JANUARY 27, 2019 / #MONGODB

How to get started with MongoDB in 10 minutes

by Navindu Jayatilake

MongoDB is a rich document-oriented NoSQL database.

Today, I wanted to share some of the basic stuff about MongoDB commands such as querying, filtering data, deleting, updating and so on.

Okay, enough of the talk, let's get to work!

Configuration ?

In order to work with MongoDB, first you need to install MongoDB on your computer. To do this, visit the official download center and download the version for your specific OS. Here, I've used Windows.

After downloading MongoDB community server setup, you'll go through a 'next after next' installation process. Once done, head over to the C drive in which you have installed MongoDB. Go to program files and select the MongoDB directory.

```
C: -> Program Files -> MongoDB -> Server -> 4.0(version) -> bin
```

In the bin directory, you'll find an interesting couple of executable files.

Let's talk about these two files.

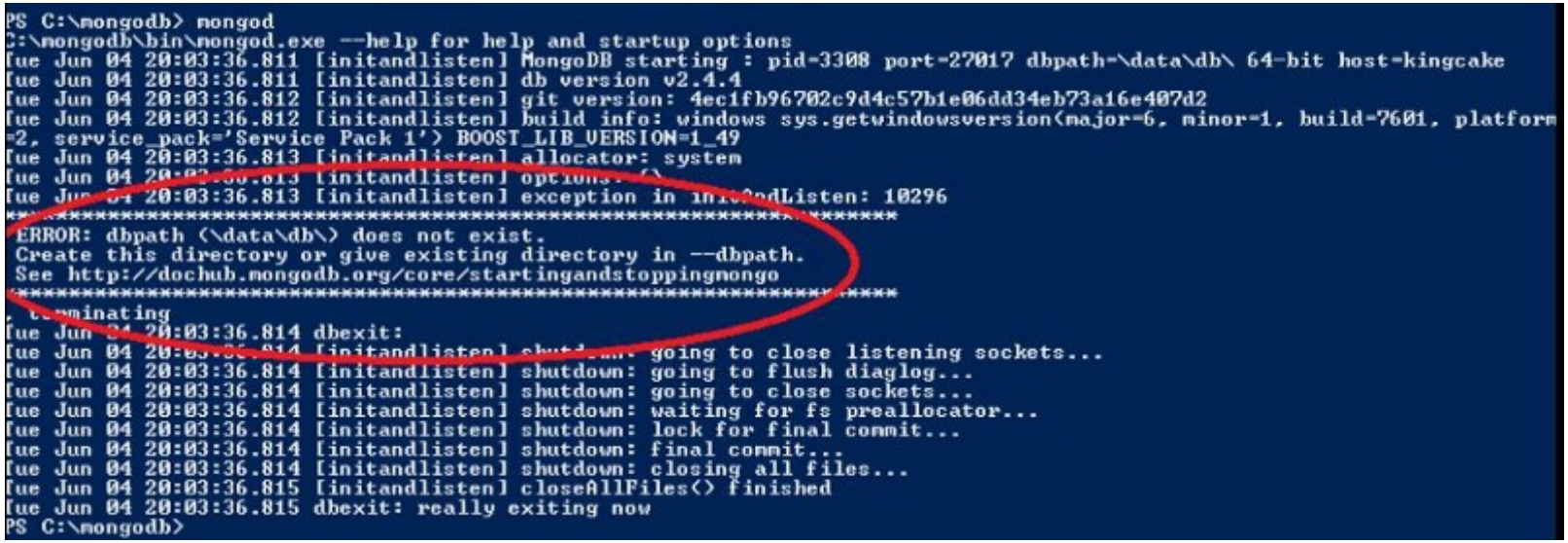
mongod stands for "Mongo Daemon". mongod is a background process used by MongoDB. The main purpose of mongod is to manage all the MongoDB server tasks. For instance, accepting requests, responding to client, and memory management.

mongo is a command line shell that can interact with the client (for example, system administrators and developers).

Now let's see how we can get this server up and running. To do that on Windows, first you need to create a couple of directories in your C drive. Open up your command prompt inside your C drive and do the following:

```
C:\> mkdir data/dbC:\> cd dataC:\> mkdir db
```

The purpose of these directories is MongoDB requires a folder to store all data. MongoDB's default data directory path is `/data/db` on the drive. Therefore, it is necessary that we provide those directories like so.



trying to start mongodb server without \data\db directories

```
mongod
```

Voilà! Now our MongoDB server is up and running! ?

In order to work with this server, we need a mediator. So open another command window inside the bind folder and run the following command:

```
mongo
```

After running this command, navigate to the shell which we ran mongod command (which is our server). You'll see a 'connection accepted' message at the end. That means our installation and configuration is successful!

Just simply run in the mongo shell:

```
```

initially you have a db called 'test'

Setting up Environment Variables

To save time, you can set up your environment variables. In Windows, this is done by following the menus below:

```
Advanced System Settings -> Environment Variables -> Path(Under System Variables) -> Edit
```

Simply copy the path of our bin folder and hit OK! In my case it's `C:\Program Files\MongoDB\Server\4.0\bin`

Now you're all set!

There's a bunch of GUIs (Graphical User Interface) to work with MongoDB server such as MongoDB Compass, Studio 3T and so on.

They provide a graphical interface so you can easily work with your database and perform queries instead of using a shell and typing queries manually.

But in this article we'll be using command prompt to do our work.

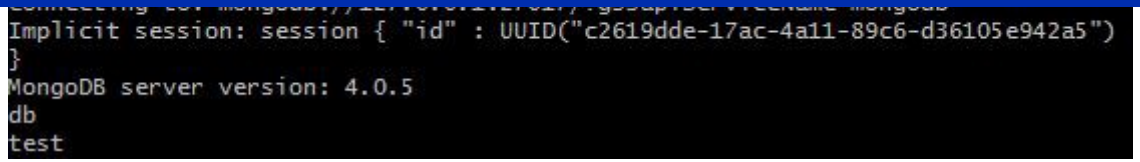
Now it's time for us to dive into MongoDB commands that'll help you to use with your future projects.

1. Open up your command prompt and type `mongod` to start the MongoDB server.

2. Open up another shell and type `mongo` to connect to MongoDB database server.

1. Finding the current database you're in

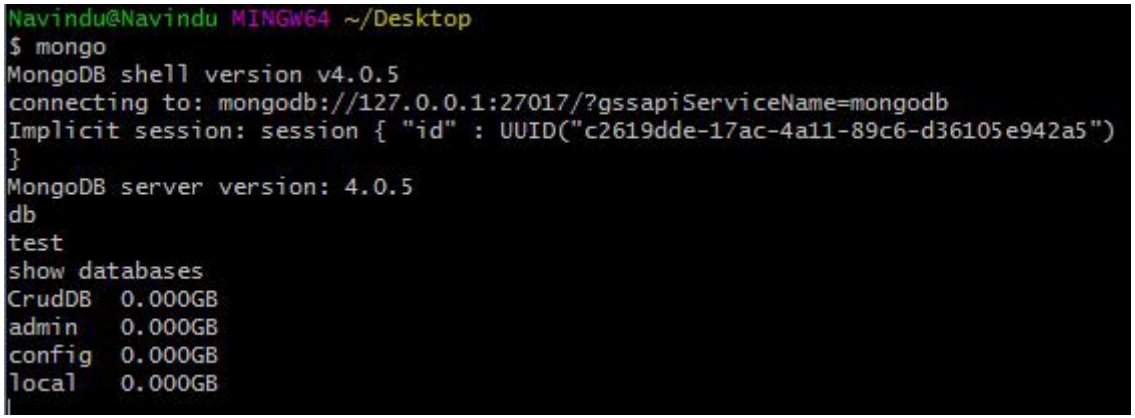
```
db
```



This command will show the current database you are in. `test` is the initial database that comes by default.

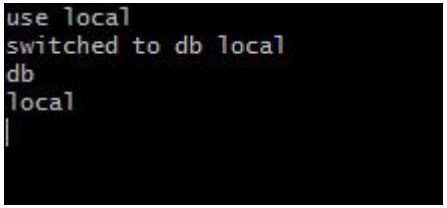
2. Listing databases

```
show databases
```



3. Go to a particular database

```
use <your_db_name>
```



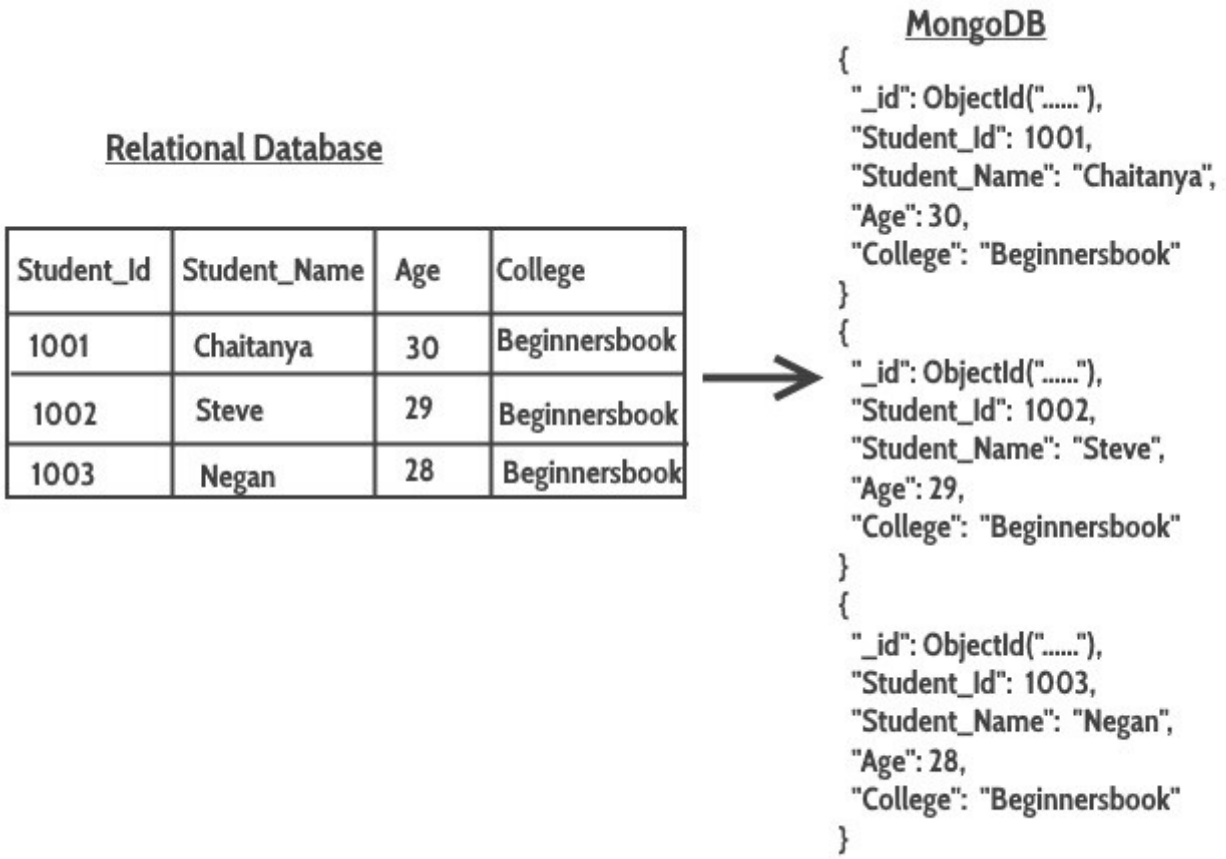
Here I've moved to the `local` database. You can check this if you try the command `db` to print out the current database name.

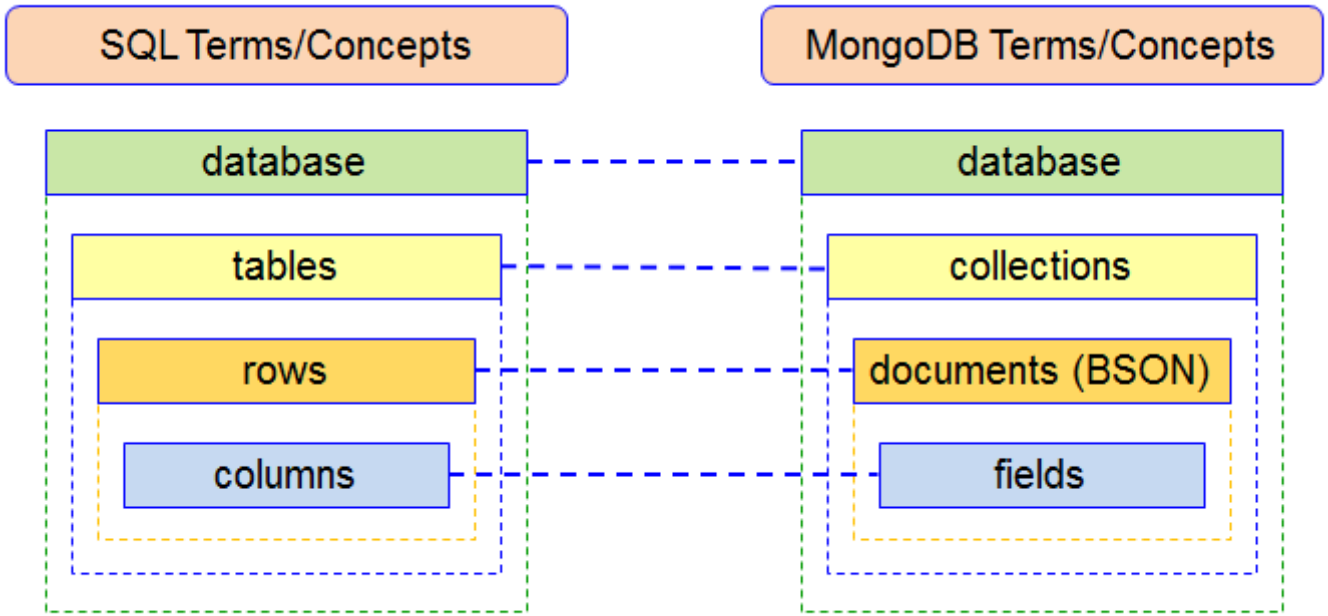
4. Creating a Database

With RDBMS (Relational Database Management Systems) we have Databases, Tables, Rows and Columns.

But in NoSQL databases, such as MongoDB, data is stored in BSON format (a binary version of

In SQL databases, these are similar to Tables.





SQL terms and NoSQL terms by Victoria Malaya

Alright, let's talk about how we create a database in the mongo shell.

```
use <your_db_name>
```

Wait, we had this command before! Why am I using it again?!

In MongoDB server, if your database is present already, using that command will navigate into your database.

But if the database is not present already, then MongoDB server is going to create the database for you. Then, it will navigate into it.

After creating a new database, running the `show database` command will not show your newly created database. This is because, until it has any data (documents) in it, it is not going to show in your db list.

Navigate into your newly created database with the `use` command.

Actually, there are two ways to create a collection. Let's see both.

One way is to insert data into the collection:

```
db.myCollection.insert({"name": "john", "age" : 22, "location": "colombo"})
```

This is going to create your collection `myCollection` even if the collection does not exist. Then it will insert a document with `name` and `age`. These are non-capped collections.

The second way is shown below:

2.1 Creating a Non-Capped Collection

```
db.createCollection("myCollection")
```

2.2 Creating a Capped Collection

```
db.createCollection("mySecondCollection", {capped : true, size : 2, max : 2})
```

In this way, you're going to create a collection without inserting data.

A "capped collection" has a maximum document count that prevents overflowing documents.

In this example, I have enabled capping, by setting its value to `true`.

The `size : 2` means a limit of two megabytes, and `max: 2` sets the maximum number of documents to two.

Now if you try to insert more than two documents to `mySecondCollection` and use the `find` command (which we will talk about soon), you'll only see the most recently inserted documents. Keep in mind this doesn't mean that the very first document has been deleted — it is just not showing.

6. Inserting Data

We can insert data to a new collection, or to a collection that has been created before.


"age": 22,
"skills": ["JS", "PHP"],
array of strings
"location": {
"city": "Colombo",
"street": "Makola"
},
an object
"hobbies": [
{
"hobby": "eat"
},
{
"hobby": "sleep"
},
{
"hobby": "code"
},
{
"hobby": "repeat"
}
]
array of objects

There are three methods of inserting data.

1. `insertOne()` is used to insert a single document only.
2. `insertMany()` is used to insert more than one document.
3. `insert()` is used to insert documents as many as you want.

Below are some examples:

- **insertOne()**

```
db.myCollection.insertOne(
```

```
  }
)
```

- **insertMany()**

```
db.myCollection.insertMany([
  {
    "name": "navindu",
    "age": 22
  },
  {
    "name": "kavindu",
    "age": 20
  },

  {
    "name": "john doe",
    "age": 25,
    "location": "colombo"
  }
])
```

The `insert()` method is similar to the `insertMany()` method

you use `find`, then you'll see only for `john doe` the `location` property is attached.

This can be an advantage when it comes to NoSQL databases such as MongoDB. It allows for scalability.

```
db.myCollection.insert({"name": "navindu", "age" : 22})
WriteResult({ "nInserted" : 1 })
```

Successfully inserted data

7. Querying Data

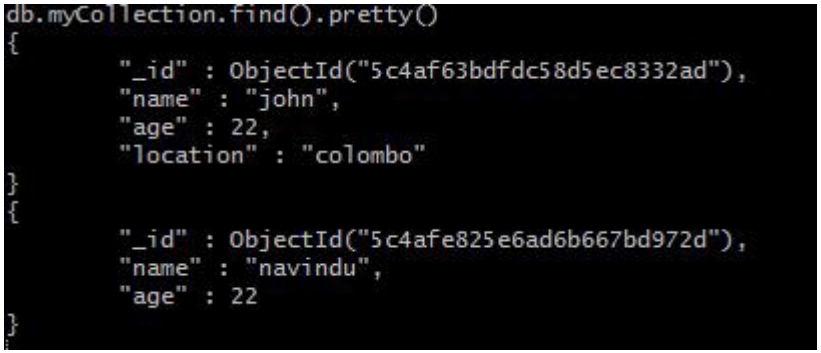
Here's how you can query all data from a collection:

```
db.myCollection.find()
```

```
db.myCollection.find()
{ "_id" : ObjectId("5c4af63bdfdc58d5ec8332ad"), "name" : "john", "age" : 22, "lo
cation" : "colombo" }
{ "_id" : ObjectId("5c4afe825e6ad6b667bd972d"), "name" : "navindu", "age" : 22 }
```

If you want to see this data in a cleaner, way just add `.pretty()` to the end of it. This will display document in pretty-printed JSON format.

```
db.myCollection.find().pretty()
```



result

Wait...In these examples did you just notice something like `_id`? How did that get there?

Well, whenever you insert a document, MongoDB automatically adds an `_id` field which uniquely identifies each document. If you do not want it to display, just simply run the following command

Next, we'll look at filtering data.

If you want to display some specific document, you could specify a single detail of the document which you want to be displayed.

```
db.myCollection.find(
  {
    name: "john"
  }
)
```

```
db.myCollection.find({ name: "john"})
{ "_id" : ObjectId("5c4af63bdfdc58d5ec8332ad"), "name" : "john", "age" : 22, "location" : "colombo"
}
```

result

Let's say you want only to display people whose age is less than 25. You can use `$lt` to filter for

```
db.myCollection.find(
  {
    age : {$lt : 25}
  }
)
```

Similarly, `$gt` stands for greater than, `$lte` is “less than or equal to”, `$gte` is “greater than or equal to” and `$ne` is “not equal”.

8. Updating documents

Let’s say you want to update someone’s address or age, how you could do it? Well, see the next example:

```
db.myCollection.update({age : 20}, {$set: {age: 23}})
```

The first argument is the field of which document you want to update. Here, I specify `age` for the simplicity. In production environment, you could use something like the `_id` field.

It is always better to use something like `_id` to update a unique row. This is because multiple fields

have same name and age.

```
db.myCollection.update({age : 22}, {$set : {age : 23}});
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
db.myCollection.find();
{ "_id" : ObjectId("5c4af63bdfdc58d5ec8332ad"), "age" : 20 }
{ "_id" : ObjectId("5c4afe825e6ad6b667bd972d"), "name" : "navindu", "age" : 23 }
```

result

If you update a document this way with a new property, let's say `location` for example, the document will be updated with the new attribute. And if you do a `find`, then the result will be:

```
db.myCollection.update({name:"navindu"}, {location:"makola"});
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
db.myCollection.find().pretty()
{ "_id" : ObjectId("5c4af63bdfdc58d5ec8332ad"), "age" : 20 }
{ "_id" : ObjectId("5c4afe825e6ad6b667bd972d"), "location" : "makola" }
```

result

If you need to remove a property from a single document, you could do something like this (let's say you want `age` to be gone):

9. Removing a document

As I have mentioned earlier, when you update or delete a document, you just need specify the `_id` not just `name`, `age`, `location`.

```
db.myCollection.remove({name: "navindu"});
```

10. Removing a collection

```
db.myCollection.remove({});
```

Note, this is not equal to the `drop()` method. The difference is `drop()` is used to remove all the documents inside a collection, but the `remove()` method is used to delete all the documents along with the collection itself.

Logical Operators

Operand	Example	Meaning
&&	$variable1 && $variable2	Are both values true?
||	$variable1 || $variable2	Is at least one value true?
AND	$variable1 AND $variable2	Are both values true?
XOR	$variable1 XOR $variable2	Is at least one value true, but NOT both?
OR	$variable1 OR $variable2	Is at least one value true?
!	!$variable1	Is NOT something

Name	Description
`$and`	Joins query clauses with a logical `AND` returns all documents that match the conditions of both clauses.
`$not`	Inverts the effect of a query expression and returns documents that do *not* match the query expression.
`$nor`	Joins query clauses with a logical `NOR` returns all documents that fail to match both clauses.
`$or`	Joins query clauses with a logical `OR` returns all documents that match the conditions of either clause.

reference: MongoDB manual

Let's say you want to display people whose age is less than 25, and also whose location is Colombo. What we could do?

We can use the `$and` operator!

```
db.myCollection.find({$and:[{age : {$lt : 25}}, {location: "colombo"}]});
```

Last but not least, let's talk about aggregation.

Aggregation

A quick reminder on what we learned about aggregation functions in SQL databases:

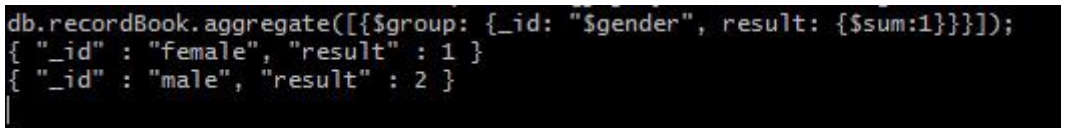
AVG	It will calculate the Average of total records (or rows) selected by the SQL SELECT Statement
CHECKSUM_AGG	It is used to return the checksum of the values in a Group
COUNT	It will Count the number of records (or rows) selected by the SELECT Statement.
COUNT_BIG	It works same as the SQL COUNT function, but it returns the bigint
GROUPING	It is used to indicate whether the specified column in a GROUP BY Clause is aggregated or not
GROUPING_ID	It is used to return the level of grouping.
MAX	It returns the Maximum value from the total records (or rows) selected.
MIN	It returns the Minimum value from the total rows selected.
STDEV	It is used to calculate the Standard Deviation of the selected records ©tutorialgateway.org
STDEVP	It is used to calculate the Standard Deviation for population
SUM	It is used to calculate the total or Sum of records selected by the SELECT Statement
VAR	It will calculate the statistical Variance of selected records
VARP	It will calculate the statistical Variance for the population

aggregation functions in SQL databases. ref : Tutorial Gateway

Simply put, aggregation groups values from multiple documents and summarizes them in some way.

Imagine if we had male and female students in a `recordBook` collection and we want a total count on each of them. In order to get the sum of males and females, we could use the `$group` aggregate function.

```
db.recordBook.aggregate([
  {
    $group : {_id : "$gender", result: {$sum: 1}}
  }
]);
```



result

Wrapping up

So, we have discussed the basics of MongoDB that you might need in the future to build an application. I hope you enjoyed this article – thanks for reading!

If you have any queries regarding this tutorial, feel free to comment out in the comment section below or contact me on Facebook or Twitter or Instagram.

See you guys in the next article! ♡ ✌?

Link to my previous article: NoSQL

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