MongoDB vs SQL: A Comparison

- **Purpose of the Presentation:**

  Understand the differences between NoSQL (MongoDB) and SQL databases.
  Compare their functionalities, use cases, and performance.

- **What is SQL?**

  SQL (Structured Query Language) is a relational database management system (RDBMS).
  Examples: MySQL, PostgreSQL, Oracle.

- **What is MongoDB?**

  MongoDB is a NoSQL document-oriented database.
  It stores data in JSON-like documents.

Data Model Comparison

- **SQL (Relational Model):**

- Data is stored in tables with rows and columns.
- Tables are related to each other using foreign keys.
- Example: A Users table with columns: id, name, email.

- **MongoDB (Document Model):**

- Data is stored in flexible JSON-like documents.
- Documents are grouped into collections.

Schema Flexibility

- **SQL (Fixed Schema):**

- Requires a predefined schema.
- All rows in a table must follow the same structure.
- Example: Adding a new column requires altering the table.

- **MongoDB (Dynamic Schema):**

- No fixed schema.
- Each document in a collection can have a different structure.
- Example: Adding a new field to a document does not affect other documents.

Query Language Comparison

- **SQL :**

- Uses SQL (Structured Query Language) for queries.
- Example Query: `SELECT * FROM Users WHERE age > 25;`

- **MongoDB :**

- Uses a JSON-like query language.
- Example Query: `db.Users.find({ age: { $gt: 25 } });`

Use Cases and Performance

- **SQL :**

- Best for structured data with complex relationships.
- Ideal for applications requiring ACID transactions (e.g., banking systems).
- Example Use Cases: ERP systems, financial applications.

- **MongoDB :**

- Best for unstructured or semi-structured data.
- Ideal for applications requiring high scalability and flexibility (e.g., real-time analytics, content management).
- Example Use Cases: Social media platforms, IoT applications.