

HW 4 - MongoDB

Bruno Palermo s309164

Question 1 How many stations have (extra.status) "online" status. How many stations have "offline" status?

```
db.bikeStation.count({"extra.status":'online'})
33
db.bikeStation.count({"extra.status":'offline'})
28
```

Question 2 How many stations have a status different than "online" and "offline"?

```
db.bikeStation.count({$nor: [{"extra.status":'offline'}, {"extra.status":'online'}]})
4
```

Question 3 For stations that have a status different than "offline" and "online" status, visualize only the value of the status field.

```
db.bikeStations.find({$nor:[{"extra.status":'offline'}, {"extra.status":'online'}]}, {_id:0, "extra.status":1})
{ "extra" : { "status" : "maintenance" } }
{ "extra" : { "status" : "maintenance" } }
{ "extra" : { "status" : "maintenance" } }
{ "extra" : { "status" : "maintenance" } }
```

Question 4 What are the active stations (status = online) with an average rating (extra.score) greater than or equal to 4? Extract the list of the names of these stations, sorted in alphabetical order

```
db.bikeStation.find({"extra.status":'online', "extra.score":{$gte:4}}, {_id:0, "name":1}).sort({"name":1})
{ "name" : "02. Pettiti" }
{ "name" : "04. Reggia" }
{ "name" : "06. Municipio" }
{ "name" : "08. San Marchese" }
{ "name" : "10. Gallo Praile" }
{ "name" : "Belfiore" }
{ "name" : "Borromini" }
{ "name" : "Castello 1" }
{ "name" : "Corte d`Appello" }
{ "name" : "Giolitti 1" }
{ "name" : "Politecnico 1" }
{ "name" : "Politecnico 3" }
{ "name" : "Porta Palatina" }
{ "name" : "Principi d`Acaja 1" }
{ "name" : "Principi d`Acaja 2" }
```

```
{ "name" : "San Francesco da Paola" }
{ "name" : "Sant'Anselmo" }
{ "name" : "Tribunale" }
```

Question 5 What is the name of the inactive stations (status = offline) that have at least one free slot (empty_slots > 0) or have at least one bike available (free_bikes > 0)? How many free slots and how many bikes are available?

```
db.bikeStations.find({"extra.status":'offline',$or:[{empty_slots:{$gt:0}},{free_bikes:{$gt:0}}]},{_id:0, name:1, empty_slots:1,free_bikes:1})

{ "empty_slots" : 1, "free_bikes" : 0, "name" : "06. Le Serre" }
{ "empty_slots" : 0, "free_bikes" : 5, "name" : "05. Corso Garibaldi" }
```

Question 6 What is the total number of reviews (extra.reviews) for all stations?

```
db.bikeStation.aggregate([{$group:{_id:null,counter:{$sum: "$extra.reviews"}}}])

{ _id: null, counter: 15311 }
```

Question 7 For each value of average ratings (score), how many stations have that rating? Sort the result by descending rating.

```
db.bikeStations.aggregate([{$group:{_id:"$extra.score",counter:{$sum: 1}}},{ $sort:{_id:-1}}])

{ "_id" : 4.7, "counter" : 1 }
{ "_id" : 4.5, "counter" : 2 }
{ "_id" : 4.4, "counter" : 2 }
{ "_id" : 4.3, "counter" : 2 }
{ "_id" : 4.2, "counter" : 7 }
{ "_id" : 4.1, "counter" : 5 }
{ "_id" : 4, "counter" : 9 }
{ "_id" : 3.9, "counter" : 9 }
{ "_id" : 3.8, "counter" : 1 }
{ "_id" : 3.7, "counter" : 2 }
{ "_id" : 3.6, "counter" : 1 }
{ "_id" : 3.5, "counter" : 4 }
{ "_id" : 3.4, "counter" : 3 }
{ "_id" : 3.2, "counter" : 1 }
{ "_id" : 3, "counter" : 4 }
{ "_id" : 2.8, "counter" : 2 }
{ "_id" : 2.7, "counter" : 1 }
{ "_id" : 2.5, "counter" : 1 }
{ "_id" : 2.4, "counter" : 1 }
{ "_id" : 2.1, "counter" : 1 }
{ "_id" : 1.5, "counter" : 1 }
{ "_id" : 1.4, "counter" : 1 }
{ "_id" : 1.2, "counter" : 1 }
```

```
{ "_id" : 1, "counter" : 3 }
```

Question 8 What is the average rating for active (status = online) and inactive (status = offline) stations?

```
db.bikeStation.aggregate( [ {$match:{ $or:
[{"extra.status":"'online'},{ "extra.status":"'offline'"} ] },
{$group:{_id:"$extra.status",mytotal:{$avg: "$extra.reviews"}}}] )

{ _id: 'online', mytotal: 317.24242424242425 }
{ _id: 'offline', mytotal: 60.607142857142854 }
```

Question 9 What are the average ratings for stations without bikes (free_bikes = 0) and for those with at least one bike available (free_bikes > 0)?

```
db.bikeStation.mapReduce(function(){if(this.free_bikes > 0 ) emit(1,this.extra.score); else
emit(0,this.extra.score); },function(key,value){return Array.avg(value);},{out:{inline:1}})
{
  "_id" : 0,
    "value" : 3.2305555555555556
},
{
  "_id" : 1,
    "value" : 3.875862068965517
}
```

Question 10 Answer question 9, referring only to active stations (status = online)

```
db.bikeStations.mapReduce(function(){if(this.extra.status == "online"){if(this.free_bikes > 0
) emit(1,this.extra.score);else emit(0,this.extra.score);}},function(key,value){return
Array.avg(value);},
{out:{inline:1}})
{
  "_id" : 0,
    "value" : 3.7399999999999998
},
{
  "_id" : 1,
    "value" : 3.864285714285714 }
```

Question 11 What are the names of the 3 stations with available bikes (free_bikes > 0) closest to the point [45.07456, 7.69463]? How many bikes are available?

```
db.bikeStation.createIndex( { "location" : "2dsphere" } )
db.bikeStation.find({"free_bikes":{$gt:0},"location":{$near: {$geometry: { type: "Point" ,
coordinates: [ 45.07456, 7.69463 ]}}}}, {name:1, free_bikes:1}).limit(3)
{ _id: ObjectId("63a73dea863a3a4650ade5a0"),
  free_bikes: 5,
  name: 'Palermo 2' }
{ _id: ObjectId("63a73dea863a3a4650ade59d"),
```

```
    free_bikes: 5,
    name: 'Castello 1' }
{ _id: ObjectId("63a73dea863a3a4650ade567"),
  free_bikes: 4,
  name: 'San Francesco da Paola' }
```

Question 12 What are the names of the 3 stations with available bikes (`free_bikes > 0`) closest to the "Politecnico 4" station? How many bikes are available?

```
db.bikeStation.find({free_bikes: {$gt: 0},location: {$near: {$geometry: {type:
"Point",coordinates: db.bikeStation.findOne({name:"Politecnico 4"}, {_id:0, "location" :
1}).location.coordinates}}}}, {_id:0, name:1}).limit(3)
{ name: 'Politecnico 1' }
{ name: 'Politecnico 3' }
{ name: 'Tribunale' }
```