Alp Kural
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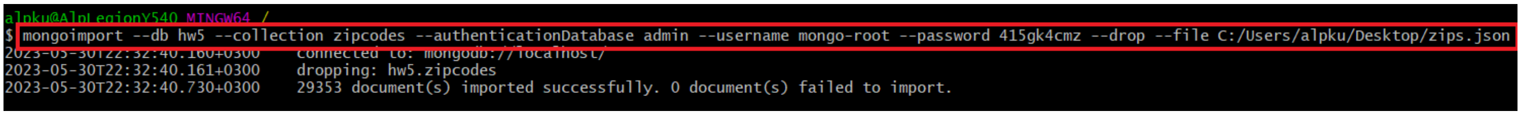
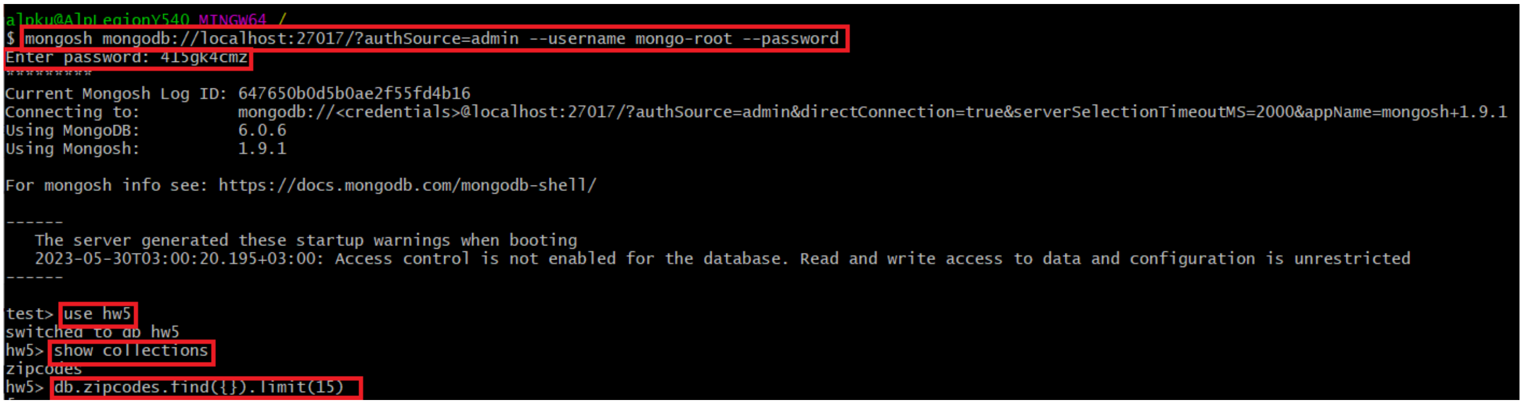
Computer Engineering

Comp 306 – Homework 5 Report

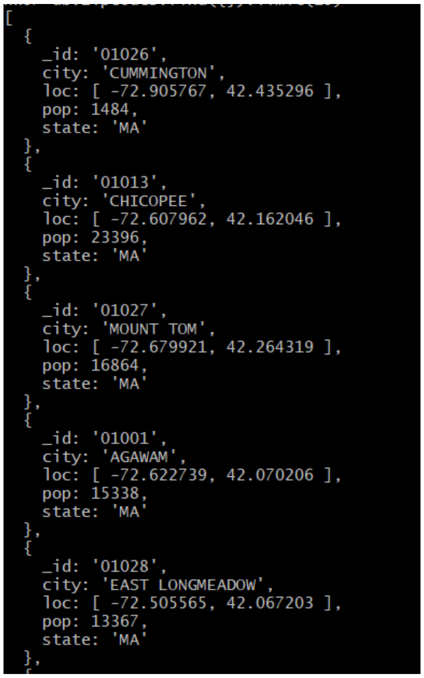
Question 1



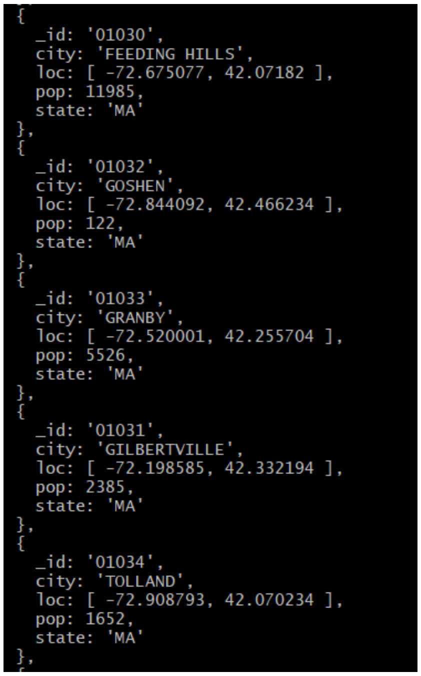
```
alpku@AlpLegionY540 MINGW64 /
$ mongoimport --db hw5 --collection zipcodes --authenticationDatabase admin --username mongo-root --password 415gk4cmz --drop --file C:/Users/alpku/Desktop/zips.json
2023-05-30T22:32:40.160+0300    connected to: mongodb://localhost/
2023-05-30T22:32:40.161+0300    dropping: hw5.zipcodes
2023-05-30T22:32:40.730+0300    29353 document(s) imported successfully. 0 document(s) failed to import.
```



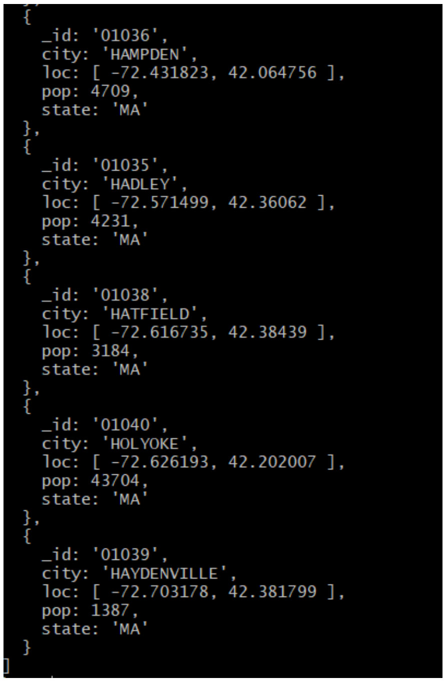
```
alpku@AlpLegionY540 MINGW64 /
$ mongosh mongodb://localhost:27017/?authSource=admin --username mongo-root --password
Enter password: 415gk4cmz
*********
Current Mongosh Log ID: 647650b0d5b0ae2f55fd4b16
Connecting to:          mongodb://<credentials>@localhost:27017/?authSource=admin&directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+1.9.1
Using MongoDB:          6.0.6
Using Mongosh:          1.9.1

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

------
   The server generated these startup warnings when booting
   2023-05-30T03:00:20.195+03:00: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
------

test> use hw5
switched to db hw5
hw5> show collections
zipcodes
hw5> db.zipcodes.find({}).limit(15)
```



```
[
  {
    _id: '01026',
    city: 'CUMMINGTON',
    loc: [ -72.905767, 42.435296 ],
    pop: 1484,
    state: 'MA'
  },
  {
    _id: '01013',
    city: 'CHICOPEE',
    loc: [ -72.607962, 42.162046 ],
    pop: 23396,
    state: 'MA'
  },
  {
    _id: '01027',
    city: 'MOUNT TOM',
    loc: [ -72.679921, 42.264319 ],
    pop: 16864,
    state: 'MA'
  },
  {
    _id: '01001',
    city: 'AGAWAM',
    loc: [ -72.622739, 42.070206 ],
    pop: 15338,
    state: 'MA'
  },
  {
    _id: '01028',
    city: 'EAST LONGMEADOW',
    loc: [ -72.505565, 42.067203 ],
    pop: 13367,
    state: 'MA'
  },
```



```
  {
    _id: '01030',
    city: 'FEEDING HILLS',
    loc: [ -72.675077, 42.07182 ],
    pop: 11985,
    state: 'MA'
  },
  {
    _id: '01032',
    city: 'GOSHEN',
    loc: [ -72.844092, 42.466234 ],
    pop: 122,
    state: 'MA'
  },
  {
    _id: '01033',
    city: 'GRANBY',
    loc: [ -72.520001, 42.255704 ],
    pop: 5526,
    state: 'MA'
  },
  {
    _id: '01031',
    city: 'GILBERTVILLE',
    loc: [ -72.198585, 42.332194 ],
    pop: 2385,
    state: 'MA'
  },
  {
    _id: '01034',
    city: 'TOLLAND',
    loc: [ -72.908793, 42.070234 ],
    pop: 1652,
    state: 'MA'
  },
```



```
  {
    _id: '01036',
    city: 'HAMPDEN',
    loc: [ -72.431823, 42.064756 ],
    pop: 4709,
    state: 'MA'
  },
  {
    _id: '01035',
    city: 'HADLEY',
    loc: [ -72.571499, 42.36062 ],
    pop: 4231,
    state: 'MA'
  },
  {
    _id: '01038',
    city: 'HATFIELD',
    loc: [ -72.616735, 42.38439 ],
    pop: 3184,
    state: 'MA'
  },
  {
    _id: '01040',
    city: 'HOLYOKE',
    loc: [ -72.626193, 42.202007 ],
    pop: 43704,
    state: 'MA'
  },
  {
    _id: '01039',
    city: 'HAYDENVILLE',
    loc: [ -72.703178, 42.381799 ],
    pop: 1387,
    state: 'MA'
  }
]
```

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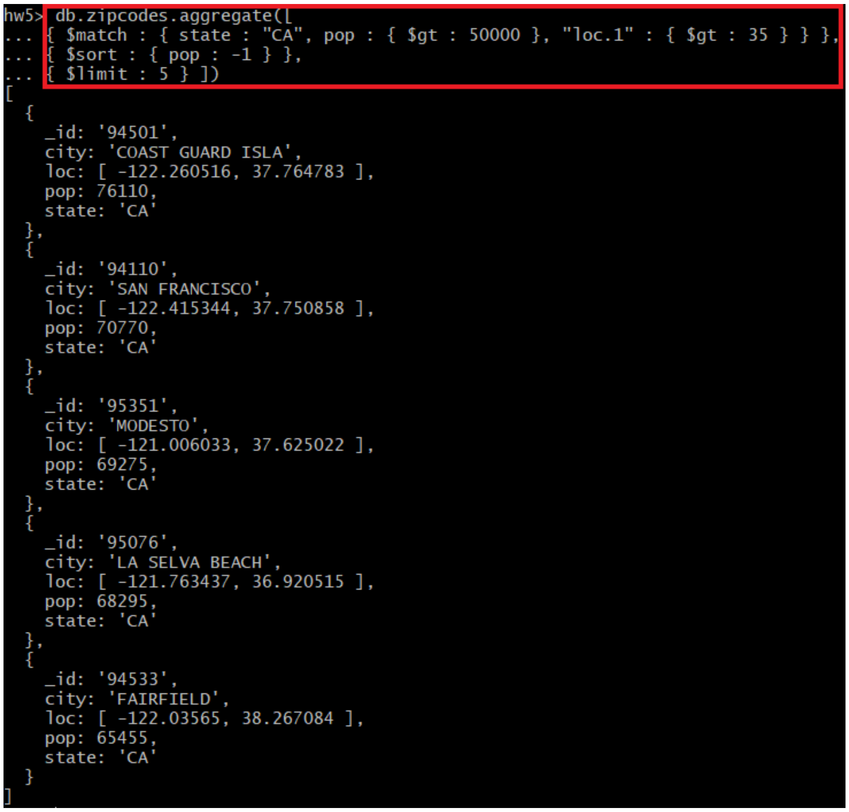
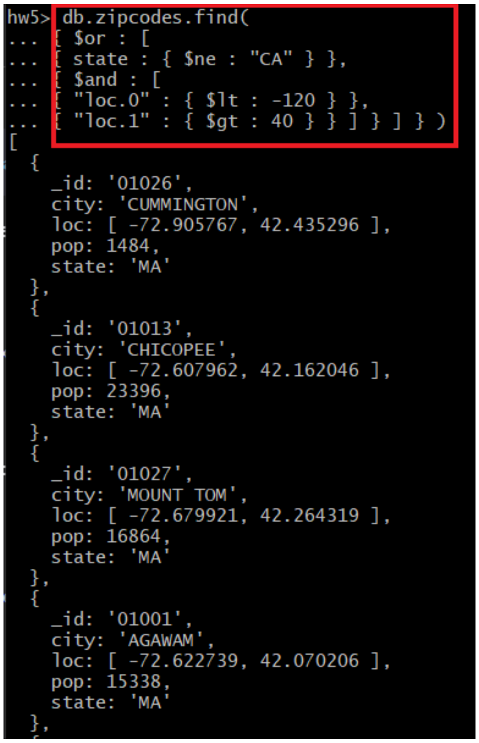
Question 2



```
hw5> db.zipcodes.aggregate([
... { $match : { state : "CA", pop : { $gt : 50000 }, "loc.1" : { $gt : 35 } } },
... { $sort : { pop : -1 } },
... { $limit : 5 } ])
[
  {
    _id: '94501',
    city: 'COAST GUARD ISLA',
    loc: [ -122.260516, 37.764783 ],
    pop: 76110,
    state: 'CA'
  },
  {
    _id: '94110',
    city: 'SAN FRANCISCO',
    loc: [ -122.415344, 37.750858 ],
    pop: 70770,
    state: 'CA'
  },
  {
    _id: '95351',
    city: 'MODESTO',
    loc: [ -121.006033, 37.625022 ],
    pop: 69275,
    state: 'CA'
  },
  {
    _id: '95076',
    city: 'LA SELVA BEACH',
    loc: [ -121.763437, 36.920515 ],
    pop: 68295,
    state: 'CA'
  },
  {
    _id: '94533',
    city: 'FAIRFIELD',
    loc: [ -122.03565, 38.267084 ],
    pop: 65455,
    state: 'CA'
  }
]
```

Question 3



```
hw5> db.zipcodes.find(
... { $or : [
... { state : { $ne : "CA" } },
... { $and : [
... { "loc.0" : { $lt : -120 } },
... { "loc.1" : { $gt : 40 } } ] } ] } )
[
  {
    _id: '01026',
    city: 'CUMMINGTON',
    loc: [ -72.905767, 42.435296 ],
    pop: 1484,
    state: 'MA'
  },
  {
    _id: '01013',
    city: 'CHICOPEE',
    loc: [ -72.607962, 42.162046 ],
    pop: 23396,
    state: 'MA'
  },
  {
    _id: '01027',
    city: 'MOUNT TOM',
    loc: [ -72.679921, 42.264319 ],
    pop: 16864,
    state: 'MA'
  },
  {
    _id: '01001',
    city: 'AGAWAM',
    loc: [ -72.622739, 42.070206 ],
    pop: 15338,
    state: 'MA'
  },
```

The results continue…

4 instances of documents displayed for demonstration purposes.

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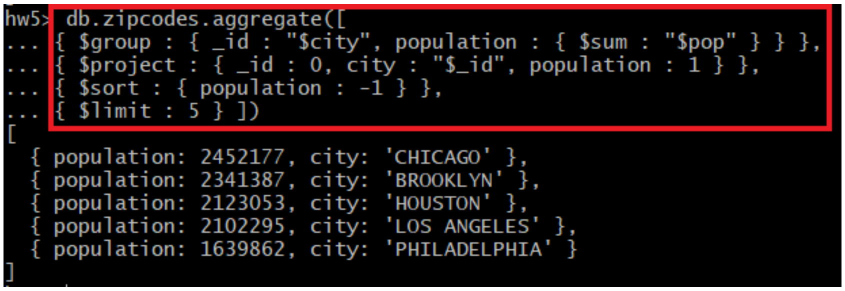
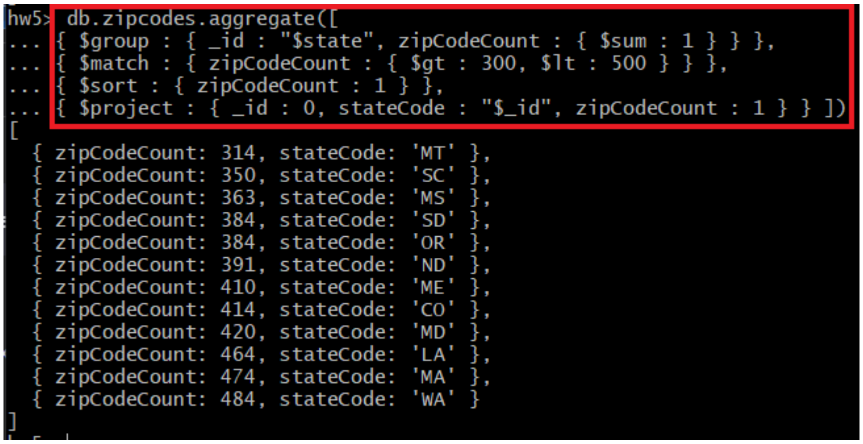
Question 4



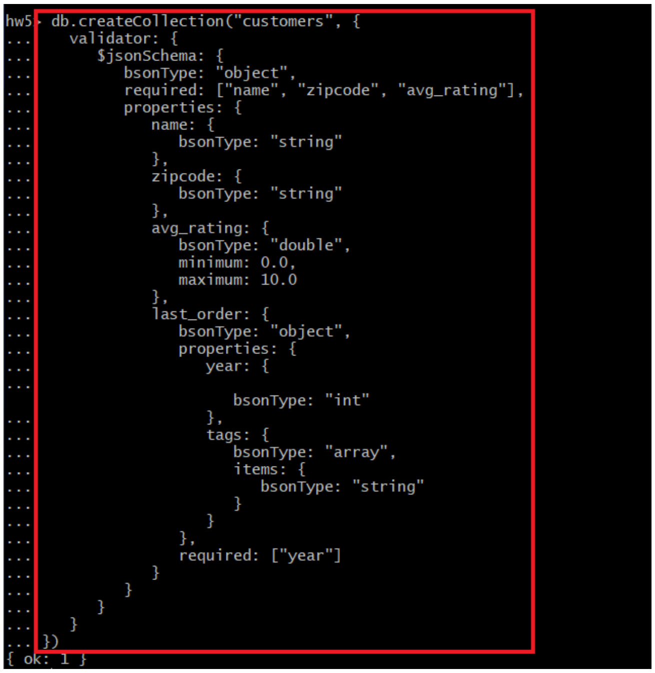
```
hw5> db.zipcodes.aggregate([
... { $group : { _id : "$city", population : { $sum : "$pop" } } },
... { $project : { _id : 0, city : "$_id", population : 1 } },
... { $sort : { population : -1 } },
... { $limit : 5 } ])
[
  { population: 2452177, city: 'CHICAGO' },
  { population: 2341387, city: 'BROOKLYN' },
  { population: 2123053, city: 'HOUSTON' },
  { population: 2102295, city: 'LOS ANGELES' },
  { population: 1639862, city: 'PHILADELPHIA' }
]
```

Question 5



```
hw5> db.zipcodes.aggregate([
... { $group : { _id : "$state", zipCodeCount : { $sum : 1 } } },
... { $match : { zipCodeCount : { $gt : 300, $lt : 500 } } },
... { $sort : { zipCodeCount : 1 } },
... { $project : { _id : 0, stateCode : "$_id", zipCodeCount : 1 } } ])
[
  { zipCodeCount: 314, stateCode: 'MT' },
  { zipCodeCount: 350, stateCode: 'SC' },
  { zipCodeCount: 363, stateCode: 'MS' },
  { zipCodeCount: 384, stateCode: 'SD' },
  { zipCodeCount: 384, stateCode: 'OR' },
  { zipCodeCount: 391, stateCode: 'ND' },
  { zipCodeCount: 410, stateCode: 'ME' },
  { zipCodeCount: 414, stateCode: 'CO' },
  { zipCodeCount: 420, stateCode: 'MD' },
  { zipCodeCount: 464, stateCode: 'LA' },
  { zipCodeCount: 474, stateCode: 'MA' },
  { zipCodeCount: 484, stateCode: 'WA' }
]
```

Question 6



```
hw5> db.createCollection("customers", {
...    validator: {
...       $jsonSchema: {
...          bsonType: "object",
...          required: ["name", "zipcode", "avg_rating"],
...          properties: {
...             name: {
...                bsonType: "string"
...             },
...             zipcode: {
...                bsonType: "string"
...             },
...             avg_rating: {
...                bsonType: "double",
...                minimum: 0.0,
...                maximum: 10.0
...             },
...             last_order: {
...                bsonType: "object",
...                properties: {
...                   year: {
...
                         bsonType: "int"
...                   },
...                   tags: {
...                      bsonType: "array",
...                      items: {
...                         bsonType: "string"
...                      }
...                   }
...                },
...                required: ["year"]
...             }
...          }
...       }
...    }
... })
{ ok: 1 }
```

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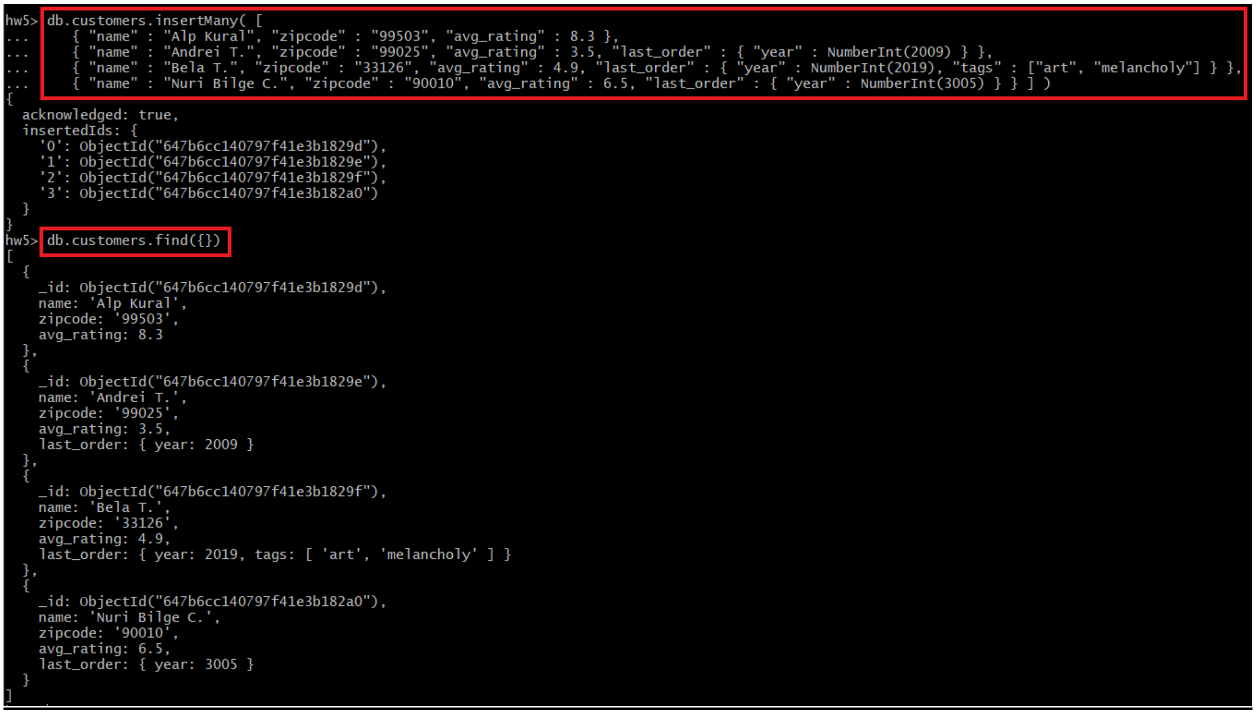
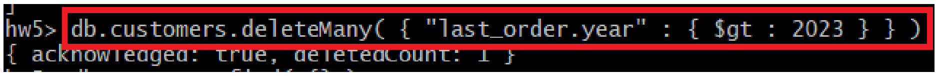
Question 7

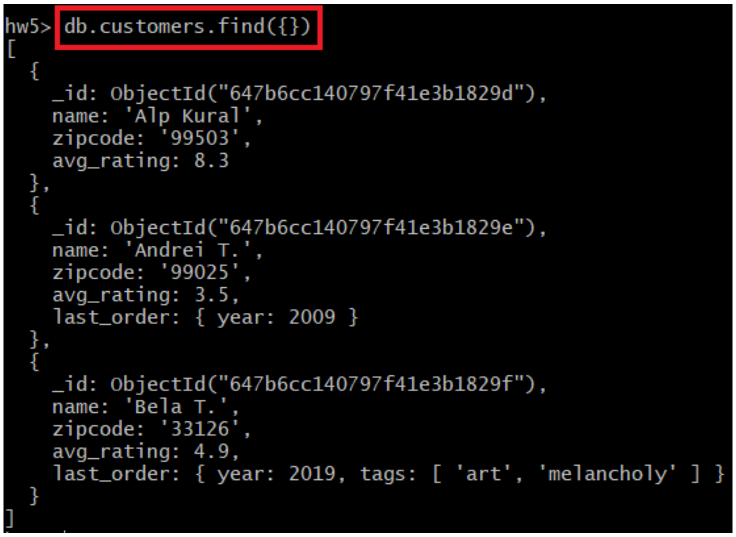


```
hw5> db.customers.insertMany( [
...     { "name" : "Alp Kural", "zipcode" : "99503", "avg_rating" : 8.3 },
...     { "name" : "Andrei T.", "zipcode" : "99025", "avg_rating" : 3.5, "last_order" : { "year" : NumberInt(2009) } },
...     { "name" : "Bela T.", "zipcode" : "33126", "avg_rating" : 4.9, "last_order" : { "year" : NumberInt(2019), "tags" : ["art", "melancholy"] } },
...     { "name" : "Nuri Bilge C.", "zipcode" : "90010", "avg_rating" : 6.5, "last_order" : { "year" : NumberInt(3005) } } ] )
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId("647b6cc140797f41e3b1829d"),
    '1': ObjectId("647b6cc140797f41e3b1829e"),
    '2': ObjectId("647b6cc140797f41e3b1829f"),
    '3': ObjectId("647b6cc140797f41e3b182a0")
  }
}
hw5> db.customers.find({})
[
  {
    _id: ObjectId("647b6cc140797f41e3b1829d"),
    name: 'Alp Kural',
    zipcode: '99503',
    avg_rating: 8.3
  },
  {
    _id: ObjectId("647b6cc140797f41e3b1829e"),
    name: 'Andrei T.',
    zipcode: '99025',
    avg_rating: 3.5,
    last_order: { year: 2009 }
  },
  {
    _id: ObjectId("647b6cc140797f41e3b1829f"),
    name: 'Bela T.',
    zipcode: '33126',
    avg_rating: 4.9,
    last_order: { year: 2019, tags: [ 'art', 'melancholy' ] }
  },
  {
    _id: ObjectId("647b6cc140797f41e3b182a0"),
    name: 'Nuri Bilge C.',
    zipcode: '90010',
    avg_rating: 6.5,
    last_order: { year: 3005 }
  }
]
```

Question 8



```
hw5> db.customers.deleteMany( { "last_order.year" : { $gt : 2023 } } )
{ acknowledged: true, deletedCount: 1 }
```



```
hw5> db.customers.find({})
[
  {
    _id: ObjectId("647b6cc140797f41e3b1829d"),
    name: 'Alp Kural',
    zipcode: '99503',
    avg_rating: 8.3
  },
  {
    _id: ObjectId("647b6cc140797f41e3b1829e"),
    name: 'Andrei T.',
    zipcode: '99025',
    avg_rating: 3.5,
    last_order: { year: 2009 }
  },
  {
    _id: ObjectId("647b6cc140797f41e3b1829f"),
    name: 'Bela T.',
    zipcode: '33126',
    avg_rating: 4.9,
    last_order: { year: 2019, tags: [ 'art', 'melancholy' ] }
  }
]
```

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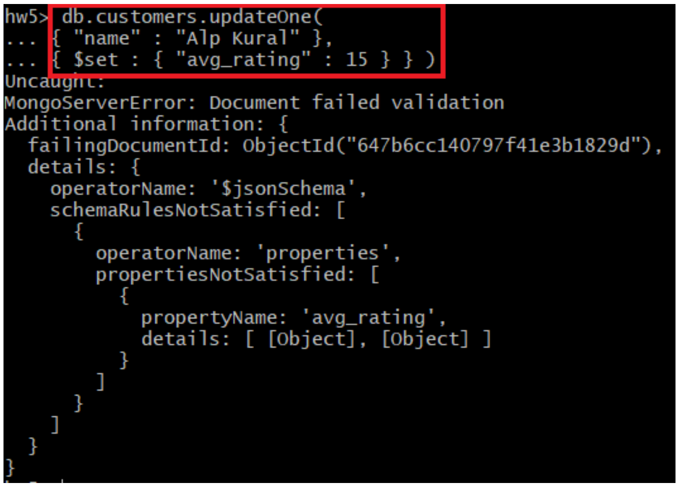
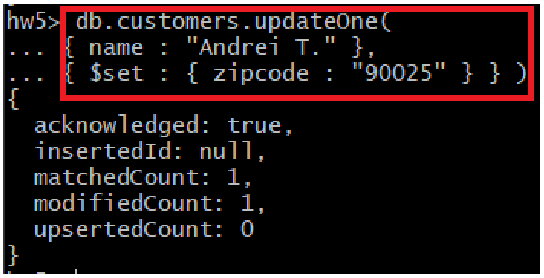
Question 9



```
hw5> db.customers.updateOne(
... { "name" : "Alp Kural" },
... { $set : { "avg_rating" : 15 } } )
Uncaught:
MongoServerError: Document failed validation
Additional information: {
  failingDocumentId: ObjectId("647b6cc140797f41e3b1829d"),
  details: {
    operatorName: '$jsonSchema',
    schemaRulesNotSatisfied: [
      {
        operatorName: 'properties',
        propertiesNotSatisfied: [
          {
            propertyName: 'avg_rating',
            details: [ [Object], [Object] ]
          }
        ]
      }
    ]
  }
}
```

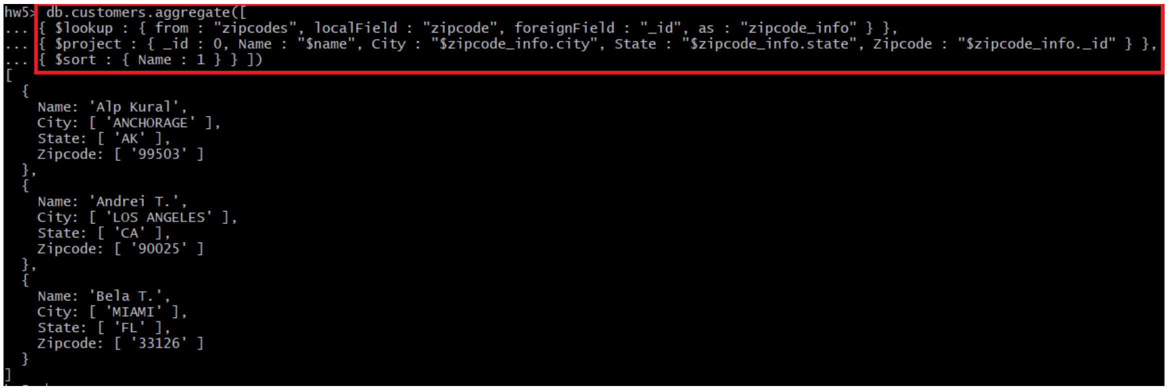
```
Because the rating field that is being attempted to be updated is not compatible with the database schema,
an error message is displayed from the database.

The rating range in the schema was previously defined as from 0.0 to 10.0,
however the new rating field that is being attemped to be updated is 15.0.
```

Question 10



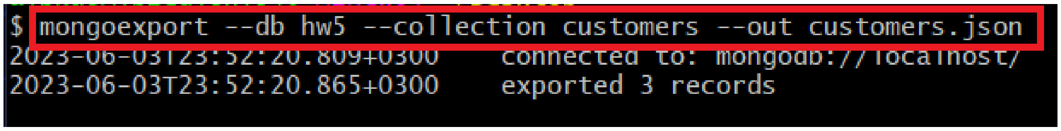
```
hw5> db.customers.updateOne(
... { name : "Andrei T." },
... { $set : { zipcode : "90025" } } )
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
```

Just realized that I accidentally entered the zip code of Andrei as “99025” instead of “90025.” Correcting it here.



```
hw5> db.customers.aggregate([
... { $lookup : { from : "zipcodes", localField : "zipcode", foreignField : "_id", as : "zipcode_info" } },
... { $project : { _id : 0, Name : "$name", City : "$zipcode_info.city", State : "$zipcode_info.state", Zipcode : "$zipcode_info._id" } },
... { $sort : { Name : 1 } } ])
[
  {
    Name: 'Alp Kural',
    City: [ 'ANCHORAGE' ],
    State: [ 'AK' ],
    Zipcode: [ '99503' ]
  },
  {
    Name: 'Andrei T.',
    City: [ 'LOS ANGELES' ],
    State: [ 'CA' ],
    Zipcode: [ '90025' ]
  },
  {
    Name: 'Bela T.',
    City: [ 'MIAMI' ],
    State: [ 'FL' ],
    Zipcode: [ '33126' ]
  }
]
```

Question 11



```
$ mongoexport --db hw5 --collection customers --out customers.json
2023-06-03T23:52:20.809+0300    connected to: mongodb://localhost/
2023-06-03T23:52:20.865+0300    exported 3 records
```