DBMS

Theory:

- **Introduction to DBMS**: Definition of data, information, database, and DBMS; Requirement of database and differences over file system; Introduction to database languages (DML, DDL, DCL, TCL, QBE).
- **Database Models**: Introduction to database models: hierarchical, network, relational, object-oriented; Introduction to entity-relationship (ER) model, object model, aggregation, generalization.
- **Relational Model**: Introduction to relational algebra (RA) and its implementation techniques; Relational algebra operations.
- **Database Keys**: Types of keys: primary key, foreign key, candidate key, super key, composite key, etc.
- **Normalization**: Introduction to normalization and its processes (1NF, 2NF, 3NF, BCNF); Introduction to stored procedures.
- **Transactions and Concurrency**: Introduction to transactions and concurrency control; ACID properties; Deadlock handling.
- **SQL and Database Operations**: Introduction to SQL clauses (SELECT, FROM, WHERE, GROUP BY, HAVING, ORDER BY); Introduction to triggers.
- **Database Administration**: Role of a Database Administrator (DBA); Security techniques; Transaction management.
- **Query Processing**: Introduction to query processing; Optimization techniques.
- **Advanced Topics**: Introduction to RDBMS; Introduction to database security, backup, and recovery.

Practical Implementation:

- **CRUD Operations**: Create database and tables; Insert, update, delete, and read data; Join tables; Alter tables.
- **SQL Operations**: Row and column operations; Creating views; Using aggregate functions; SQL joins; Key implementation.
- **Advanced SQL**: Normalization implementation; Drop queries; Data indexing and index creation; SQL triggers creation; SQL views creation; Role setting and access control.
- **Stored Procedures**: Creating and using stored procedures; Control management queries.
- **Additional Topics**: Implementing SQL clauses; Transaction management.
- **RAG**: Create Rag or Converting RAG into SQL Queries.

Visual Demonstration:

- **Normalization**: Demonstrate normalization process.
- **ER Model**: ER diagram creation; Converting ER diagrams into tables.
- **Serialization**: Transaction management and serialization checking.

IMPORTANT: Normalization – ER Diagram – Relational Algebra – Store Procedure – Query Processing – Relational Modal

https://t.me/BCATU   Mahendra Mahara