, writers, countries from the 'movies' collection in MongoDB that have aword "scene" in the title.**

```
db.movies.find(  
  { title: { $regex: /scene/i } },  
  {  
    title: 1,  
    languages: 1,
```

released: 1,  
directors: 1,  
writers: 1,  
countries: 1  
};  
);

Ex.No.: 15	
Date: 27/09/2024	OTHER DATABASE OBJECTS

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

```
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;
```

SEQUENCE_NAME	MAX_VALUE	INCREMENT_BY	LAST_NUMBER
DEPT_ID_SEQ	1000	10	200
ISQ\$\$_G5H4J05	9999999999999999999999999999	1	48
ISQ\$\$_J2T14T04	9999999999999999999999999999	1	21

3 rows returned in 0.025 seconds Connec

- 3 Write a script to insert two rows into the DEPT table. Name your script lab12\_3.sql. Besure to use the sequence that you created for the ID column. Add two departments named Education And Administration. Confirm your additions. Run the commands in your script.

```
INSERT INTO DEPT (DEPT_ID, DEPT_NAME)
VALUES (DEPT_ID_SEQ.NEXTVAL, 'Education');
```

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

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

```
SELECT * FROM DEPT  
WHERE DEPT_NAME IN ('Education', 'Administration');
```

DEPT_ID	DEPT_NAME
210	Administration
200	Education

2 rows returned in 0.04 seconds    Download

4. Create a non unique index on the foreign key column (**DEPARTMENT\_ID**) in the **EMPLOYEES** table.

```
CREATE INDEX employees_department_id_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_C006560075	UNIQUE

2 rows returned in 0.05 seconds    Download

Ex.No.: 16	CONTROLLING USER ACCESS
Date: 03/10/2024	

**1. What privilege should a user be given to log on to the Oracle Server? Is this a system or 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 OPTION or GRANT ANY PRIVILEGE system privilege) can grant privileges on your table to other users.

**GRANT SELECT ON your\_table TO other\_user;**

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

As a DBA, to simplify the process of granting the same system privileges to multiple users, 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 you query Access to his or her DEPARTMENTS table.**

**Grant Access to Your DEPARTMENTSTable**

**GRANT SELECT ON your\_username.DEPARTMENTS TO other\_user;**

**Grant Query Access to Other User's DEPARTMENTSTable**

**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	750	10	UK	megan
45	IT support	400	15	ES	bill
15	sales manager	750	7	ESP	mari

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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,manager_name)
VALUES (500, 'Education',300,12,'BAN','ball');
```

```
INSERT INTO DEPARTMENT(dept_id,
DEPT_NAME,manager_id,location_id,country_id,manager_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	bill

**9. Query the USER\_TABLES data dictionary to see information about the tables that you own.**

```
SELECT * FROM USER_TABLES;
```

Results	Actions	Describe	Saved SQL	History								
TABLE_NAME	TABLESPACE_NAME	CLUSTER_NAME	IOT_NAME	STATUS	PCT_FREE	PCT_USED	BLK_TRANS	MAX_TRANS	INITIAL_EXTENT	NEXT_EXTENT	MINEXTENTS	MAX_EXTENTS
AUDIT_LOG	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
BOOKS	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
COUNTRIES	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
DEPARTMENT	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
DEPS	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMP	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMP1	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	-	-	-	-
EMPLOYEES	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
EMPLOYEE_AUDIT	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	65536	1048576	1	2147483645
ITEMS03_PLAN_TABLE	APTX_BIGFILE_INSTANCE_TS03	-	-	VALID	10	-	1	255	-	-	-	-
INVENTORY	APTX_BIGFILE_INSTANCE_TS03	-	-	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 the changes.**

**DELETE FROM DEPARTMENT  
WHERE DEPT\_ID IN (500, 510);**