1. What is SQL?

SQL (Structured Query Language) databases are relational databases (RDBMS).

Data is stored in tables (rows and columns) with a fixed schema.

Examples: MySQL, PostgreSQL, Oracle, Microsoft SQL Server.

SQL focuses on structured data with strict relationships.

2. What is NoSQL?

NoSQL (Not Only SQL) databases are non-relational databases.

Data can be stored in different formats:

Document-based (MongoDB, CouchDB)

Key-Value (Redis, DynamoDB)

Wide-Column (Cassandra, HBase)

Graph (Neo4j)

Flexible schemas, designed for scalability and speed.

NoSQL focuses on unstructured / semi-structured data and high scalability.

3. Scenarios – When to Choose Which?

Use SQL when:

Data is highly structured with clear relationships.

You need ACID compliance (Atomicity, Consistency, Isolation, Durability).

Complex queries, joins, and transactions are required.

Example: Banking systems, ERPs, CRM, HR systems.

Use NoSQL when:

Data is unstructured or semi-structured (e.g., JSON, logs, IoT).

System requires horizontal scalability (large-scale apps with millions of users).

You need fast read/write speeds over strict consistency.

Example: Social media apps, real-time analytics, e-commerce catalogs, IoT platforms.

SQL Advantages:

1. Structured and organized data storage.

2. Powerful query language (JOINs, aggregations, filtering).

3. ACID compliance ensures reliable transactions.

4. Mature ecosystem, widely adopted, lots of tools and support.

NoSQL Advantages:

1. Flexible schema – can handle changing data structures.

2. High scalability – supports distributed systems easily.

3. Optimized for large-scale read/write operations.

4. Better performance for unstructured data (JSON, key-value).