Industry-Ready SQL Training Outline

1. Introduction to the IT world and Data

a. What are Applications and how does it generate and manipulate data

b. What is Data, how is it stored, why is it stored?

c. Data ecosystem

d. ETL and Data warehousing basics

e. Data Analytics vs Data science

f. Various job opportunities related to data

2. Introduction to SQL

a. What is SQL?

b. SQL History and Evolution

c. Overview of Relational Databases

2. Database Design Fundamentals

a. Relational Database Concepts

b. Schema Design and Normalization

c. Entity-Relationship Diagrams (ERD)

d. Indexing and Keys

3. SQL Query Basics

a. Create and Drop Table

b. Importance of Data types and how does it control Data quality

c. SELECT Statements

d. Filtering Data with WHERE

e. Sorting Data with ORDER BY

f. Delete and Truncate

4. SQL Constraints

a. Primary Key

b. Foreign Key

c. Unique Key

d. Default

e. Check

5. Advanced Query Techniques

a. Joins: INNER, LEFT, RIGHT, FULL OUTER

b. Subqueries

c. Set Operations: UNION, INTERSECT, EXCEPT

d. Common Table Expressions (CTEs)

e. Temp Table : Global/Local

6. Data Manipulation

a. INSERT, UPDATE, DELETE Statements

b. Transactions and Concurrency Control

c. Error Handling and Rollbacks

7. Data Aggregation and Analysis

a. Aggregate Functions: COUNT, SUM, AVG, MIN, MAX

b. GROUP BY and HAVING Clauses

c. How to identify duplicates and delete it

d. Window Functions: ROW_NUMBER, RANK, DENSE_RANK, LEAD,LAG

8. Advanced SQL Features

a. Stored Procedures

b. Triggers

c. Views and Materialized Views

d. User-Defined Functions (UDFs)

9.Incremental Loads

a. Upsert using Merge Statement

10. Performance Optimization

a. Query Optimization Techniques

b. Index Optimization

c. Analyzing Execution Plans

11. Security and Compliance

a. User Authentication and Authorization

b. Compliance with Data Protection Regulations (e.g., GDPR)

12. Real-World Applications

a. Case Studies and Industry Use Cases

b. Integration with BI Tools (e.g., Tableau, Power BI)

c. Best Practices for SQL Development

13. Hands-On Projects and Exercises

a. Real-World Data Challenges

b. Project Work: Building and Querying Databases

c. Industry Scenario Simulations

14. Course Summary and Review

a. Key Takeaways

b. Further Learning Resources

c. Certification and Career Guidance

d. Interview Questions and Preparations