

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
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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)
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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
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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
```

The screenshot shows a SQL query editor interface. The 'Input' tab is active, displaying the query `SELECT * FROM Employees`. A 'Run SQL' button is visible. The 'Output' section shows the result of the query as a table with 4 rows and 4 columns: id, name, salary, and department. The data is as follows:

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

On the right side, under 'Available Tables', there are three tables listed: Customers, Employees, and Orders. The 'Customers' table has 5 rows and 5 columns (customer_id, first_name, last_name, age, country). The 'Employees' table has 4 rows and 4 columns (id, name, salary, department). The 'Orders' table is currently empty.

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

ANS :

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

Input

Run SQL

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

Output

name	salary
john doe	55000
mary	5000
david	40000
peter	45000
ariel	55000

Available Tables

Customers

customer_id	first_name	last_name	age	country
1	John	Doe	31	USA
2	Robert	Luna	22	USA
3	David	Robinson	22	UK
4	John	Reinhardt	25	UK
5	Betty	Doe	28	UAE

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

Orders

order_id	customer_id	employee_id	amount
1	1	1	10000
2	2	2	20000
3	3	3	30000
4	4	4	40000
5	5	5	50000

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

ANS :

```
SELECT * FROM Employees WHERE salary > 50000
```

Input

Run SQL

SELECT * FROM Employees WHERE salary > 50000

Output

id	name	salary	department
1	john doe	55000	sales
4	ariel	55000	sales

Available Tables

Customers

customer_id	first_name	last_name	age	country
1	John	Doe	31	USA
2	Robert	Luna	22	USA
3	David	Robinson	22	UK
4	John	Reinhardt	25	UK
5	Betty	Doe	28	UAE

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

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

ANS :

```
SELECT * FROM Employees ORDER BY salary DESC LIMIT 5
```

Input

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⋮

Run SQL

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Available Tables

SELECT * FROM Employees ORDER BY salary DESC LIMIT 5

Output

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

Customers

customer_id	first_name	last_name	age	country
1	John	Doe	31	USA
2	Robert	Luna	22	USA
3	David	Robinson	22	UK
4	John	Reinhardt	25	UK
5	Betty	Doe	28	UAE

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

Orders

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

Input

DELETE FROM Employees

Run SQL

Available Tables

Customers

customer_id	first_name	last_name	age	country
1	John	Doe	31	USA
2	Robert	Luna	22	USA
3	David	Robinson	22	UK
4	John	Reinhardt	25	UK
5	Betty	Doe	28	UAE

Employees

id	name	salary	department
empty			

Output

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

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

Input

```
--**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?**

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

--insert into departments
--values (1,'HR')

SELECT * FROM departments
```

Run SQL

Available Tables

Customers

customer_id	first_name	last_name	age	country
1	John	Doe	31	USA
2	Robert	Luna	22	USA
3	David	Robinson	22	UK
4	John	Reinhardt	25	UK
5	Betty	Doe	28	UAE

Departments

id	name
1	HR

Orders

order_id	customer_id	product_id	quantity	price
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Output

id	name
1	HR

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

Input

```
--How do you update the department name from 'HR' to 'Human Resources' where id = 1 and then delete this department?**

DELETE FROM Departments
```

Run SQL

Available Tables

Customers

customer_id	first_name	last_name	age	country
1	John	Doe	31	USA
2	Robert	Luna	22	USA
3	David	Robinson	22	UK
4	John	Reinhardt	25	UK
5	Betty	Doe	28	UAE

Departments

id	name
empty	

Orders

order_id	customer_id	product_id	quantity	price
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Output

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

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.
