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CLASS:- B.E - 4
ROLL NO:- 04
BATCH:- A

EXPERIMENT NO: 6

Aim: To install and Configure MongoDB to execute NoSQL commands.

THEORY:

What is NoSQL:

NoSQL(Not Only SQL) is a non-relational database management systems, different from traditional relational database management systems in some significant ways. It is designed for distributed data stores where very large scale of data storing needs These type of data storing may not require fixed schema, avoid join operations and typically scale horizontally.

Why NoSQL?

In today's time data is becoming easier to access and capture through third parties such as Facebook, Google+ and others. Personal user information, social graphs, geo location data, user generated content and machine logging data are just a few examples where the data has been increasing exponentially. To avail the above service properly, it is required to process huge amount of data. Which SQL databases were never designed. The evolution of NoSql databases is to handle these huge data properly.

Benefits of NoSQL over RDBMS:

• **Schema Less:** NoSQL databases being schema-less do not define any strict data structure. • **Dynamic and Agile:** NoSQL databases have good tendency to grow dynamically with changing requirements. It can handle structured, semi-structured and unstructured data.

• **Scales Horizontally:** In contrast to SQL databases which scale vertically, NoSQL scales horizontally by adding more servers and using concepts of sharding and replication. This behavior of NoSQL fits with the cloud computing services such as Amazon Web Services (AWS) which allows you to handle virtual servers which can be expanded horizontally on demand.

• **Better Performance:** All the NoSQL databases claim to deliver better and faster performance as compared to traditional RDBMS implementations.

Types of NoSQL Databases

• **Document Oriented Databases**

Document oriented databases treat a document as a whole and avoid splitting a document in its constituent name/value pairs. At a collection level, this allows for putting together a diverse set of documents into a single collection. Document databases allow indexing of documents on the basis of not only its primary identifier but also its properties. Different open-source document databases are available today but the most prominent among the available options are MongoDB and CouchDB. In fact, MongoDB has become one of the most popular NoSQL databases.

• **Graph Based Databases**

A graph database uses graph structures with nodes, edges, and properties to represent and store data. By definition, a graph database is any storage system that provides index-free adjacency. This means that every element contains a direct pointer to its adjacent element and no index lookups are necessary. General graph databases that can store any graph are distinct from specialized graph databases such as triple-stores and network databases. Indexes are used for traversing the graph. •

Column Based Databases

The column-oriented storage allows data to be stored effectively. It avoids consuming space when storing nulls by simply not storing a column when a value doesn't exist for that column. Each unit of data can be thought of as a set of key/value pairs, where the unit itself is identified with the help of a primary identifier, often referred to as the primary key. Bigtable and its clones tend to call this primary key the row-key.

- **Key Value Databases**

The key of a key/value pair is a unique value in the set and can be easily looked up to access the data. Key/value pairs are of varied types: some keep the data in memory and some provide the capability to persist the data to disk. A simple, yet powerful, key/value store is Oracle's Berkeley DB.

Popular NoSQL Databases

NoSQL databases that falls in the above categories respectively.

- **Document Oriented Databases –** MongoDB, HBase, Cassandra, Amazon SimpleDB, Hypertable, etc.
- **Graph Based Databases –** Neo4j, OrientDB, Facebook Open Graph, FlockDB, etc. •

Column Based Databases – CouchDB, OrientDB, etc.

- **Key Value Databases –** Membase, Redis, MemcacheDB, etc.

MongoDB

MongoDB is a cross-platform, document oriented database that provides, high performance, high availability, and easy scalability. MongoDB works on concept of collection and document. • **Database:** Database is a physical container for collections. Each database gets its own set of files on the file system. A single MongoDB server typically has multiple databases.

- **Collection:** Collection is a group of MongoDB documents. It is the equivalent of an RDBMS table. A collection exists within a single database. Collections do not enforce a schema. Documents within a collection can have different fields. Typically, all documents in a collection are of similar or related purpose.
- **Document:** A document is a set of key-value pairs. Documents have dynamic schema. Dynamic schema means that documents in the same collection do not need to have the same set of fields or structure, and common fields in a collection's documents may hold different types of data.

MongoDB Installation steps:

Step 1-: 1. Download MongoDB

Download MongoDB from official MongoDB website. Choose Windows 32 bits or 64 bits.

Step 2-:There are two ways of installation of MongoDB,either download and extract zip file in to C drive or download msi package and Install it by double clicking on setup file which install it in c:/program files directory.

Step 3-: Review MongoDB folder
In MongoDB, it contains only 10+ executable files (exe) in the bin folder. This is true, and that are the required files to MongoDB, it's really hard to believe for a developer like me who come from a relation database background. MongoDB need a folder (data directory) to store its data. By default, it will store in "C:\data\db", create this folder manually. MongoDB won't create it for you. You can also specify an alternate data directory with --dbpath option.

Step 4-: Run MongoDB server
change directory copy the path of program files till bin...
Open command prompt type following command to start to start MongoDBserver.
c:\mongodb\bin>mongod //--config c:\mongodb\mongo.config

Step 5: Connect client to MongoDB Server by typing mongo on another
command prompt c:\mongodb\bin>mongo
MongoDB shell version: 2.2.3

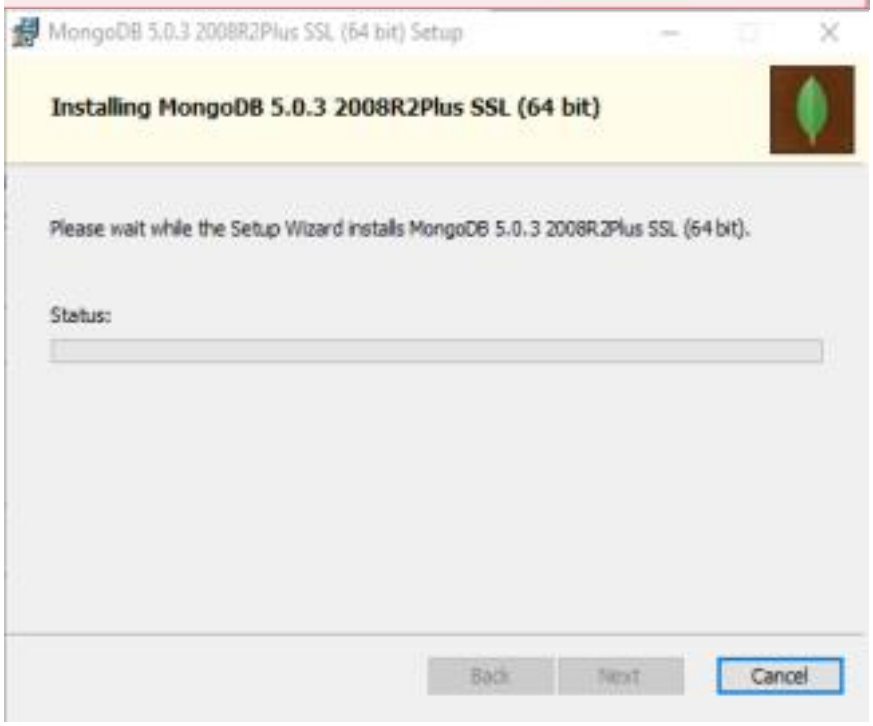
> ← Mongodb shell
connecting to: test

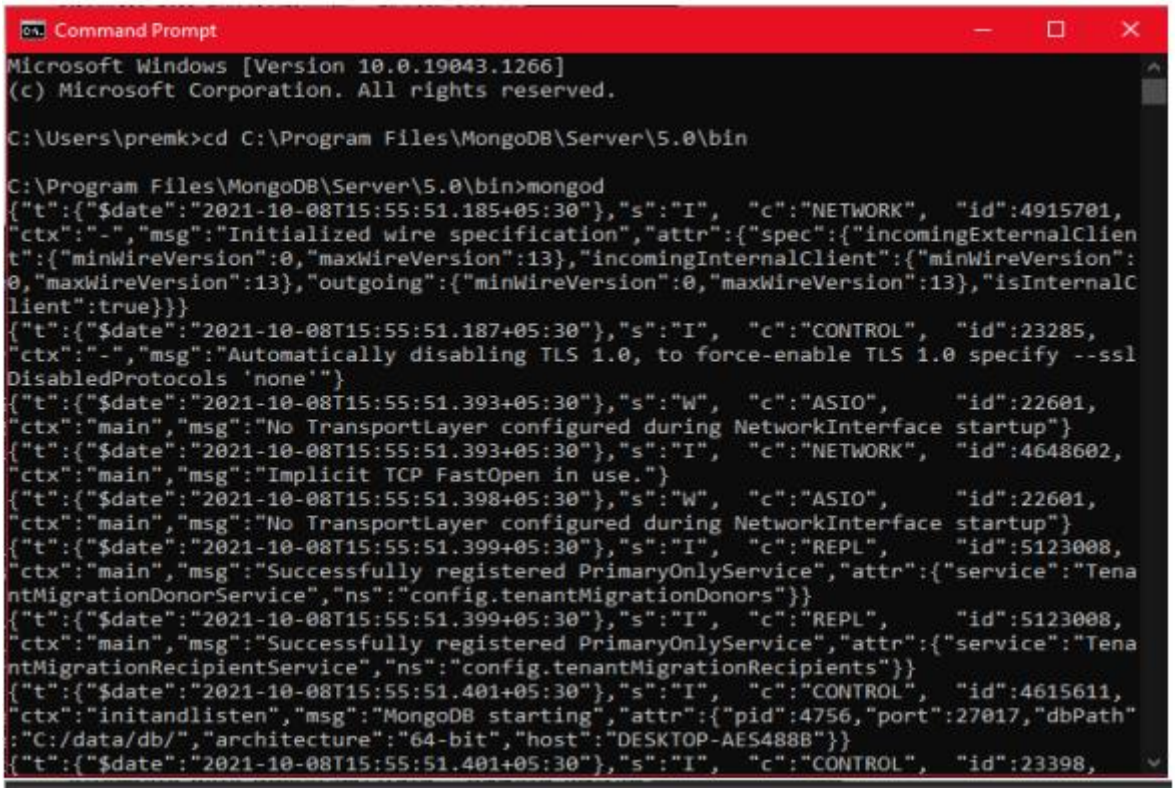
CONCLUSION:

MongoDB is an open-source document database that provides high performance, high availability, and automatic scaling. MongoDB obviates the need for an Object Relational Mapping (ORM) to facilitate development.

Program formation/ Execution/ ethical practices (06)	Timely Submission and Documentation (02)	Viva Answer (02)	Experiment Marks (10)	Teacher Signature with date


MongoDB 5.0.3 2008R2Plus SSL (64 bit) Setup
Welcome to the MongoDB 5.0.3 2008R2Plus SSL (64 bit) Setup Wizard
The Setup Wizard will install MongoDB 5.0.3 2008R2Plus SSL (64 bit) on your computer. Click Next to continue or Cancel to exit the Setup Wizard.
Back
Next
Cancel


MongoDB 5.0.3 2008R2Plus SSL (64 bit) Setup
Installing MongoDB 5.0.3 2008R2Plus SSL (64 bit)
Please wait while the Setup Wizard installs MongoDB 5.0.3 2008R2Plus SSL (64 bit).
Status:
Back
Next
Cancel


Command Prompt
Microsoft Windows [Version 10.0.19043.1266]
(c) Microsoft Corporation. All rights reserved.
C:\Users\premk>cd C:\Program Files\MongoDB\Server\5.0\bin
C:\Program Files\MongoDB\Server\5.0\bin>mongod
{"t":{"$date":"2021-10-08T15:55:51.185+05:30"},"s":"I", "c":"NETWORK", "id":4915701, "ctx":"-","msg":"Initialized wire specification","attr":{"spec":{"incomingExternalClient":{"minWireVersion":0,"maxWireVersion":13},"incomingInternalClient":{"minWireVersion":0,"maxWireVersion":13},"outgoing":{"minWireVersion":0,"maxWireVersion":13},"isInternalClient":true}}}
{"t":{"$date":"2021-10-08T15:55:51.187+05:30"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"-","msg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDisabledProtocols 'none'"}
{"t":{"$date":"2021-10-08T15:55:51.393+05:30"},"s":"W", "c":"ASIO", "id":22601, "ctx":"main","msg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2021-10-08T15:55:51.393+05:30"},"s":"I", "c":"NETWORK", "id":4648602, "ctx":"main","msg":"Implicit TCP FastOpen in use."}
{"t":{"$date":"2021-10-08T15:55:51.398+05:30"},"s":"W", "c":"ASIO", "id":22601, "ctx":"main","msg":"No TransportLayer configured during NetworkInterface startup"}
{"t":{"$date":"2021-10-08T15:55:51.399+05:30"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully registered PrimaryOnlyService","attr":{"service":"TenantMigrationDonorService","ns":"config.tenantMigrationDonors"}}
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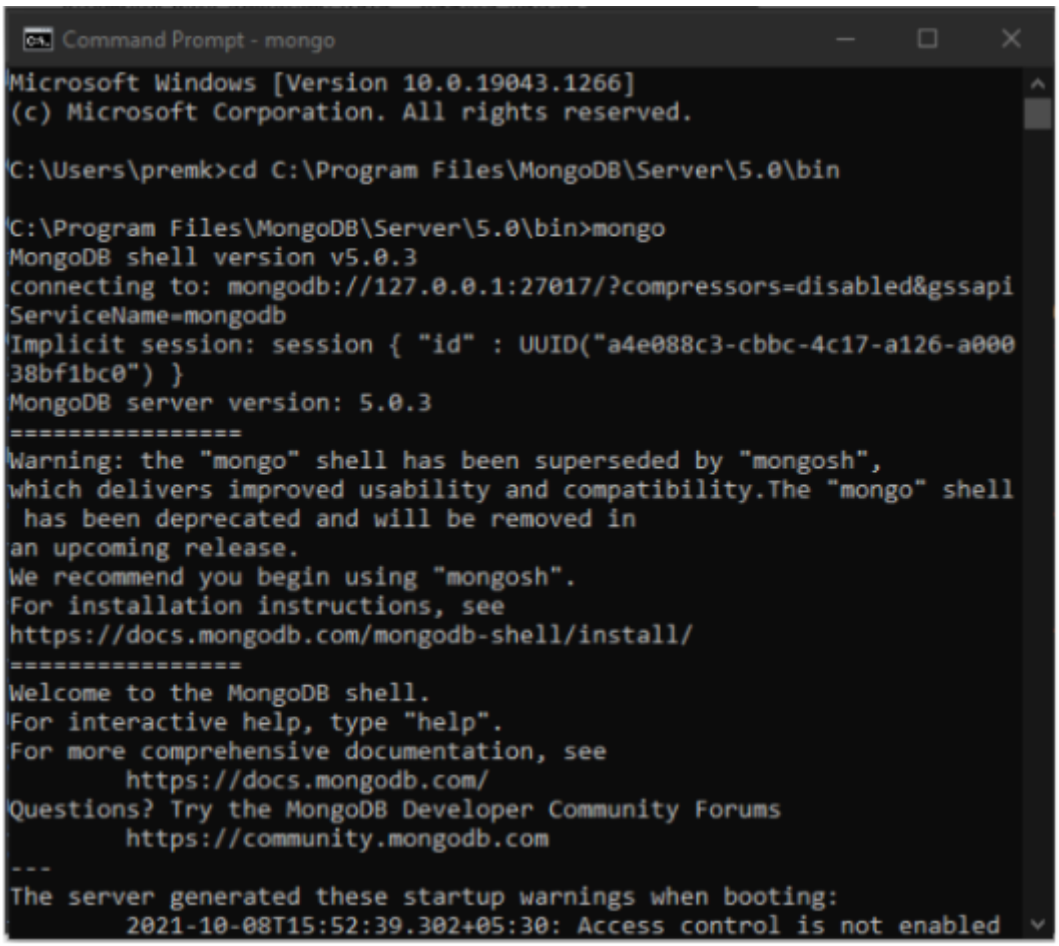
{"t":{"$date":"2021-10-08T15:55:51.401+05:30"},"s":"I", "c":"CONTROL", "id":4615611, "ctx":"initandlisten","msg":"MongoDB starting","attr":{"pid":4756,"port":27017,"dbPath":"C:/data/db/","architecture":"64-bit","host":"DESKTOP-AES488B"}}
{"t":{"$date":"2021-10-08T15:55:51.401+05:30"},"s":"I", "c":"CONTROL", "id":23398,


Command Prompt - mongo
Microsoft Windows [Version 10.0.19043.1266]
(c) Microsoft Corporation. All rights reserved.
C:\Users\premk>cd C:\Program Files\MongoDB\Server\5.0\bin
C:\Program Files\MongoDB\Server\5.0\bin>mongo
MongoDB shell version v5.0.3
connecting to: mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("a4e088c3-cbbc-4c17-a126-a00038bf1bc0") }
MongoDB server version: 5.0.3
================
Warning: the "mongo" shell has been superseded by "mongosh",
which delivers improved usability and compatibility.The "mongo" shell has been deprecated and will be removed in
an upcoming release.
We recommend you begin using "mongosh".
For installation instructions, see
https://docs.mongodb.com/mongodb-shell/install/
================
Welcome to the MongoDB shell.
For interactive help, type "help".
For more comprehensive documentation, see
https://docs.mongodb.com/
Questions? Try the MongoDB Developer Community Forums
https://community.mongodb.com

The server generated these startup warnings when booting:
2021-10-08T15:52:39.302+05:30: Access control is not enabled