

SQL and Databases (Basics)

Week 1:

Day 1-2:

Block 1: Introduction to Databases

- Overview of databases and their importance
- Different types of databases (SQL vs. NoSQL)

Block 2: Introduction to SQL

- Basic SQL syntax and structure
- Understanding SQL statements (SELECT, INSERT, UPDATE, DELETE)

Day 3-4:

Block 3: Creating and Managing Databases

- Creating databases and tables
- Understanding data types

Block 4: SQL Constraints

- Primary keys, foreign keys, and unique constraints
- Ensuring data integrity with constraints

Day 5-6:

Block 5: Querying Data - Part 1

- Retrieving data with the SELECT statement
- Filtering and sorting data

Block 6: Querying Data - Part 2

- Using aggregate functions (COUNT, SUM, AVG, MAX, MIN)
- Grouping and summarizing data

Day 7:

Block 7: Introduction to SQL Joins

- Understanding different types of joins (INNER, LEFT, RIGHT, FULL)
- Joining tables to retrieve related data

Week 2:

Day 8-9:

Block 8: Subqueries and Nested Queries

- Using subqueries in SQL statements
- Nesting queries for more complex scenarios

Block 9: Modifying Data with SQL

- INSERT, UPDATE, and DELETE statements
- Best practices for data modification

Day 10-11:

Block 10: Transactions and ACID Properties

- Understanding database transactions
- ACID properties and their importance

Block 11: Indexing in SQL

- Creating and using indexes
- Optimizing query performance with indexes

Day 12-13:

Block 12: Views in SQL

- Creating and using views
- Advantages of using views in database design

Block 13: Stored Procedures and Functions

- Writing and executing stored procedures
- Creating and using functions in SQL

Day 14:

Block 14: Triggers in SQL

- Understanding triggers
- Implementing triggers for data validation and automation

Week 3:

Day 15-16:

Block 15: Introduction to Database Normalization

- Basics of database normalization
- Reducing data redundancy and improving data integrity

Block 16: Denormalization in SQL

- Understanding when and why to denormalize
- Trade-offs and considerations in denormalization

Day 17-18:

Block 17: Introduction to NoSQL Databases

- Overview of NoSQL databases
- Contrasting NoSQL with SQL databases

Block 18: Working with SQL in Python (e.g., using SQLite with Python)

- Interacting with SQL databases using Python
- Basic CRUD operations in Python with SQL

Day 19-20:

Block 19: Introduction to Data Modeling

- Entity-Relationship Diagrams (ERDs)
- Designing databases based on business requirements

Block 20: Common SQL Interview Questions and Practice

- Review common SQL interview questions
- Practice answering them to reinforce your knowledge

Week 4:

Day 21-22:

Block 21: Backup and Recovery in SQL

- Importance of database backups
- Strategies for backup and recovery

Block 22: Security in SQL

- User authentication and authorization
- Implementing security measures in SQL databases

Day 23-24:

Block 23: Advanced SQL Topics

- Window functions
- Common Table Expressions (CTEs)

Block 24: Real-world SQL Scenarios and Problem Solving

- Work on practical, real-world scenarios
- Troubleshoot and solve common SQL challenges

Day 25:

Block 25: Capstone Project

- Apply learned concepts in a small database project
- Seek feedback and make improvements

Day 26:

Block 26: Building a Portfolio and Showcase SQL Projects

- Document and showcase SQL projects in a portfolio
- Discussing your projects in interviews

Day 27:

Block 27: Networking in the Database Community

- Joining database-related forums and communities
- Engaging with professionals in the field

Day 28:

Block 28: Continuing Your Learning Journey

- Explore advanced SQL topics and specialized databases
- Identify areas for ongoing improvement

Day 29-30:

Block 29-30: Reflection and Review

- Reflect on your learning journey
- Address any remaining questions or uncertainties