Experiment - 6

Student Name: Misal Saini
UID: 23BCS13467
Branch: BE-CSE
Section/Group: KRG_2B
Semester: 5th
Date of Performance: 22/9/25
Subject Name: Advanced Database and Management System
Subject Code: 23CSP-333

1. **Problem Description/Aim:**

Medium-Problem Title: **Gender Diversity Tracking-**Create a PostgreSQL stored procedure to track gender diversity in the workforce. The procedure takes a gender as input and returns the total number of employees of that gender, providing HR with instant and secure reporting.

Procedure (Step-by-Step):

1. Create a table employees with columns like emp_id,emp_name and gender.
2. Insert sample data with varying genders.
3. Create a stored procedure 'count_employees_by_gender' that:
   - Takes a gender as input.
   - Counts the number of employees with that gender.
   - Returns the result as an OUT parameter.
4. Call the procedure in a DO block to capture and display the result.

Sample Output Description:

- Input: 'Male' --- Output: 3
- Input: 'Female'----Output: 2
-HR sees results instantly without accessing full employee data.

Hard-Problem Title: **Order Placement and Inventory Management-**Automate the ordering process in a retail company. The procedure validates stock availability, logs sales, updates inventory, and provides real-time confirmation or rejection messages.

Procedure (Step-by-Step):

1. Create products table with columns: product_id, product_name, price, quantity_remaining, quantity_sold.
2. Create sales table with columns: sale_id, product_id,

quantity, total_price, sale_date.

3. Create a stored procedure place_order that:
   - Takes product_id and quantity as input.
   - Checks if quantity_remaining is sufficient.
   - If yes:
     - Logs the sale in sales table.
     - Updates products(decrease quantity_remaining, increase quantity_sold).
     - Display “Product sold successfully!!”.
   - If no:
     - Display “Insufficient quantity available!!”
4. Call the procedure for different orders to validate functionality.

Sample Output Description:

- Order 5 units of Smartphone (stock available): "Product sold successfully!".
- Order 100 units of Tablet (insufficient stock): "Insufficient Quantity Available!".
- Inventory updates automatically for successful orders.

2. **Objective:** The objective is to automate critical business operations using PostgreSQL stored procedures. For HR, it tracks gender diversity by returning the total count of employees by gender. For retail, it manages orders by validating stock, logging sales, updating inventory, and providing real-time confirmation or rejection messages. This ensures efficiency, accuracy, and real-time insights in both workforce and inventory management.

3. SQL QUERY AND OUTPUTS -

----------MEDIUM PROBLEM----------

```
CREATE TABLE employees
   ( emp_id SERIAL PRIMARY KEY,
   emp_name VARCHAR(100),
   gender VARCHAR(10)
);

-- Sample data
INSERT INTO employees (emp_name, gender) VALUES
('Amit', 'Male'),
('Priya', 'Female'),
('Ravi', 'Male'),
('Sneha', 'Female'),
('Karan', 'Male');
```

```
select * from EMPLOYEES;
----CREATING A PROCEDURE----
CREATE OR REPLACE PROCEDURE
    count_employees_by_gender( IN input_gender VARCHAR,
        OUT total_count int
)
LANGUAGE plpgsql
AS $$
BEGIN
   SELECT COUNT(*) INTO total_count
   FROM employees
   WHERE gender = input_gender;
END;
$$;

---CALLING THE PROCEDURE-----
DO
$$ DECLA
RE
   result INT;
BEGIN
   CALL count_employees_by_gender('Male', result);
   RAISE NOTICE 'TOTAL EMPLOYEES OF GENDER Male ARE %', result;
END;
$$;
```

```
16
17  select * from EMPLOYEES;
```

Data Output | Messages | Notifications

SQL

	emp_id [PK] integer	emp_name character varying (100)	gender character varying (10)
1	1	Amit	Male
2	2	Priya	Female
3	3	Ravi	Male
4	4	Sneha	Female
5	5	Karan	Male

```
33  DO $$
34  DECLARE
35      result INT;
36  BEGIN
37      CALL count_employees_by_gender('Male', result);
38      RAISE NOTICE 'TOTAL EMPLOYEES OF GENDER Male ARE %', result;
39  END;
```

Data Output | Messages | Notifications

```
NOTICE:  TOTAL EMPLOYEES OF GENDER Male ARE 3
DO

Query returned successfully in 104 msec.
```

----------**HARD PROBLEM** ----------

```
CREATE TABLE products (
    product_id SERIAL PRIMARY KEY,
    product_name VARCHAR(100),
    price NUMERIC(10,2),
    quantity_remaining INT,
    quantity_sold INT DEFAULT 0
);

INSERT INTO products (product_name, price, quantity_remaining) VALUES
('Smartphone', 30000, 50),
('Tablet', 20000, 30),
('Laptop', 60000, 20);

CREATE TABLE sales (
    sale_id SERIAL PRIMARY KEY,
    product_id INT REFERENCES products(product_id),
    quantity INT,
    total_price NUMERIC(10,2),
    sale_date TIMESTAMP DEFAULT NOW()
);
```

```
CREATE OR REPLACE PROCEDURE
   place_order( IN p_product_id INT,
   IN p_quantity INT
)
LANGUAGE plpgsql
AS $$
DECLARE
   available_stock INT;
   product_price NUMERIC(10,2);
BEGIN
   SELECT quantity_remaining, price
   INTO available_stock, product_price
   FROM products
   WHERE product_id = p_product_id;

   IF available_stock IS NULL THEN
      RAISE NOTICE 'Product ID % does not exist!', p_product_id;
   ELSIF available_stock >= p_quantity THEN
      -- LOGGING THE ORDER
      INSERT INTO sales (product_id, quantity, total_price)
      VALUES (p_product_id, p_quantity, p_quantity * product_price);

      UPDATE products
      SET quantity_remaining = quantity_remaining - p_quantity,
         quantity_sold = quantity_sold + p_quantity
      WHERE product_id = p_product_id;

      RAISE NOTICE 'Product sold successfully!';
   ELSE
      RAISE NOTICE 'Insufficient Quantity Available!';
   END IF;
END;
$$;


CALL PLACE_ORDER(2,20); --PRODUCT SOLD SUCCESSFULLY AND
QUANTITY_REMAINING COLUMN SET TO -20 AND DATA LOGGED TO SALES
TABLE
SELECT * FROM SALES;
SELECT * FROM PRODUCTS;
CALL PLACE_ORDER(3,100); --INSUFFICIENT QUANTITY AVAILABLE
```

```
100  CALL PLACE_ORDER(2,20); --PRODUCT SOLD SUCCESSFULLY AND QUANTITY_REMAINING COLUMN
101  SELECT * FROM SALES;
102  SELECT * FROM PRODUCTS;
103  CALL PLACE_ORDER(3,100); --INSUFFICIENT QUANTITY AVAILABLE
104
```

Data Output | Messages | Notifications

Showing rows: 1 to 1

	sale_id [PK] integer	product_id integer	quantity integer	total_price numeric (10,2)	sale_date timestamp without time zone
1	1	2	20	400000.00	2025-09-25 23:12:19.653032

```
101  SELECT * FROM SALES;
102  SELECT * FROM PRODUCTS;
103  CALL PLACE_ORDER(3,100); --INSUFFICIENT QUANTITY AVAILABLE
104
```

Data Output | Messages | Notifications

Showing rows: 1 t

	product_id [PK] integer	product_name character varying (100)	price numeric (10,2)	quantity_remaining integer	quantity_sold integer
1	1	Smartphone	30000.00	50	0
2	3	Laptop	60000.00	20	0
3	2	Tablet	20000.00	10	20

--Here in above output, After selling 20 tablets (id==2) we are left with 10 and the selling data is logged into sales table.

```
103  CALL PLACE_ORDER(3,100); --INSUFFICIENT QUANTITY AVAILABLE
104
```

Data Output | Messages | Notifications

```
NOTICE:  Insufficient Quantity Available!
CALL

Query returned successfully in 158 msec.
```

ID ==3 means laptop are 20 only and we place order for 100 …so we get notice - for insufficient quantity!!