INDUSTRIAL TRAINING DAILY DIARY
DAY 09

04 June, 2025

Topic : Introduction to SQL and Database Management

Objectives of the Day

- Understand what SQL is and its role in databases
- Learn basic SQL commands for managing data
- Perform simple queries using SELECT, INSERT, UPDATE, and DELETE
- Practice creating and modifying tables

Topics Covered

1. **Introduction to SQL**
    - SQL stands for *Structured Query Language*
    - It is used to manage and manipulate relational databases
    - SQL allows users to create, retrieve, update, and delete data efficiently
2. **Basic SQL Commands**
    - **DDL (Data Definition Language):**
        - CREATE TABLE – to define a new table structure
        - ALTER TABLE – to add, remove, or modify columns
    - **DML (Data Manipulation Language):**
        - INSERT INTO – to add new records
        - UPDATE – to modify existing data
        - DELETE – to remove records
    - **DQL (Data Query Language):**
        - SELECT – to retrieve specific data from one or more tables
3. **Hands-on Practice**
    - Created a table named Students with columns: ID, Name, Age, Course
    - Inserted sample data into the table
    - Retrieved data using SELECT queries
    - Modified a record using UPDATE and deleted a row using DELETE

4. **Tools Used**
    - SQL editor/terminal (e.g., SQLite / MySQL / SQL Plus)
    - Python (optional, if SQL was practiced using Python scripts)

Learning Outcomes

- Gained fundamental knowledge of SQL and relational databases
- Learned how to interact with databases using SQL commands
- Understood the difference between data definition, manipulation, and query commands
- Became comfortable writing and executing basic SQL queries

Challenges Faced

- Initially faced syntax errors due to missing commas or incorrect quotes
- Forgot semicolon at the end of SQL statements, which caused execution issues
- Solved these through practice and careful observation of syntax rules

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SQL BASIC QUESTIONS

CREATE

Q1. **What is the SQL statement to create a new table named employees with columns id (integer), name (varchar), and salary (decimal)?**

ANS :

CREATE TABLE employees (id int , name varchar(50) , salary decimal)

Employees

id	name	salary
empty		

Q2. **How do you add a new column department (varchar) to the existing employees table?
ANS :

```
ALTER TABLE Employees
ADD department varchar(50)
```

Employees

id	name	salary	department
empty			

INSERT
Q3. **How do you insert a new row into the employees table with id = 1, name = 'John Doe', and salary = 50000?**
ANS :

```
INSERT INTO Employees
VALUES (1,'john doe',50000,null)
```

Employees

id	name	salary	department
1	john doe	50000	

Q4. **How can you insert multiple rows into the employees table in a single query?**
ANS :

```
INSERT INTO Employees
VALUES (2,'mary',5000,null),
       (2,'david',40000,null),
       (3,'peter',45000,null),
       (4,'ariel',55000,null)
```

Employees

id	name	salary	department
1	john doe	50000	
2	mary	5000	
2	david	40000	
3	peter	45000	
4	ariel	55000	

UPDATE
Q5. **How do you update the salary of the employee with id = 1 to 55000?
ANS :

```
UPDATE Employees SET salary = 55000 WHERE id = 1
```

Employees

id	name	salary	department
1	john doe	55000	
2	mary	5000	
2	david	40000	
3	peter	45000	
4	ariel	55000	

Q6. **How can you update the department column for all employees to 'Sales'?
ANS :

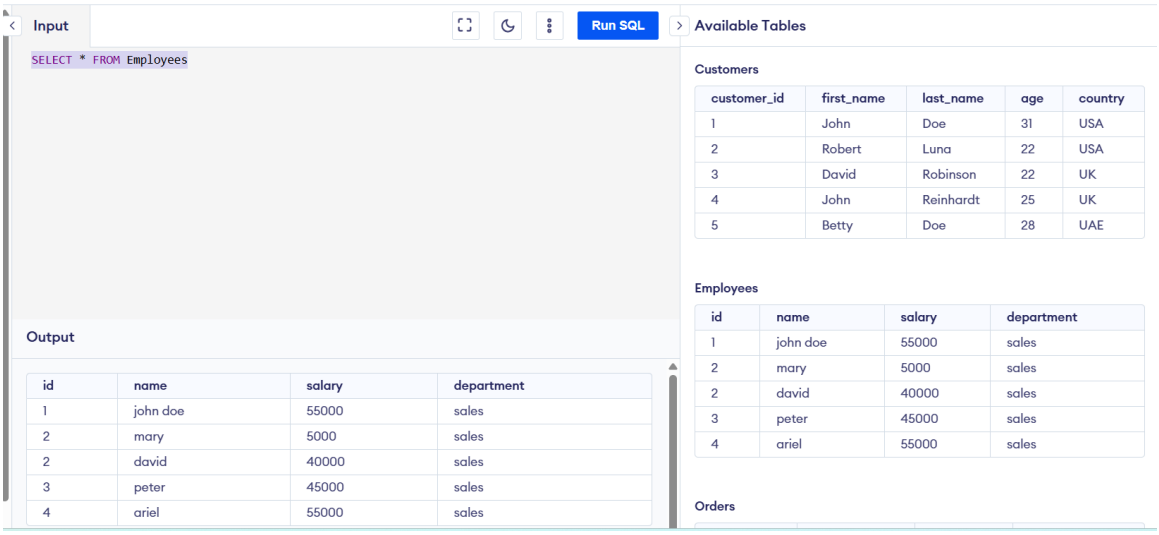
```
UPDATE Employees SET department = 'sales'
```

Employees

id	name	salary	department
1	john doe	55000	sales
2	mary	5000	sales
2	david	40000	sales
3	peter	45000	sales
4	ariel	55000	sales

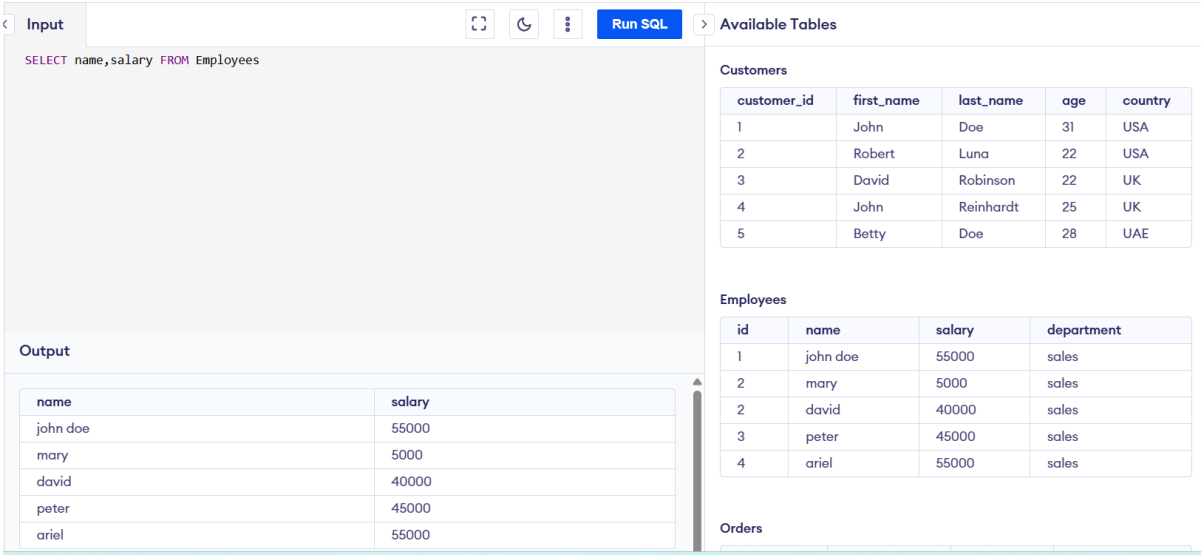
SELECT
Q7. **How do you select all columns from the employees table?
ANS :

```
SELECT * FROM Employees
```



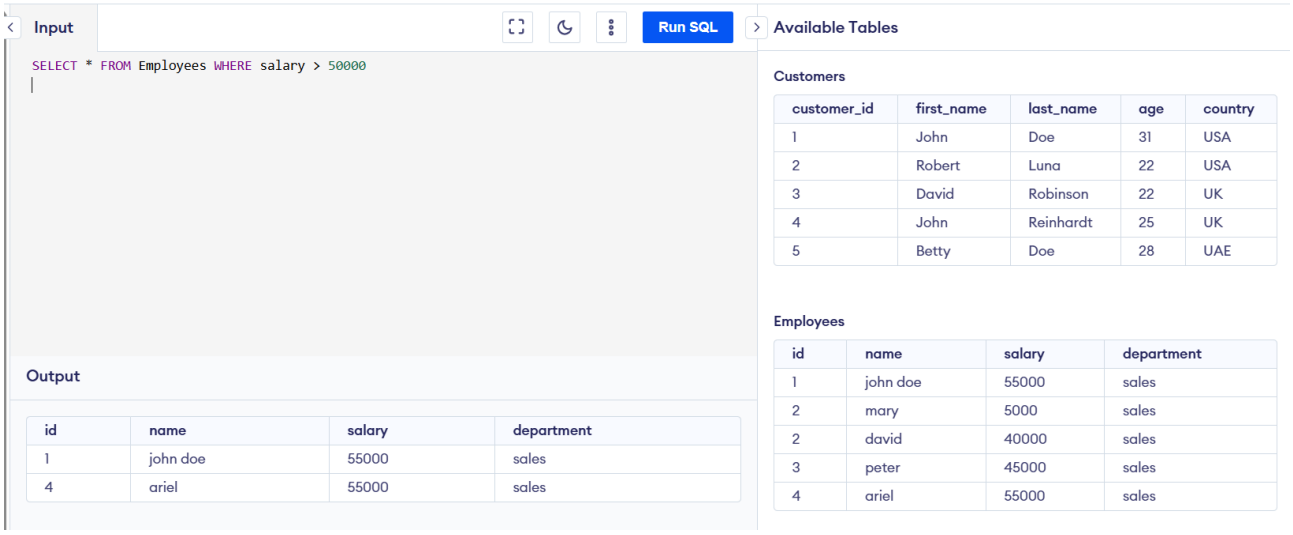
Q8. **How do you select only the name and salary columns from the employees table?
ANS :

```
SELECT name,salary FROM Employees
```



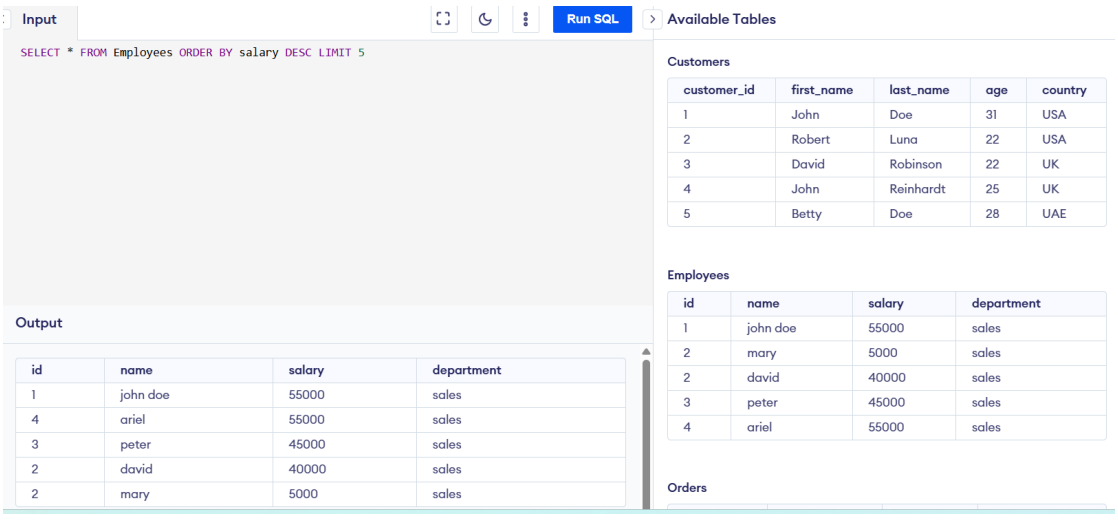
9. **How can you select employees whose salary is greater than 50000?
ANS :

SELECT * FROM Employees WHERE salary > 50000



10. **How do you select the top 5 highest paid employees?
ANS :

SELECT * FROM Employees ORDER BY salary DESC LIMIT 5



DELETE
11. **How do you delete the row where id = 1 from the employees table?**
ANS :

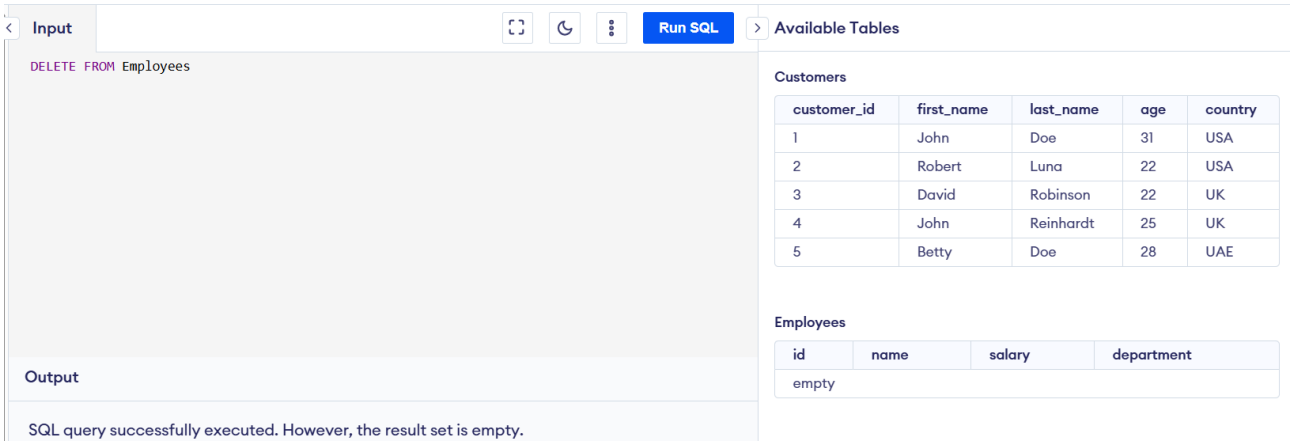
DELETE FROM Employees WHERE id = 1

Employees

id	name	salary	department
2	mary	5000	sales
2	david	40000	sales
3	peter	45000	sales
4	ariel	55000	sales

12. **How can you delete all rows from the employees table without dropping the table itself?
ANS :

DELETE FROM Employees



Combined Questions
13. **How do you create a table departments with id (integer) and name (varchar), insert a new department with id = 1 and name = 'HR', and select all departments?**
ANS :

- CREATE TABLE departments(id int, name varchar(50))

Departments

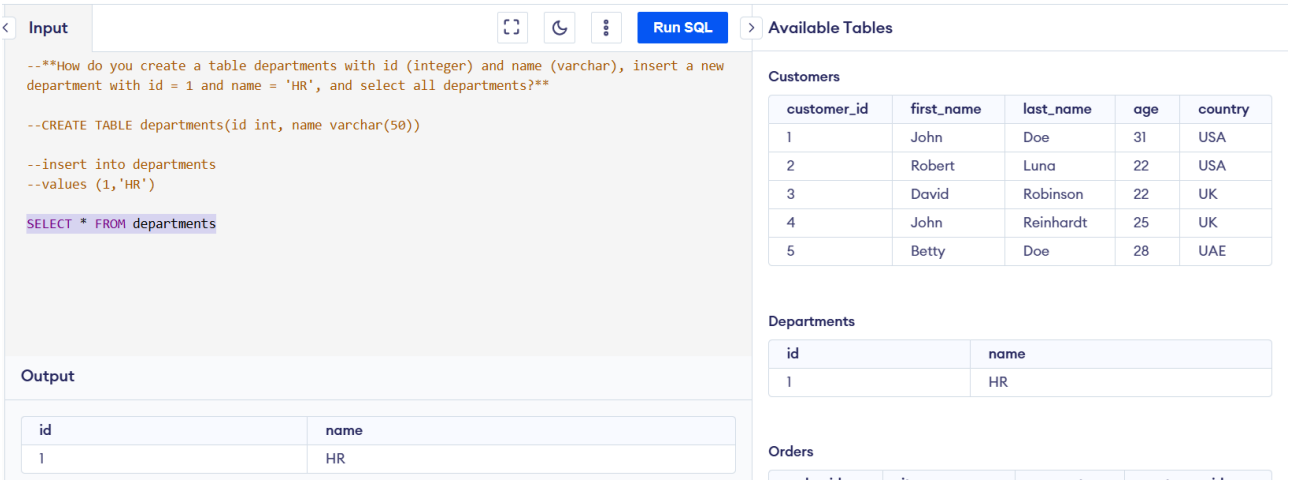
id	name
empty	

- INSERT INTO departments
  Values (1,'HR')

Departments

id	name
1	HR

- SELECT * FROM departments



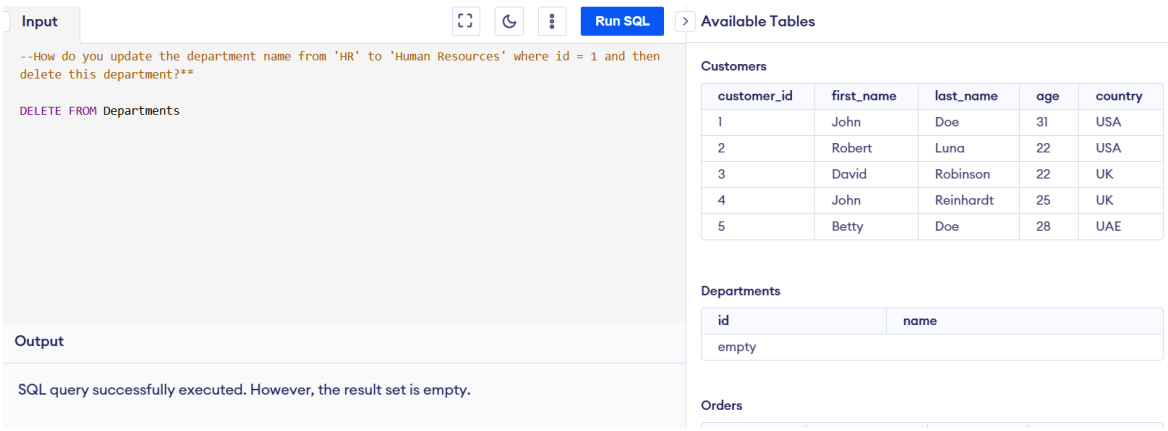
14. **How do you update the department name from 'HR' to 'Human Resources' where id = 1 and then delete this department?**
ANS :

- UPDATE departments SET name = 'Human Resources' WHERE id = 1

Departments

id	name
1	Human Resources

- DELETE FROM Departments



Conclusion

The session provided a strong foundation in SQL. Understanding the core commands will help in managing data efficiently and will be useful for both academic projects and future real-world applications.