DADS Experiment No: 5

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Aim:

Creating a sample database using MongoDB and implement all the CRUD operations.

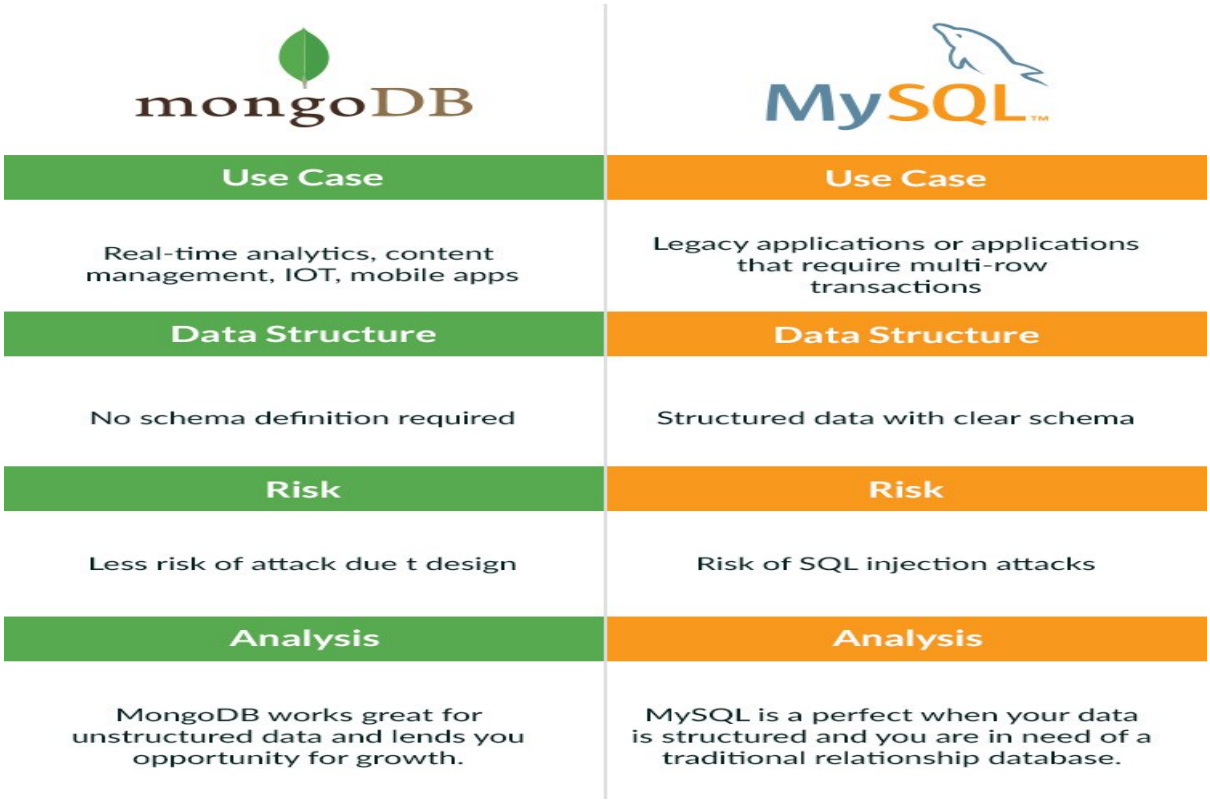
What is MongoDB?:

MongoDB is a document-oriented NoSQL database used for high volume data storage. Instead of using tables and rows as in the traditional relational databases, MongoDB makes use of collections and documents. Documents consist of key-value pairs which are the basic unit of data in MongoDB. Collections contain sets of documents and function which is the equivalent of relational database tables. MongoDB is a database which came into light around the mid-2000s.

Benefits of MongoDB:

- Full cloud-based developer data platform
- Flexible document schemas
- Widely supported and code-native data access
- Change-friendly design
- Powerful querying and analytics
- Easy horizontal scale-out with sharding
- Simple installation
- Cost-effective
- Full technical support and documentation

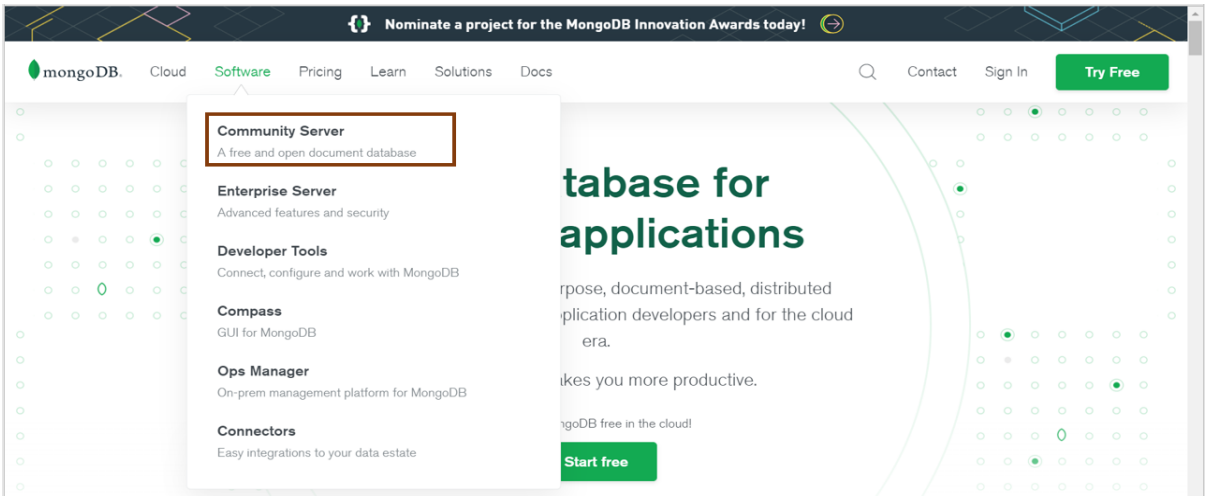
Comparison of MongoDB with MySQL:



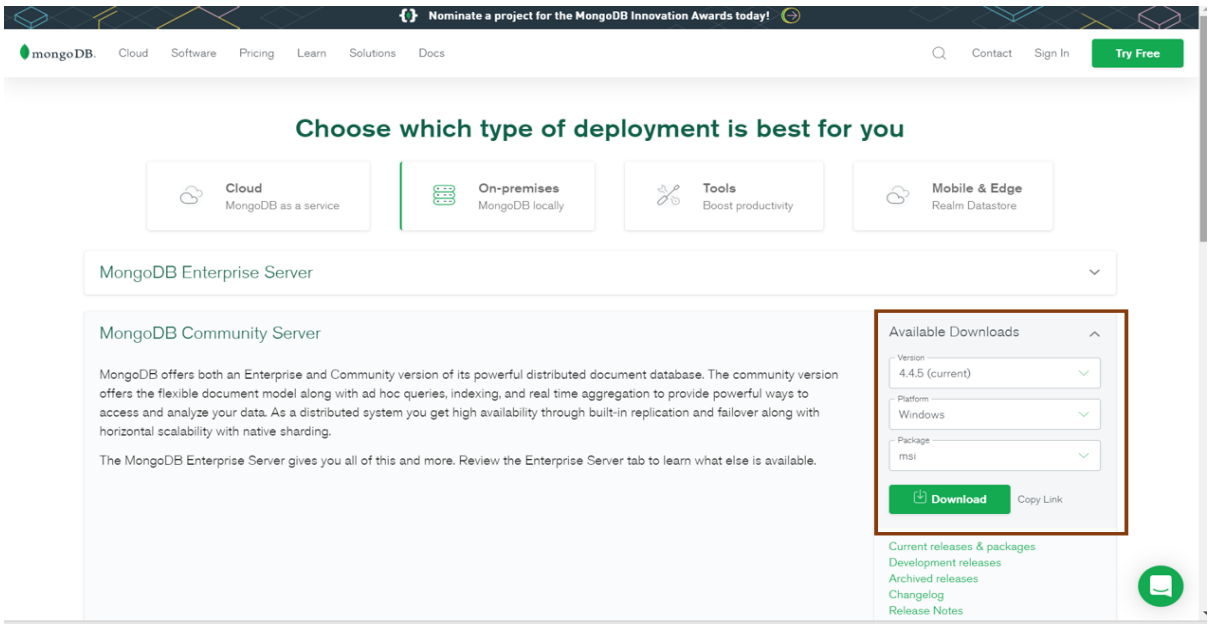
Installation Process:

Cross-check the Specifications and Download MongoDB

Under the Software section, click on the Community server version.

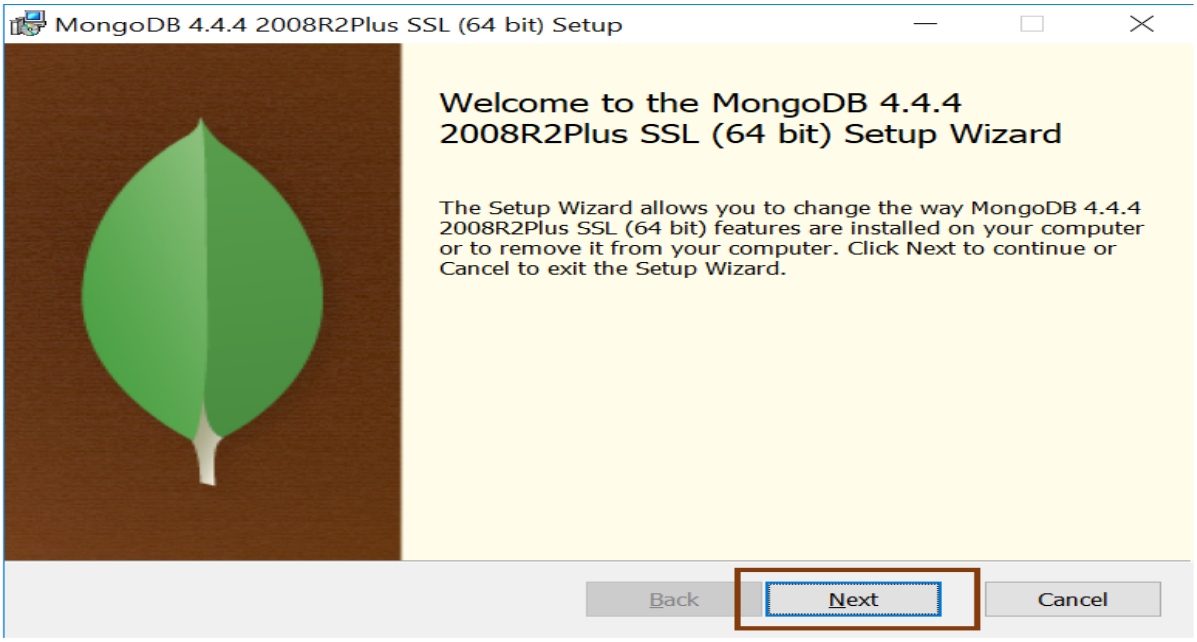


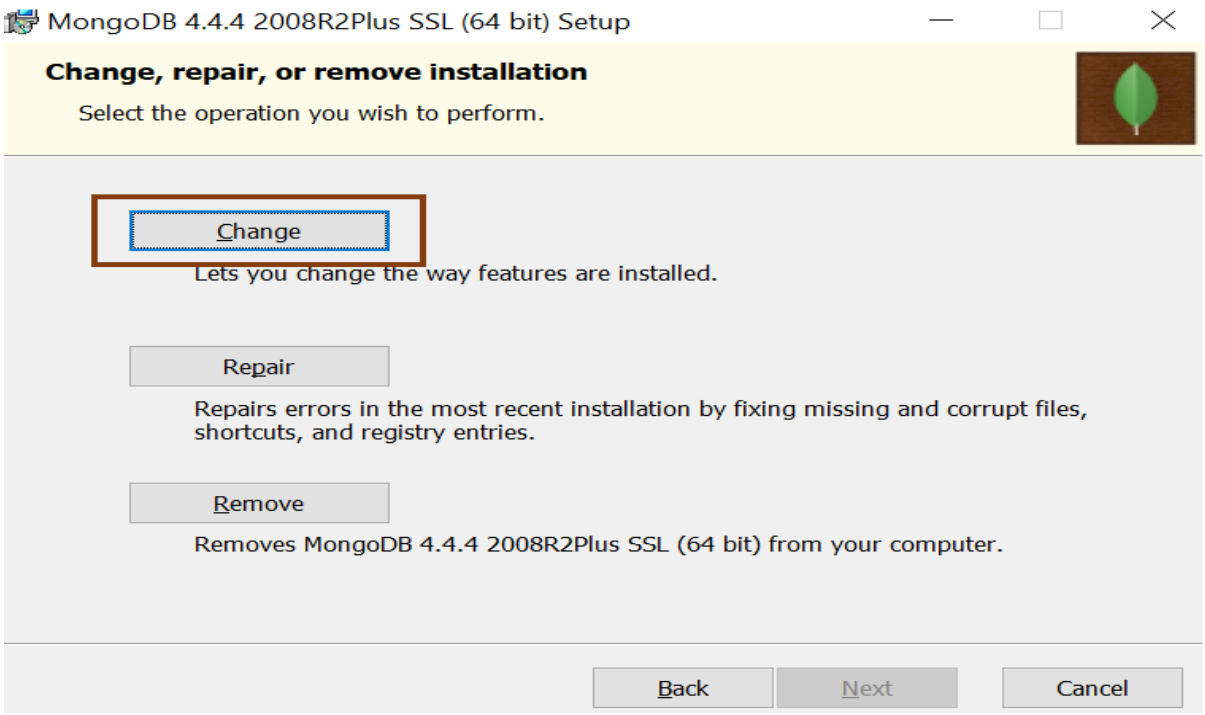
Make sure that the specifications to the right of the screen are correct. At the time of writing, the latest version is 4.4.5. Ensure that the platform is Windows, and the package is MSI. Go ahead and click on download.



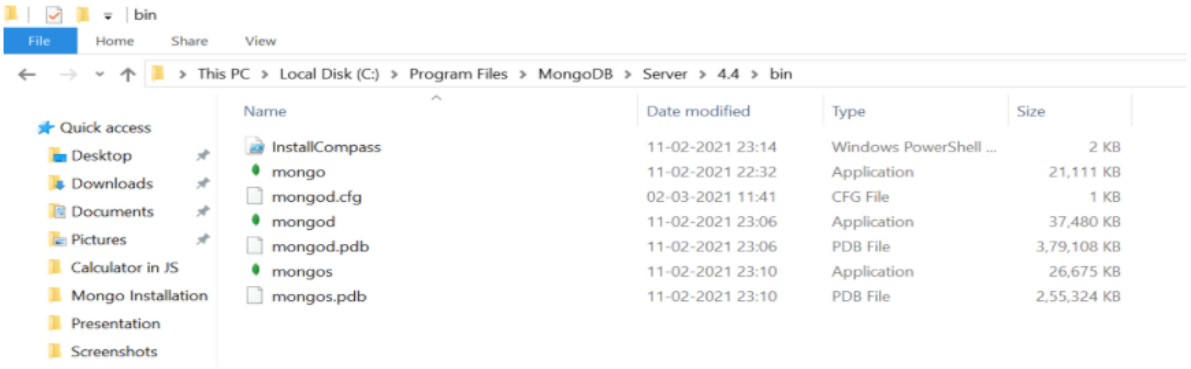
MongoDB Installation:

You can find the downloaded file in the download's directory. You can follow the steps mentioned there and install the software.





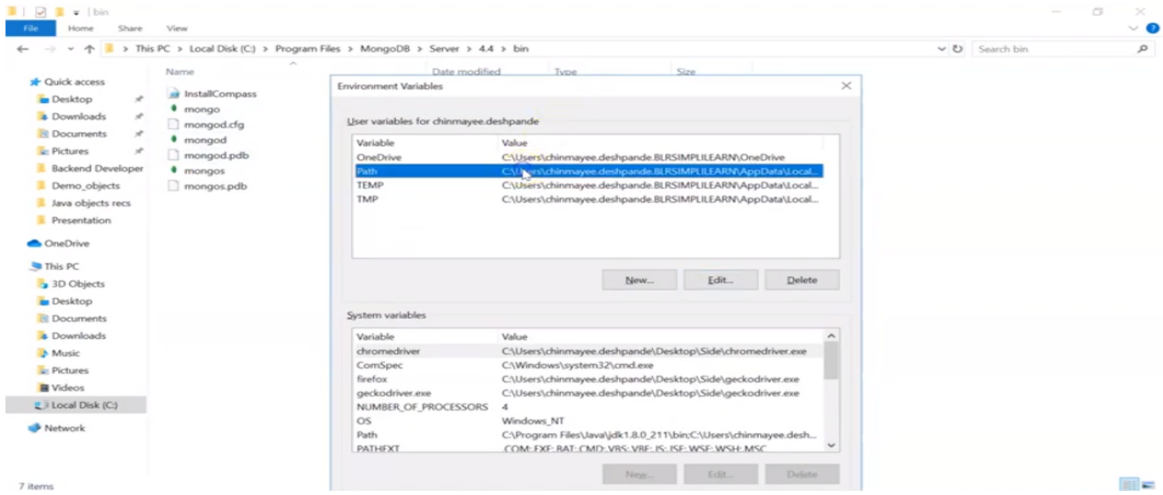
On completing the installation successfully, you will find the software package in your C drive. C:\Program Files\MongoDB\Server\4.4\bin.

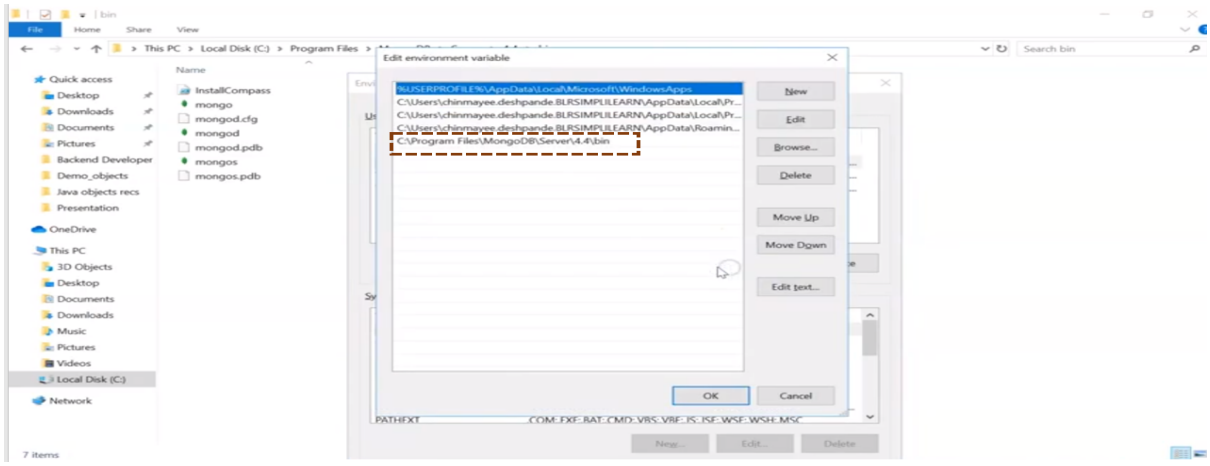


You can see that there are mongo and mongod executable files. The mongod file is the daemon process that does the background jobs like accessing, retrieving, and updating the database.

Create an Environment Variable:

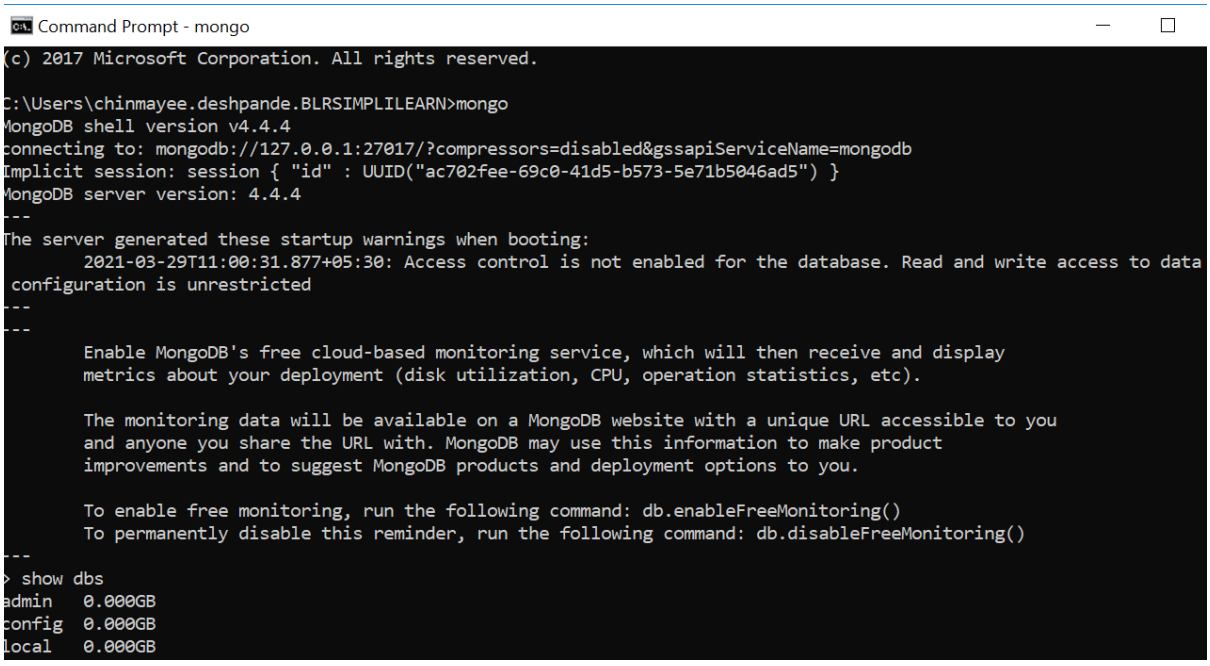
It’s best practice to create an environment variable for the executable file so that you don’t have to change the directory structure every time you want to execute the file.





Execute the Mongo App

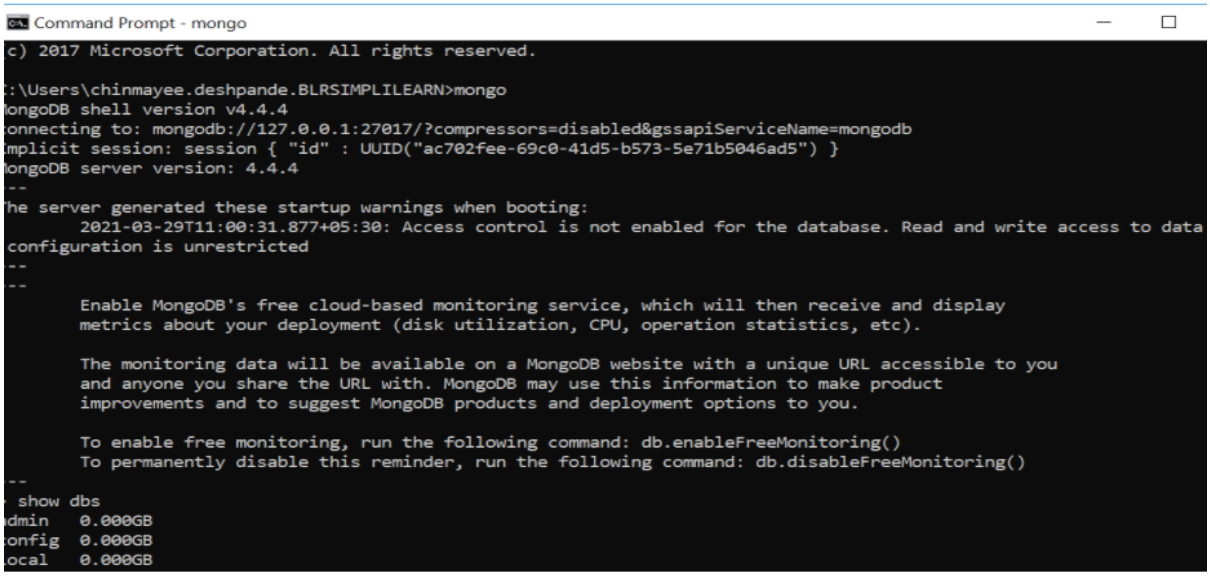
After creating an environment path, you can open the command prompt and just type in mongo and press enter.



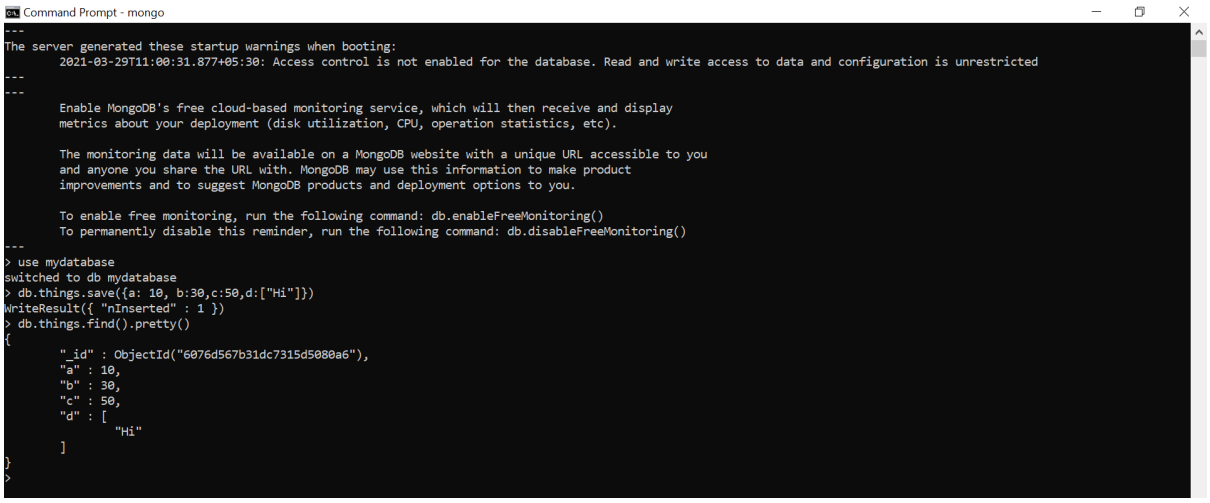
The mongo server is then generated and is up and running.

Verify the Setup

To verify if it did the setup correctly, type in the command show DBS.



With that, you have successfully installed and set up MongoDB on your Windows system.



This demo sample has also created a database called mydatabase, with some data added to it. It has also displayed the same using the find() method.

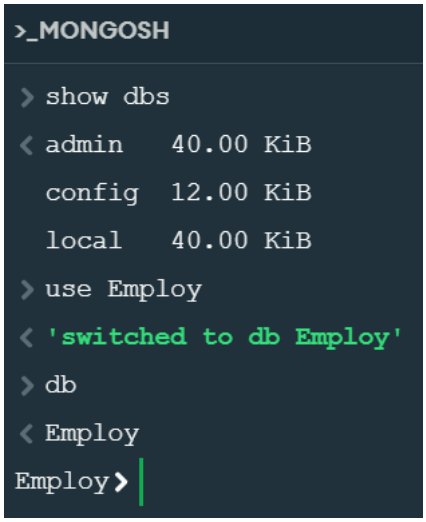
CRUD Operations:

Create:

Create new database

To create a new database execute the following command.

- ⇨ use DATABASE_NAME



Create collection

To create the new collection execute the following commands

⇨ db.createCollection(name)

Read:

To check collections list

To get the list of collections created execute the following command

⇨ Show collections

```
> db.createCollection("Employee")
< { ok: 1 }
> db.createCollection("Department")
< { ok: 1 }
> show collections
< department
  Department
  Employ
  Employee
```

Update:

Update document

To update the document in collection execute the following command

⇨ db.COLLECTION_NAME.update(SELECTION_CRITERIA, UPDATED_DATA)

```
> db.Employee.update({rank: "Prof"},{$set:{rank : "N Prof"}})
< 'DeprecationWarning: Collection.update() is deprecated. Use updateOne, updateMany, or bulkWrite.'
< { acknowledged: true,
    insertedId: null,
    matchedCount: 0,
    modifiedCount: 0,
    upsertedCount: 0 }
```

Delete:

Delete document

To delete document in selected collection execute the following command

⇨ db.COLLECTION_NAME.deleteOne(DELLETION_CRITTERIA)

```
> db.Employee.deleteOne({rank: "Prof"})
< { acknowledged: true, deletedCount: 0 }
> db.Employee.deleteOne({"_id": "ObjectId('638f485c8295ca9144bb4af3'"})
< { acknowledged: true, deletedCount: 0 }
```

Conclusion:

MongoDB is a popular NoSQL database solution that suits modern development requirements.

Some advantages of using MongoDB are:

- No complex joins in the Database.
- Ability to make deep and complex queries
- Easy to scale
- Ability to store unstructured data in an organized fashion.

References:

- https://www.geeksforgeeks.org/mongodb-crud-operations/
- https://www.mongodb.com/docs/compass/current/query/queries/
- https://www.guru99.com/what-is-mongodb.html