



Modifying
Documents

The Coolest
Thing

Comparing
Values

Parsing Text

Queries

Consider This
...

Introduction to Database Systems: CS312

Editing Documents

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Consider This

...

create container for Mongodb

```
sudo docker pull mongo
```

create directory to contain data

```
mkdir -p ~/mongodata
```

start Mongo server - command fits on one line

```
sudo docker run -it -v ~/mongodata:/data/db --name mongodb -d mongo
```



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Consider This

...

check server`sudo docker logs mongodb`**check server logs**`sudo docker ps`**start the bash**`sudo docker exec -it mongodb bash`**start client inside container**`mongo`



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Consider This

...

Trouble?!?

Remove Docker image and container and restart the above code

remove image

```
sudo docker image rm mongo -f
```

remove container

```
sudo docker container rm mongodb -f
```

Still Having Trouble?!?

If all else fails, you may just need to stop the container from running (see next slide) and remove the /mongodata/. Then try running the commands from above.



Killing a Docker Container 1/2

If you have trouble running it, try relaunching the container

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Consider This

Find out the container's ID

```
docker ps
```

Your container's ID. This one is; 4e9d863407ac

CONTAINER ID	IMAGE
4e9d863407ac	mongo

Stop MongoDB container

```
docker stop mongodb # Windows
```

```
sudo docker stop mongodb # MacOS and Linux
```

Remove MongoDB container

```
docker rm 4e9d863407ac # Windows
```

```
sudo docker rm 4e9d863407ac # MacOS and Linux
```

You should now be able to run your run and execute commands from above.



Killing a Docker Container 2/2

If you have trouble running it, try removing the container

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Consider This

...

I Try to Run a Container

```
sudo docker run -it -v ~/mongodata:/data/db --name mongodb -d mongo
```

I Get This Error ...

docker: Error response from daemon: Conflict. The container name "/mongodb" is already in use by container "0edb80...8529c8c2". You have to remove (or rename) that container to be able to reuse that name.

I Remove Container With ...

```
sudo docker rm "0edb80...8529c8c2"
```

Relaunch

Now remove all files in /mongodata/ to start a fresh database. Use the commands from above to rebuild the container)

Adding to a Document in Mongo With a Date

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Consider This
...

Start a new database in Mongo

```
use myRestaurants
```

Insertion of several documents using insertMany()

```
db.restaurants.insertMany( [  
  { "_id" : 1, "name": "Central Perk Cafe", "Borough": "Manhattan", "avgCost": 100},  
  { "_id" : 2, "name": "Rock A Feller Bar and Grill", "Borough": "Queens", "violations": 2,  
   "avgCost": 250},  
  { "_id" : 3, "name": "Empire State Pub", "Borough": "Brooklyn", "violations": 0,  
   "avgCost": 300},  
  { "_id" : 4, "name": "The Captain's Cafe", "Borough": "London", "avgCost": 80 },  
  { "_id" : 5, "name": "The Resto in a Cave", "Borough": "Paris", "violations": 0,  
   "avgCost": 1 },  
  { "_id" : 6, "name": "The Crow Bar", "Borough": "Paris", "violations": 98, "note": "gross",  
   "avgCost": 40}]);
```

- Note: we are able to override the `_id` settings from Mongo and implement our own values.

Check that the above commands worked

```
show dbs  
show collections  
db.restaurants.find().pretty()
```

Inserting New Data Using \$set{}

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Consider This

...

Check document

```
db.restaurants.find({"name": "Empire State Pub"}, {})
```

Add to document

```
db.restaurants.updateOne(  
  {"name": "Empire State Pub"},  
  { $set: {  
    rating: "Thumbs-Up",  
    status: "Loved it!" },  
    $currentDate: { lastModified: true }  
});
```

```
{  
  "_id" : 3,  
  "name" : "Empire State Pub",  
  "Borough" : "Brooklyn",  
  "violations" : 0,  
  "lastModified" : ISODate("2019-04-03T01:06:48.584Z"),  
  "rating" : "Thumbs-Up",  
  "status" : "Love it!"  
}
```

Inserting New Data Using \$set{}

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Consider This

Check document

```
db.restaurants.find({name:"Central Perk Cafe"},{})
```

```
db.restaurants.updateOne(  
  {"name":"Central Perk Cafe"},  
  { $set: {  
    rating: "Good",  
    status: "Loved it!",  
    kitchenQuality: "ok" },  
    $currentDate: { lastModified: true }  
});
```

```
> db.restaurants.find({name:"Central Perk Cafe"},{}).pretty()  
{  
  "_id" : 1,  
  "name" : "Central Perk Cafe",  
  "Borough" : "Manhattan",  
  "kitchenQuality" : "ok",  
  "lastModified" : ISODate("2019-04-03T01:51:11.879Z"),  
  "rating" : "Good",  
  "status" : "Loved it!"  
}
```

Inserting New Data Using \$set{}

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Consider This
...

Check document

```
db.restaurants.find({"name": "The Resto in a Cave"}, {})
```

```
db.restaurants.updateOne(  
  {"name": "The Resto in a Cave"},  
  {  
    $set: {  
      rating: "Musty",  
      status: "Dirty and full of rocks!!!",  
      kitchenQuality: "A fire in the floor",  
      Note: "The waiter was a bear who chased me.",  
      $currentDate: { lastModified: true }  
    }  
);
```

```
> db.restaurants.find({name: "The Resto in a Cave"}, {}).pretty()  
{  
  "_id" : 5,  
  "name" : "The Resto in a Cave",  
  "Borough" : "Paris",  
  "violations" : 0,  
  "Note" : "The waiter was a bear who chased me.",  
  "kitchenQuality" : "A fire in the floor",  
  "lastModified" : ISODate("2019-04-03T02:03:59.055Z"),  
  "rating" : "Musty",  
  "status" : "Dirty and full of rocks!!!"  
}
```

MongoDB Is, “*The Coolest Thing*”!!

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Consider This

...



BTW: This graphic was *also* found as a result of searching, “The Coolest Thing” on the Internet. Apologies.



How Do I Compare Values?

Commands for the restaurant database

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Consider This
...

Operation	MongoDB	RDBMS
Equality	db.employees.find({"salary": "5000"})	where 'salary' = '5000'
Less Than	db.employees.find({"age": "{\$lt:30}}")	where age < 30
Less Than Equals	db.employees.find({"age": "{\$lte:30}}")	where age <= 30
Greater Than	db.employees.find({"age": "{\$gt:30}}")	where age > 30
Greater Than Equals	db.employees.find({"age": "{\$gte:30}}")	where age >= 30
Not Equals	db.employees.find({"age": "{\$ne:30}}")	where age != 30

RestaurantsDB: Details where avgCost is less than 200

```
db.restaurants.find({"avgCost":{$lt:200}}, {"_id": 0, "name":1, "avgCost":1})
```

```
> db.restaurants.find({"avgCost":{$lt:200}}, {"_id": 0, "name":1, "avgCost":1})
{ "name" : "Central Perk Cafe", "avgCost" : 100 }
{ "name" : "The Captain's Cafe", "avgCost" : 80 }
{ "name" : "The Resto in a Cave", "avgCost" : 1 }
{ "name" : "The Crow Bar", "avgCost" : 40 }
```



How Do I Compare Values?

Commands for the restaurant database

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Consider This
...

RestaurantsDB: Details where *avgCost* is greater than 20 and less than 100 and

```
db.restaurants.find({ "avgCost": { $gt: 20 }, "avgCost": { $lt: 100 } }, {} )
```

```
> db.restaurants.find({ "avgCost": { $gt: 20 }, "avgCost": { $lt: 100 } },  
... { "_id": 0, "name": 1, "avgCost": 1 } )  
{ "name": "The Captain's Cafe", "avgCost": 80 }  
{ "name": "The Resto in a Cave", "avgCost": 1 }  
{ "name": "The Crow Bar", "avgCost": 40 }
```



How Do I Compare Values?

Commands for the employee database

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Consider This
...

age > 25

```
db.employee.find({"age":{$gt:25}, }, {"age":1, "name.first":1})
```

```
> db.employee.find({"age":{$gt:25}, }, {"age":1, "name.first":1})  
{ "_id" : "5c89c73ea91e2b221611b950", "age" : 33, "name" : { "first" : "Pennington" } }  
{ "_id" : "5c89c73ec4863a49668b3784", "age" : 27, "name" : { "first" : "Belinda" } }  
{ "_id" : "5c89c73ea080dbf02bd40f0e", "age" : 31, "name" : { "first" : "Rosemary" } }  
> █
```

age < 25

```
db.employee.find({"age":{$lt:25}, }, {"age":1, "name.first":1})
```

```
> db.employee.find({"age":{$lt:25}, }, {"age":1, "name.first":1})  
{ "_id" : "5c89c73e5e7b4f23f0a32660", "age" : 23, "name" : { "first" : "Cora" } }
```

25 < age < 31

```
db.employee.find({"age":{$gt:25}, "age":{$lt:31}}, {"age":1, "name":1, "_id":0})
```

```
> db.employee.find({"age":{$gt:25}, "age":{$lt:31}}, {"age":1, "name":1, "_id":0})  
{ "age" : 27, "name" : { "first" : "Belinda", "last" : "Guzman" } }  
{ "age" : 23, "name" : { "first" : "Cora", "last" : "Keith" } }
```



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Consider This

...

- Index the text field to allow for parsing
- The \$text operator assigns a score to each document that contains the search term in the indexed fields.
- The score represents the relevance of a document to a given text search query.
- Return documents that have high scores from text searches.

Create an index-able name field

```
db.restaurants.createIndex( { subject: "name" } )
```

Search the name field for the word, “Cafe”

```
db.restaurants.find( { $text: { $search: "Cafe" } } )
```

Advanced Data and Queries

Let's horse around with data and code ...

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Consider This

...



Locate your data file, open it in Atom and copy and past the contents (all at once) into the MondoDB client

`syntheticData_small.json`

Synthetic data available from:

<https://next.json-generator.com/>

Investigating Queries

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Consider This

...



What do the following queries do?

```
db.employee.find({}, {"name.last":1, "name.first":1})  
db.employee.find({}, {company:1})  
db.employee.find({}, {"name.last":1, address:1})  
db.employee.find({}, {company:1, registered:1, _id:0})  
db.employee.find({}, {company:1, "friends.name":1, _id:0})  
db.employee.find({company:"RADIANTIX"},  
    {"friends.name":1, _id:0})
```

Rewriting Queries

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Consider This
...

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```
db.collection.find({searchSpace}, {showAttrib:1})
```

Rewrite the queries to get...

- The last name, first name and balance information of each document
- The company name, latitude and longitude of each document
- The list of friends of record associated with the company PROSURE
- The phone number for the PROSURE company

Want Another Challenge

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Consider This
...

THINK

- Play with your code!
 - ① Try adding new attributes to a document
 - ② Try modifying existing attributes in a document
 - ③ Add some numerical data to try the encoded operators;
 $\{<, >, \leq, \geq, ==\}$

Consider This ...

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Consider This

THINK

- Can you create and populate a completely new MongoDB database?
- Can you edit your data in your database?
- Can you write sophisticated queries in your database to isolate meaningful information from the data?