

HOMEWORK 18

1- mongoDB

a. After downloading data, save them to the mongo db manually.

```
ubuntu@X550LN:~$ mongoimport --jsonArray -d homework18 -c customerInfos /home/ubuntu/Desktop/18/data.json
2021-11-14T19:07:43.790+0330   connected to: localhost
2021-11-14T19:07:44.162+0330   imported 5000 documents
```

b. Find the first name and last name of all users that have more than 50 years and reside on گلستان.

```
> db.customerInfos.find({"location.city": "گلستان", "dob.age": {$gt: 50}}, {"name.first": 1, "name.last": 1, "_id": 0}).pretty()
{ "name" : { "first" : "دینا", "last" : "کریبی" } }
{ "name" : { "first" : "عشیا", "last" : "کامیارل" } }
{ "name" : { "first" : "پوریا", "last" : "شالاری" } }
{ "name" : { "first" : "هلیا", "last" : "رضای" } }
{ "name" : { "first" : "نیمیا", "last" : "سلطانی نژاد" } }
{ "name" : { "first" : "رادین", "last" : "شالاری" } }
{ "name" : { "first" : "فوللمه", "last" : "موسیقی" } }
{ "name" : { "first" : "علی", "last" : "کریبی" } }
{ "name" : { "first" : "تارا", "last" : "علیزاده" } }
{ "name" : { "first" : "سام", "last" : "زارعی" } }
{ "name" : { "first" : "پارمیی", "last" : "صدر" } }
{ "name" : { "first" : "آرمین", "last" : "احمدی" } }
{ "name" : { "first" : "محمد", "last" : "فلسی" } }
{ "name" : { "first" : "دربسا", "last" : "نکو نظر" } }
{ "name" : { "first" : "آرمینا", "last" : "رضای" } }
{ "name" : { "first" : "امیرمحمد", "last" : "علیزاده" } }
{ "name" : { "first" : "طاهرا", "last" : "حیدری" } }
{ "name" : { "first" : "زهرا", "last" : "کامروا" } }
{ "name" : { "first" : "آوی", "last" : "علیزاده" } }
{ "name" : { "first" : "یلدا", "last" : "کامیارل" } }
```

c. We want to reward those users who have registered on our site for more than 20 years. Find their last name, phone and address.

```
> db.customerInfos.find({"registered.age":{"$gte:19}},{"name.last":1,"phone":1,"location":1,_id:0}).pretty()
{
  "name" : {
    "last" : "کریمی"
  },
  "location" : {
    "street" : {
      "number" : 1548,
      "name" : "شهید کبیری طایمه"
    },
    "city" : "زاهدن",
    "state" : "بوشهر",
    "country" : "Iran",
    "postcode" : 56692,
    "coordinates" : {
      "latitude" : "40.0124",
      "longitude" : "99.1139"
    },
    "timezone" : {
      "offset" : "+11:00",
      "description" : "Magadan, Solomon Islands, New Caledonia"
    }
  },
  "phone" : "023-52646854"
},
{
  "name" : {
    "last" : "کامیارل"
  },
  "location" : {
    "street" : {
      "number" : 8428
```

d. At the end of each day, we want to grant a discount code or a gift to those whose birthday is today and send them a “Happy Birthday” email. Find the full name and email address of these guys.

e. Find the number of users based on their province(=state).

```
> db.customerInfos.aggregate([{$group:{_id:"$location.state",number:{$sum:1}}}])
{"_id": "قزوین", "number": 160 }
{"_id": "فلس", "number": 172 }
{"_id": "صفه", "number": 156 }
{"_id": "کهگیلویه و بویراحمد", "number": 164 }
{"_id": "چهارمحال و بختیاری", "number": 151 }
{"_id": "گیلان", "number": 137 }
{"_id": "مازندران", "number": 164 }
{"_id": "گلستان", "number": 168 }
{"_id": "کرمانشاه", "number": 174 }
{"_id": "کرمان", "number": 161 }
{"_id": "قم", "number": 173 }
{"_id": "خراسان رضوی", "number": 141 }
{"_id": "همدان", "number": 183 }
{"_id": "آسیمن", "number": 179 }
{"_id": "خراسان جنوبی", "number": 157 }
{"_id": "تهران", "number": 166 }
{"_id": "لریستان", "number": 157 }
{"_id": "زاجل", "number": 175 }
{"_id": "بهشهر", "number": 130 }
{"_id": "سیستان و بلوچستان", "number": 154 }
```

f. Which city has the most number of users and which one has the least number of users?

```
> db.customerInfos.aggregate([{$group:{_id:"$location.state",number:{$sum:1}}},{ $sort:{number:1}}])
{"_id": "بهشهر", "number": 130 }
{"_id": "گیلان", "number": 137 }
{"_id": "خراسان شمالی", "number": 137 }
{"_id": "خراسان رضوی", "number": 141 }
{"_id": "ایلام", "number": 150 }
{"_id": "چهارمحال و بختیاری", "number": 151 }
{"_id": "اردبیل", "number": 153 }
{"_id": "سیستان و بلوچستان", "number": 154 }
{"_id": "صفه", "number": 156 }
{"_id": "خراسان جنوبی", "number": 157 }
{"_id": "لریستان", "number": 157 }
{"_id": "قزوین", "number": 160 }
{"_id": "آذربایجان غربی", "number": 160 }
{"_id": "آذربایجان شرقی", "number": 160 }
{"_id": "کرمان", "number": 161 }
{"_id": "هرمزگان", "number": 163 }
{"_id": "کهگیلویه و بویراحمد", "number": 164 }
{"_id": "مازندران", "number": 164 }
{"_id": "خوزستان", "number": 164 }
{"_id": "تهران", "number": 166 }
```

```
> db.customerInfos.aggregate([{$group: {_id: "$location.state", number: {$sum: 1}}}, {$sort: {number: -1}}])
{"_id": "همدل", "number": 183 }
{"_id": "سمنان", "number": 179 }
{"_id": "زجل", "number": 175 }
{"_id": "کرسین", "number": 175 }
{"_id": "کرمانشاه", "number": 174 }
{"_id": "قم", "number": 173 }
{"_id": "مرکزی", "number": 173 }
{"_id": "فلس", "number": 172 }
{"_id": "البرز", "number": 172 }
{"_id": "یزد", "number": 171 }
{"_id": "گلستان", "number": 168 }
{"_id": "تهران", "number": 166 }
{"_id": "کهگیلویه و بویراحمد", "number": 164 }
{"_id": "مازندران", "number": 164 }
{"_id": "خوزستان", "number": 164 }
{"_id": "هرمزگان", "number": 163 }
{"_id": "کرمان", "number": 161 }
{"_id": "قزوین", "number": 160 }
{"_id": "آذربایجان غربی", "number": 160 }
{"_id": "آذربایجان شرقی", "number": 160 }
```

g. Compare the average of users' age in Tehran with the average of users' age in other cities.

```
> db.customerInfos.aggregate([{$group: {_id: "$location.state", averageAge: {$avg: "$dob.age"}}}, {$addFields: {tehranAverage: "52.373493975903614"}}])
{"_id": "قزوین", "averageAge": 49.85625, "tehranAverage": "52.373493975903614" }
{"_id": "فلس", "averageAge": 50.093023255813954, "tehranAverage": "52.373493975903614" }
{"_id": "صفهان", "averageAge": 51.65384615384615, "tehranAverage": "52.373493975903614" }
{"_id": "کهگیلویه و بویراحمد", "averageAge": 47.859756097560975, "tehranAverage": "52.373493975903614" }
{"_id": "چهارمحال و بختیاری", "averageAge": 50, "tehranAverage": "52.373493975903614" }
{"_id": "گیلان", "averageAge": 51.21897810218978, "tehranAverage": "52.373493975903614" }
{"_id": "مازندران", "averageAge": 50.51219512195122, "tehranAverage": "52.373493975903614" }
{"_id": "گلستان", "averageAge": 48.75595238095238, "tehranAverage": "52.373493975903614" }
{"_id": "کرمانشاه", "averageAge": 47.98850574712644, "tehranAverage": "52.373493975903614" }
{"_id": "کرمان", "averageAge": 50.850931677018636, "tehranAverage": "52.373493975903614" }
{"_id": "قم", "averageAge": 52.543352601156066, "tehranAverage": "52.373493975903614" }
{"_id": "خراسان رضوی", "averageAge": 49.234042553191486, "tehranAverage": "52.373493975903614" }
{"_id": "همدل", "averageAge": 48.7103825136612, "tehranAverage": "52.373493975903614" }
{"_id": "سمنان", "averageAge": 49.229050279329606, "tehranAverage": "52.373493975903614" }
{"_id": "خراسان جنوبی", "averageAge": 51.64331210191083, "tehranAverage": "52.373493975903614" }
{"_id": "تهران", "averageAge": 52.373493975903614, "tehranAverage": "52.373493975903614" }
{"_id": "لریستان", "averageAge": 49.75796178343949, "tehranAverage": "52.373493975903614" }
{"_id": "زجل", "averageAge": 51.23428571428571, "tehranAverage": "52.373493975903614" }
{"_id": "بوشهر", "averageAge": 48.38461538461539, "tehranAverage": "52.373493975903614" }
{"_id": "سیستان و بلوچستان", "averageAge": 48.05844155844156, "tehranAverage": "52.373493975903614" }
```

h. For an advertisement, we want to categorize users based on their age. Write a query to categorize them into three groups:

*Youth for ages < 16

*Middle-aged for 16 < ages < 40

*Old for ages > 40

```
> db.customerInfos.aggregate([{$match:{"dob.age":{$lt:16}}},{ $project:{"name.first":1,"name.last":1,"dob.age":1}}])
> db.customerInfos.aggregate([{$match:{"dob.age":{$lt:20}}},{ $project:{"name.first":1,"name.last":1,"dob.age":1}}])
> db.customerInfos.aggregate([{$match:{"dob.age":{$lt:30}}},{ $project:{"name.first":1,"name.last":1,"dob.age":1}}])
{ "_id" : ObjectId("61912d4752ac36ca783660ed"), "name" : { "first" : "أوينّا", "last" : "كاميارل", "dob" : { "age" : 24 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366103"), "name" : { "first" : "آيلن", "last" : "سلطانی نژاد", "dob" : { "age" : 27 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836610d"), "name" : { "first" : "آيلن", "last" : "حيدري", "dob" : { "age" : 27 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836610f"), "name" : { "first" : "محمصاها", "last" : "سسالاری", "dob" : { "age" : 29 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366110"), "name" : { "first" : "مهس", "last" : "کریبی", "dob" : { "age" : 25 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366112"), "name" : { "first" : "هلیا", "last" : "نجانی", "dob" : { "age" : 26 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366122"), "name" : { "first" : "سوکند", "last" : "رضایی", "dob" : { "age" : 24 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366127"), "name" : { "first" : "سورنا", "last" : "مرای", "dob" : { "age" : 28 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836612a"), "name" : { "first" : "سوکند", "last" : "جعفری", "dob" : { "age" : 28 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836612b"), "name" : { "first" : "یرنیا", "last" : "مرای", "dob" : { "age" : 26 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366139"), "name" : { "first" : "حسین", "last" : "فلسی", "dob" : { "age" : 28 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836613f"), "name" : { "first" : "یلدا", "last" : "کامروا", "dob" : { "age" : 24 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366155"), "name" : { "first" : "مهس", "last" : "کریبی", "dob" : { "age" : 25 } } }
```

```
> db.customerInfos.aggregate([{$match:{"dob.age":{$lt:40,$gt:16}}},{ $project:{"name.first":1,"name.last":1,"dob.age":1}}])
{ "_id" : ObjectId("61912d4752ac36ca783660ed"), "name" : { "first" : "أوينّا", "last" : "كاميارل", "dob" : { "age" : 24 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f7"), "name" : { "first" : "نارا", "last" : "یلسی", "dob" : { "age" : 31 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f8"), "name" : { "first" : "مهرداد", "last" : "یلسی", "dob" : { "age" : 30 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366102"), "name" : { "first" : "رهام", "last" : "مرای", "dob" : { "age" : 39 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366103"), "name" : { "first" : "آيلن", "last" : "سلطانی نژاد", "dob" : { "age" : 27 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836610d"), "name" : { "first" : "آيلن", "last" : "حيدري", "dob" : { "age" : 27 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836610f"), "name" : { "first" : "محمصاها", "last" : "سسالاری", "dob" : { "age" : 29 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366110"), "name" : { "first" : "مهس", "last" : "کریبی", "dob" : { "age" : 25 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366112"), "name" : { "first" : "هلیا", "last" : "نجانی", "dob" : { "age" : 26 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366115"), "name" : { "first" : "میلاد", "last" : "موسی", "dob" : { "age" : 33 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836611d"), "name" : { "first" : "پوریا", "last" : "کلتن", "dob" : { "age" : 38 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366122"), "name" : { "first" : "سوکند", "last" : "رضایی", "dob" : { "age" : 24 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366123"), "name" : { "first" : "أوينّا", "last" : "مرای", "dob" : { "age" : 38 } } }
{ "_id" : ObjectId("61912d4752ac36ca78366127"), "name" : { "first" : "سورنا", "last" : "مرای", "dob" : { "age" : 28 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836612a"), "name" : { "first" : "سوکند", "last" : "جعفری", "dob" : { "age" : 28 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836612b"), "name" : { "first" : "یرنیا", "last" : "مرای", "dob" : { "age" : 26 } } }
{ "_id" : ObjectId("61912d4752ac36ca7836612d"), "name" : { "first" : "یریا", "last" : "کامروا", "dob" : { "age" : 33 } } }
```

```
> db.customerInfos.aggregate([{$match:{"dob.age":{$gt:40}}},{ $project:{"name.first":1,"name.last":1,"dob.age":1}}])
{ "_id" : ObjectId("61912d4752ac36ca783660ee"), "name" : { "first" : "آسارا", "last" : "کامروا", "dob" : { "age" : 61 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660ef"), "name" : { "first" : "کیانا", "last" : "رضایی", "dob" : { "age" : 48 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f0"), "name" : { "first" : "تسبهر", "last" : "نکو ظر", "dob" : { "age" : 54 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f1"), "name" : { "first" : "مریم", "last" : "کریبی", "dob" : { "age" : 65 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f3"), "name" : { "first" : "رادین", "last" : "حیدری", "dob" : { "age" : 57 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f4"), "name" : { "first" : "ارمین", "last" : "زارعی", "dob" : { "age" : 66 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f5"), "name" : { "first" : "دیسبا", "last" : "پاسا", "dob" : { "age" : 64 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f6"), "name" : { "first" : "سوکند", "last" : "محمدرجل", "dob" : { "age" : 54 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660f9"), "name" : { "first" : "دانیل", "last" : "سلطانی نژاد", "dob" : { "age" : 55 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660fa"), "name" : { "first" : "مهرداد", "last" : "جعفری", "dob" : { "age" : 71 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660fb"), "name" : { "first" : "تینتیش", "last" : "صدر", "dob" : { "age" : 75 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660fc"), "name" : { "first" : "ارمین", "last" : "کامیارل", "dob" : { "age" : 63 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660fd"), "name" : { "first" : "نیلش", "last" : "صدر", "dob" : { "age" : 49 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660fe"), "name" : { "first" : "علیضا", "last" : "کامیارل", "dob" : { "age" : 63 } } }
{ "_id" : ObjectId("61912d4752ac36ca783660ff"), "name" : { "first" : "محیا", "last" : "حسینی", "dob" : { "age" : 70 } } }
```


h. By using pymongo, save the information of these users to a new collection and make sure that the info of all users is saved to your collection using “count”.

```
> show dbs
admin          0.000GB
config         0.000GB
homework18     0.003GB
hw18           0.003GB
local          0.000GB
pymongo_json   0.003GB
test1          0.000GB
> use pymongo_json
switched to db pymongo_json
> db
pymongo_json
> db.showCollectionNames()
2021-11-15T22:10:30.556+0330 E QUERY [thread1] TypeError: db.showCollectionNames is not a function :
@ (shell):1:1
> db.getCollectionNames()
[ "users" ]
> db.users.find().pretty()
{
  "_id" : ObjectId("6192a94e159938eda7c3e295"),
  "gender" : "female",
  "name" : {
    "title" : "Mrs",
    "first" : "أويننا",
    "last" : "كاميارل"
  },
  "location" : {
    "street" : {
      "number" : 8521,
      "name" : "اڦيل لاهوري"
    },
    "city" : "نڀ آباد",
    "state" : "پنجاب"
  }
}
```

