SQL Database plan

Phase 1 SQL Basics

1. Introduction to databases  
     
   what is a Database?

Types of databases

Introduction to relational databases

1. Basic SQL syntax  
     
   Writing SQL Queries

Understanding the SELECT Statement

Filtering Data with WHERE

Sorting Data with ORDER BY

Limiting Results with LIMIT or OFFSET

1. Data Types in SQL

Numeric Types

String/Text Types

Date and Time Types

Boolean, JSON, and Arrays

1. Joins and relationships

Understanding Primary and Foreign Keys

Types of Joins

INNER JOIN

LEFT JOIN

RIGHT JOIN

FULL OUTER JOIN

Cross Joins, Self Joins

1. Basic data manipulation

Inserting Data with INSERT INTO

Updating Data with UPDATE

Deleting Data with DELETE

1. Basic aggregation and grouping

Aggregation Functions COUNT, SUM, AVG, MAX, MIN

Grouping Data with GROUP BY

Filtering Groups with HAVING

Phase 2 Intermediate SQL

1. Advanced Filtering and Subqueries

Advanced WHERE Clauses using BETWEEN, IN, LIKE

Subqueries Nested Queries

Using EXISTS and NOT EXISTS

1. Joining Multiple Tables

Complex Joins with Multiple Tables

Understanding N Relationships

1. Views

What are Views?

Creating, Updating, and Deleting Views

Advantages of Using Views

1. Indexes and performance optimization

Understanding Indexes and Their Importance

Types of Indexes like B-Tree, Hash Indexes

Impact of Indexes on Query Performance

1. Transactions

What is a Transaction?

ACID Properties

Using BEGIN, COMMIT, and ROLLBACK

Savepoints and Nested Transactions

Phase 3 Advanced SQL

1. Advanced joins and set operations

Full Outer Joins

Union and Intersection of Queries

1. Window functions

What are Window Functions?

Using OVER with Partitioning

ROW\_NUMBER(), RANK(), DENSE\_RANK(), and NTILE()

1. Common table expressions  
     
   Writing Recursive Queries

Benefits of CTEs over Subqueries

1. Trigger and stored procedures

Introduction to Stored Procedures

Writing and Calling Stored Procedures

Creating and Managing Triggers

1. Database design and normalization

Normalization

Denormalization

Indexing and Partitioning Strategies

Phase 4 Mastery and special topics

1. Advanced data types

Working with JSON, Arrays, and Geographic Data

1. Database security

User Roles and Permissions

Securing Data with Encryption

Preventing SQL Injection Attacks

1. SQL performance tuning

Query Execution Plans

Optimizing Queries

Caching Strategies

1. Handling big data in SQL

Partitioning

Parallel Query Execution

Working with Shards