Introduction to Databases and SQL Basics (40 hours)

Module 1: Introduction to Databases and SQL Basics (14 hours)

- Overview of Databases
- Introduction to databases and their types
    - Importance of databases in computing
- SQL Fundamentals
    - Basic SQL syntax and data types
    - Creating and modifying databases, tables, and records
    - Primary keys and foreign keys
- Basic SQL Queries
    - SELECT statement
    - Sorting and filtering data with ORDER BY and WHERE clauses

Module 2: Advanced SQL Queries (14 hours)

- Working with Multiple Tables
    - JOIN operations (INNER, LEFT, RIGHT, FULL OUTER)
    - Combining data from multiple tables
- Subqueries and Nested Queries
    - Understanding subqueries and their applications
    - Correlated subqueries
- Aggregation and Grouping
    - Aggregation functions (SUM, AVG, COUNT, MAX, MIN)
    - GROUP BY and HAVING clauses

Module 3: Data Manipulation and Transaction Control (12 hours)

- Data Manipulation
    - Inserting, updating, and deleting data
    - Managing transactions (BEGIN, COMMIT, ROLLBACK)
- Constraints and Indexes
    - Constraints (UNIQUE, NOT NULL, CHECK)
- Views and Stored Procedures
    - Creating and managing views
    - Introduction to stored procedures
- Working with Dates and Times
    - Date and time functions
    - Formatting query results

- Case Statements and Conditional Logic
  - Using CASE statements
  - Advanced filtering techniques

Optional (add more hours to course) Advanced Database Concepts (14 hours)

- Triggers and Optimization
  - Indexes and their impact on performance
  - Overview of triggers and their applications
  - Optimizing SQL queries
- Window Functions
  - Introduction to window functions
  - ROW_NUMBER(), RANK(), DENSE_RANK(), etc.

sqLabs
המכללה הגבוהה להייטק

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