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Practical No 01

- Aim:- Installation and setup of MongoDB client & server

- Theory: A database is an organized collection of data stored electronically designed to efficiently manage, retrieve and manipulate information. It enable users to access data systematically through queries and transaction. The two main type of databases.

- 1> Relational Databases (RDBMS)

- Organize data into predefined structure & tables by using SQL (eg. MySQL, PostgreSQL)

- 2> Non-Relational Database :- (NoSQL)
Handle unstructured & semi structured data with flexible schema.

NoSQL needed over SQL for foll. reasons:

- 1> Scalability → Efficient horizontal scaling over large data & traffic

- 2> flexibility → Provides dynamic schema

- 3> High Performance → faster operations

- 4> Big Data → handle large data efficiently

- 5> Complex Relationships → ideal for graph based & non tabular relⁿ

- 6> Distributed Systems → seamless integration with cloud & distributed systems.

- MongoDB → A popular NoSQL database that store data in JSON like format called BSON. Handles unstructured & semi structured data. Offers scalability, high performance & dynamic schema.

making it highly usable in modern apps.

* MongoDB server →

Core DB engine that stores & processes data. Handles client requests & performs CRUD operations. Also ensures data consistency & availability.

* MongoDB client →

A Tool or Interface used to connect to the MongoDB server. Allow users to connect with server and interact with database by executing queries, managing collections & performing administrative tasks.

MongoDB server installation steps.

- 1) Download MongoDB MSI installer from MongoDB community Download Centre.
- 2) Open the MSI file & follow the installation wizard.
- 3) Choose "Run MongoDB as a service" during installation.
- 4) Set data directory default.
- 5) Add bin folder to system's PATH.
- 6) Open terminal & run mongod to start server.
- 7) Open terminal & run "mongod --version" to verify installation.

Steps to install Mongosh (MongoDB client)

- 1) Go to the MongoDB shell download page.
- 2) Select appropriate version for windows.
- 3) Run the installer & follow setup wizard.

4) Add mongosh PATH to system PATH for easy access from command line

(Optional step)

5) open terminal & run "mongosh --version" to verify installation

• Advantages

- Scalability
- Availability

- Flexibility
- Agility

- Performance

• Disadvantages

- Complexity

- Data redundancy due to flexible schema

- Not always fully ACID-compliant for transactions

- Results → Successfully installed MongoDB client & server on device.

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