

ORACLE LAB (BCA-DS-552)

Manav Rachna International Institute of Research and Studies

School of Computer Applications

Department of Computer Applications

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EXPERIMENT 1:

Create the following tables and insert five records for each table. And make Customer_SID column in the ORDERS table a foreign key pointing to the SID column in the CUSTOMER table.

Customer

<u>Column_name</u>	<u>Data type</u>	<u>Size</u>	<u>Constraint</u>
SID	Varchar2	4	Primary Key
First_Name	Char	20	
Last_name	Char	20	

Orders

<u>Column_name</u>	<u>Data type</u>	<u>Size</u>	<u>Constraint</u>
Order_ID	Varchar2	4	Primary Key
Order_date	Char	20	
Customer_SID	Varchar2	20	Foreign Key
Amount	Number		Check > 20000

1. Customer table:

```
create table customer ( SID varchar(4) PRIMARY KEY, First_name char(20) NOT NULL, Last_name char(20));
insert into customer values (1001, 'Kunal', 'Jha');
insert into customer values (1002, 'Neeraj', 'Besoya');
insert into customer values (1003, 'Harshita', 'Madaan');
insert into customer values (1004, 'Madhav', 'Tyagi');
insert into customer values (1005, 'Harsha', 'Chauhan');
select * from customer;
```

OUTPUT:

Output

SID	First_name	Last_name
1001	Kunal	Jha
1002	Neeraj	Besoya
1003	Harshita	Madaan
1004	Madhav	Tyagi
1005	Harsha	Chauhan

2. Order table:

```
CREATE TABLE Order1 (orderid VARCHAR(4) PRIMARY KEY, orderdate DATE, customersid VARCHAR(4), Amount INTEGER CHECK (Amount > 2000), FOREIGN KEY (customersid) REFERENCES Customer(SID));
insert into Order1 values ('1201', '01-01-2024', 1001, 2230);
insert into Order1 values ('1202', '12-01-2024', 1002, 2400);
insert into Order1 values ('1203', '21-01-2024', 1003, 2950);
insert into Order1 values ('1204', '30-01-2024', 1004, 5400);
insert into Order1 values ('1205', '14-01-2024', 1005, 8723);
select * from Order1;
```

OUTPUT:

orderid	orderdate	customersid	Amount
1201	01-01-2024	1001	2230
1202	12-01-2024	1002	2400
1203	21-01-2024	1003	2950
1204	30-01-2024	1004	5400
1205	14-01-2024	1005	8723

- Joining of above two tables:

```
select order1.order_id, order1.order_date, order1.amount, customer.first_name,  
customer.last_name  
from order1 inner join customer ON order1.customer_SID = customer.SID;
```

OUTPUT:

order_id	order_date	amount	First_name	Last_name
1201	12-04-2024	2008	Kunal	Jha
1202	13-04-2024	5000	Neeraj	Besoya
1203	18-04-2024	4100	Harshita	Madaan
1204	24-05-2024	3200	Madhav	Tyagi
1205	28-05-2024	2700	Harsha	Chauhan

Q. List the details of the customers along with the amount.

```
select customer.first_name, customer.last_name, order1.amount  
from order1 inner join customer ON order1.customer_SID = customer.SID;
```

OUTPUT:

First_name	Last_name	amount
Kunal	Jha	2008
Neeraj	Besoya	5000
Harshita	Madaan	4100
Madhav	Tyagi	3200
Harsha	Chauhan	2700

Q. List the customers whose names end with “s”.

```
insert into customer values (1007, 'Sandeep', 'joshi');  
select * from customer where first_name like 's%';
```

OUTPUT:

SID	First_name	Last_name
1007	Sandeep	joshi

Q. List the orders where amount is between 2000 and 3000.

```
select * from order1 where amount between 2000 and 3000;
```

OUTPUT:

order_id	order_date	customer_SID	amount
1201	12-04-2024	1001	2008
1205	28-05-2024	1005	2700

Q. Calculate the total amount of orders that has more than 2500.

```
select sum(amount) from order1 where amount > 2500;
```

OUTPUT:

sum(amount)
15000

Q. List the orders where amount is increased by 500 and replace with name “New Amount”.

```
UPDATE Order1  
SET Amount = Amount + 500;  
  
SELECTorderid, orderdate, customersid, Amount AS "New Amount"  
FROM Order1;
```

OUTPUT:

orderid	orderdate	customersid	New Amount
1201	01-01-2024	1001	3230
1202	12-01-2024	1002	3400
1203	21-01-2024	1003	3950
1204	30-01-2024	1004	6400
1205	14-01-2024	1005	9723

EXPERIMENT 2:

Create the following tables and insert values:

Student

<u>Column name</u>	<u>Data type</u>	<u>Size</u>	<u>Constraint</u>
RollNo	Varchar2	20	Primary Key
Name	Char	20	
Class	Varchar2	20	
Marks	Number	6,2	

Student1

<u>Column name</u>	<u>Data type</u>	<u>Size</u>	<u>Constraint</u>
R_No	Varchar2	20	Primary Key
Name	Char	20	
Class	Varchar2	20	
Marks	Number	6,2	

1. Student table:

```
CREATE TABLE student (rno VARCHAR(20) PRIMARY KEY, name char(20) not null, class VARCHAR(4), marks integer);
insert into student values ('2024/01', 'Kunal', 'BCA-5E', 245);
insert into student values ('2024/02', 'Madhav', 'BCA-5D', 223);
insert into student values ('2024/03', 'Harshita', 'BCA-5D', 230);
insert into student values ('2024/04', 'Bharti', 'BSc', 220);
insert into student values ('2024/05', 'Ishika', 'MBBS', 246);
select * from student;
```

OUTPUT:

rno	name	class	marks
2024/01	Kunal	BCA-5E	245
2024/02	Madhav	BCA-5D	223
2024/03	Harshita	BCA-5D	230
2024/04	Bharti	BSc	220
2024/05	Ishika	MBBS	246

2. Student1 table:


```
CREATE TABLE student1 (rno VARCHAR(20) PRIMARY KEY, name char(20) not null, class
VARCHAR(4),
marks integer);
insert into student1 values ('2023/01', 'Aditya', 'BCA-5A', 235);
insert into student1 values ('2025/02', 'Avinash', 'BCA-3A', 243);
insert into student1 values ('2022/03', 'Aman', 'BCA-1D', 234);
insert into student1 values ('2022/04', 'Shivakshi', 'BSc', 290);
insert into student1 values ('2022/05', 'Anant', 'BBA', 226);
select * from student1;
```

OUTPUT:

rno	name	class	marks
2023/01	Aditya	BCA-5A	235
2025/02	Avinash	BCA-3A	243
2022/03	Aman	BCA-1D	234
2022/04	Shivakshi	BSc	290
2022/05	Anant	BBA	226

Q. Display all the contents of student and student1 using union clause.

```
select * from student
union
select * from student1 order by rno;
```

OUTPUT:

rno	name	class	marks
2022/03	Aman	BCA-1D	234
2022/04	Shivakshi	BSc	290
2022/05	Anant	BBA	226
2023/01	Aditya	BCA-5A	235
2024/01	Kunal	BCA-5E	245
2024/02	Madhav	BCA-5D	223
2024/03	Harshita	BCA-5D	230
2024/04	Bharti	BSc	220
2024/05	Ishika	MBBS	246
2025/02	Avinash	BCA-3A	243

Q. Find out the intersection of student and student1 tables.

```
SELECT rno, name, class, marks From student
INTERSECT
SELECT rno, name, class, marks FROM student1;
```

OUTPUT:

SQL query successfully executed. However, the result set is empty.

*Since there is no common entry between student and student1; the result set comes as empty.

Q. Display the names of student and student1 tables using left, right, inner and full join.

1. Inner Join:

```
-- INNER JOIN to display names of students from both tables where there's a match
SELECT S.name AS student_name, S1.name AS student1_name FROM student S
INNER JOIN student1 S1
ON S.name = S1.name;
```

OUTPUT:

SQL query successfully executed. However, the result set is empty.

2. Left Join:

```
-- LEFT JOIN to display names from Student and corresponding names from Student1 (if any)
SELECT S.name AS student_name, S1.name AS student1_name FROM student S
LEFT JOIN student1 S1
ON S.name = S1.name;
```

OUTPUT:

student_name	student1_name
Kunal	
Madhav	
Harshita	
Bharti	
Ishika	

3. Right Join:

```
SELECT S.name AS student_name, S1.name AS student1_name FROM student S
RIGHT JOIN student1 S1
ON S.name = S1.name;
```

OUTPUT:

STUDENT_NAME	STUDENT1_NAME
-	Aman
-	Avinash
-	Anant
-	Aditya
-	Shivakshi

4. Full Join:

```
SELECT S.name AS student_name, S1.name as student1_name FROM student S
FULL OUTER JOIN student1 S1
ON S.name = S1.name;
```

OUTPUT:

STUDENT_NAME	STUDENT1_NAME
-	Aditya
-	Avinash
-	Aman
-	Shivakshi
-	Anant
Harshita	-
Kunal	-
Bharti	-
Madhav	-
Ishika	-

EXPERIMENT 3:

Display all the string functions used in SQL.

OUTPUT:

```
SELECT
    LOWER('ORACLE') AS "Lowercase",    -- Converts string to lowercase
    UPPER('oracle') AS "Uppercase",    -- Converts string to uppercase
    SUBSTR('ORACLE', 2, 3) AS "Substring", -- Extracts substring
    LENGTH('ORACLE') AS "Length",      -- Returns length of string
    INSTR('ORACLE', 'A') AS "Position", -- Returns position of a character
    LPAD('123', 5, '0') AS "Left Padding", -- Pads a string on the left
    RPAD('123', 5, '0') AS "Right Padding", -- Pads a string on the right
    TRIM('O' FROM 'ORACLE') AS "Trimmed" -- Trims a specified character
FROM DUAL;
```

TRIGGERS

EXPERIMENT 1:

Create a trigger on the emp table, which store the empno & operation in the table auditor for each operation i.e. Insert, Update & Delete.

```
-- Step 1: Create the EMP table
CREATE TABLE IF NOT EXISTS EMP (empno INT PRIMARY KEY, ename TEXT, job TEXT, salary REAL);
-- Step 2: Create the AUDITOR table to log operations
CREATE TABLE IF NOT EXISTS AUDITOR (audit_id INTEGER PRIMARY KEY AUTOINCREMENT, empno INT, operation TEXT,
timestamp DATETIME DEFAULT CURRENT_TIMESTAMP);
-- Step 3: Create a trigger for INSERT operation
CREATE TRIGGER IF NOT EXISTS trg_emp_insert
AFTER INSERT ON EMP
BEGIN
    INSERT INTO AUDITOR (empno, operation)
    VALUES (NEW.empno, 'INSERT');
END;
-- Step 4: Create a trigger for UPDATE operation
CREATE TRIGGER IF NOT EXISTS trg_emp_update
AFTER UPDATE ON EMP
BEGIN
    INSERT INTO AUDITOR (empno, operation)
    VALUES (NEW.empno, 'UPDATE');
END;
-- Step 5: Create a trigger for DELETE operation
CREATE TRIGGER IF NOT EXISTS trg_emp_delete
AFTER DELETE ON EMP
BEGIN
    INSERT INTO AUDITOR (empno, operation)
    VALUES (OLD.empno, 'DELETE');
END;
-- Step 6: Insert sample data to test the triggers
DELETE FROM EMP;
INSERT INTO EMP VALUES (101, 'Ken', 'Manager', 60000);
INSERT INTO EMP VALUES (102, 'Kunal', 'UI/UX Designer', 40000);
DELETE FROM EMP WHERE empno = 102;
--Output Table
SELECT * FROM EMP;
SELECT * FROM AUDITOR;
```

OUTPUT:

empno	ename	job	salary
101	Ken	Manager	60000

audit_id	empno	operation	timestamp
1	101	INSERT	2024-12-08 07:16:05
2	102	INSERT	2024-12-08 07:16:05
3	102	DELETE	2024-12-08 07:16:05

EXPERIMENT 2:

Create a trigger so that no operation can be performed on emp table.

```
-- Step 1: Create the EMP table
CREATE TABLE IF NOT EXISTS EMP (empno INT PRIMARY KEY, ename TEXT, job TEXT, salary REAL);
-- Step 2: Create a trigger to block INSERT operation
CREATE TRIGGER IF NOT EXISTS trg_block_insert
BEFORE INSERT ON EMP
BEGIN
SELECT RAISE(ABORT, 'INSERT operation is not allowed on EMP table');
END;
-- Step 3: Create a trigger to block UPDATE operation
CREATE TRIGGER IF NOT EXISTS trg_block_update
BEFORE UPDATE ON EMP
BEGIN
SELECT RAISE(ABORT, 'UPDATE operation is not allowed on EMP table');
END;
-- Step 4: Create a trigger to block DELETE operation
CREATE TRIGGER IF NOT EXISTS trg_block_delete
BEFORE DELETE ON EMP
BEGIN
SELECT RAISE (ABORT, 'DELETE operation is not allowed on EMP table');
END;
-- Step 5: Attempt to perform some operations to see the triggers in action
INSERT INTO EMP (empno, ename, job, salary) VALUES (101, 'Ken', 'Manager',
50000);
UPDATE EMP SET salary = 60000 WHERE empno = 101;
DELETE FROM EMP WHERE empno = 101;
```

OUTPUT:

Error: INSERT operation is not allowed on EMP table

*Since script has raised an abort function, the code will terminate once insert trigger is triggered.

PL/SQL

EXPERIMENT 1:

Write a PL/SQL block to calculate total salary of employee having employee number 100.

```
-- creating table employees
BEGIN
    EXECUTE IMMEDIATE 'CREATE TABLE employees (
        employee_id NUMBER PRIMARY KEY,
        salary NUMBER,
        bonus NUMBER
    )';
    COMMIT;
END;
/

-- inserting values
BEGIN
    EXECUTE IMMEDIATE 'INSERT INTO employees (employee_id, salary, bonus)
        VALUES (100, 5000, 1000)';
    COMMIT;
END;
/

-- calculate the salary of employee with employee_id 100
DECLARE
    v_employee_salary NUMBER;
    v_bonus NUMBER;
    v_total_salary NUMBER;
BEGIN
    SELECT salary, bonus
    INTO v_employee_salary, v_bonus
    FROM employees
    WHERE employee_id = 100;
    v_total_salary := v_employee_salary + v_bonus;

    -- Output the total salary
    DBMS_OUTPUT.PUT_LINE('Total salary of employee with ID 100 is: ' || v_total_salary);
EXCEPTION
    WHEN NO_DATA_FOUND THEN
        DBMS_OUTPUT.PUT_LINE('Employee with ID 100 not found.');
```

When OTHERS THEN

DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM);

```
END;
/
```

OUTPUT:

Output:

Total salary of employee with ID 100 is: 6000

EXPERIMENT 2:

Write a PL/SQL code to find the greatest of three numbers.

```
DECLARE
    num1 NUMBER := 10;
    num2 NUMBER := 20;
    num3 NUMBER := 15;
    greatest_number NUMBER;
BEGIN
    IF num1 >= num2 AND num1 >= num3 THEN
    ELSIF num2 >= num1 AND num2 >= num3 THEN
    ELSE
    END IF;
    DBMS_OUTPUT.PUT_LINE('The greatest number is: ' || greatest_number);
END;
```

OUTPUT:

Output:

The greatest number is: 20

EXPERIMENT 3:

Write a PL/SQL code to print the numbers from 1 to n.

```
DECLARE
```

```
    n NUMBER := 10;
```

```
BEGIN
```

```
    FOR i IN 1..n LOOP
```

```
        DBMS_OUTPUT.PUT_LINE(i);
```

```
    END LOOP;
```

```
END;
```

```
/
```

OUTPUT:

Statement processed.

1
2
3
4
5
6
7
8
9
10

EXPERIMENT 4:

Write a PL/SQL code to reverse a string using for loop.

```
DECLARE
    original_string VARCHAR2(20) := 'RDBMS PRACTICAL LAB';
    reversed_string VARCHAR2(20) := '';
    len NUMBER;
BEGIN
    len := LENGTH(original_string);
    FOR i IN REVERSE 1..len LOOP
        reversed_string := reversed_string || SUBSTR(original_string, i, 1);
    END LOOP;
    DBMS_OUTPUT.PUT_LINE('Reversed string is: ' || reversed_string);
END;
/
```

OUTPUT:

Output:

Reversed string is: BAL LACITCARP SMBDR

EXPERIMENT 5:

Write a PL/SQL code to find the sum of n numbers.

```
DECLARE
    n NUMBER;
    num NUMBER;
    total_sum NUMBER := 0;
BEGIN
    DBMS_OUTPUT.PUT_LINE('Enter the number of terms (n):');
    n := 5;

    FOR i IN 1..n LOOP
        DBMS_OUTPUT.PUT_LINE('Enter number ' || i || ':');

        ACCEPT num NUMBER prompt 'Enter number ' || i || ': ';
        num := &num;

        total_sum := total_sum + num;
    END LOOP;

    DBMS_OUTPUT.PUT_LINE('The sum of the ' || n || ' numbers is: ' || total_sum);
END;
/
```

OUTPUT:

```
Enter the number of terms (n):
Enter the value of n: 5
Enter number 1:
Enter number 1: 20
Enter number 2:
Enter number 2: 30
Enter number 3:
Enter number 3: 50
Enter number 4:
Enter number 4: 70
Enter number 5:
Enter number 5: 40
The sum of the 5 numbers is: 210
```

EXPERIMENT 6:

Write a PL/SQL code to display the empno, ename, job of employees of department number 10.

```
CREATE TABLE emp (empno NUMBER(4) PRIMARY KEY, ename VARCHAR2(20), job VARCHAR2(20), deptno NUMBER(2));
INSERT INTO emp (empno, ename, job, deptno) VALUES (1001, 'Jordan', 'President', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1002, 'James', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1003, 'Curry', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1004, 'Oneal', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1005, 'Johnson', 'Analyst', 20);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1006, 'Giannis', 'Analyst', 20);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1007, 'Doncic', 'Salesman', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1008, 'Pippen', 'Clerk', 30);
```

- Creation of table emp

```
BEGIN
  FOR emp_record IN (SELECT empno, ename, job
                     FROM emp
                     WHERE deptno = 10)
  LOOP
    -- Display employee information using DBMS_OUTPUT
    DBMS_OUTPUT.PUT_LINE('Empno: ' || emp_record.empno || ', Ename: ' || emp_record.ename || ', Job: ' || emp_record.job);
  END LOOP;
END;
```

- PL/SQL script to display empno, ename, job of employees with department number 10.

OUTPUT:

```
Statement processed.
Empno: 1001, Ename: Jordan, Job: President
Empno: 1002, Ename: James, Job: Manager
Empno: 1003, Ename: Curry, Job: Manager
Empno: 1004, Ename: Oneal, Job: Manager
Empno: 1007, Ename: Doncic, Job: Salesman
```

EXPERIMENT 7:

Write a PL/SQL code to display the employee number & name of top five highest paid employees.

```
CREATE TABLE emp (empno NUMBER(4) PRIMARY KEY, ename VARCHAR2(20), job VARCHAR2(20), salary INTEGER, deptno NUMBER(2));
INSERT INTO emp VALUES (1001, 'Jordan', 'President', 50000, 10);
INSERT INTO emp VALUES (1002, 'James', 'Manager', 40000, 10);
INSERT INTO emp VALUES (1003, 'Curry', 'Manager', 40000, 10);
INSERT INTO emp VALUES (1004, 'Oneal', 'Manager', 40000, 10);
INSERT INTO emp VALUES (1005, 'Johnson', 'Analyst', 25000, 20);
INSERT INTO emp VALUES (1006, 'Giannis', 'Analyst', 25000, 20);
INSERT INTO emp VALUES (1007, 'Doncic', 'Salesman', 15000, 10);
INSERT INTO emp VALUES (1008, 'Pippen', 'Clerk', 20000, 30);
```

- Creation of table emp

```
BEGIN
  FOR emp_record IN (
    SELECT empno, ename, salary
    FROM (
      SELECT empno, ename, salary
      FROM emp
      ORDER BY salary DESC
    )
    WHERE ROWNUM <= 5
  )
  LOOP
    DBMS_OUTPUT.PUT_LINE('Empno: ' || emp_record.empno || ', Ename: ' || emp_record.ename || ', Salary: ' || emp_record.salary);
  END LOOP;
END;
```

- PL/SQL script to display top 5 highest paid employees.

OUTPUT:

Statement processed.

```
Empno: 1001, Ename: Jordan, Salary: 50000
Empno: 1002, Ename: James, Salary: 40000
Empno: 1003, Ename: Curry, Salary: 40000
Empno: 1004, Ename: Oneal, Salary: 40000
Empno: 1005, Ename: Johnson, Salary: 25000
```

EXPERIMENT 8:

Write a PL/SQL procedure that accepts 2 numbers & return addition, subtraction, multiplication & division of two numbers using stored procedure AND local procedure.

```
-- Main procedure to accept two numbers and perform operations
CREATE OR REPLACE PROCEDURE calculate_operations(
    p_num1 IN NUMBER,
    p_num2 IN NUMBER,
    p_add OUT NUMBER,
    p_sub OUT NUMBER,
    p_mul OUT NUMBER,
    p_div OUT NUMBER,
    p_error_msg OUT VARCHAR2
) IS

    -- Local procedure to perform calculations
    PROCEDURE perform_calculations(
        num1 IN NUMBER,
        num2 IN NUMBER,
        add_result OUT NUMBER,
        sub_result OUT NUMBER,
        mul_result OUT NUMBER,
        div_result OUT NUMBER,
        error_msg OUT VARCHAR2
    ) IS
    BEGIN
        add_result := num1 + num2;
        sub_result := num1 - num2;
        mul_result := num1 * num2;
        IF num2 = 0 THEN
            div_result := NULL;
            error_msg := 'Error: Division by zero is not allowed';
        ELSE
            div_result := num1 / num2;
            error_msg := NULL;
        END IF;
    END perform_calculations;

BEGIN
    perform_calculations(p_num1, p_num2, p_add, p_sub, p_mul, p_div, p_error_msg);
    IF p_error_msg IS NOT NULL THEN
        DBMS_OUTPUT.PUT_LINE(p_error_msg);
    ELSE
        DBMS_OUTPUT.PUT_LINE('Addition: ' || p_add);
        DBMS_OUTPUT.PUT_LINE('Subtraction: ' || p_sub);
        DBMS_OUTPUT.PUT_LINE('Multiplication: ' || p_mul);
        DBMS_OUTPUT.PUT_LINE('Division: ' || p_div);
    END IF;
END calculate_operations;
/
```

- Creation of procedure

Procedure created.

```

DECLARE
    v_add NUMBER;
    v_sub NUMBER;
    v_mul NUMBER;
    v_div NUMBER;
    v_error_msg VARCHAR2(100);
BEGIN
    -- Calling the stored procedure with sample numbers
    calculate_operations(10, 2, v_add, v_sub, v_mul, v_div, v_error_msg);

    -- Output the results
    IF v_error_msg IS NOT NULL THEN
        DBMS_OUTPUT.PUT_LINE(v_error_msg);
    ELSE
        DBMS_OUTPUT.PUT_LINE('Addition: ' || v_add);
        DBMS_OUTPUT.PUT_LINE('Subtraction: ' || v_sub);
        DBMS_OUTPUT.PUT_LINE('Multiplication: ' || v_mul);
        DBMS_OUTPUT.PUT_LINE('Division: ' || v_div);
    END IF;
END;
/

```

- PL/SQL script to call the calculation_operations() procedure

OUTPUT:

```

Statement processed.
Addition: 12
Subtraction: 8
Multiplication: 20
Division: 5
Addition: 12
Subtraction: 8
Multiplication: 20
Division: 5

```

- Output after passing 10 and 2 in the procedure

EXPERIMENT 9:

Write a PL/SQL block to show the use of NO_DATA FOUND exception.

```
CREATE TABLE emp (empno NUMBER(4) PRIMARY KEY, ename VARCHAR2(20), job VARCHAR2(20), deptno NUMBER(2));
INSERT INTO emp (empno, ename, job, deptno) VALUES (1001, 'Jordan', 'President', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1002, 'James', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1003, 'Curry', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1004, 'Oneal', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1005, 'Johnson', 'Analyst', 20);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1006, 'Giannis', 'Analyst', 20);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1007, 'Doncic', 'Salesman', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1008, 'Pippen', 'Clerk', 30);
```

- Creation of table for searching data

```
DECLARE
    -- Variable to hold employee name
    v_emp_name VARCHAR2(100);
    -- Variable to hold employee ID
    v_emp_id NUMBER := 999;
BEGIN
    BEGIN
        SELECT ename
        INTO v_emp_name
        FROM emp
        WHERE empno = v_emp_id;
        DBMS_OUTPUT.PUT_LINE('Employee Name: ' || v_emp_name);
    EXCEPTION
        WHEN NO_DATA_FOUND THEN
            -- Handle the case where no data is found
            DBMS_OUTPUT.PUT_LINE('Error: No employee found with employee ID ' || v_emp_id);
    END;
END;
/
```

- PL/SQL scrip to create the NO_DATA_FOUND exception

OUTPUT:

Statement processed.

Error: No employee found with employee ID 999

EXPERIMENT 10:

Write a PL/SQL block to show the use of TOO_MANY_ROWS exception.

```
CREATE TABLE emp (empno NUMBER(4) PRIMARY KEY, ename VARCHAR2(20), job VARCHAR2(20), deptno NUMBER(2));
INSERT INTO emp (empno, ename, job, deptno) VALUES (1001, 'Jordan', 'President', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1002, 'James', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1003, 'Curry', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1004, 'Oneal', 'Manager', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1005, 'Johnson', 'Analyst', 20);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1006, 'Giannis', 'Analyst', 20);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1007, 'Doncic', 'Salesman', 10);
INSERT INTO emp (empno, ename, job, deptno) VALUES (1008, 'Pippen', 'Clerk', 30);
```

- Creation of table

```
DECLARE
    v_emp_name VARCHAR2(50);
    v_job VARCHAR2(50) := 'Analyst';
BEGIN
    BEGIN
        SELECT ename
        INTO v_emp_name
        FROM emp
        WHERE job = v_job;
        DBMS_OUTPUT.PUT_LINE('Employee Name: ' || v_emp_name);
    EXCEPTION
        WHEN TOO_MANY_ROWS THEN
            -- Handle the case where multiple rows are returned
            DBMS_OUTPUT.PUT_LINE('Error: More than one employee found for job ' || v_job);
    END;
END;
```

- PL/SQL script to create the TOO_MANY_ROWS exception

OUTPUT:

Statement processed.

Error: More than one employee found for job Analyst

EXPERIMENT 11:

Write a PL/SQL block to show the use of ZERO_DIVIDE exception.

```
DECLARE
    v_dividend NUMBER := 10;
    v_divisor  NUMBER := 0;
    v_result   NUMBER;
BEGIN
    -- Attempt to divide the dividend by the divisor
    BEGIN
        v_result := v_dividend / v_divisor;
        DBMS_OUTPUT.PUT_LINE('Result: ' || v_result);
    EXCEPTION
        WHEN ZERO_DIVIDE THEN
            -- Handle the case of division by zero
            DBMS_OUTPUT.PUT_LINE('Error: Division by zero is not allowed.');
```

OUTPUT:

```
Statement processed.
Error: Division by zero is not allowed.
```

- 10 divided by 0 will throw the Zero Divide error