

Homework 4 – MongoDB

- Question #1

```
[stationsDB> db.stations.find({"extra.status": "online"}).count()
33
[stationsDB> db.stations.find({"extra.status": "offline"}).count()
28
```

- Question #2

```
db.stations.find({$and: [
  {"extra.status":{$ne:"online"}},
  {"extra.status": {$ne: "offline"}}]}).count()
```

Answer: 4

- Question #3

```
db.stations.find({$and: [
  {"extra.status": {$ne: "online"}},
  {"extra.status": {$ne: "offline"}}
]}, {_id: 0,"extra.status":1})
```

Answer:

```
[
  { extra: { status: 'maintenance' } },
  { extra: { status: 'maintenance' } },
  { extra: { status: 'maintenance' } },
  { extra: { status: 'maintenance' } }
]
```

- Question #4

```
db.stations.find({
  "extra.status": "online",
  "extra.score": {$gte:4}
}, {name:1, _id:0}).sort({name: 1})
```

Answer:

```
[
  { 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

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

Answer:

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

- Question #6

```
db.stations.aggregate({$group: {
    _id:null,
    totReviews: {$sum: "$extra.reviews"}
  }})
```

Answer:

```
[ { _id: null, totReviews: 15311 } ]
```

- Question #7

```
db.stations.aggregate({$group: {
    _id: "$extra.score",
    n: {$sum: 1}
  }}).sort({_id: -1})
```

Answer:

```
[
  { _id: 4.7, n: 1 }, { _id: 4.5, n: 2 },
  { _id: 4.4, n: 2 }, { _id: 4.3, n: 2 },
  { _id: 4.2, n: 7 }, { _id: 4.1, n: 5 },
  { _id: 4, n: 9 }, { _id: 3.9, n: 9 },
  { _id: 3.8, n: 1 }, { _id: 3.7, n: 2 },
  { _id: 3.6, n: 1 }, { _id: 3.5, n: 4 },
  { _id: 3.4, n: 3 }, { _id: 3.2, n: 1 },
  { _id: 3, n: 4 }, { _id: 2.8, n: 2 },
  { _id: 2.7, n: 1 }, { _id: 2.5, n: 1 },
  { _id: 2.4, n: 1 }, { _id: 2.1, n: 1 }
]
Type "it" for more
stationsDB> it
[
  { _id: 1.5, n: 1 },
  { _id: 1.4, n: 1 },
  { _id: 1.2, n: 1 },
  { _id: 1, n: 3 }
]
```

- Question #8

```
db.stations.aggregate({$match: {
  $or: [
    {"extra.status": "online"},
    {"extra.status": "offline"}
  ]}, {$group: {
  _id: "$extra.status",
  averageScore: {$avg: "$extra.score"}
}})
```

Answer:

```
[
  { _id: 'offline', averageScore: 3.0285714285714285 },
  { _id: 'online', averageScore: 3.8454545454545457 }
]
```

- Question #9

```
db.stations.mapReduce(function() {
  if (this.free_bikes == 0){
    emit(this.free_bikes, this.extra.score);
  } else {
    emit(1, this.extra.score);
  }}, function(key, values) {
  return Array.avg(values)
}, {out: {inline:1}})
```

Answer:

```
{
  results: [
    { _id: 1, value: 3.875862068965518 },
    { _id: 0, value: 3.2305555555555555 }
  ],
  ok: 1
}
```

- Question #10

```
db.stations.mapReduce(function() {
  if (this.free_bikes == 0){
    emit(this.free_bikes, this.extra.score);
  } else {
    emit(1, this.extra.score);
  }}, function(key, values) {
  return Array.avg(values)
}, {out: {inline:1}, query: {"extra.status": "online"}})
```

Answer:

```
{
  results: [
    { _id: 0, value: 3.7399999999999998 },
    { _id: 1, value: 3.8642857142857148 }
  ],
  ok: 1
}
```

- **Question #11**

```
db.stations.find({
  free_bikes: {$gt:0},
  location: {$near: {
    $geometry: {
      $type: "Point",
      coordinates: [45.07456, 7.69463]
    }
  }}, {name: 1, free_bikes: 1}).limit(3)
```

Answer:

```
[
  {
    _id: ObjectId("61d46f285bbaca4a51be8960"),
    free_bikes: 5,
    name: 'Palermo 2'
  },
  {
    _id: ObjectId("61d46f285bbaca4a51be895c"),
    free_bikes: 5,
    name: 'Castello 1'
  },
  {
    _id: ObjectId("61d46f285bbaca4a51be8927"),
    free_bikes: 4,
    name: 'San Francesco da Paola'
  }
]
```

- **Question #12**

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

Answer:

```
[
  {
    _id: ObjectId("61d46f285bbaca4a51be895a"),
    free_bikes: 9,
    name: 'Politecnico 1'
  },
  {
    _id: ObjectId("61d46f285bbaca4a51be8957"),
    free_bikes: 5,
    name: 'Politecnico 3'
  },
  {
    _id: ObjectId("61d46f285bbaca4a51be8958"),
    free_bikes: 3,
    name: 'Tribunale'
  }
]
```