Assignment: NoSQL and MongoDB Database

1. Introduction to NoSQL:

NoSQL (Not Only SQL) databases are non-relational databases that store data in various formats like key-value, document, columnar, or graph. They are designed to handle large volumes of unstructured or semi-structured data, providing high scalability and flexibility.

2. Introduction to MongoDB:

MongoDB is a popular open-source NoSQL database that stores data in flexible, JSON-like documents. It is designed for scalability, high performance, and ease of development.

3. History of MongoDB:

MongoDB was developed by a company called 10gen in 2007, which later became MongoDB Inc. It was created to meet the growing demand for scalable and flexible databases. MongoDB gained popularity quickly and is now one of the leading NoSQL databases.

4. Advantages of MongoDB:

- Schema-less: Flexible document structure.
- High Performance: Fast read/write operations.
- Scalability: Supports horizontal scaling using sharding.
- Rich Query Language: Powerful queries and indexing.
- Easy Integration: Works well with many programming languages and tools.

5. Disadvantages of MongoDB:

- Data Redundancy: No joins can lead to duplication.
- Less ACID Compliance: May not be suitable for highly transactional systems.

- Large Document Size: Can affect performance.

- Memory Usage: Can be high due to indexing and in-memory storage.

6. How to Use MongoDB:

- Install MongoDB from the official website.

- Start the MongoDB server using `mongod`.

- Use the MongoDB shell (`mongo`) to interact with the database.

- Basic Commands:

  - `use dbname`: Switch to or create a database.

  - `db.createCollection('collectionName')`: Create a collection.

  - `db.collection.insertOne({key: 'value'})`: Insert a document.

  - `db.collection.find()`: Retrieve documents.

MongoDB also integrates well with programming languages like JavaScript (Node.js), Python, Java, etc., using official drivers or ODMs like Mongoose (for Node.js).