

BIG DATA ANALYTICS

MINI PROJECT

Experiment No.: 11

To implement a weather forecast dataset using MongoDB

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Experiment No.: 11

Aim: To implement a weather forecast dataset using MongoDB.

- **What will you learn by performing this experiment?**

How different MongoDB operations are used in mini-project.

- **Software/Languages Required:** MongoDB.

- **Theory:**

What is MongoDB?

MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License (SSPL).

MongoDB Community Server

As of October 2018, MongoDB is released under the Server Side Public License (SSPL), a license developed by the project. It replaces the GNU Affero General Public License, and is nearly identical to the GNU General Public License version 3, but requires that those making the software publicly available as part of a "service" must make the service's entire source code available under this license. The SSPL was submitted for certification to the Open Source Initiative but later withdrawn. The language drivers are available under an Apache License. In addition, MongoDB Inc. offers proprietary licenses for MongoDB. The last versions licensed as AGPL version 3 are 4.0.3 (stable) and 4.1.4.

MongoDB has been removed from the Debian, Fedora, and Red Hat Enterprise Linux distributions due to the licensing change. Fedora determined that the SSPL version 1 is not a free software license because it is "intentionally crafted to be aggressively discriminatory" towards commercial users.

What is Kaggle?

Kaggle allows users to find and publish data sets, explore and build models in a web-based data-science environment, work with other data scientists and machine learning engineers, and enter competitions to solve data science challenges.

- **Procedure/ Program:**

1. Get CSV dataset from Kaggle.com
2. Install MongoDB Community Server
3. Install MongoDB toolkit
4. In command prompt change directory where MongoDB bin folder is located.
5. Import and Convert CSV file to MongoDB code.
6. Open mongo.exe and execute the following commands.



- **Results**

Step 1:

Import mongodb in cmd

mongoimport -d forecast_data -c temp_c --type csv --file forecast_data.csv --headerline

```
Command Prompt
Microsoft Windows [Version 10.0.19042.1288]
(c) Microsoft Corporation. All rights reserved.

C:\Users\shrey>cd C:\Program Files\MongoDB\Server\5.0\bin

C:\Program Files\MongoDB\Server\5.0\bin>mongoimport -d forecast_data -c temp_c --type csv --file forecast_data.csv --headerline
2021-10-29T12:08:37.614+0530   connected to: mongodb://localhost/
2021-10-29T12:08:40.622+0530   [#####] forecast_data.temp_c 7.49MB/7.49MB (100.0%)
2021-10-29T12:08:40.627+0530   [#####] forecast_data.temp_c 7.49MB/7.49MB (100.0%)
2021-10-29T12:08:40.628+0530   29568 document(s) imported successfully. 0 document(s) failed to import.

C:\Program Files\MongoDB\Server\5.0\bin>
```

Step 2:
Show dbs

```
C:\Program Files\MongoDB\Server\5.0\bin>mongo.exe
MongoDB shell version v5.0.3
connecting to: mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("4602570b-fc06-439d-a863-ea5278e08aef") }
MongoDB server version: 5.0.3
*****
Warning: the "mongo" shell has been superseded by "mongosh",
which delivers improved usability and compatibility. The "mongo" shell has been deprecated and will be removed in
an upcoming release.
We recommend you begin using "mongosh".
For installation instructions, see
https://docs.mongodb.com/mongodb-shell/install/
*****
---
The server generated these startup warnings when booting:
  2021-10-28T23:49:01.372+05:30: Access control is not enabled for the database. Read and write access to data and configuration 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()
---
> show dbs
admin            0.000GB
config           0.000GB
forecast_data    0.000GB
local            0.000GB
> use forecast_data
switched to db forecast_data
```

Step 3:
db.temp_c.count()

```
C:\Program Files\MongoDB\Server\5.0\bin\mongo.exe
> "despoint_f" : 61.1,
  "will_it_rain" : 0,
  "chance_of_rain" : 0,
  "will_it_snow" : 0,
  "chance_of_snow" : 0,
  "vis_km" : 10,
  "vis_miles" : 6,
  "gust_mph" : 8.5,
  "gust_kph" : 13.7,
  "state" : "Andhra Pradesh",
  "city" : "Amaravati"
}
type "it" for more
> db.temp_c.count()
29568
>
```

Step 4:

db.temp_c.find().pretty()

```
C:\Program Files\MongoDB\Server\5.0\bin\mongo.exe
> db.temp_c.find().pretty
function() {
  this.pretty = true;
  return this;
}
> db.temp_c.find().pretty()

{
  "_id" : ObjectId("617aec181714ff0b5f3478dc"),
  "time_epoch" : 163432800,
  "time" : "2021-10-15 00:00",
  "temp_c" : 23.2,
  "temp_f" : 73.8,
  "is_day" : 0,
  "condition" : [{"text": "Clear", "icon": "//cdn.weatherapi.com/weather/64x64/night/113.png", "code": 1000}],
  "wind_mph" : 4.3,
  "wind_kph" : 6.8,
  "wind_degree" : 41,
  "wind_dir" : "NE",
  "pressure_mb" : 1006,
  "pressure_in" : 29.69,
  "precip_mm" : 0,
  "precip_in" : 0,
  "humidity" : 67,
  "cloud" : 5,
  "feelslike_c" : 25.1,
  "feelslike_f" : 77.2,
  "windchill_c" : 23.9,
  "windchill_f" : 75.0,
  "heatindex_c" : 23.1,
  "heatindex_f" : 73.6,
  "humidity_c" : 77.2,
  "humidity_f" : 167.2,
  "dewpoint_c" : 16.7,
  "dewpoint_f" : 62.1,
  "will_it_rain" : 0,
  "chance_of_rain" : 0,
  "will_it_snow" : 0,
  "chance_of_snow" : 0,
  "vis_mi" : 10,
  "vis_km" : 16,
  "gust_mph" : 8.9,
  "gust_kph" : 14.4,
  "state" : "Andhra Pradesh",
  "city" : "Amravati"
}

{
  "_id" : ObjectId("617aec181714ff0b5f3478dc"),
  "time_epoch" : 163432800,
  "time" : "2021-10-15 01:00",
  "temp_c" : 22.3,
  "temp_f" : 72.1,
  "is_day" : 0,
  "condition" : [{"text": "Clear", "icon": "//cdn.weatherapi.com/weather/64x64/night/113.png", "code": 1000}],
  "wind_mph" : 4.3,
  "wind_kph" : 6.8,
  "wind_degree" : 41,
  "wind_dir" : "NE",
  "pressure_mb" : 1006,
  "pressure_in" : 29.69,
  "precip_mm" : 0,
  "precip_in" : 0,
  "humidity" : 67,
  "cloud" : 5,
  "feelslike_c" : 25.1,
  "feelslike_f" : 77.2,
  "windchill_c" : 23.9,
  "windchill_f" : 75.0,
  "heatindex_c" : 23.1,
  "heatindex_f" : 73.6,
  "humidity_c" : 77.2,
  "humidity_f" : 167.2,
  "dewpoint_c" : 16.7,
  "dewpoint_f" : 62.1,
  "will_it_rain" : 0,
  "chance_of_rain" : 0,
  "will_it_snow" : 0,
  "chance_of_snow" : 0,
  "vis_mi" : 10,
  "vis_km" : 16,
  "gust_mph" : 8.9,
  "gust_kph" : 14.4,
  "state" : "Andhra Pradesh",
  "city" : "Amravati"
}
```

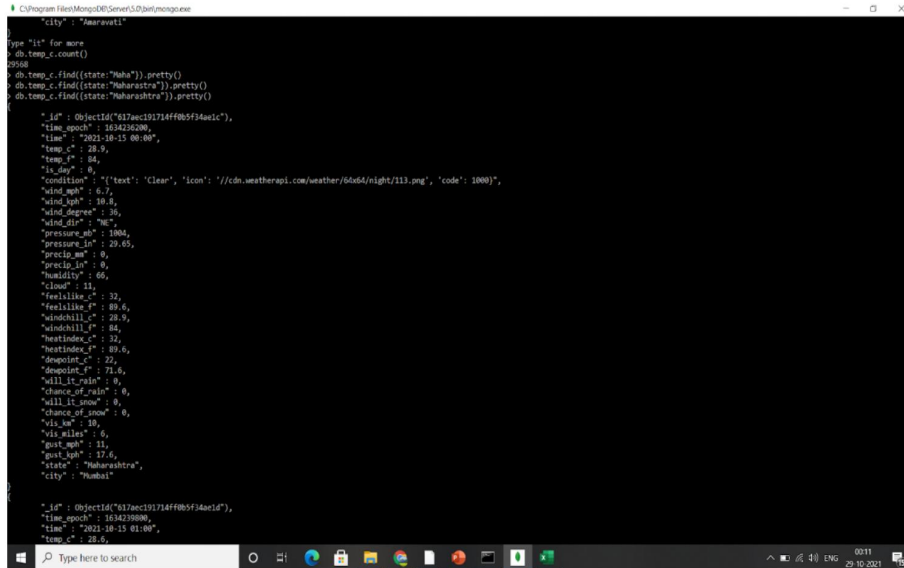
```
C:\Program Files\MongoDB\Server\5.0\bin\mongo.exe
> db.temp_c.find().pretty
function() {
  this.pretty = true;
  return this;
}
> db.temp_c.find().pretty()

{
  "_id" : ObjectId("617aec181714ff0b5f3478dc"),
  "time_epoch" : 163432800,
  "time" : "2021-10-15 21:00",
  "temp_c" : 24.7,
  "temp_f" : 76.5,
  "is_day" : 0,
  "condition" : [{"text": "Clear", "icon": "//cdn.weatherapi.com/weather/64x64/night/113.png", "code": 1000}],
  "wind_mph" : 4.3,
  "wind_kph" : 6.8,
  "wind_degree" : 41,
  "wind_dir" : "NE",
  "pressure_mb" : 1006,
  "pressure_in" : 29.69,
  "precip_mm" : 0,
  "precip_in" : 0,
  "humidity" : 67,
  "cloud" : 5,
  "feelslike_c" : 25.1,
  "feelslike_f" : 77.2,
  "windchill_c" : 23.9,
  "windchill_f" : 75.0,
  "heatindex_c" : 23.1,
  "heatindex_f" : 73.6,
  "humidity_c" : 77.2,
  "humidity_f" : 167.2,
  "dewpoint_c" : 16.7,
  "dewpoint_f" : 62.1,
  "will_it_rain" : 0,
  "chance_of_rain" : 0,
  "will_it_snow" : 0,
  "chance_of_snow" : 0,
  "vis_mi" : 10,
  "vis_km" : 16,
  "gust_mph" : 8.9,
  "gust_kph" : 14.4,
  "state" : "Andhra Pradesh",
  "city" : "Amravati"
}

{
  "_id" : ObjectId("617aec181714ff0b5f3478dc"),
  "time_epoch" : 163432800,
  "time" : "2021-10-15 22:00",
  "temp_c" : 23.9,
  "temp_f" : 75.0,
  "is_day" : 0,
  "condition" : [{"text": "Clear", "icon": "//cdn.weatherapi.com/weather/64x64/night/113.png", "code": 1000}],
  "wind_mph" : 4.3,
  "wind_kph" : 6.8,
  "wind_degree" : 41,
  "wind_dir" : "NE",
  "pressure_mb" : 1006,
  "pressure_in" : 29.69,
  "precip_mm" : 0,
  "precip_in" : 0,
  "humidity" : 67,
  "cloud" : 5,
  "feelslike_c" : 25.1,
  "feelslike_f" : 77.2,
  "windchill_c" : 23.9,
  "windchill_f" : 75.0,
  "heatindex_c" : 23.1,
  "heatindex_f" : 73.6,
  "humidity_c" : 77.2,
  "humidity_f" : 167.2,
  "dewpoint_c" : 16.7,
  "dewpoint_f" : 62.1,
  "will_it_rain" : 0,
  "chance_of_rain" : 0,
  "will_it_snow" : 0,
  "chance_of_snow" : 0,
  "vis_mi" : 10,
  "vis_km" : 16,
  "gust_mph" : 8.9,
  "gust_kph" : 14.4,
  "state" : "Andhra Pradesh",
  "city" : "Amravati"
}
```

Step 5:

`db.temp_c.find({state:"Maharashtra"}).pretty()`

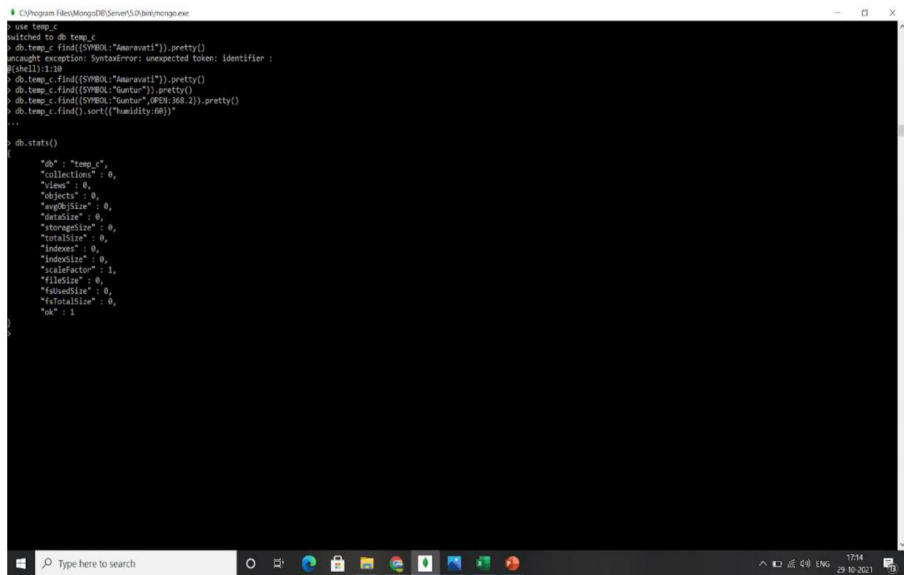


```
C:\Program Files\MongoDB\Server\5.0\bin>mongo
> use temp_c
switched to db temp_c
> db.temp_c.find({state:"Maharashtra"}).pretty()
{"_id" : ObjectId("617aec101714ff0b5f34ae1c"),
  "time_epoch" : 1634236200,
  "time" : "2021-10-15 00:00",
  "temp_c" : 28.9,
  "temp_f" : 84,
  "humidity" : 66,
  "condition" : {"text": "Clear", "icon": "https://cdn.weatherapi.com/weather/64x64/night/113.png", "code": 1000},
  "wind_mph" : 6.7,
  "wind_kph" : 10.8,
  "wind_degree" : 36,
  "wind_dir" : "NE",
  "pressure_mb" : 1004,
  "pressure_in" : 29.65,
  "precip_mm" : 0,
  "precip_in" : 0,
  "cloud" : 11,
  "feelslike_c" : 32,
  "feelslike_f" : 89.6,
  "windchill_c" : 28.9,
  "windchill_f" : 84,
  "heatindex_c" : 32,
  "heatindex_f" : 89.6,
  "dewpoint_c" : 22,
  "dewpoint_f" : 71.6,
  "will_it_rain" : 0,
  "chance_of_rain" : 0,
  "will_it_snow" : 0,
  "chance_of_snow" : 0,
  "vis_mi" : 10,
  "vis_km" : 16,
  "gust_mph" : 11,
  "gust_kph" : 17.6,
  "state" : "Maharashtra",
  "city" : "Mumbai"}

{"_id" : ObjectId("617aec101714ff0b5f34ae1d"),
  "time_epoch" : 1634236800,
  "time" : "2021-10-15 01:00",
  "temp_c" : 28.6}
```

Step 6:

`db.stats()`



```
C:\Program Files\MongoDB\Server\5.0\bin>mongo
> use temp_c
switched to db temp_c
> db.temp_c.find({SYMBOL:"Gunter"}).pretty()
MongoDBException: SyntaxError: unexpected token: Identifier
[shell]:1:10
> db.temp_c.find({SYMBOL:"Gunter"}).pretty()
> db.temp_c.find({SYMBOL:"Gunter"}).pretty()
> db.temp_c.find({SYMBOL:"Gunter",OPEN:368.2}).pretty()
> db.temp_c.find().sort({"humidity:00"})
...
> db.stats()
{"ok" : 1,
  "temp_c" : {
    "collections" : 0,
    "indexes" : 0,
    "objects" : 0,
    "avgObjSize" : 0,
    "dataSize" : 0,
    "storageSize" : 0,
    "totalSize" : 0,
    "indexSize" : 0,
    "scaleFactor" : 1,
    "fileSize" : 0,
    "fixedSize" : 0,
    "totalSize" : 0,
    "ok" : 1
  }}
```

Step 7:

`db.forecast_dataCollection.createIndex({"state": 1})`

```
C:\Program Files\MongoDB\Server\5.0\bin\mongo.exe
> db.forecast_dataCollection.createIndex({"state":1})
{"numIndexesBefore" : 2,
 "numIndexesAfter" : 2,
 "note" : "all indexes already exist",
 "ok" : 1}

> db.forecast_dataCollection.createIndex({"state":2})
{"numIndexesBefore" : 2,
 "numIndexesAfter" : 3,
 "createdCollectionAutomatically" : false,
 "ok" : 1}

> db.forecast_dataCollection.createIndex({"state":4})
{"numIndexesBefore" : 3,
 "numIndexesAfter" : 4,
 "createdCollectionAutomatically" : false,
 "ok" : 1}
```

Step 8:

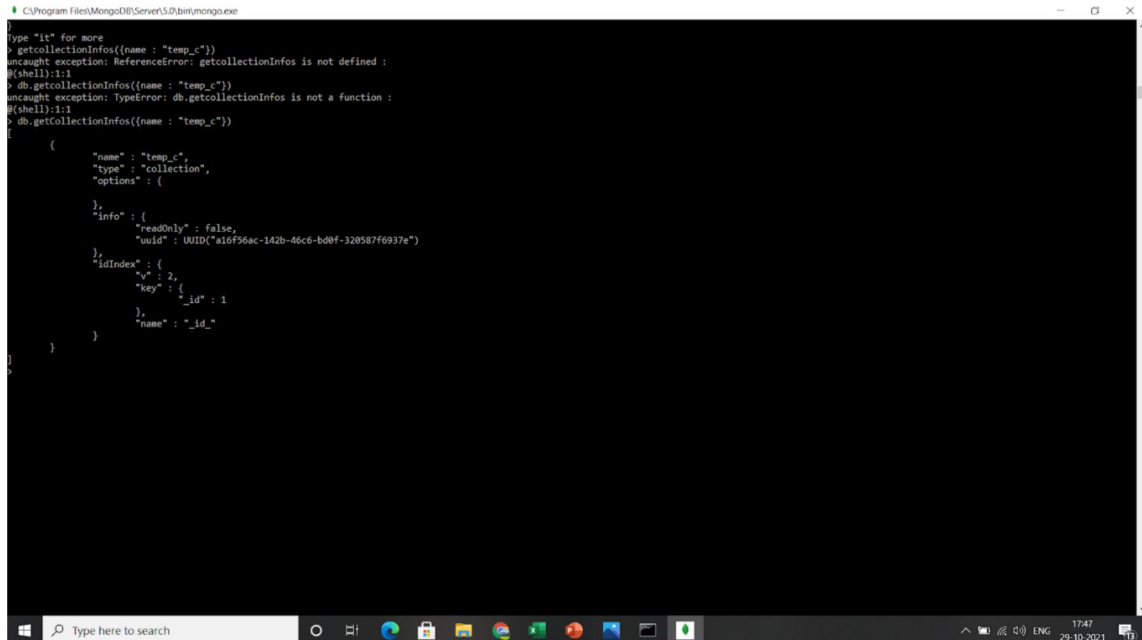
`db.temp_c.find().sort({"Qty":1}).pretty()`

```
C:\Program Files\MongoDB\Server\5.0\bin\mongo.exe
> db.temp_c.find().sort({"Qty":1}).pretty()
{"_id" : ObjectId("617aec181714ff0b5f3478dc"),
 "time_epoch" : 1634256200,
 "time" : "2021-10-15 04:00",
 "temp_c" : 23.2,
 "temp_f" : 73.8,
 "is_day" : 0,
 "condition" : {"text": "Clear", "icon": "http://cdn.weatherapi.com/weather/64x64/night/113.png", "code": 1000},
 "wind_mph" : 4.3,
 "wind_kph" : 6.9,
 "wind_degree" : 41,
 "wind_dir" : "NE",
 "pressure_mb" : 1006,
 "pressure_in" : 29.69,
 "precip_mm" : 0,
 "precip_in" : 0,
 "humidity" : 67,
 "cloud" : 5,
 "feelslike_c" : 25.1,
 "feelslike_f" : 77.2,
 "windchill_c" : 23.2,
 "windchill_f" : 73.8,
 "heatindex_c" : 25.1,
 "heatindex_f" : 77.2,
 "dewpoint_c" : 16.7,
 "dewpoint_f" : 62.1,
 "will_it_rain" : 0,
 "chance_of_rain" : 0,
 "will_it_snow" : 0,
 "chance_of_snow" : 0,
 "vis_km" : 10,
 "vis_miles" : 6,
 "gust_mph" : 8.9,
 "gust_kph" : 14.4,
 "state" : "Andhra Pradesh",
 "city" : "Amaravati"}

{"_id" : ObjectId("617aec181714ff0b5f3478dd"),
 "time_epoch" : 1634256600,
 "time" : "2021-10-15 04:00",
 "temp_c" : 22.3,
 "temp_f" : 72.1,
 "is_day" : 0,
 "condition" : {"text": "Clear", "icon": "http://cdn.weatherapi.com/weather/64x64/night/113.png", "code": 1000},
 "wind_mph" : 3.7,
 "wind_kph" : 6}
```

Step 9:

db.getcollectionInfos({name : "temp_c"})



```
C:\Program Files\MongoDB\Server\5.0\bin>mongo.exe
Type "it" for more
> getcollectionInfos({name : "temp_c"})
uncaught exception: ReferenceError: getcollectionInfos is not defined :
#(shell):1:1
> db.getcollectionInfos({name : "temp_c"})
uncaught exception: TypeError: db.getcollectionInfos is not a function :
#(shell):1:1
> db.getCollectionInfos({name : "temp_c"})
[
  {
    "name" : "temp_c",
    "type" : "collection",
    "options" : {
    },
    "info" : {
      "readOnly" : false,
      "uuid" : UUID("a16f56ac-142b-46c6-bd0f-320587f6937e")
    },
    "idIndex" : {
      "v" : 2,
      "key" : {
        "_id" : 1
      },
      "name" : "_id_"
    }
  }
]
```

- **Conclusion and Discussion:**

Using MongoDB we are able to analyze the real-time data of Weather Forecast Easily and efficiently. By using different commands we were able to find open, find data related to respective cities or states.