mongoDB®

REPORT

What is database?

A database is an organized collection of structured information or data, typically stored electronically in a computer system. Database holds one or more collections of documents. Each document is stored as a Json-like object (specifically bson) and is part of a collection. Unlike traditional relational databases, mongodb doesn’t rely on a table-based structure. Instead, it uses flexible documents with dynamic schemas. This makes it easy to store and retrieve data efficiently, especially in hierarchical formats within the Json documents.

Structured Data:

The information is typically organized in a specific format, often using tables with rows and columns. This makes it easier to search, filter, and analyze the data.

Database Management System (DBMS):

This is the software that acts like the filing cabinet manager. It allows you to store, retrieve, update, and manage all the data within the database.

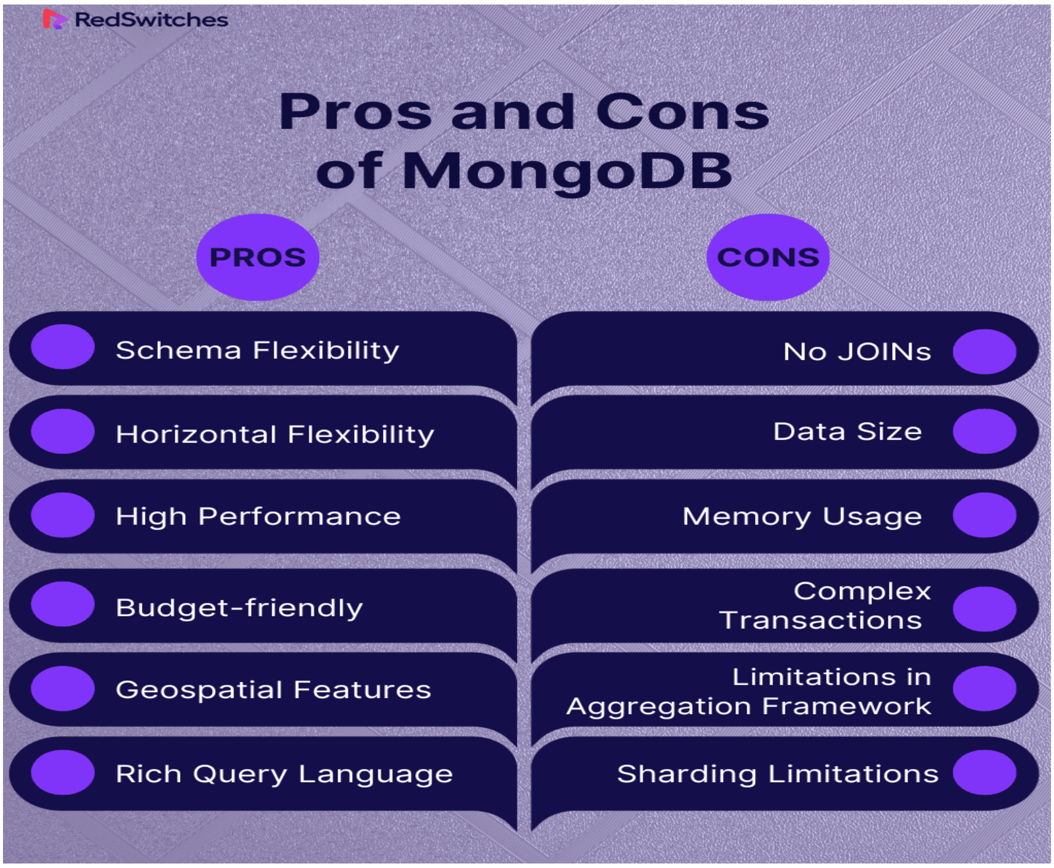
Data Types:

Databases can hold various kinds of information, including text, numbers, images, videos, and more.

Introduction of mongodb:

As per the above diagram, in MySQL the data are arranged in its own order and in mongodb they are distributed. The mongodb has no arrangement in it.

Advantages and limitations:



RedSwitches

Pros and Cons of MongoDB

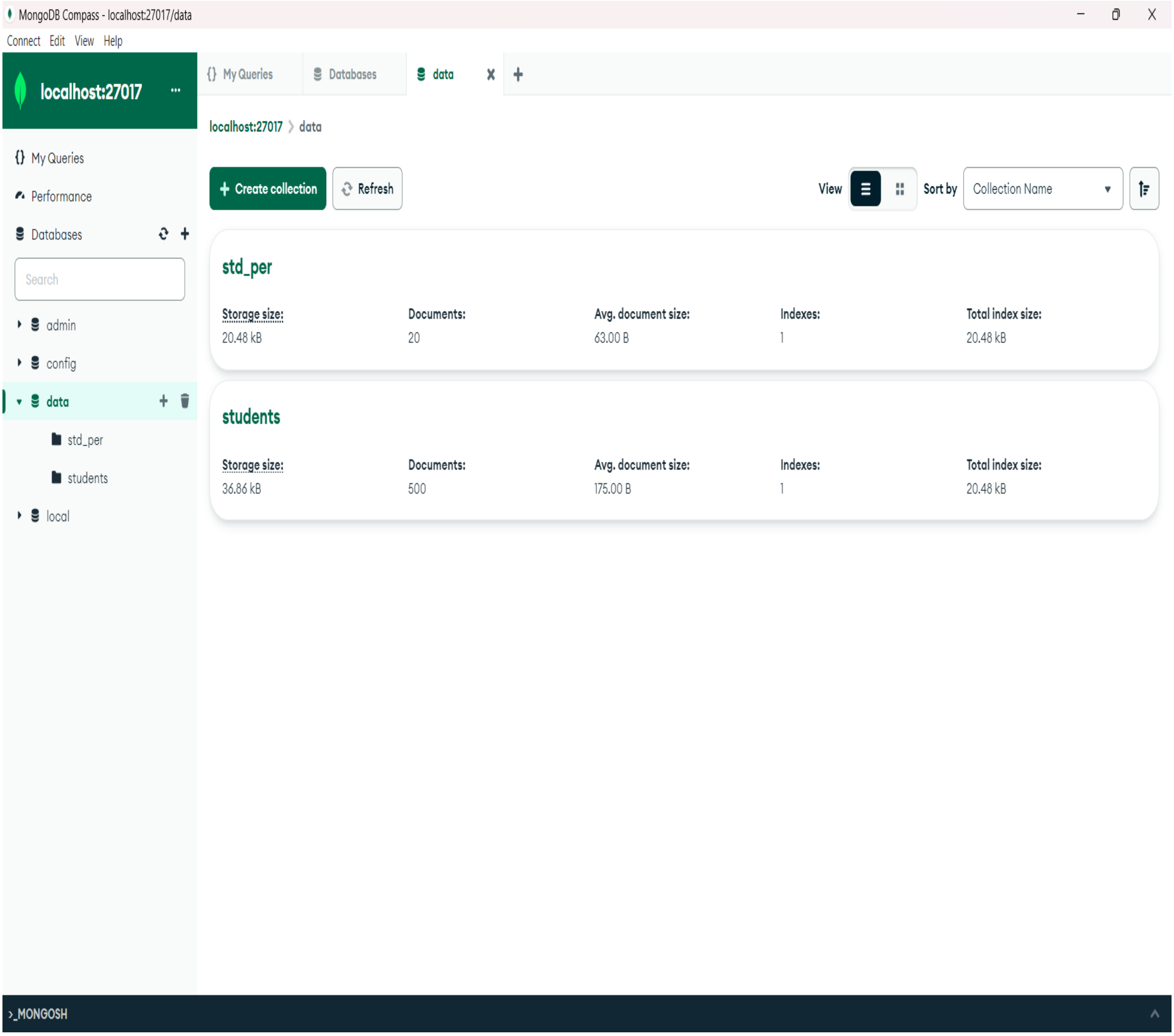
PROS	CONS
Schema Flexibility	No JOINs
Horizontal Flexibility	Data Size
High Performance	Memory Usage
Budget-friendly	Complex Transactions
Geospatial Features	Limitations in Aggregation Framework
Rich Query Language	Sharding Limitations

Few Commands to test after connections:

Command	Notes
Show dbs	All database are shown
Use db	Connect and use db
show collections	Show all tables
db.boo.insert({“car” :”bus”})	Insert a record to collection. create collection if not
db.boo.find()	Print all rows

Installation of mongodb:

- Mongo shell download link
- Mongodb download link
- Mongodb compass download link
- Connect the shell with localhost:27017



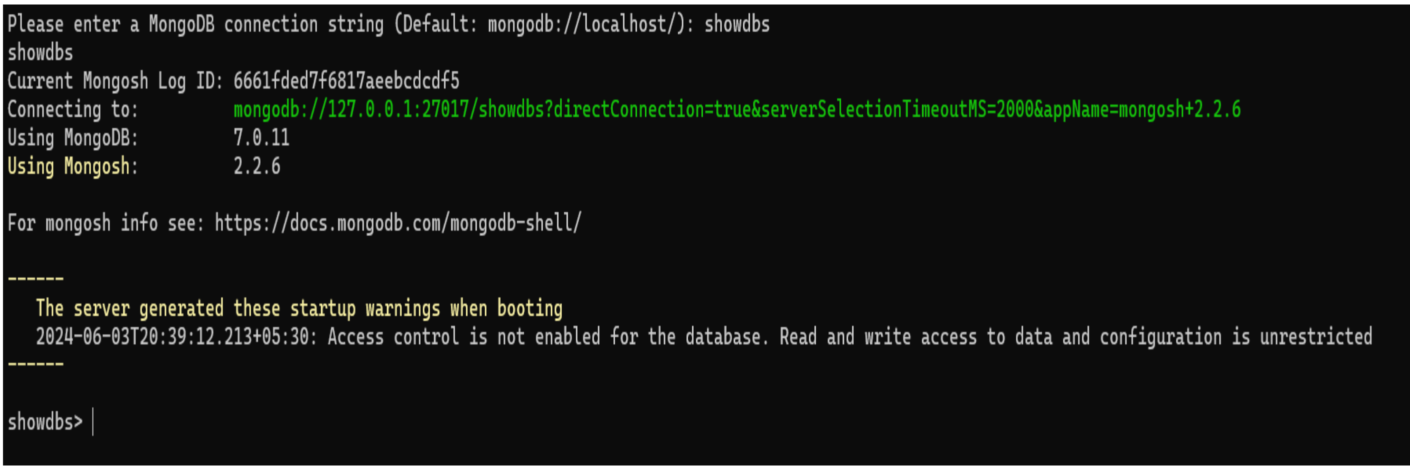
std_per

Storage size: 20.48 kB
Documents: 20
Avg. document size: 63.00 B
Indexes: 1
Total index size: 20.48 kB

students

Storage size: 36.86 kB
Documents: 500
Avg. document size: 175.00 B
Indexes: 1
Total index size: 20.48 kB

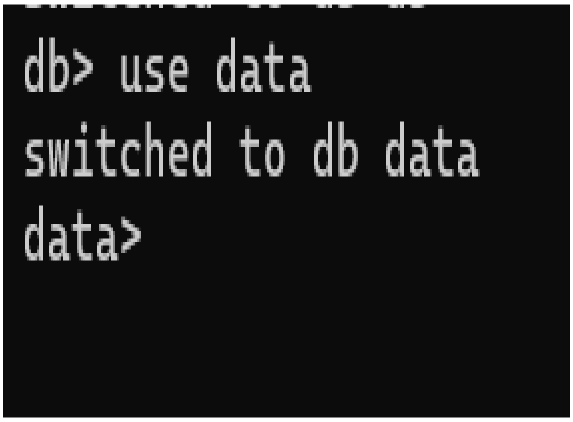
showdbs:



```
Please enter a MongoDB connection string (Default: mongodb://localhost/): showdbs
showdbs
Current Mongosh Log ID: 6661fded7f6817aeebcdcdf5
Connecting to:          mongodb://127.0.0.1:27017/showdbs?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2.2.6
Using MongoDB:          7.0.11
Using Mongosh:          2.2.6

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

------
   The server generated these startup warnings when booting
   2024-06-03T20:39:12.213+05:30: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
------

showdbs>
```

Add, update and delete data:

First step is we want to switch our database to the given collection by using command.

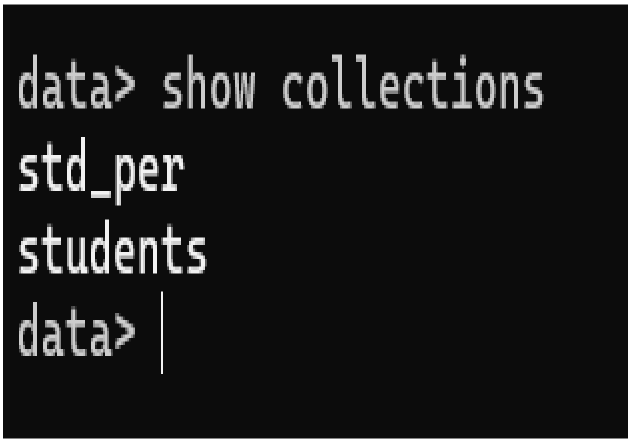


```
db> use data
switched to db data
data>
```

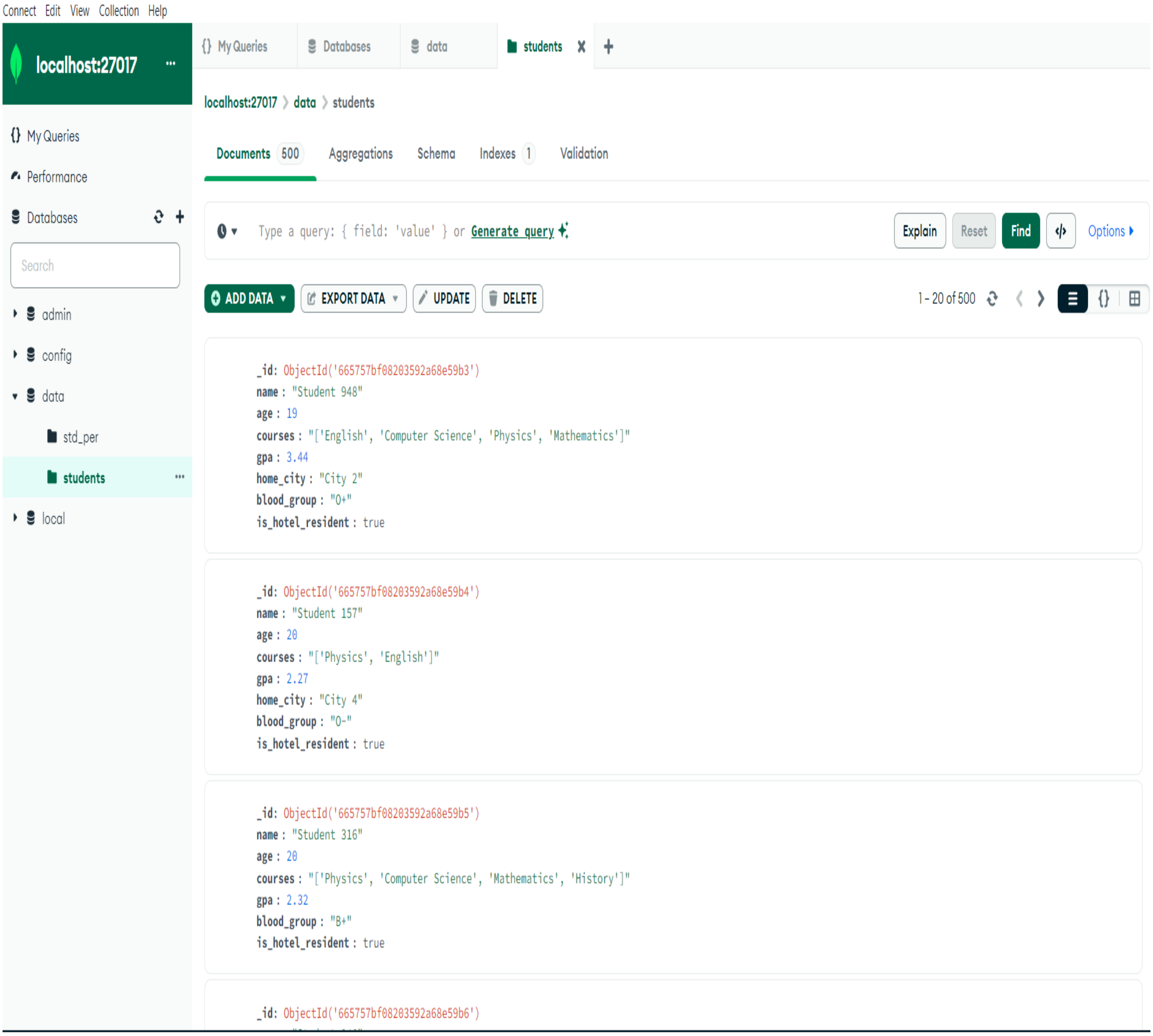
Now the database is switched to db named ‘data’.

To find whether the data present in the given collection, here the collection name is about the information of students.

We can use the command “Show collections”.



```
data> show collections
std_per
students
data>
```

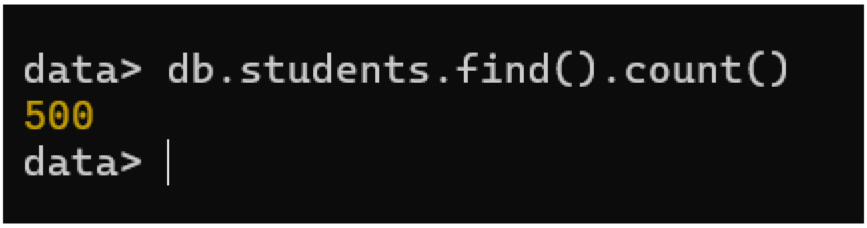


```
_id: ObjectId('665757bf08203592a68e59b3')
name : "Student 948"
age : 19
courses : "['English', 'Computer Science', 'Physics', 'Mathematics']"
gpa : 3.44
home_city : "City 2"
blood_group : "O+"
is_hotel_resident : true

_id: ObjectId('665757bf08203592a68e59b4')
name : "Student 157"
age : 20
courses : "['Physics', 'English']"
gpa : 2.27
home_city : "City 4"
blood_group : "O-"
is_hotel_resident : true

_id: ObjectId('665757bf08203592a68e59b5')
name : "Student 316"
age : 20
courses : "['Physics', 'Computer Science', 'Mathematics', 'History']"
gpa : 2.32
blood_group : "B+"
is_hotel_resident : true

_id: ObjectId('665757bf08203592a68e59b6')
```

In the above example the collection name is students.

To find the total number of collection of the database use the command.

“db.students.find().count()”

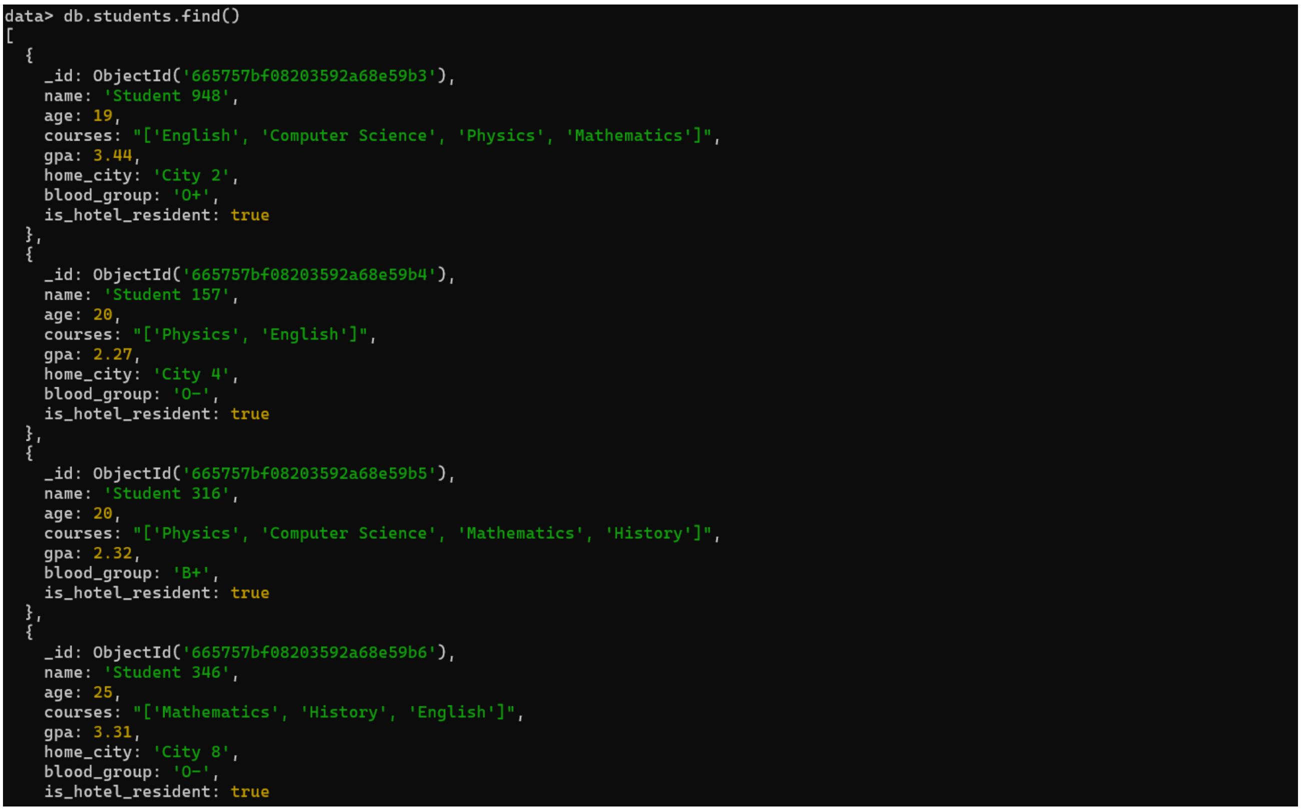


```
data> db.students.find().count()
500
data> 
```

It shows the total collections of students in the database.

To find the collection of the database use the command.

“db.students.find()”



```
data> db.students.find()
[
  {
    _id: ObjectId('665757bf08203592a68e59b3'),
    name: 'Student 948',
    age: 19,
    courses: "['English', 'Computer Science', 'Physics', 'Mathematics']",
    gpa: 3.44,
    home_city: 'City 2',
    blood_group: 'O+',
    is_hotel_resident: true
  },
  {
    _id: ObjectId('665757bf08203592a68e59b4'),
    name: 'Student 157',
    age: 20,
    courses: "['Physics', 'English']",
    gpa: 2.27,
    home_city: 'City 4',
    blood_group: 'O-',
    is_hotel_resident: true
  },
  {
    _id: ObjectId('665757bf08203592a68e59b5'),
    name: 'Student 316',
    age: 20,
    courses: "['Physics', 'Computer Science', 'Mathematics', 'History']",
    gpa: 2.32,
    blood_group: 'B+',
    is_hotel_resident: true
  },
  {
    _id: ObjectId('665757bf08203592a68e59b6'),
    name: 'Student 346',
    age: 25,
    courses: "['Mathematics', 'History', 'English']",
    gpa: 3.31,
    home_city: 'City 8',
    blood_group: 'O-',
    is_hotel_resident: true
```

Collections:

A collection is a group of documents. If a document is the MongoDB analog of a row in a relational database, then a collection can be thought of as the analog to a table.

Database:

MongoDB groups collections into databases. A single instance of MongoDB can host several databases, each grouping together zero or more collections.