PROIECT
ADMINISTRAREA BAZELOR DE DATE

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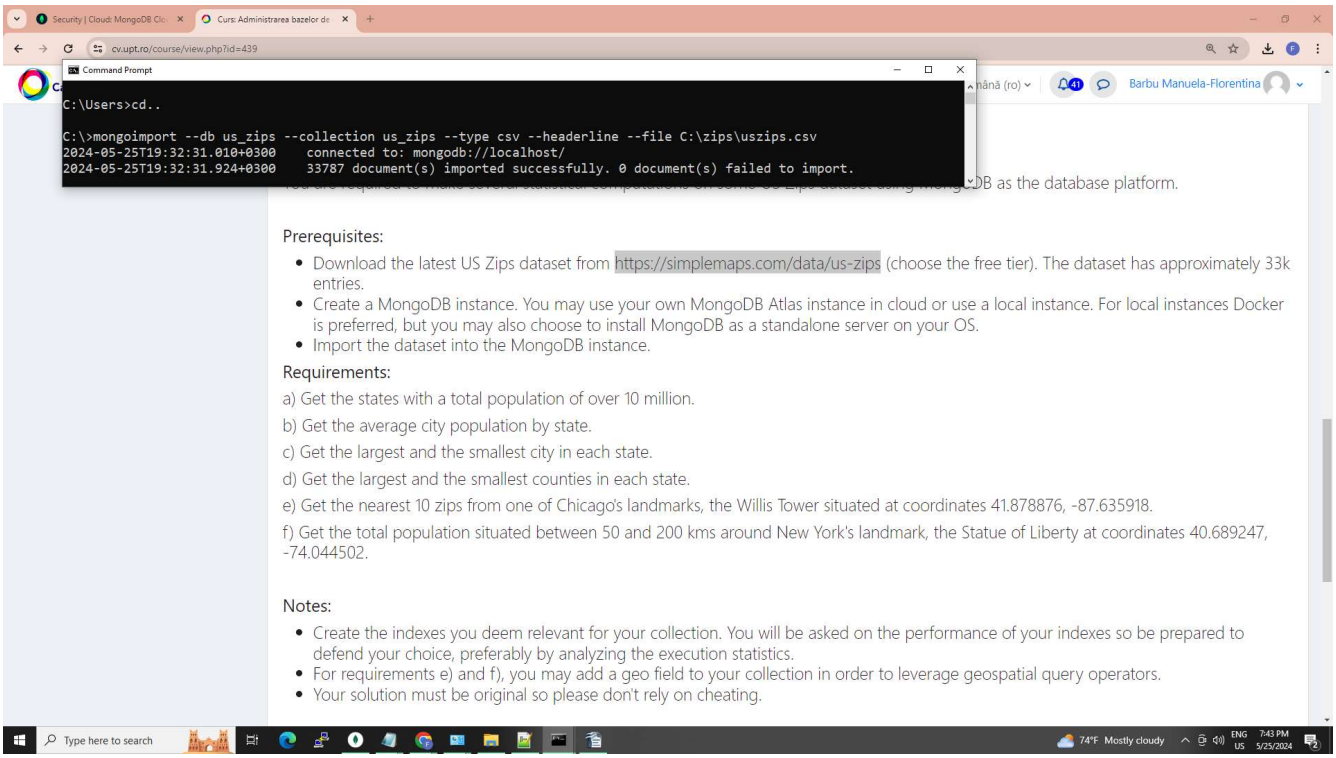
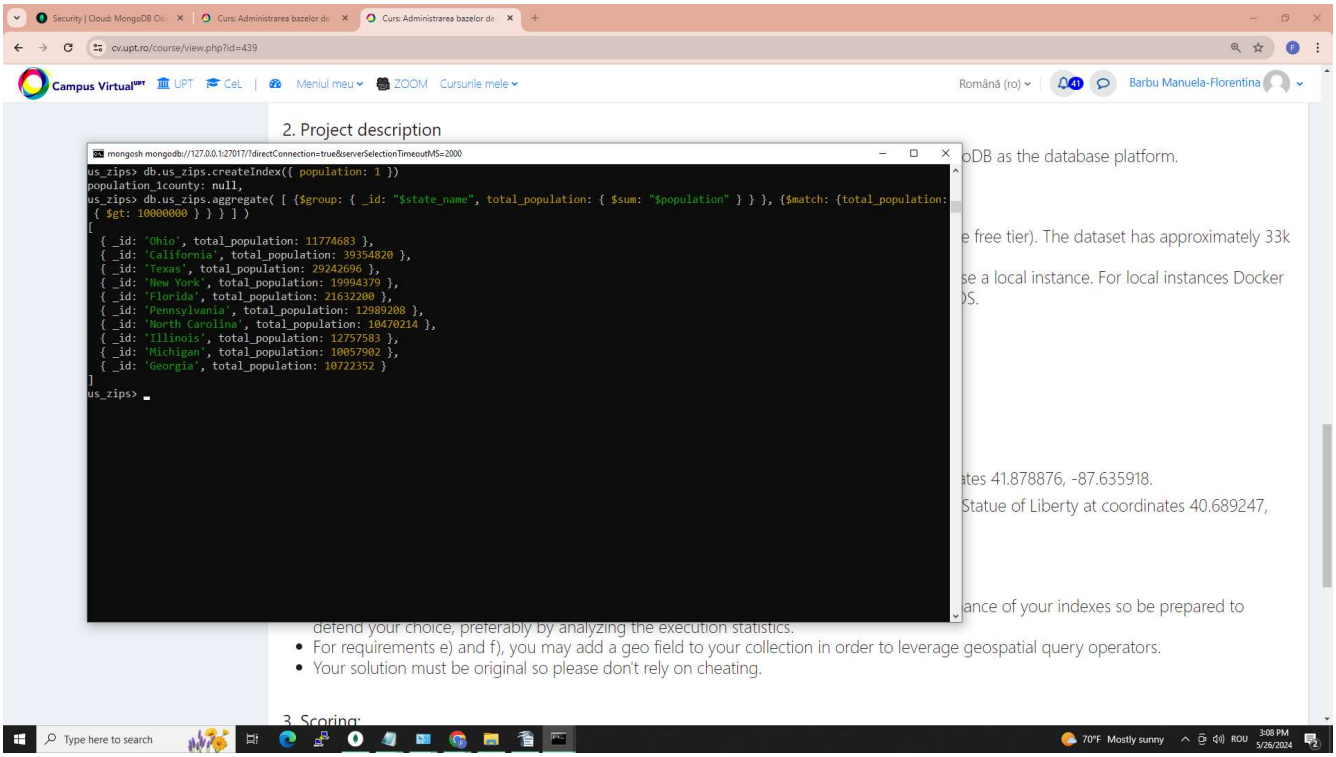
Master TI, anul I
Coordonator: BOCAN VALER



a) Get the states with a total population of over 10 million.

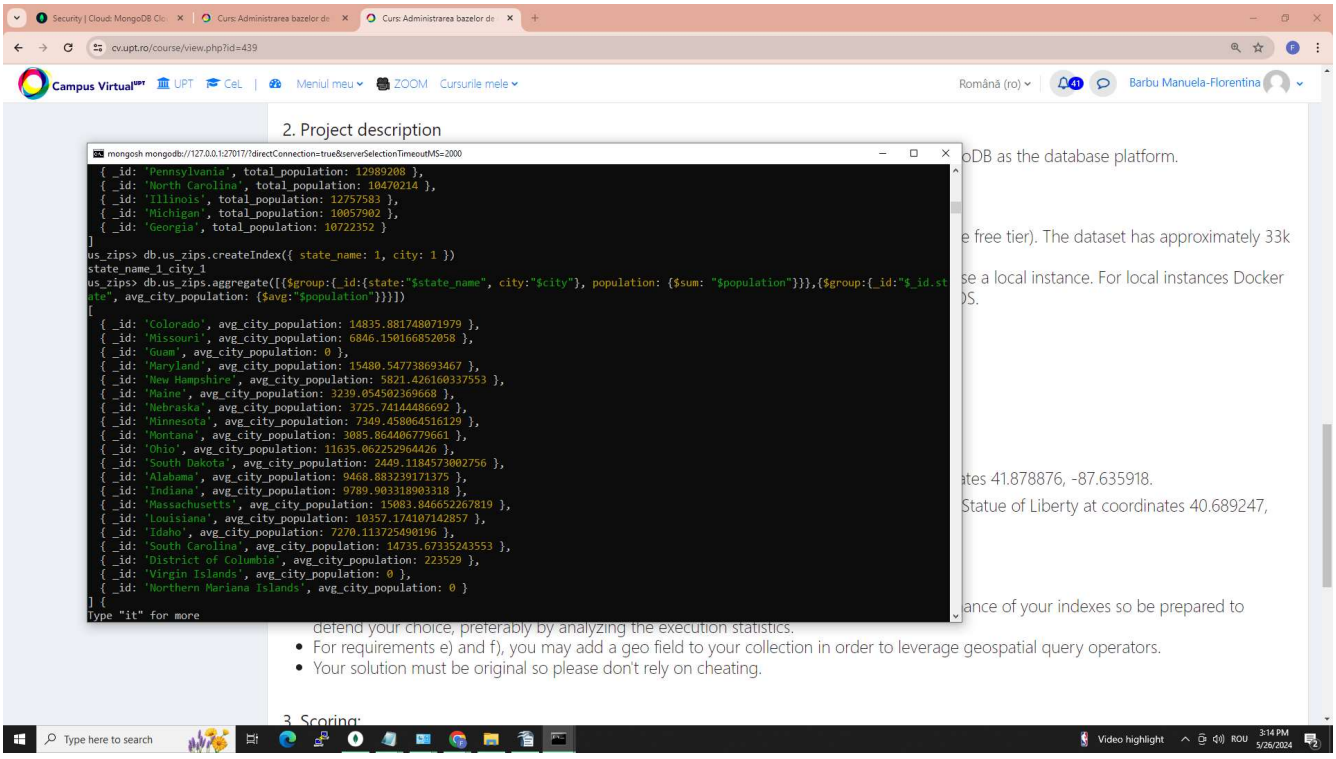
```
us_zips> db.us_zips.createIndex({ population: 1 })
us_zips> db.us_zips.aggregate([
      {
      $group:{_id:"$state_name",total_population:{$sum:"$population"}}
      },
      {
      $match:{total_population:{$gt: 10000000}}
      }
])
```



b) Get the average city population by state

```
us_zips> db.us_zips.createIndex({ state_name: 1, city: 1 })
```

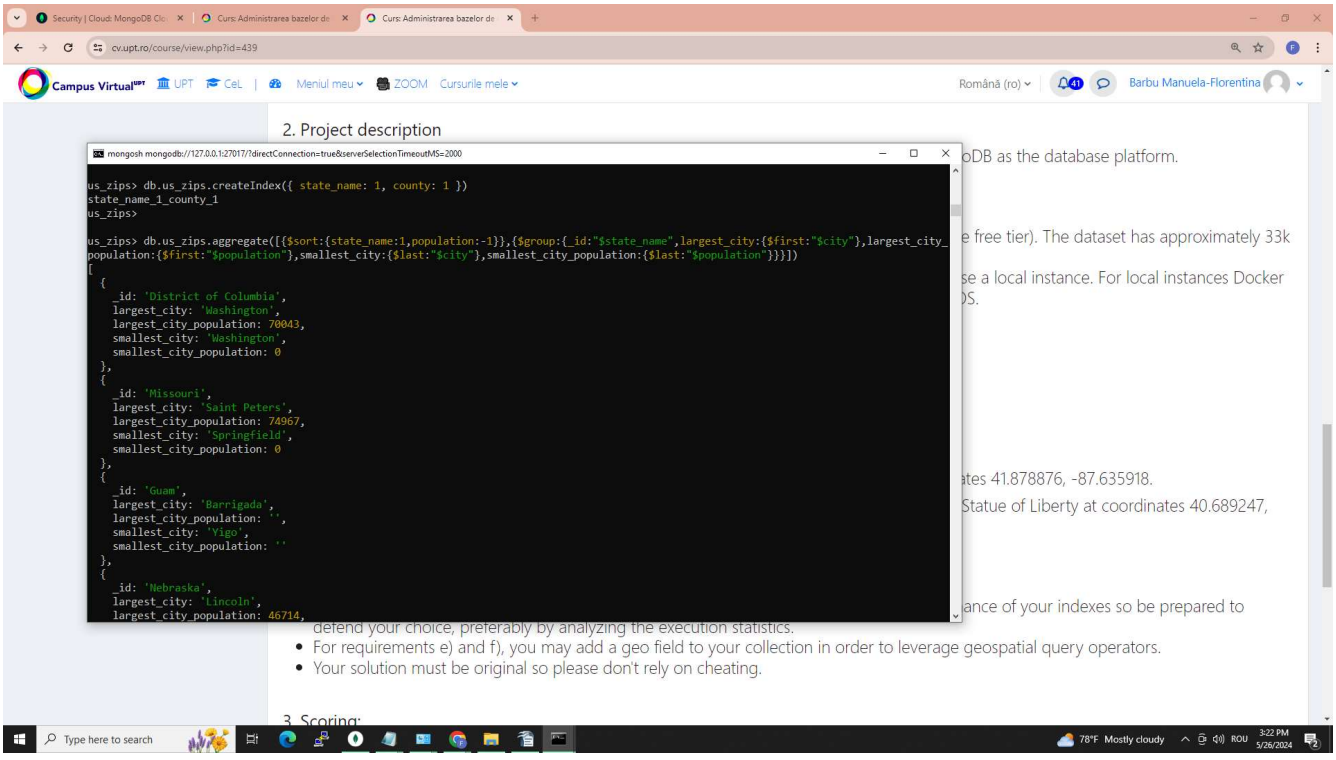
```
us_zips> db.us_zips.aggregate([{$group:{_id:{state:"$state_name", city:"$city"}, population: {$sum: "$population"}}},{$group:{_id:"$_id.state", avg_city_population: {$avg:"$population"}}}])
```



c) Get the largest and the smallest city in each state

- Se sorteaza înregistrările aferente fiecărui stat după populație în ordine descrescătoare
- Se grupează înregistrările după stat și se folosește $first și $last ca să se obțină cel mai mare și cel mai mic oraș

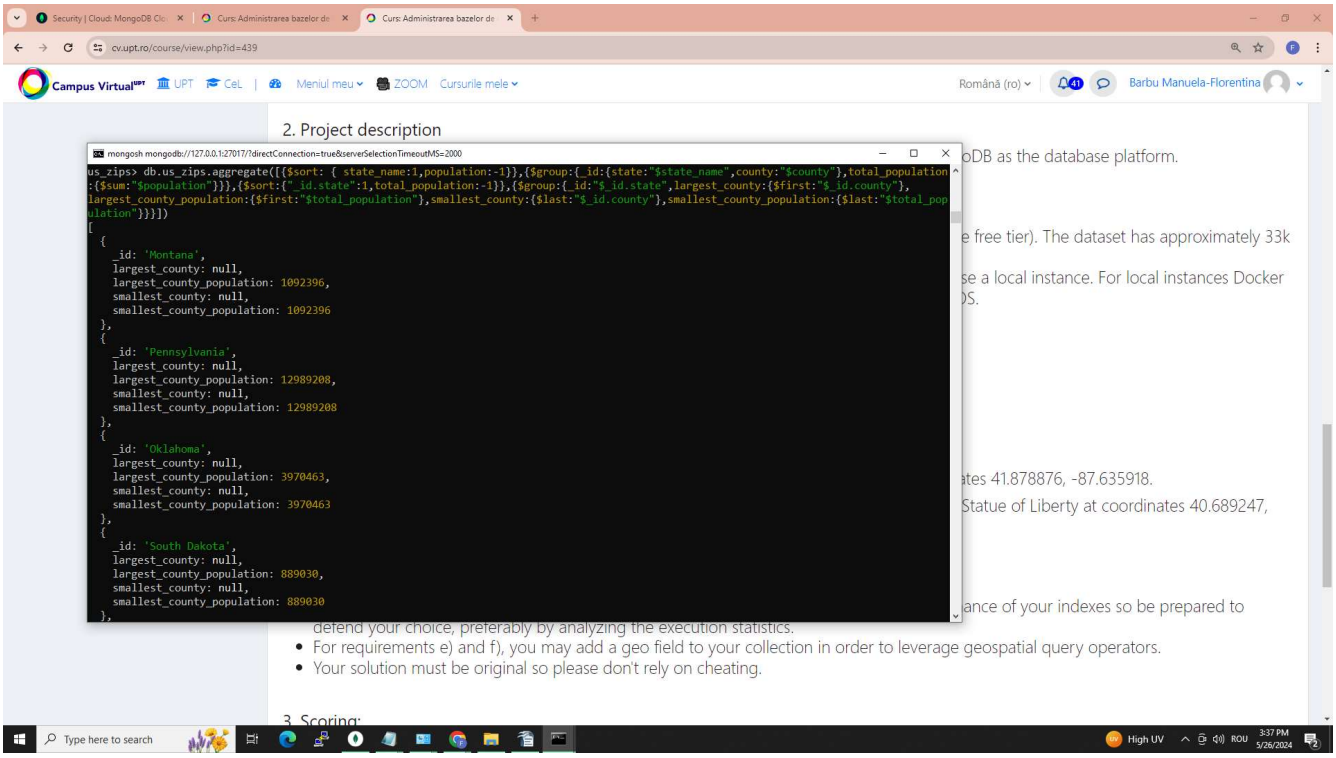
```
us_zips> db.us_zips.aggregate([
  {
    $sort:{state_name:1,population:-1}
  },
  {
    $group:{
      _id: "$state_name",
      largest_city:{$first:"$city" },
      largest_city_population:{$first:"$population"},
      smallest_city:{$last:"$city"},
      smallest_city_population:{$last:"$population"}
    }
  }
])
```



d) Get the largest and the smallest counties in each state

- Se sortează înregistrările din fiecare stat după populație în ordine descrescătoare - Se grupează înregistrările după stat și utilizăm $first și $last pentru a obține cel mai mare și cel mai mic oraș
- Se grupează după stat și județ pentru a calcula totalul populatiei pe fiecare județ
- Se sortează rezultatele dupa stat și populație în ordine descrescătoare
- Se folosește $first și $last pentru a detrmina cel mai mare si cel mai mic județ

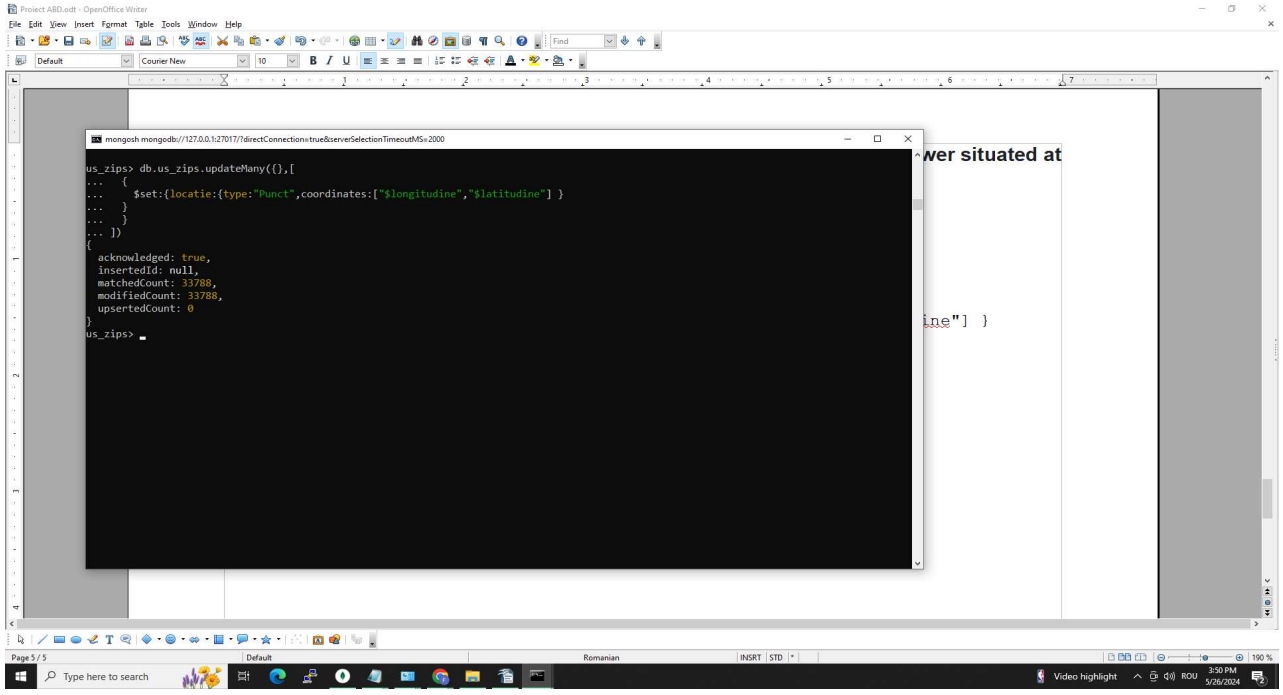
```
us_zips> db.us_zips.aggregate([
  {
    $sort:{state_name:1,population:-1}
  },
  {
    $group:{_id:{state:"$state_name",county:"$county"},total_population:{$sum:
                "$population"}}
  },
  {
    $sort:{"_id.state":1,total_population:-1}
  },
  {
    $group: {_id: "$_id.state",
      largest_county:{$first:"$_id.county"},
      largest_county_population:{$first:"$total_population"},
      smallest_county:{$last:"$_id.county"},
      smallest_county_population:{$last:"$total_population"}
            }
  }
])
```

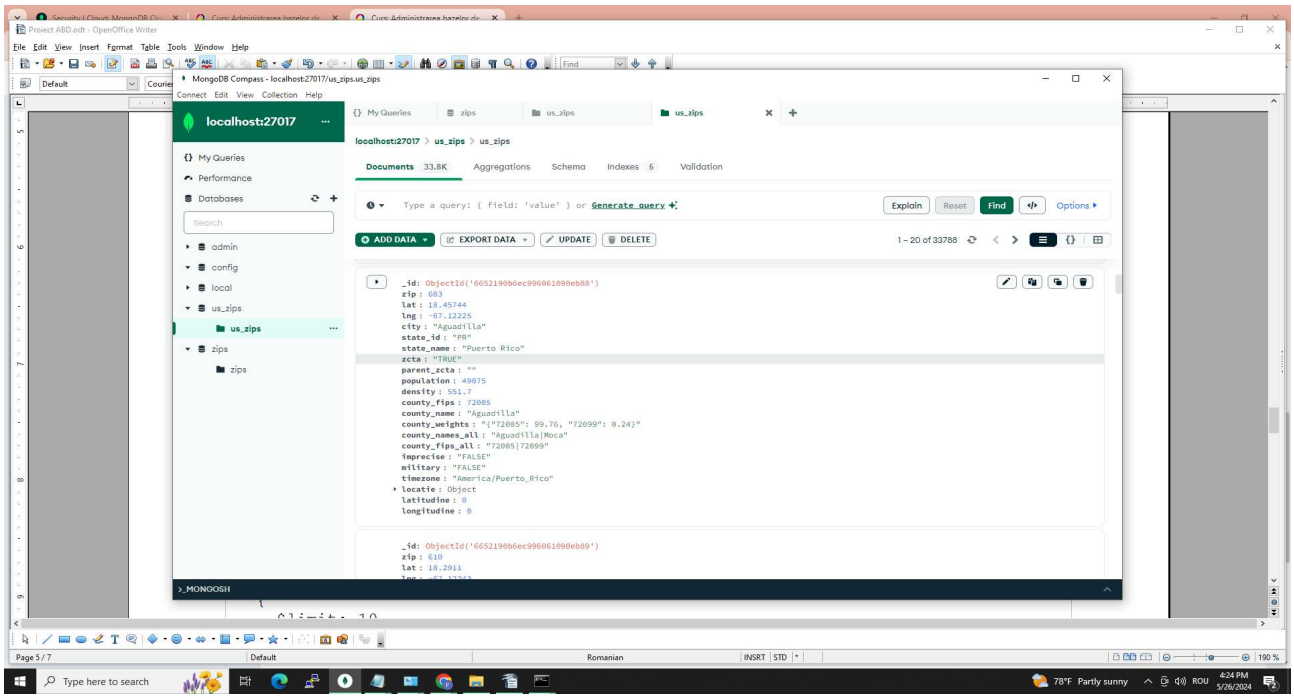


e) Get the nearest 10 zips from one of Chicago's landmarks, the Willis Tower situated at coordinates 41.878876, -87.635918.

- Adăugare câmp geospațial

```
us_zips> db.us_zips.updateMany({},[
   {
     $set:{locatie:{type:"Point",coordinates:["$longitudine","$latitudine"] }
   }
   }
])
```



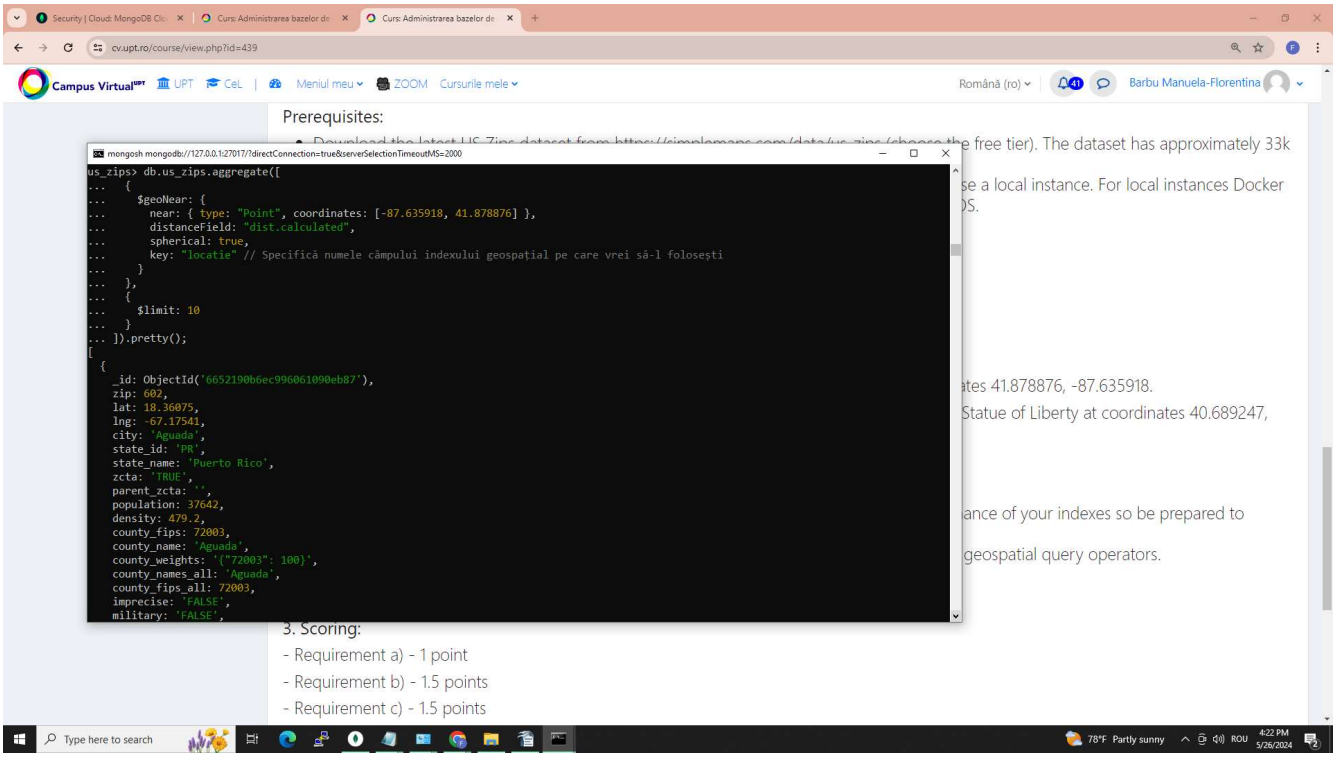


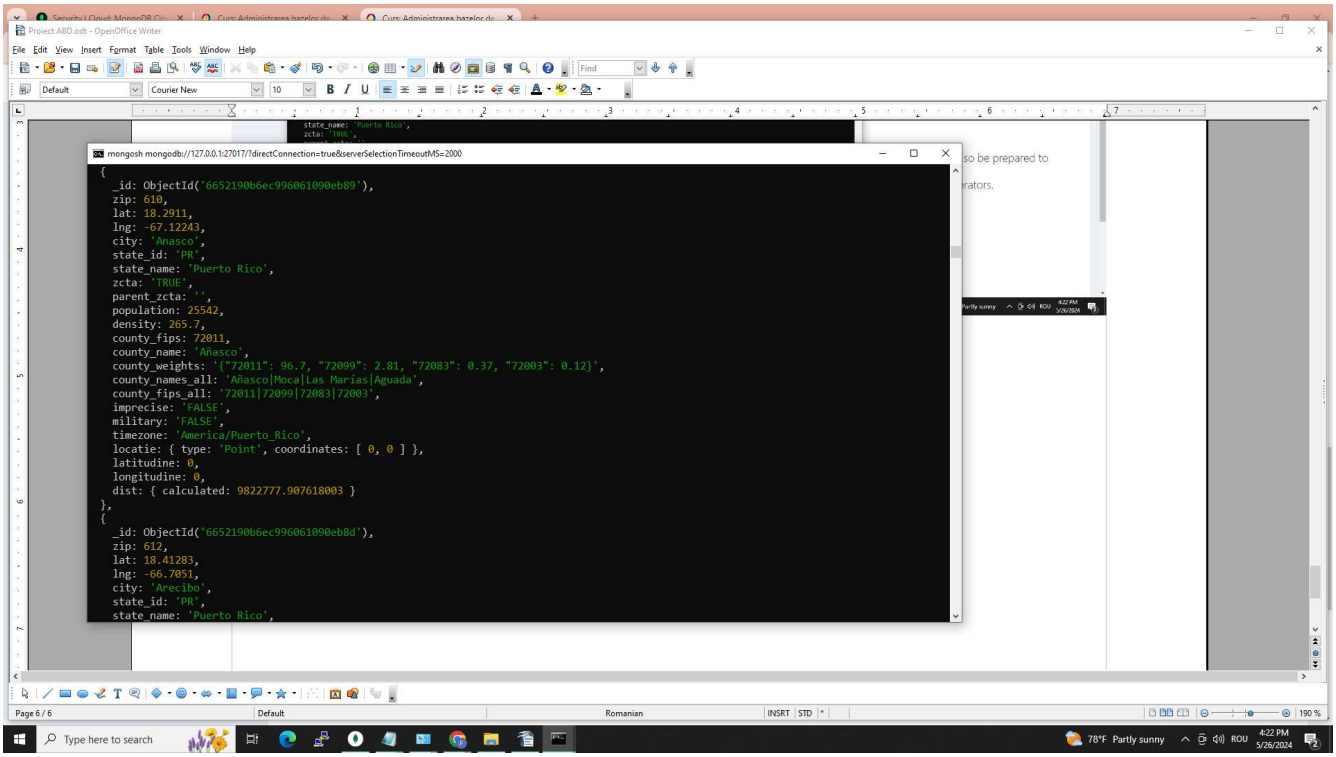
- Crearea unui index geospațial

```
us_zips> db.us_zips.createIndex({location:"2dsphere"})
```

- Identificarea celor mai apropiate 10 locații de Willis Tower

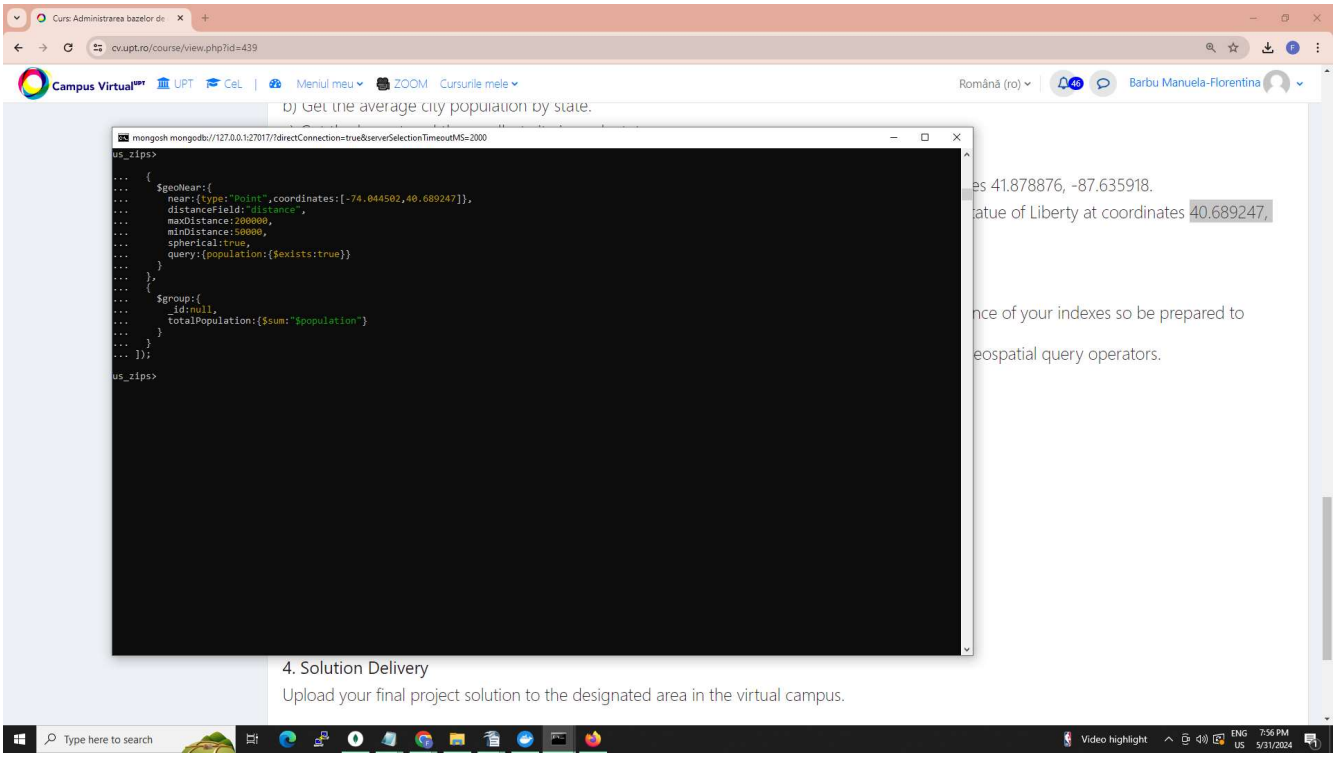
```
us_zips> db.us_zips.aggregate([
    {
      $geoNear:{
        near:{type:"Point",coordinates:[-87.635918,41.878876]},
        distanceField: "dist.calculated",
        spherical:true,
        key:"locatie"
      }
    },
    {
      $limit:10
    }
 ]).pretty();
```





f) Get the total population situated between 50 and 200 kms around New York's landmark, the Statue of Liberty at coordinates 40.689247, -74.044502

```
db.us_zips.aggregate([
  {
    $geoNear:{
      near:{type:"Point",coordinates:[-74.044502,40.689247]},
      distanceField:"distance",
      maxDistance:200000,
      minDistance:50000,
      spherical:true,
      query:{population:{$exists:true}},
      key:"locatie_2dsphere"
    }
  },
  {
    $group:{
      _id:null,
      totalPopulation:{$sum:"$population"}
    }
  }
]);
```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cv.upt.ro/course/view.php?id=439
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UPT
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Meniul meu
ZOOM
Cursurile mele
Română (ro)
Barbu Manuela-Florentina
b) Get the average city population by state.
mongosh mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000
us_zips>
... {
... $geoNear:{
... near:{type:"Point",coordinates:[-74.044502,40.689247]},
... distanceField:"distance",
... maxDistance:200000,
... minDistance:50000,
... sphericalitrue,
... query:{population:{$exists:true}}
... }
... },
... {
... $group:{
... _id:null,
... totalPopulation:{$sum:"$population"}
... }
... }
...]);
us_zips>
es 41.878876, -87.635918.
tatue of Liberty at coordinates 40.689247,
nce of your indexes so be prepared to
eospatial query operators.
4. Solution Delivery
Upload your final project solution to the designated area in the virtual campus.
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