

Homework 4

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January 2023

Queries

Query 1.a:

```
1 db.bikeStations.find({"extra.status": "online"}).count()
```

Result 1.a:

33.

Query 1.b:

```
1 db.bikeStations.find({"extra.status": "offline"}).count()
```

Result 1.b:

28.

Query 2:

```
1 db.bikeStations.find({
2   "extra.status": {
3     $nin: ["online", "offline"]
4   }
5 }).count()
```

Result 2:

4.

Query 3:

```
1 db.bikeStations.find({
2   "extra.status": {
3     $nin: ["online", "offline"]
4   }
5 },
6 {
7   "extra.status": 1,
8   _id: 0
9 })
```

Result 3:

```
1  [  
2    {  
3      "extra": {  
4        "status": "maintenance"  
5      }  
6    },  
7    {  
8      "extra": {  
9        "status": "maintenance"  
10     }  
11   },  
12   {  
13     "extra": {  
14       "status": "maintenance"  
15     }  
16   },  
17   {  
18     "extra": {  
19       "status": "maintenance"  
20     }  
21   }  
22 ]
```

Query 4:

```
1 db.bikeStations.find({  
2   "extra.status": "online",  
3   "extra.score": {$gte: 4}  
4 },  
5 {  
6   name: 1,  
7   _id: 0  
8 }).sort({name: 1})
```

Result 4:

```
1  [  
2    {  
3      "extra": {  
4        "status": "online",  
5        "score": 4  
6      }  
7    },  
8    {  
9      "extra": {  
10       "status": "online",  
11       "score": 4  
12     }  
13   },  
14   {  
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17       "score": 4  
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19   },  
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963    "extra": {  
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965      "score": 4  
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971      "score": 4  
972    }  
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979  },  
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983      "score": 4  
984    }  
985  },  
986  {  
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989      "score": 4  
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994      "status": "online",  
995      "score": 4  
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1001     "score": 4  
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1014   }  
1015 },  
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1040 {  
1041   "extra": {  
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1045 },  
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1047   "extra": {  
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1052 {  
1053   "extra": {  
1054     "status": "online",  
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1057 },  
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1060     "status": "online",  
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1063 },  
1064 {  
1065   "extra": {  
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1071   "extra": {  
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1075 },  
1076 {  
1077   "extra": {  
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1079     "score": 4  
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1081 },  
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1087 },  
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1093 },  
1094 {  
1095   "extra": {  
1096     "status": "online",  
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1099 },  
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1104   }  
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1106 {  
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1108     "status": "online",  
1109     "score": 4  
1110   }  
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1114     "status": "online",  
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1141 },  
1142 {  
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1147 },  
1148 {  
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1153 },  
1154 {  
1155   "extra": {  
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1167   "extra": {  
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1172 {  
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1183 },  
1184 {  
1185   "extra": {  
1186     "status": "online",  
1187     "score": 4  
1188   }  
1189 },  
1190 {  
1191   "extra": {  
1192     "status": "online",  
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1194   }  
1195 },  
1196 {  
1197   "extra": {  
1198     "status": "online",  
1199     "score": 4  
1200   }  
1201 },  
1202 {  
1203   "extra": {  
1204     "status": "online",  
1205     "score": 4  
1206   }  
1207 },  
1208 {  
1209   "extra": {  
1210     "status": "online",
```

```
2      {
3          "name": "02. Pettiti"
4      },
5      {
6          "name": "04. Reggia"
7      },
8      {
9          "name": "06. Municipio"
10     },
11     {
12         "name": "08. San Marchese"
13     },
14     {
15         "name": "10. Gallo Praile"
16     },
17     {
18         "name": "Belfiore"
19     },
20     {
21         "name": "Borromini"
22     },
23     {
24         "name": "Castello 1"
25     },
26     {
27         "name": "Corte d'Appello"
28     },
29     {
30         "name": "Giolitti 1"
31     },
32     {
33         "name": "Politecnico 1"
34     },
35     {
36         "name": "Politecnico 3"
37     },
38     {
39         "name": "Porta Palatina"
```

```

40     },
41     {
42         "name": "Principi d'Acaja 1"
43     },
44     {
45         "name": "Principi d'Acaja 2"
46     },
47     {
48         "name": "San Francesco da Paola"
49     },
50     {
51         "name": "Sant'Anselmo"
52     },
53     {
54         "name": "Tribunale"
55     }
56 ]

```

Query 5:

```

1 db.bikeStations.find({
2     "extra.status": "offline",
3     $or: [
4         {empty_slots: {$gt: 0}},
5         {free_bikes: {$gt: 0}}
6     ]
7 },
8 {
9     name: 1,
10    free_bikes: 1,
11    empty_slots: 1,
12    _id: 0
13 })

```

Result 5:

```

1 [
2     {
3         "empty_slots": 1,
4         "free_bikes": 0,

```

```

5         "name": "06. Le Serre"
6     },
7     {
8         "empty_slots": 0,
9         "free_bikes": 5,
10        "name": "05. Corso Garibaldi"
11    }
12 ]

```

Query 6:

```

1 db.bikeStations.aggregate([
2     $group: {
3         _id: null,
4         totalReviews: {
5             $sum: "$extra.reviews"
6         }
7     }
8 ])

```

Result 6:

15311.

Query 7:

```

1 db.bikeStations.aggregate([
2     $group: {
3         _id: "$extra.score",
4         count: {$sum: 1}
5     },
6 ],
7 {
8     $sort: {_id: -1}
9 })

```

Result 7:

```

1 [
2     {

```

```
3         "_id": 4.7,
4         "count": 1
5     },
6     {
7         "_id": 4.5,
8         "count": 2
9     },
10    {
11        "_id": 4.4,
12        "count": 2
13    },
14    {
15        "_id": 4.3,
16        "count": 2
17    },
18    {
19        "_id": 4.2,
20        "count": 7
21    },
22    {
23        "_id": 4.1,
24        "count": 5
25    },
26    {
27        "_id": 4,
28        "count": 9
29    },
30    {
31        "_id": 3.9,
32        "count": 9
33    },
34    {
35        "_id": 3.8,
36        "count": 1
37    },
38    {
39        "_id": 3.7,
40        "count": 2
```

```
41     },
42     {
43         "_id": 3.6,
44         "count": 1
45     },
46     {
47         "_id": 3.5,
48         "count": 4
49     },
50     {
51         "_id": 3.4,
52         "count": 3
53     },
54     {
55         "_id": 3.2,
56         "count": 1
57     },
58     {
59         "_id": 3,
60         "count": 4
61     },
62     {
63         "_id": 2.8,
64         "count": 2
65     },
66     {
67         "_id": 2.7,
68         "count": 1
69     },
70     {
71         "_id": 2.5,
72         "count": 1
73     },
74     {
75         "_id": 2.4,
76         "count": 1
77     },
78     {
```



```

79         "_id": 2.1,
80         "count": 1
81     }
82 ]

```

Query 8:

```

1 db.bikeStations.aggregate([
2     $match: {
3         "extra.status": {
4             $in: ["online", "offline"]
5         }
6     }
7 },
8 {
9     $group: {
10         _id: null,
11         averageRating: {
12             $avg: "$extra.score"
13         }
14     }
15 }])

```

Result 8:

3.4704918032786884

Query 9:

```

1 db.bikeStations.mapReduce(
2     function()
3     {
4         if(this.free_bikes == 0)
5             emit("no_free_bikes", this.extra.score);
6         else
7             emit("free_bikes", this.extra.score)
8     },
9     function(key, value)
10    {
11        return Array.avg(value);
12    },
13    {

```

```
14         out: {inline: 1 }
15     }
16 )
```

Result 9:

```
1 {
2   "results": [
3     {
4       "_id": "no_free_bikes",
5       "value": 3.23055555555555565
6     },
7     {
8       "_id": "free_bikes",
9       "value": 3.875862068965518
10    }
11  ],
12  "ok": 1
13 }
```

Query 10:

```
1 db.bikeStations.mapReduce(
2   function()
3   {
4     if(this.free_bikes == 0)
5       emit("no_free_bikes", this.extra.score);
6     else
7       emit("free_bikes", this.extra.score)
8   },
9   function(key, value)
10  {
11    return Array.avg(value);
12  },
13  {
14    query: {"extra.status": "online"},
15    out: {inline: 1 }
16  }
17 )
```

Result 10:

```
1 {
2   "results": [
3     {
4       "_id": "no_free_bikes",
5       "value": 3.7399999999999998
6     },
7     {
8       "_id": "free_bikes",
9       "value": 3.8642857142857148
10    }
11  ],
12  "ok": 1
13 }
```

Query 11:

```
1 //create index
2 db.bikeStations.createIndex({location: "2dsphere"})
3
4 //query
5 db.bikeStations.find({
6   free_bikes: { $gt: 0 },
7   location: {
8     $near: {
9       $geometry: {
10         type: "Point",
11         coordinates: [45.07456, 7.69463]
12       }
13     }
14   }
15 },
16 {
17   name: 1,
18   free_bikes: 1,
19   _id: 0
20 }).limit(3)
```

Result 11:

```

1  [
2    {
3      "free_bikes": 5,
4      "name": "Palermo 2"
5    },
6    {
7      "free_bikes": 5,
8      "name": "Castello 1"
9    },
10   {
11     "free_bikes": 4,
12     "name": "San Francesco da Paola"
13   }
14 ]

```

Query 12:

```

1  db.bikeStations.find({
2    free_bikes: { $gt: 0 },
3    location: {
4      $near: {
5        $geometry: {
6          type: "Point",
7          coordinates: db.bikeStations.findOne({
8            name: "Politecnico 4"
9          }).location.coordinates
10        }
11      }
12    }
13  },
14  {
15    name: 1,
16    free_bikes: 1,
17    _id: 0
18  }).limit(3)

```

Result 12:

```

1  [
2    {

```

```
3         "free_bikes": 9,  
4         "name": "Politecnico 1"  
5     },  
6     {  
7         "free_bikes": 5,  
8         "name": "Politecnico 3"  
9     },  
10    {  
11        "free_bikes": 3,  
12        "name": "Tribunale"  
13    }  
14 ]
```