University Institute of Engineering

Department of Computer Science & Engineering

Experiment: 2

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Branch: CSE **Section/Group: AIT-KRG-GP2**

Semester: 4th **Date of Performance:7/01/26**

Subject Name: DBMS

1. **Aim of the practical:** To understand and implement SQL SELECT queries using various clauses such as WHERE, ORDER BY, GROUP BY, and HAVING to retrieve and manipulate data efficiently from relational database tables.

2. Tool Used:

- **Database Management System:**

○ **PostgreSQL**

- **Database Administration Tool:**

○ **pgAdmin**

3. **Objective:**
   To practice writing SQL SELECT statements.
   To apply filtering conditions using the WHERE clause.
   To sort query results using the ORDER BY clause.
   To group records using the GROUP BY clause.
   To filter grouped data using the HAVING clause.
   To analyze data using aggregate functions like COUNT(), SUM(), AVG(), MIN(), and MAX().

4. Practical / Experimental Steps

(1) Start the system and log in to the computer.

(2) Open PgAdmin (PostgreSQL).

(3) Create or select the required database (e.g., lab_db).

(4) Create the EMPLOYEE table using the given schema.

(5) Insert sample data into the EMPLOYEE table.

(6) Execute the queries step-by-step according to the practical steps.

(7) Verify the output after each query execution.

(8) Capture screenshots of execution and results for record.

(9) Save the work and upload worksheet (Word + PDF) on GitHub.

5. I / O Analysis

DATABASE DESIGN

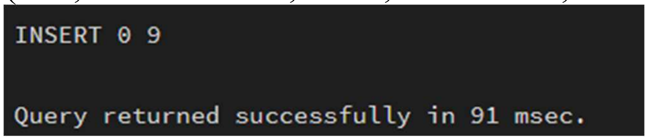
Query to create Table employee :

```
CREATE TABLE employee (
    emp_id       INT PRIMARY KEY,
    emp_name     VARCHAR(50),
    department   VARCHAR(50),
    salary       NUMERIC(10,2),
    joining_date DATE
);
```

DATA MANIPULATION

Insert Sample records in the table

```
INSERT INTO employee (emp_id, emp_name, department, salary, joining_date) VALUES
(101, 'Amit Sharma',   'IT',        45000, '2022-01-10'),
(102, 'Neha Verma',    'HR',        22000, '2021-03-15'),
(103, 'Rahul Singh',   'IT',        30000, '2020-06-20'),
(104, 'Priya Mehta',   'Finance',   55000, '2019-09-05'),
(105, 'Karan Gupta',   'HR',        18000, '2023-02-12'),
(106, 'Sneha Kapoor',  'Finance',   28000, '2020-11-25'),
(107, 'Rohit Jain',    'Sales',     35000, '2021-07-30'),
(108, 'Ananya Joshi',  'Sales',     15000, '2022-12-01'),
(109, 'Vikram Rao',    'IT',        25000, '2022-04-18');
```

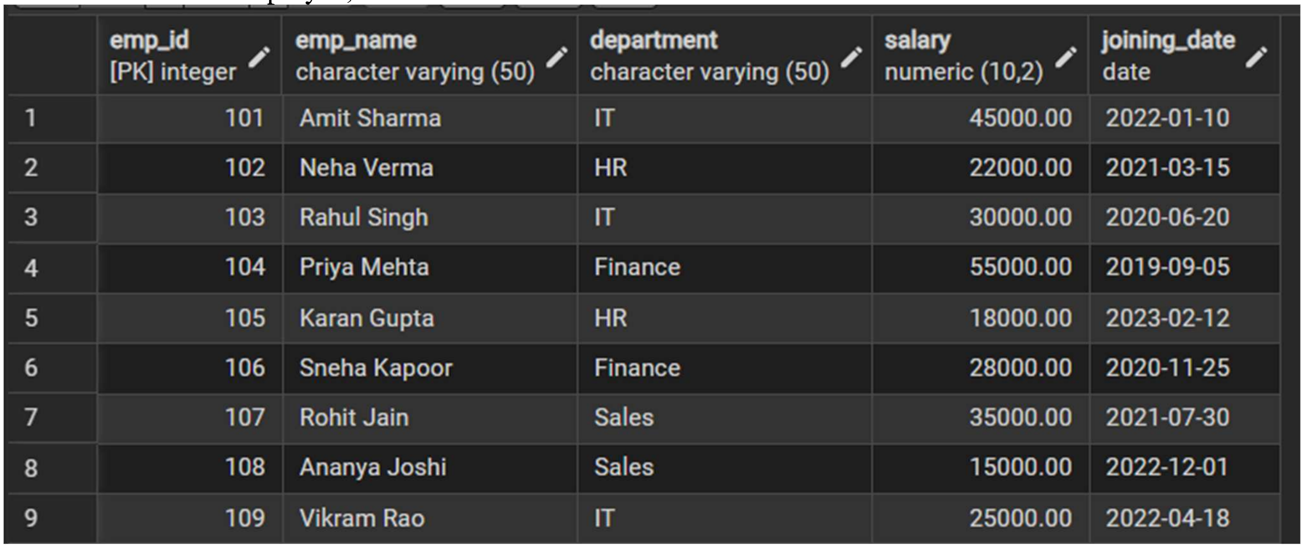


```
INSERT 0 9

Query returned successfully in 91 msec.
```

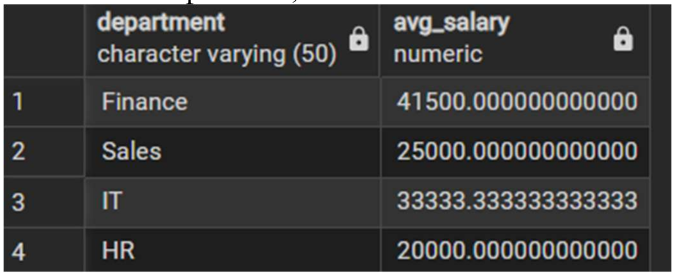
DISPLAY THE TABLE

SELECT * FROM employee;



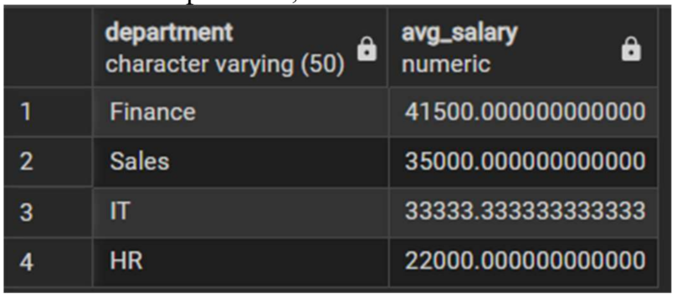
	emp_id [PK] integer	emp_name character varying (50)	department character varying (50)	salary numeric (10,2)	joining_date date
1	101	Amit Sharma	IT	45000.00	2022-01-10
2	102	Neha Verma	HR	22000.00	2021-03-15
3	103	Rahul Singh	IT	30000.00	2020-06-20
4	104	Priya Mehta	Finance	55000.00	2019-09-05
5	105	Karan Gupta	HR	18000.00	2023-02-12
6	106	Sneha Kapoor	Finance	28000.00	2020-11-25
7	107	Rohit Jain	Sales	35000.00	2021-07-30
8	108	Ananya Joshi	Sales	15000.00	2022-12-01
9	109	Vikram Rao	IT	25000.00	2022-04-18

SELECT department,AVG(salary) AS avg_salary
FROM employee
GROUP BY department;



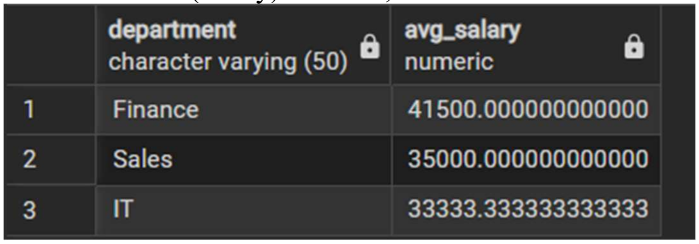
	department character varying (50)	avg_salary numeric
1	Finance	41500.000000000000
2	Sales	25000.000000000000
3	IT	33333.333333333333
4	HR	20000.000000000000

SELECT department,AVG(salary) AS avg_salary
FROM employee
WHERE salary > 20000
GROUP BY department;



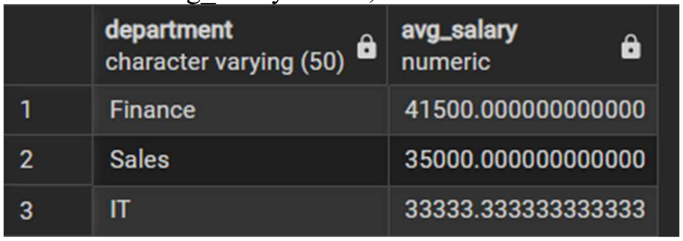
	department character varying (50)	avg_salary numeric
1	Finance	41500.000000000000
2	Sales	35000.000000000000
3	IT	33333.333333333333
4	HR	22000.00000000000

```
SELECT department,AVG(salary) AS avg_salary
FROM employee
WHERE salary > 20000
GROUP BY department
HAVING AVG(salary) > 30000;
```



	department character varying (50)	avg_salary numeric
1	Finance	41500.000000000000
2	Sales	35000.000000000000
3	IT	33333.333333333333

```
SELECT department,AVG(salary) AS avg_salary
FROM employee
WHERE salary > 20000
GROUP BY department
HAVING AVG(salary) > 30000
ORDER BY avg_salary DESC;
```



	department character varying (50)	avg_salary numeric
1	Finance	41500.000000000000
2	Sales	35000.000000000000
3	IT	33333.333333333333

6. Learning outcomes (What I have learnt):

- Understood the syntax and usage of SQL SELECT statements.
- Gained practical knowledge of WHERE clause for filtering rows.
- Learned grouping operations using GROUP BY clause.
- Applied HAVING clause to filter grouped results.
- Sorted query outputs using ORDER BY clause.
- Got hands-on experience in PostgreSQL execution using PgAdmin.