Practical 4 (Aditya Pulikal / 22 / DSAI)

Operators in MongoDB:

Importing dataset to the server and reading it in shell:

```
C:\Users\Aditya>mongoimport --jsonArray --db heart_data --collection heart_data --file C:\Users\Aditya\Downloads\heart.json
2024-02-26T21:26:21.632+0530    connected to: mongodb://localhost/
2024-02-26T21:26:21.661+0530    1025 document(s) imported successfully. 0 document(s) failed to import.
```

```
test> show dbs
adidb        40.00 KiB
admin        40.00 KiB
config      108.00 KiB
heart_data   84.00 KiB
local        40.00 KiB
test> use heart_data
switched to db heart_data
heart_data> db.heart_data.find()
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8d'),
    age: 52,
    sex: 1,
    cp: 0,
    trestbps: 125,
    chol: 212,
    fbs: 0,
    restecg: 1,
    thalach: 168,
    exang: 0,
    oldpeak: 1,
    slope: 2,
    ca: 2,
    thal: 3,
    target: 0
  },
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8e'),
    age: 58,
    sex: 0,
    cp: 0,
```

1. Retrieving all those records of people with age above 50:

```
heart_data> db.heart_data.find(
... {age:{$gte:50}}
... );
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8d'),
    age: 52,
    sex: 1,
    cp: 0,
    trestbps: 125,
    chol: 212,
    fbs: 0,
    restecg: 1,
    thalach: 168,
    exang: 0,
    oldpeak: 1,
    slope: 2,
    ca: 2,
    thal: 3,
    target: 0
  },
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8e'),
    age: 58,
    sex: 0,
    cp: 0,
    trestbps: 100,
```

2. Retrieving all records of people with cholesterol within the range of 190 to 210:

```
heart_data> db.heart_data.find(
... {chol:{$gte:190,$lte:210}}
... );
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f91'),
    age: 61,
    sex: 1,
    cp: 0,
    trestbps: 148,
    chol: 203,
    fbs: 0,
    restecg: 1,
    thalach: 161,
    exang: 0,
    oldpeak: 0,
    slope: 2,
    ca: 1,
    thal: 3,
    target: 0
  },
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f92'),
    age: 34,
    sex: 0,
    cp: 1,
    trestbps: 118,
    chol: 210,
    fbs: 0,
    restecg: 1,
```

3. Retrieving all records of people having non zero oldpeak values:

```
heart_data> db.heart_data.find(
... {oldpeak:{$ne:0}}
... );
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8d'),
    age: 52,
    sex: 1,
    cp: 0,
    trestbps: 125,
    chol: 212,
    fbs: 0,
    restecg: 1,
    thalach: 168,
    exang: 0,
    oldpeak: 1,
    slope: 2,
    ca: 2,
    thal: 3,
    target: 0
  },
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8e'),
    age: 58,
    sex: 0,
    cp: 0,
    trestbps: 100,
    chol: 248,
    fbs: 0,
    restecg: 0,
    thalach: 122,
    exang: 0,
    oldpeak: 1,
```

4. Retrieving records of all those who are at risk of getting heart disease (high chol or high trestbps):

```
heart_data> db.heart_data.find({$or:[
... {chol:{$gte:200}},
... {trestbps:{$gte:140}}
... ]});
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8d'),
    age: 52,
    sex: 1,
    cp: 0,
    trestbps: 125,
    chol: 212,
    fbs: 0,
    restecg: 1,
    thalach: 168,
    exang: 0,
    oldpeak: 1,
    slope: 2,
    ca: 2,
    thal: 3,
    target: 0
  },
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8e'),
    age: 58,
    sex: 0,
    cp: 0,
    trestbps: 100,
    chol: 248,
```

5. Finding all those people who are male, aged over 50 having a heart disease:

```
heart_data> db.heart_data.find({$and:[
... {age:{$gte:50}},
... {sex:1},
... {target:1}
... ]});
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f95'),
    age: 58,
    sex: 1,
    cp: 2,
    trestbps: 140,
    chol: 211,
    fbs: 1,
    restecg: 0,
    thalach: 165,
    exang: 0,
    oldpeak: 0,
    slope: 2,
    ca: 0,
    thal: 2,
    target: 1
  },
  {
    _id: ObjectId('65dcb4a5e094d757dcb36faf'),
    age: 50,
    sex: 1,
    cp: 2,
    trestbps: 129,
    chol: 196,
    fbs: 0,
    restecg: 1,
    thalach: 163,
    exang: 0,
    oldpeak: 0,
    slope: 2,
    ca: 0,
    thal: 2,
    target: 1
  },
```

6. Finding all those people who are neither male nor their cholesterol is less than 200:

```
heart_data> db.heart_data.find({$nor:[
... {sex:1},
... {chol:{$lte:200}}
... ]});
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8e'),
    age: 58,
    sex: 0,
    cp: 0,
    trestbps: 100,
    chol: 248,
    fbs: 0,
    restecg: 0,
    thalach: 122,
    exang: 0,
    oldpeak: 1,
    slope: 1,
    ca: 0,
    thal: 2,
    target: 1
  },
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f92'),
    age: 34,
    sex: 0,
    cp: 1,
    trestbps: 118,
    chol: 210,
    fbs: 0,
    restecg: 1,
    thalach: 192,
    exang: 0,
    oldpeak: 0.7,
    slope: 2,
    ca: 0,
    thal: 2,
    target: 1
  },
```

7. To check the existence of a field and return its count in the dataset. Also check for null values in the existing field.

```
heart_data> db.heart_data.countDocuments(
... {"age":{$exists:true}});
1025
heart_data> db.heart_data.countDocuments(
... {"age":null});
0
heart_data> db.heart_data.countDocuments(
... {"spo2":{$exists:false}});
1025
```

8. Calculating the min and max age of patients in the given dataset:

```
heart_data> db.heart_data.aggregate([
... {$group:{_id:null,minAge:{$min:"$age"}}}
... ]);
[ { _id: null, minAge: 29 } ]
heart_data> db.heart_data.aggregate([
... {$group:{_id:null,maxAge:{$max:"$age"}}}
... ]);
[ { _id: null, maxAge: 77 } ]
heart_data>
```

9. Finding all records of the youngest and the oldest patient:

```
heart_data> db.heart_data.find({age:29});
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36fc7'),
    age: 29,
    sex: 1,
    cp: 1,
    trestbps: 130,
    chol: 204,
    fbs: 0,
    restecg: 0,
    thalach: 202,
    exang: 0,
    oldpeak: 0,
    slope: 2,
    ca: 0,
    thal: 2,
    target: 1
  },
```


```
heart_data> db.heart_data.find({age:29});
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36fc7'),
    age: 29,
    sex: 1,
    cp: 1,
    trestbps: 130,
    chol: 204,
    fbs: 0,
    restecg: 0,
    thalach: 202,
    exang: 0,
    oldpeak: 0,
    slope: 2,
    ca: 0,
    thal: 2,
    target: 1
  },
```


10. Retrieving all records of patients not having heart disease:

```
heart_data> db.heart_data.find(
... {target:{$ne:0}});
[
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f8e'),
    age: 58,
    sex: 0,
    cp: 0,
    trestbps: 100,
    chol: 248,
    fbs: 0,
    restecg: 0,
    thalach: 122,
    exang: 0,
    oldpeak: 1,
    slope: 1,
    ca: 0,
    thal: 2,
    target: 1
  },
  {
    _id: ObjectId('65dcb4a5e094d757dcb36f92'),
    age: 34,
    sex: 0,
    cp: 1,
    trestbps: 118,
    chol: 210,
    fbs: 0,
    restecg: 1,
    thalach: 192,
    exang: 0,
    oldpeak: 0.7,
    slope: 2,
    ca: 0,
    thal: 2,
    target: 1
  },
```