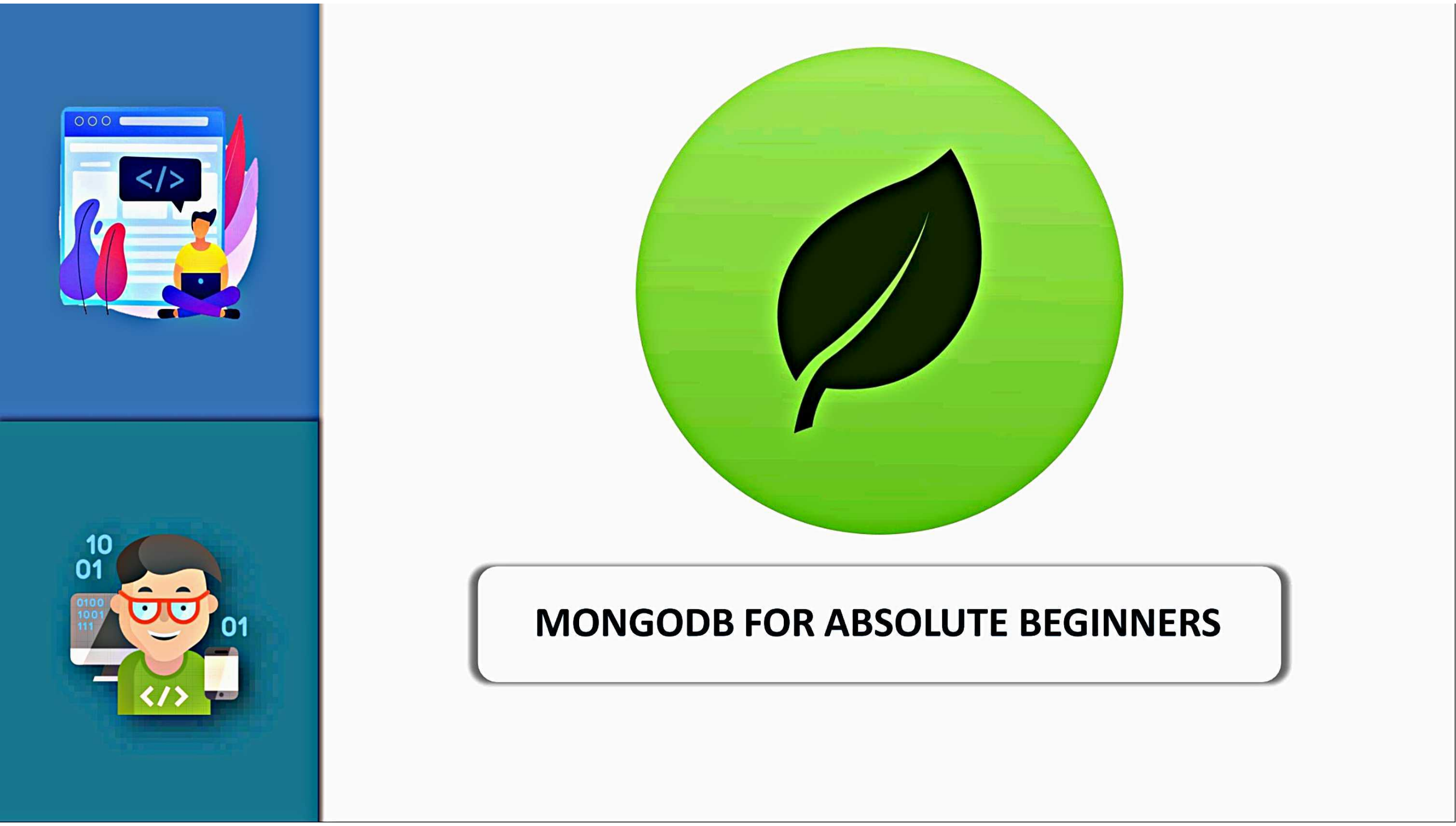


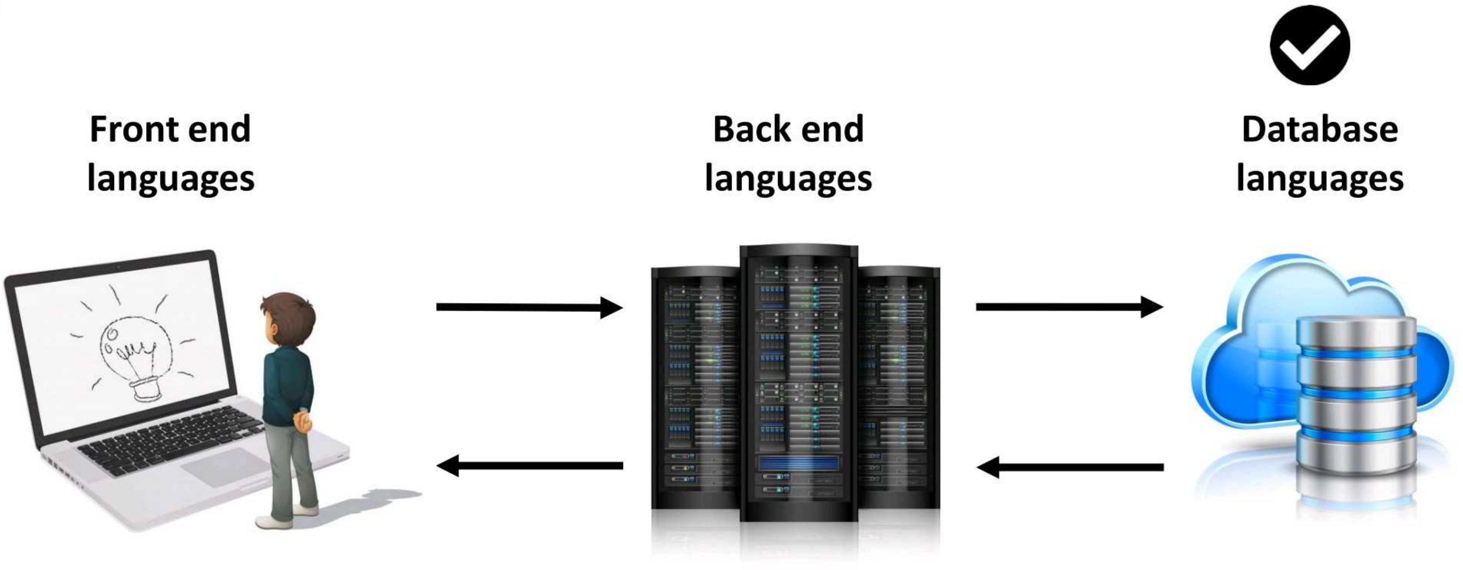
MONGODB FOR ABSOLUTE BEGINNERS

Agenda

1. Introduction
2. Introduction to NoSQL
3. SQL vs NoSQL
4. Installation
5. Create Databases
6. Create Collection
7. Create Documents

Introduction

Introduction



✓

Front end languages

Back end languages

Database languages

Introduction

A database Management System provides the mechanism to store and retrieve the data. There are different kinds of database Management Systems:

1. RDBMS (Relational Database Management Systems)

2. OLAP (Online Analytical Processing)

3. NoSQL (Not only SQL)

Introduction to NoSQL

Limitations of RDBMS

1.In relational database we need to define structure and schema of data first and then only we can process the data.

2.Relational database systems provides consistency and integrity of data by enforcing ACID properties (Atomicity, Consistency, Isolation and Durability). However in most of the other cases these properties are significant performance overhead and can make your database response very slow.

3.Most of the applications store their data in JSON format and RDBMS don’t provide you a better way of performing operations such as create, insert, update, delete etc on this data.

What is NoSQL Database?

Not Only SQL (NoSQL) or non relational databases provides a mechanism for storage and retrieval of data other than tabular relations model used in relational databases. NoSQL database doesn't use tables for storing data. It is generally used to store big data and real-time web applications.

Why NoSQL Database?

NoSQL databases were created in response to the limitations of traditional relational database technology.

When compared against relational databases, NoSQL databases are more scalable and provide superior performance, and their data model addresses several shortcomings of the relational model.

The advantages of NoSQL include being able to handle:

- Large volumes of structured, semi-structured, and unstructured data
- Agile sprints, quick iteration, and frequent code pushes
- Object-oriented programming that is easy to use and flexible
- Efficient, scale-out architecture instead of expensive, monolithic architecture

When to use NoSQL Database?

- When you want to store and retrieve huge amount of data.
- The relationship between the data you store is not that important
- The data is not structured and changing over time
- Constraints and Joins support is not required at database level
- The data is growing continuously and you need to scale the database regular to handle the data.

Where to use NoSQL Database?

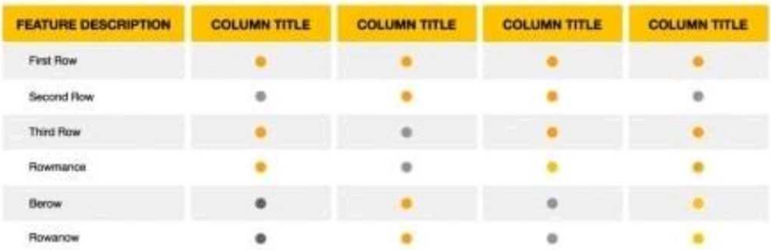
- Data isn't relational (e.g. Documents)
- Too much data to fit in a relational database

SQL vs NoSQL

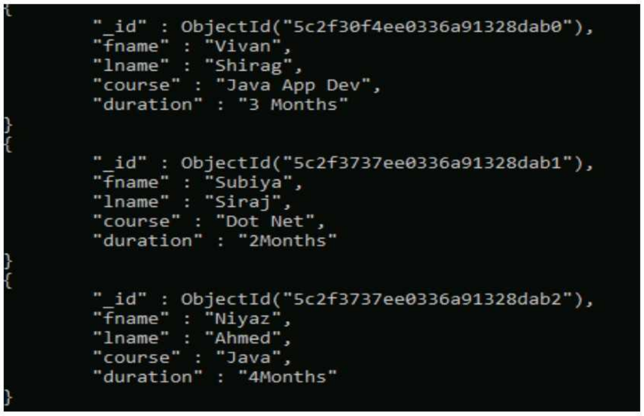
SQL vs NoSQL

SQL Database	NoSQL Database
SQL databases are primarily called RDBMS or Relational Databases	NoSQL databases are primarily called as Non-relational or distributed database
SQL databases are table based databases	NoSQL databases can be document based, key-value pairs, graph databases
MySQL uses SQL to query database	MongoDB uses BSON to query database
Developed in the 1970s with a focus on reducing data duplication	Developed in the late 2000s with a focus on scaling and allowing for rapid application change driven by agile and DevOps practices.
Oracle, MySQL, Microsoft SQL Server, and PostgreSQL	Document: MongoDB and CouchDB, Key-value: Redis and DynamoDB, Wide-column: Cassandra and HBase, Graph: Neo4j and Amazon Neptune

SQL vs NoSQL



FEATURE DESCRIPTION	COLUMN TITLE	COLUMN TITLE	COLUMN TITLE	COLUMN TITLE
First Row	●	●	●	●
Second Row	●	●	●	●
Third Row	●	●	●	●
Rowmance	●	●	●	●
Berow	●	●	●	●
Rowanow	●	●	●	●



```
{
        "_id" : ObjectId("5c2f30f4ee0336a91328dab0"),
        "fname" : "Vivan",
        "lname" : "Shirag",
        "course" : "Java App Dev",
        "duration" : "3 Months"
}
{
        "_id" : ObjectId("5c2f3737ee0336a91328dab1"),
        "fname" : "Subiya",
        "lname" : "Siraj",
        "course" : "Dot Net",
        "duration" : "2Months"
}
{
        "_id" : ObjectId("5c2f3737ee0336a91328dab2"),
        "fname" : "Niyaz",
        "lname" : "Ahmed",
        "course" : "Java",
        "duration" : "4Months"
}
```

Installation

Installation

- C:\Program Files\MongoDB\Server\4.4\bin\mongo.exe --version
- C:\Program Files\MongoDB\Server\4.4\bin\mongod.exe --version
- C:\Program Files\MongoDB\Server\4.4\bin\mongod.exe
- C:\Program Files\MongoDB\Server\4.4\bin\mongo.exe
- mongo

CORE MODULE 3

Aim: Installation MongoDB.

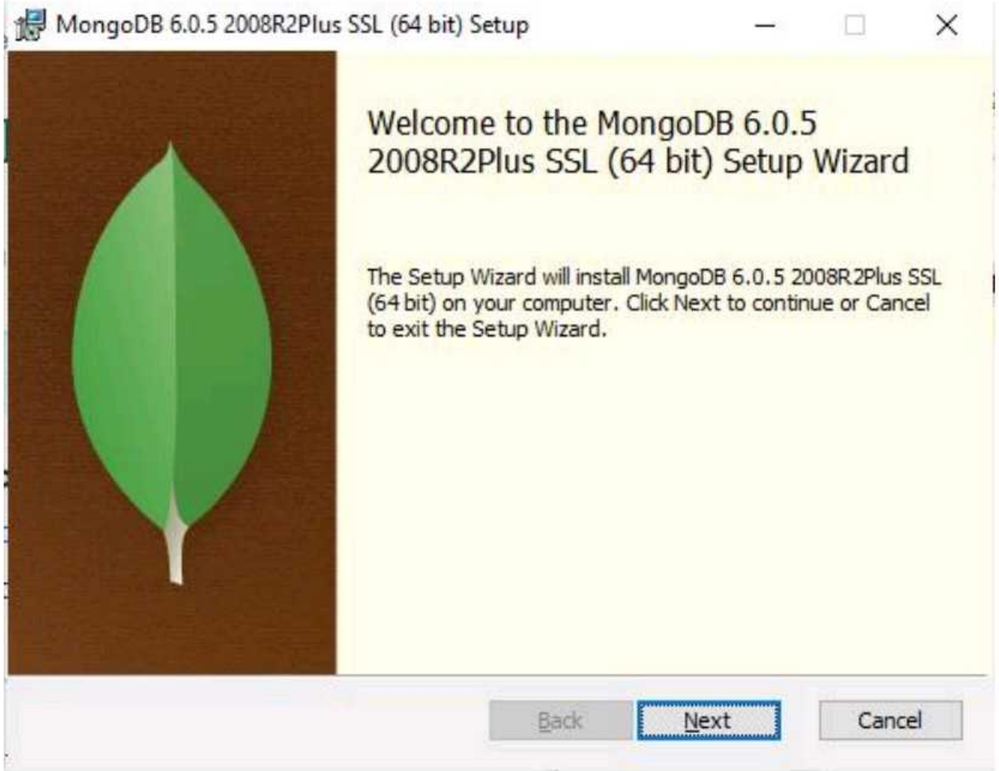
Install MongoDB

STEP 1: Click this link download the MongoDB.

https://www.mongodb.com/try/download/community

STEP 2: click on the downloaded exe file.

STEP 3: Click on Next

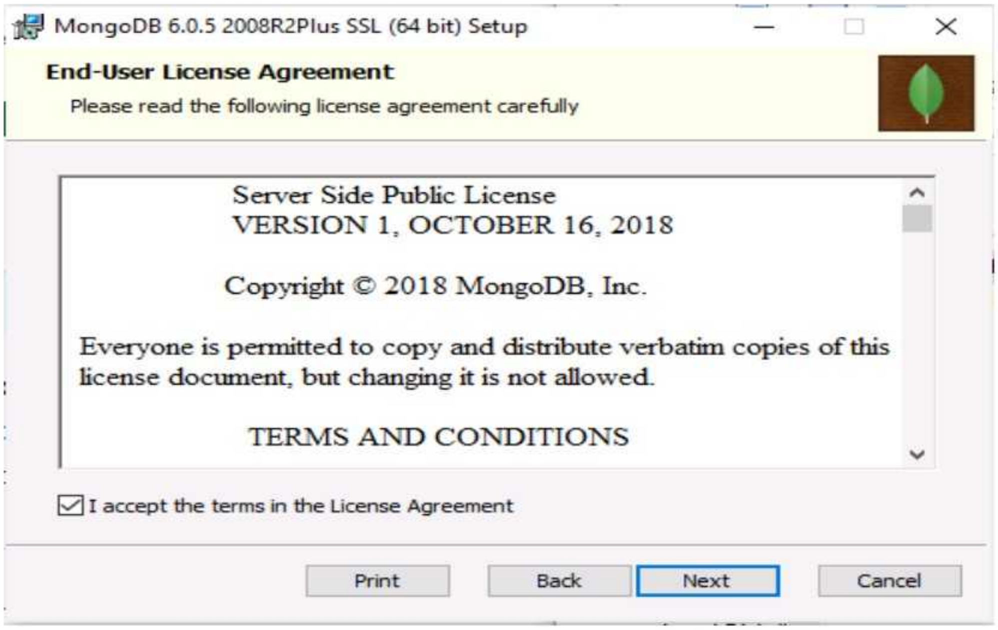


MongoDB 6.0.5 2008R2Plus SSL (64 bit) Setup

Welcome to the MongoDB 6.0.5 2008R2Plus SSL (64 bit) Setup Wizard

The Setup Wizard will install MongoDB 6.0.5 2008R2Plus SSL (64 bit) on your computer. Click Next to continue or Cancel to exit the Setup Wizard.

STEP 4: Click on Next



MongoDB 6.0.5 2008R2Plus SSL (64 bit) Setup

End-User License Agreement

Please read the following license agreement carefully

Server Side Public License
VERSION 1, OCTOBER 16, 2018

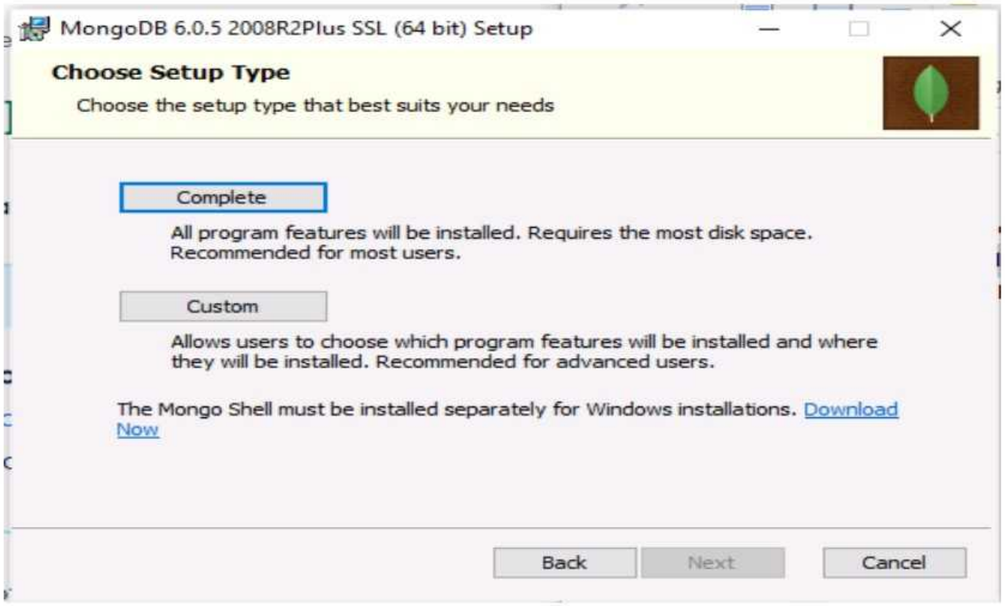
Copyright © 2018 MongoDB, Inc.

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

TERMS AND CONDITIONS

☑ I accept the terms in the License Agreement

STEP 5: Click on Complete



MongoDB 6.0.5 2008R2Plus SSL (64 bit) Setup

Choose Setup Type

Choose the setup type that best suits your needs

Complete

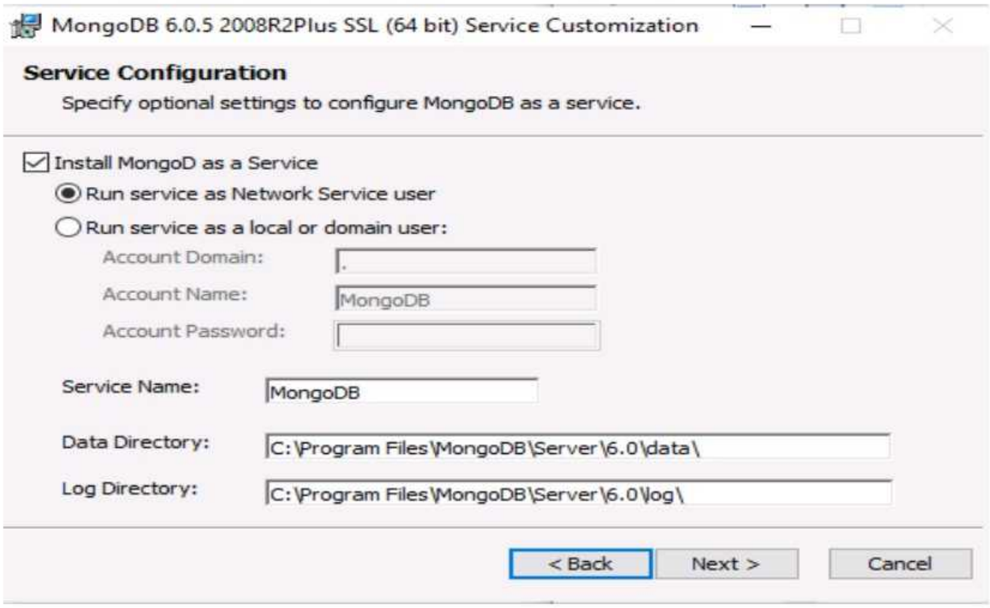
All program features will be installed. Requires the most disk space. Recommended for most users.

Custom

Allows users to choose which program features will be installed and where they will be installed. Recommended for advanced users.

The Mongo Shell must be installed separately for Windows installations. Download Now

STEP 6: Click on Next



MongoDB 6.0.5 2008R2Plus SSL (64 bit) Service Customization

Service Configuration

Specify optional settings to configure MongoDB as a service.

☑ Install MongoD as a Service

● Run service as Network Service user

○ Run service as a local or domain user:

Account Domain: .

Account Name: MongoDB

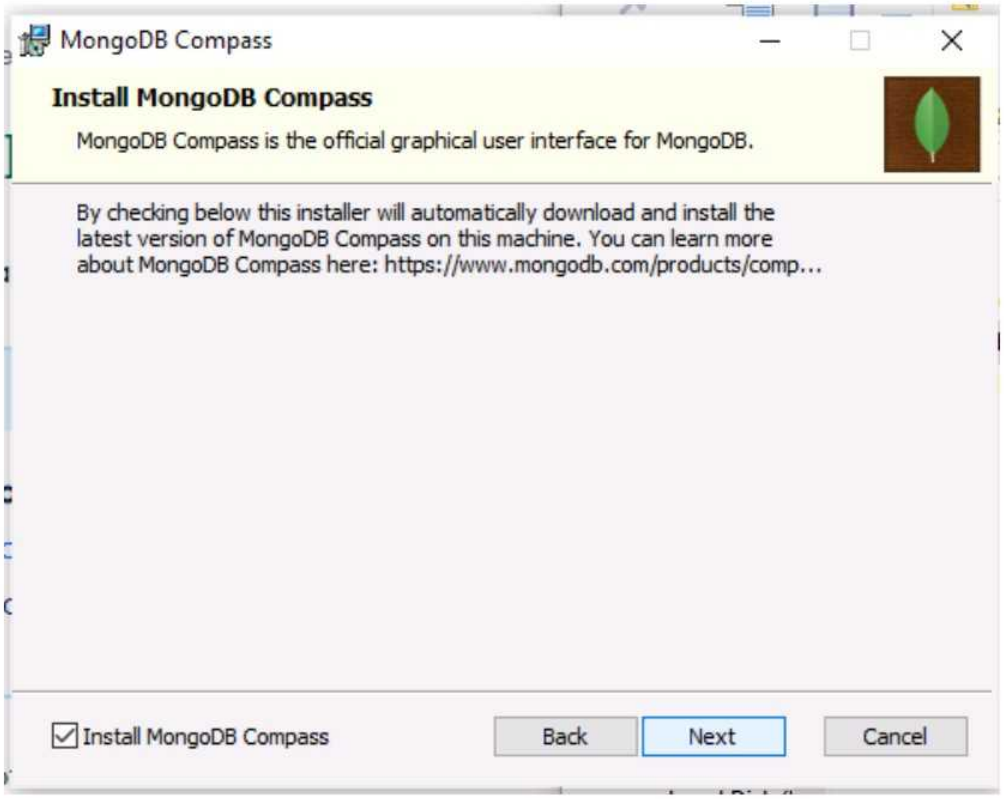
Account Password:

Service Name: MongoDB

Data Directory: C:\Program Files\MongoDB\Server\6.0\data\

Log Directory: C:\Program Files\MongoDB\Server\6.0\log\

STEP 7: Click on Next



MongoDB Compass

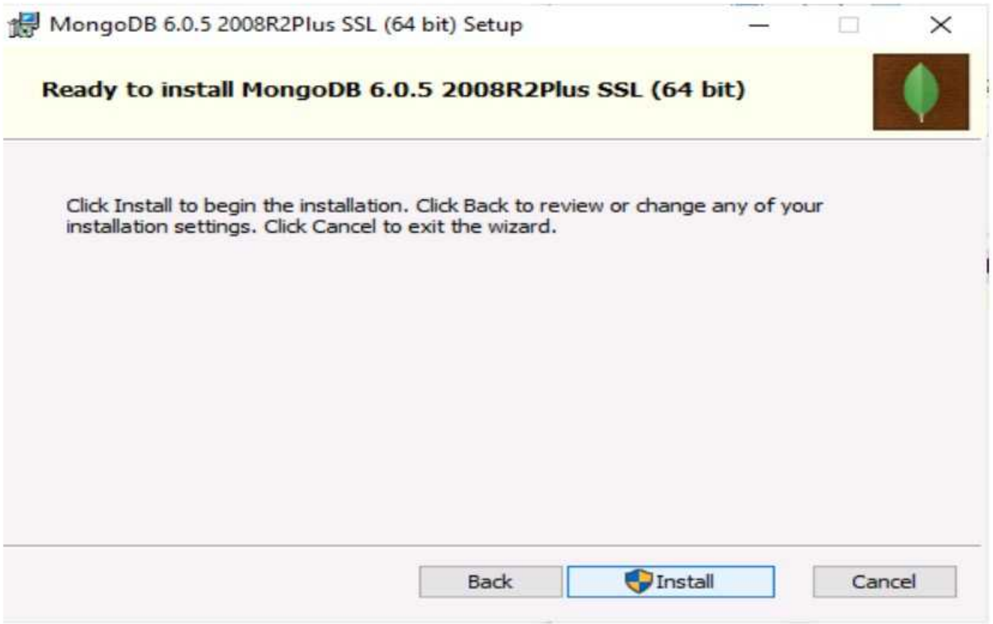
Install MongoDB Compass

MongoDB Compass is the official graphical user interface for MongoDB.

By checking below this installer will automatically download and install the latest version of MongoDB Compass on this machine. You can learn more about MongoDB Compass here: https://www.mongodb.com/products/comp...

☑ Install MongoDB Compass

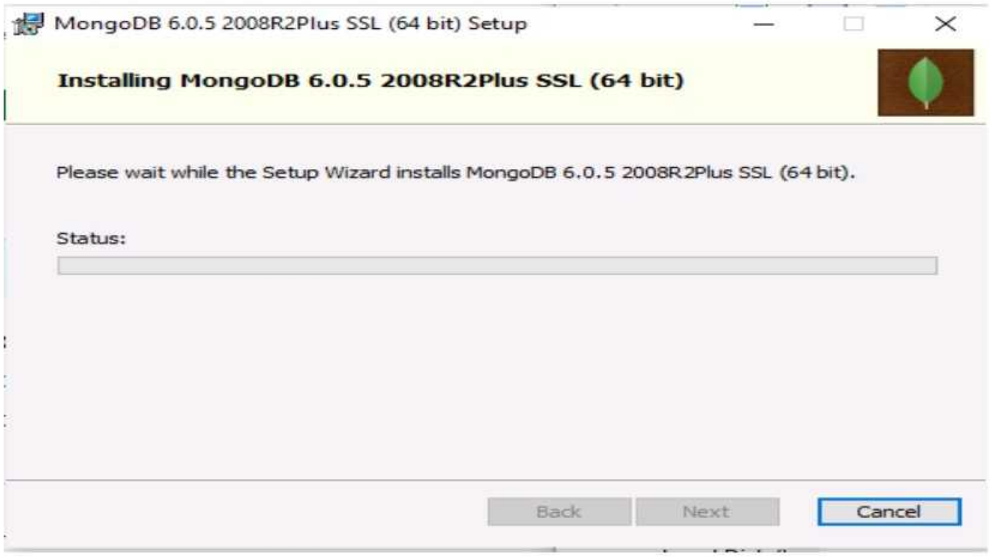
STEP 8: Click on install.



MongoDB 6.0.5 2008R2Plus SSL (64 bit) Setup

Ready to install MongoDB 6.0.5 2008R2Plus SSL (64 bit)

Click Install to begin the installation. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.



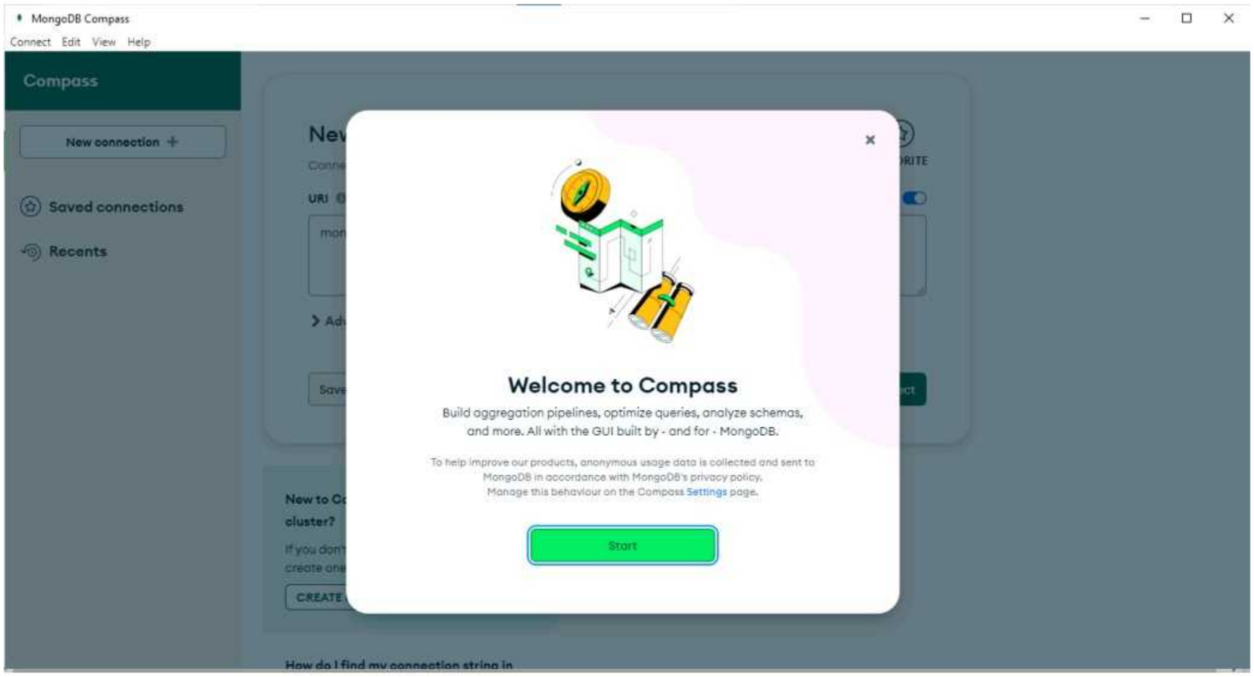
MongoDB 6.0.5 2008R2Plus SSL (64 bit) Setup

Installing MongoDB 6.0.5 2008R2Plus SSL (64 bit)

Please wait while the Setup Wizard installs MongoDB 6.0.5 2008R2Plus SSL (64 bit).

Status:

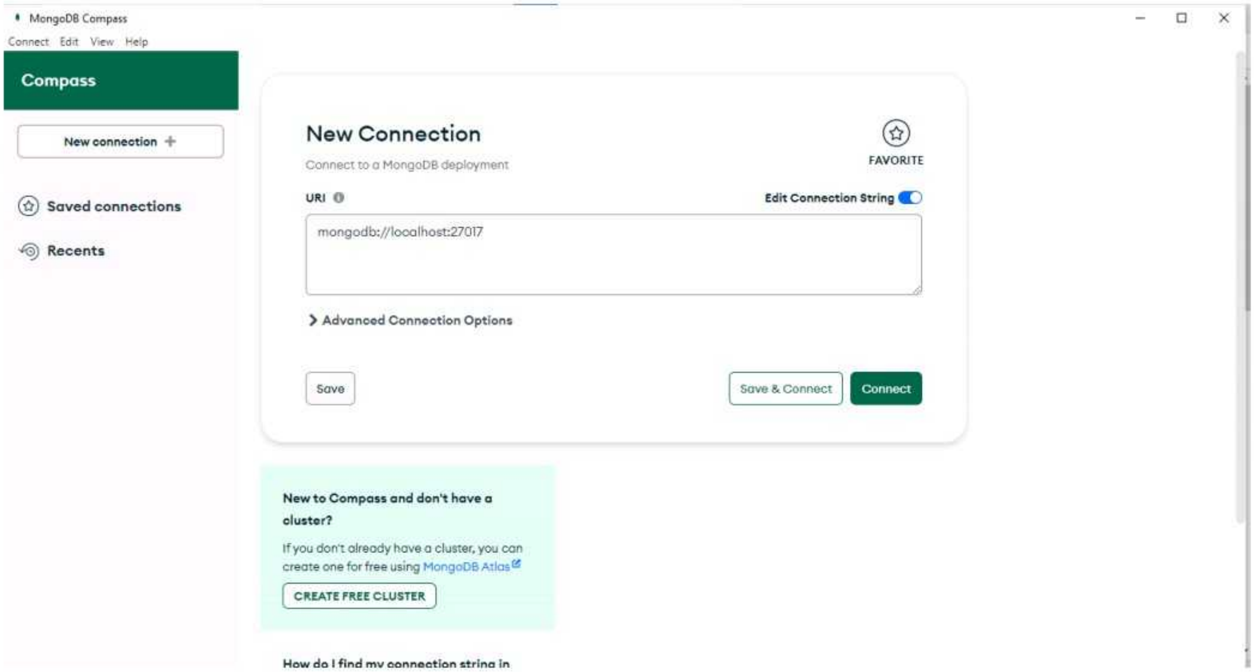
STEP 9: Now we are able to install MongoDB



Welcome to Compass

Build aggregation pipelines, optimize queries, analyze schemas, and more. All with the GUI built by - and for - MongoDB.

To help improve our products, anonymous usage data is collected and sent to MongoDB in accordance with MongoDB's privacy policy. Manage this behaviour on the Compass Settings page.



New Connection

Connect to a MongoDB deployment

URI

mongodb://localhost:27017

New to Compass and don't have a cluster?

If you don't already have a cluster, you can create one for free using MongoDB Atlas

How do I find my connection string in

Install Power Shell

STEP 1: Click this link download the PowerShell.

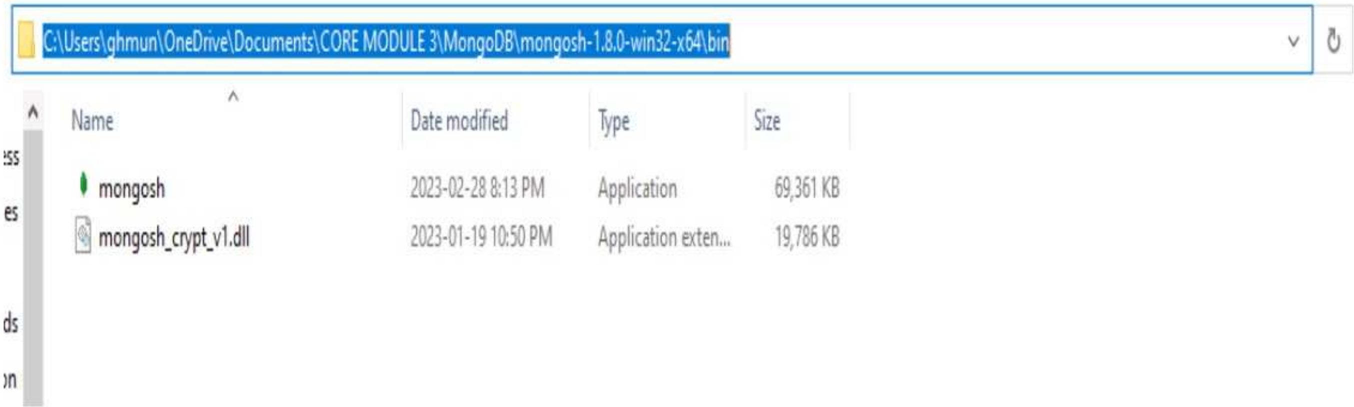
https://www.mongodb.com/try/download/shell

STEP 2: click on the downloaded exe file.

STEP 3: Extract the exe file.

STEP 4: Open the mongosh folder.

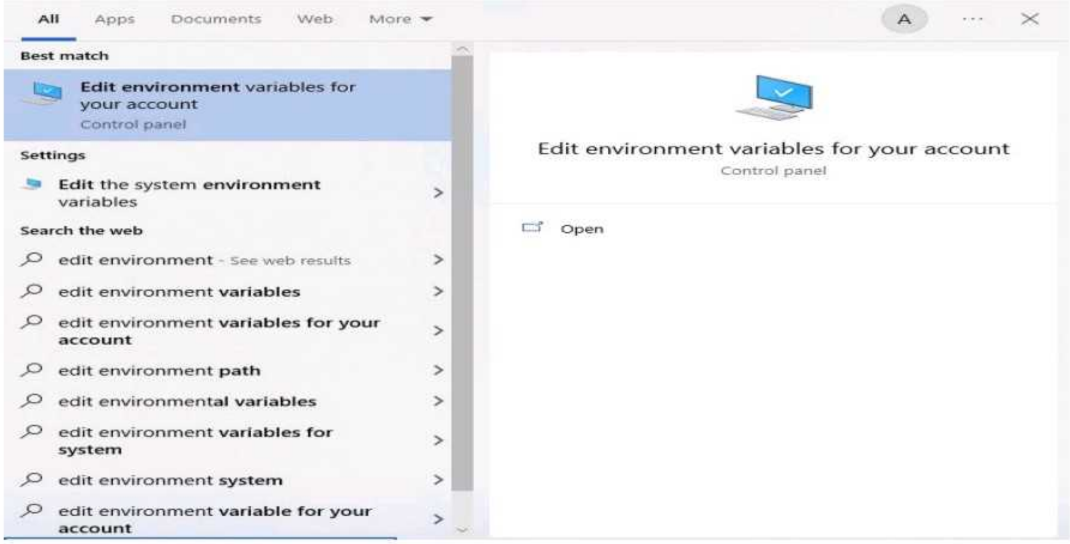
STEP 5: Go to the bin folder → copy the path



C:\Users\ghmun\OneDrive\Documents\CORE MODULE 3\MongoDB\mongosh-1.8.0-win32-x64\bin

Name	Date modified	Type	Size
mongosh	2023-02-28 8:13 PM	Application	69,361 KB
mongosh_crypt_v1.dll	2023-01-19 10:50 PM	Application exten...	19,786 KB

STEP 6: Go to search bar then type edit environment variables then hit enter



Best match

Edit environment variables for your account
Control panel

Settings

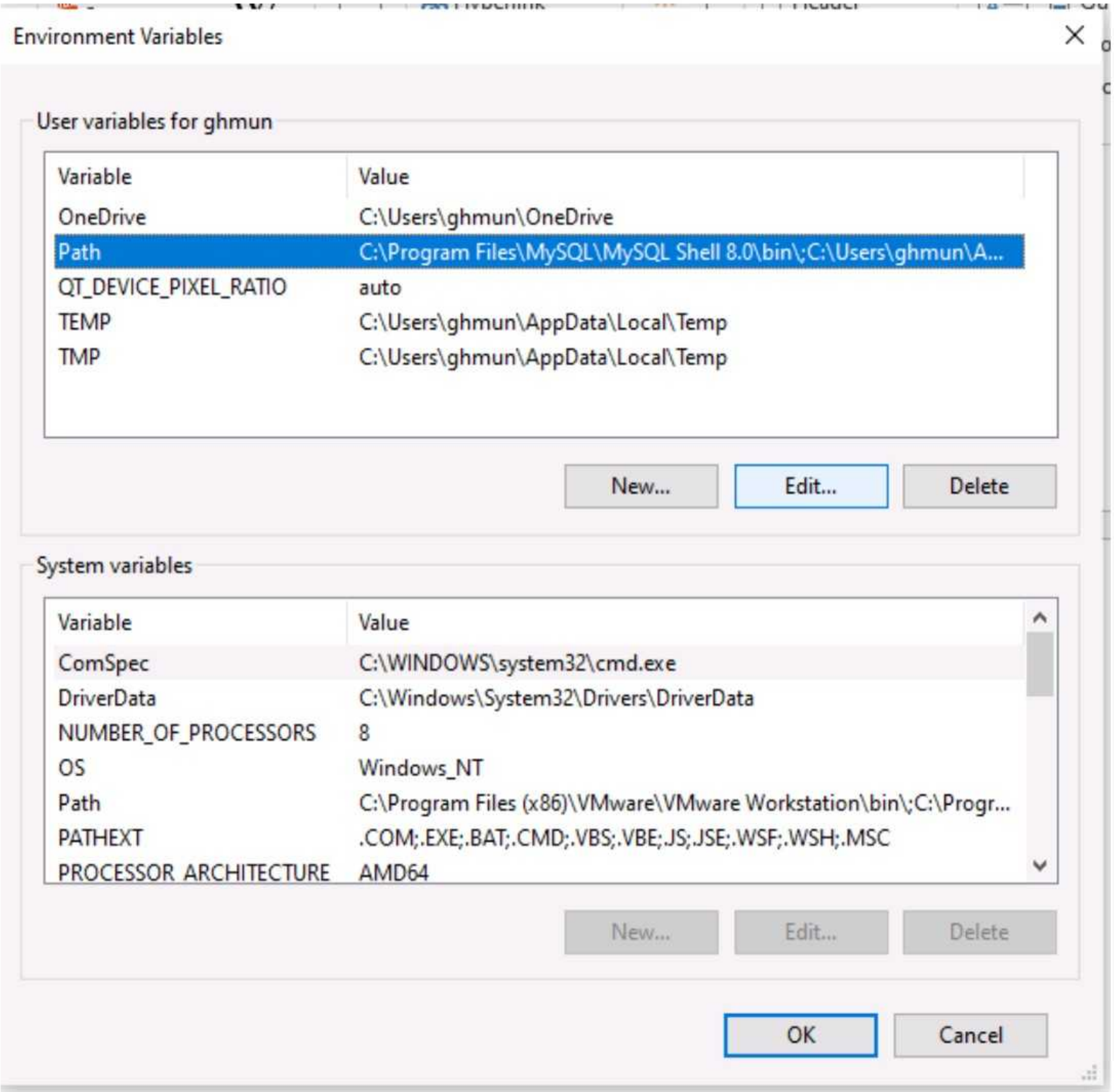
Edit the system environment variables

Search the web

edit environment - See web results
edit environment variables
edit environment variables for your account
edit environment path
edit environmental variables
edit environment variables for system
edit environment system
edit environment variable for your account

Edit environment variables for your account
Control panel

STEP 7: select path then click on edit



Environment Variables

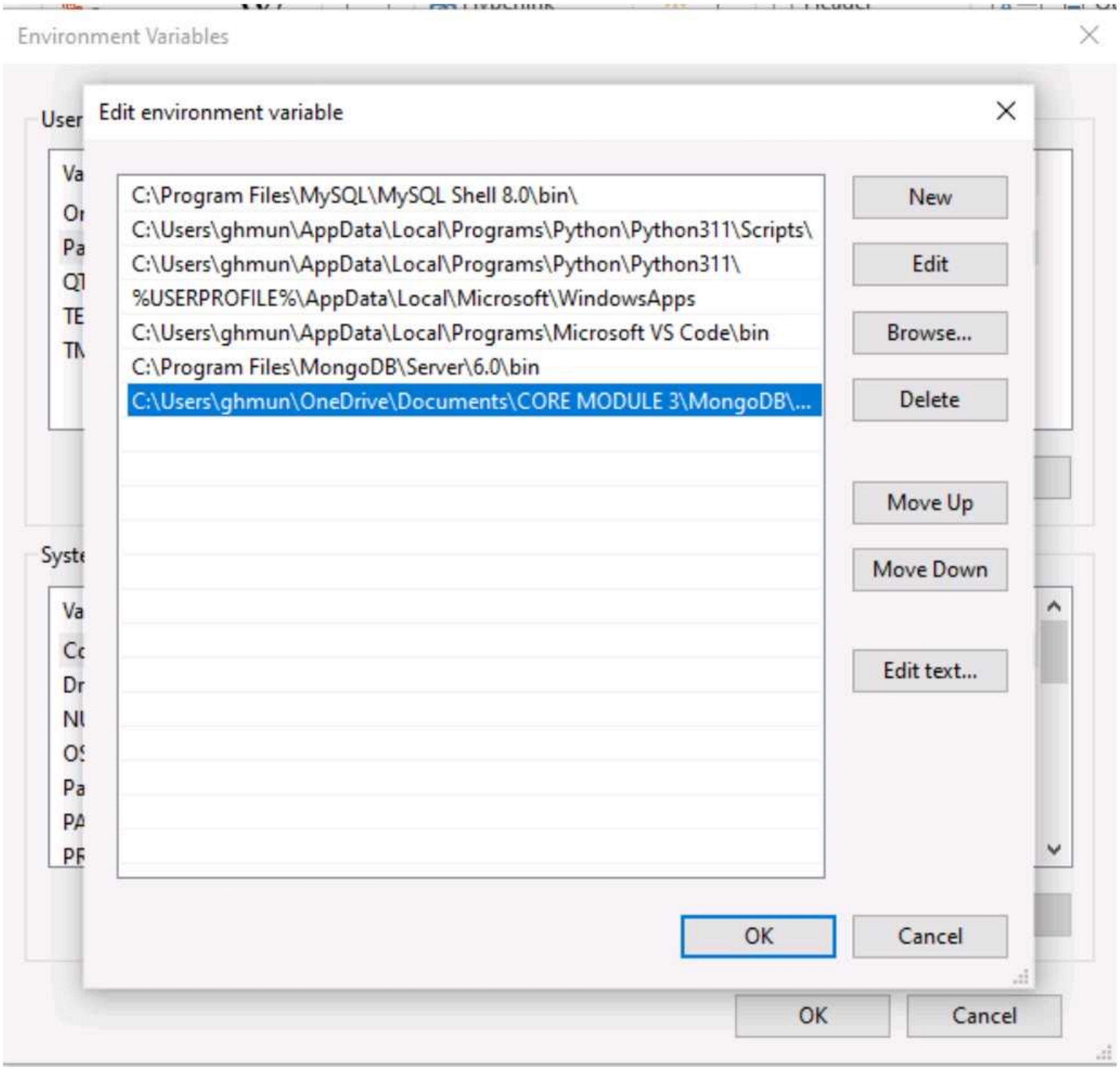
User variables for ghmun

Variable	Value
OneDrive	C:\Users\ghmun\OneDrive
Path	C:\Program Files\MySQL\MySQL Shell 8.0\bin\;C:\Users\ghmun\A...
QT_DEVICE_PIXEL_RATIO	auto
TEMP	C:\Users\ghmun\AppData\Local\Temp
TMP	C:\Users\ghmun\AppData\Local\Temp

System variables

Variable	Value
ComSpec	C:\WINDOWS\system32\cmd.exe
DriverData	C:\Windows\System32\Drivers\DriverData
NUMBER_OF_PROCESSORS	8
OS	Windows_NT
Path	C:\Program Files (x86)\VMware\VMware Workstation\bin\;C:\Progr...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
PROCESSOR_ARCHITECTURE	AMD64

STEP 8: click on New then paste the copied path(mongosh shell)



Environment Variables

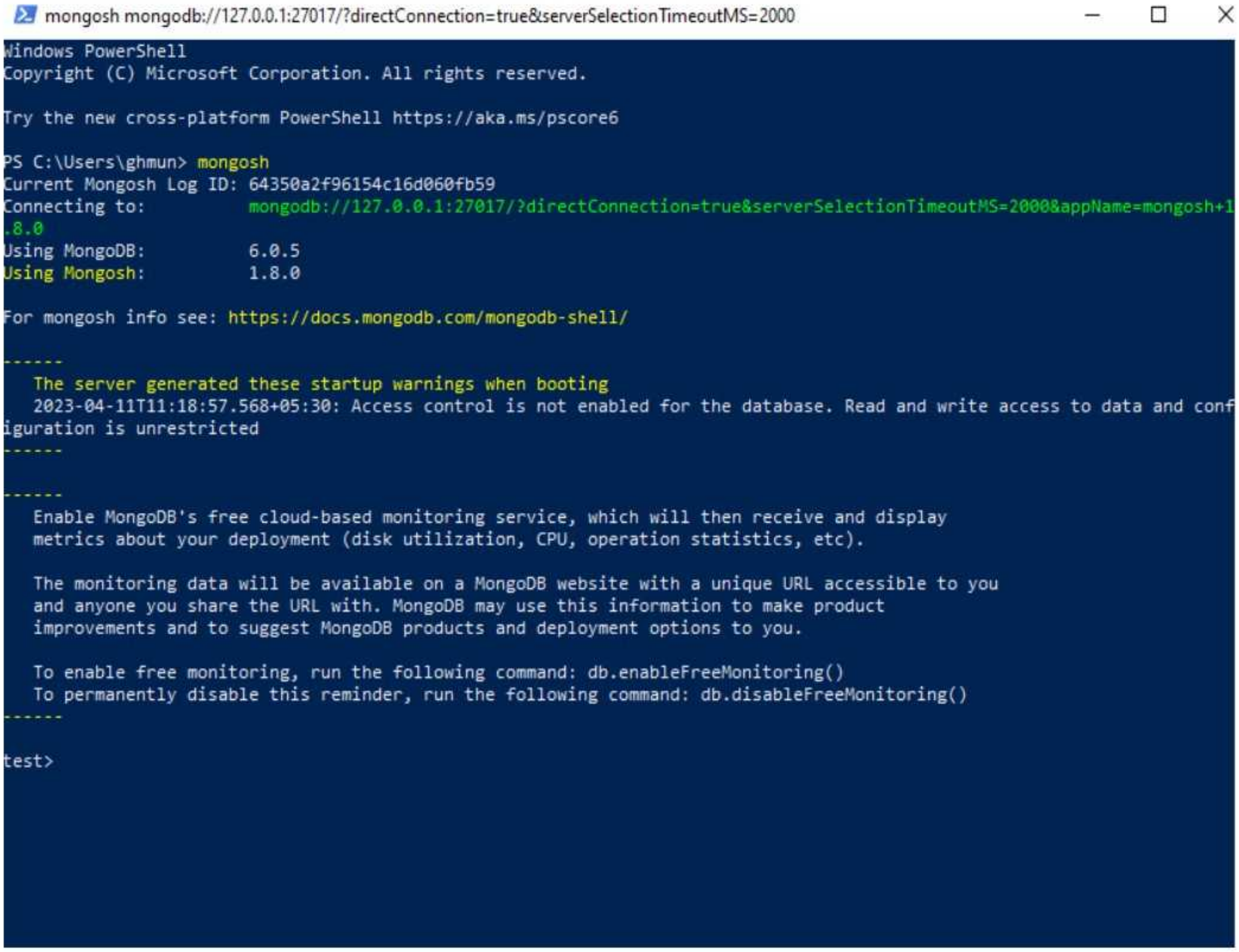
Edit environment variable

C:\Program Files\MySQL\MySQL Shell 8.0\bin\
C:\Users\ghmun\AppData\Local\Programs\Python\Python311\Scripts\
C:\Users\ghmun\AppData\Local\Programs\Python\Python311\
%USERPROFILE%\AppData\Local\Microsoft\WindowsApps
C:\Users\ghmun\AppData\Local\Programs\Microsoft VS Code\bin
C:\Program Files\MongoDB\Server\6.0\bin
C:\Users\ghmun\OneDrive\Documents\CORE MODULE 3\MongoDB\...

STEP 9: Now we are able to install windows Power shell.

- To check whether the power shell has been successfully installed or not type the command on powerShell:

```
mongosh
```



mongosh mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\ghmun> mongosh
Current Mongosh Log ID: 64350a2f96154c16d060fb59
Connecting to:          mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+1
.8.0
Using MongoDB:          6.0.5
Using Mongosh:          1.8.0

For mongosh info see: https://docs.mongodb.com/mongodb-shell/

------
   The server generated these startup warnings when booting
   2023-04-11T11:18:57.568+05:30: Access control is not enabled for the database. Read and write access to data and conf
iguration is unrestricted
------

------
   Enable MongoDB's free cloud-based monitoring service, which will then receive and display
   metrics about your deployment (disk utilization, CPU, operation statistics, etc).

   The monitoring data will be available on a MongoDB website with a unique URL accessible to you
   and anyone you share the URL with. MongoDB may use this information to make product
   improvements and to suggest MongoDB products and deployment options to you.

   To enable free monitoring, run the following command: db.enableFreeMonitoring()
   To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
------

test>
```

Create Database

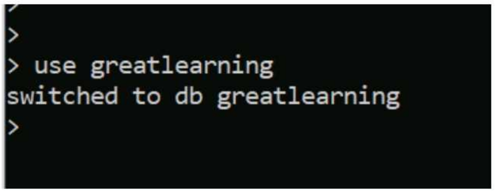
Create Database

Once you are on MongoDb shell, Use the following command to create a database

use database_name;

if the database doesn't exists, above command creates a new database otherwise opens the existing one.

Eg: use greatlearning



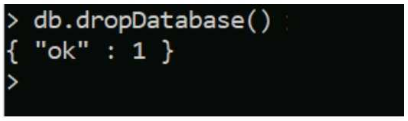
```
>
> use greatlearning
switched to db greatlearning
>
```

Note:
In MongoDB, databases hold collections of documents

Delete Database

Use the following command to delete a database

db.dropDatabase()



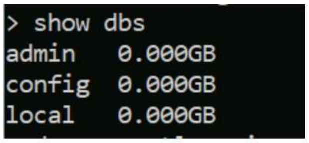
```
> db.dropDatabase()
{ "ok" : 1 }
>
```

List all Databases

- To list down all the databases, use the command below

  show dbs

- This command lists down all the databases and their size on the disk.



```
> show dbs
admin   0.000GB
config  0.000GB
local   0.000GB
```

Note:
As you can see that the database "greatlearning" that we have created is not present in the list of all the databases. This is because a database is not created until you save a document in it

Create Collection

Collection

- MongoDB stores documents in collections. Collections are analogous to tables in relational databases
- A collection exists within a single database. Collections do not enforce a schema.
- A collection may store documents those which are not same in structure because its schema free database.

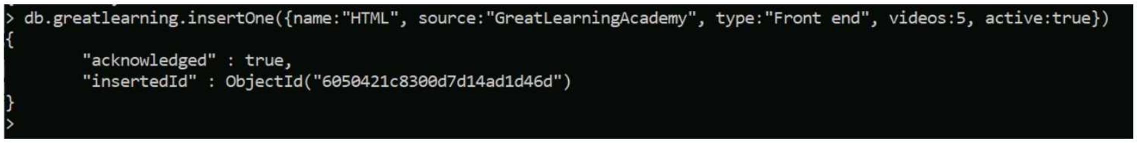
Create Collection – Method 1

- In MongoDB you need not to create collection before you insert document in it. With a single command you can insert a document in the collection and the MongoDB creates that collection on the fly.

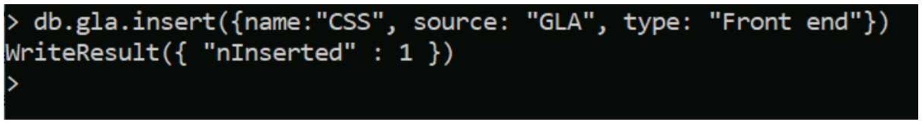
  Syntax: *db.collection_name.insert({key:value, key:value…})*

- Eg: To create a collection in the database iprimeddb, we use the following command.

  db.gla.insert({name:“CSS",source:“GLA“, type:”Front end”});



```
> db.greatlearning.insertOne({name:"HTML", source:"GreatLearningAcademy", type:"Front end", videos:5, active:true})
{
        "acknowledged" : true,
        "insertedId" : ObjectId("6050421c8300d7d14ad1d46d")
}
>
```



```
> db.gla.insert({name:"CSS", source: "GLA", type: "Front end"})
WriteResult({ "nInserted" : 1 })
>
```

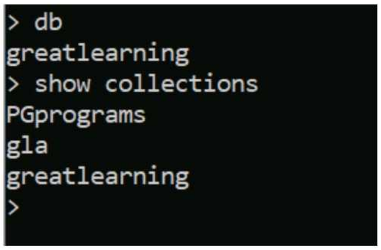
Create Collection – Method 2

We can also create collection before we actually insert data in it. This method provides you the options that you can set while creating a collection.

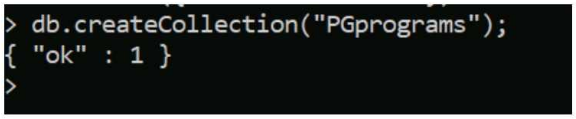
Syntax: *db.createCollection(name, options)*

- name is the collection name
- options is an optional field that we can use to specify certain parameters such as size, max number of documents etc. in the collection.

Eg: db.createCollection(“PGprograms");



```
> db
greatlearning
> show collections
PGprograms
gla
greatlearning
>
```



```
> db.createCollection("PGprograms");
{ "ok" : 1 }
>
```

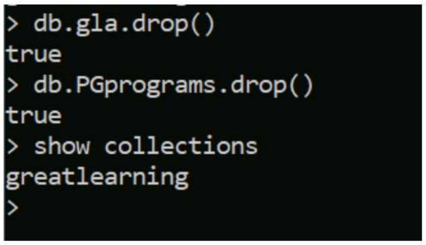
Deleting the Collection

To drop a collection , first connect to the database in which you want to delete collection and then type the following command to delete the collection:

db.collection_name.drop()

Note: Once you drop a collection all the documents and the indexes associated with them will also be dropped. To preserve the indexes we use remove() function that only removes the documents in the collection but doesn't remove the collection itself and the indexes created on it.

Eg: db.gla.drop();



```
> db.gla.drop()
true
> db.PGprograms.drop()
true
> show collections
greatlearning
>
```

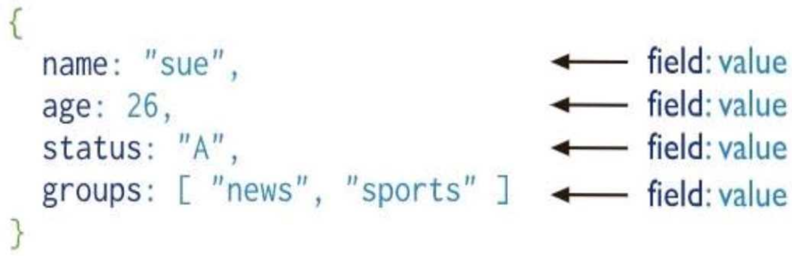
Create Documents

Documents

MongoDB stores data records as BSON documents. BSON is a binary representation of JSON documents.

MongoDB documents are composed of field-and-value pairs and have the following structure:

```
{
  field1: value1,
  field2: value2,
  field3: value3,
  ...
  fieldN: valueN
}
```



```
{
  name: "sue",
  age: 26,
  status: "A",
  groups: [ "news", "sports" ]
}
```