

## Domanda 1:

Query:

```
db.getCollection('BikeStations').aggregate(  
  {  
    $match: {  
      $or: [  
        { 'extra.status': 'online' },  
        { 'extra.status': 'offline' }  
      ]  
    }  
  },  
  { $count: 'number_of_stations' }  
);
```

Risposta:

```
{  
  number_of_stations: 61  
}
```

## Domanda 2:

Query:

```
db.getCollection('BikeStations').aggregate(  
  {  
    $match: {  
      $and: [  
        {  
          'extra.status': {  
            $not: { $eq: 'online' }  
          }  
        },  
        {  
          'extra.status': {  
            $not: { $eq: 'offline' }  
          }  
        }  
      ]  
    }  
  },  
  { $count: 'number_of_stations' }  
);
```

Risposta:

```
{
  number_of_stations: 4
}
```

### Domanda 3:

Query:

```
db.getCollection('BikeStations').aggregate(
  {
    $match: {
      $and: [
        {
          'extra.status': {
            $not: { $eq: 'online' }
          }
        },
        {
          'extra.status': {
            $not: { $eq: 'offline' }
          }
        }
      ]
    },
    { $project: { 'extra.status': 1, _id: 0 } }
  ]
);
```

Risposta:

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

### Domanda 4:

Query:

```
db.getCollection('BikeStations').aggregate(
  {
    $match: {
      'extra.status': 'online',
      'extra.score': { $gte: 4 }
    }
  },
  { $project: { 'extra.status': 1, _id: 0 } }
);
```

```
{ $project: { name: 1, _id: 0 } },
{ $sort: { name: 1 } }
);
```

Risposta:

```
[
  { 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' }
]
```

## Domanda 5:

Query:

```
db.getCollection('BikeStations').aggregate(
  {
    $match: {
      $and: [
        { 'extra.status': 'offline' },
        {
          $or: [
            { empty_slots: { $gt: 0 } },
            { free_bikes: { $gt: 0 } }
          ]
        }
      ]
    }
  },
  {
    $project: {
      name: 1,
      free_bikes: 1,
```

```
    empty_slots: 1,
    _id: 0
  }
}
);
```

Risposta:

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

### Domanda 6:

Query:

```
db.getCollection('BikeStations').aggregate(
  {
    $group: {
      _id: null,
      totalReviews: { $sum: '$extra.reviews' }
    }
  },
  { $project: { _id: 0, totalReviews: 1 } }
);
```

Risposta:

```
[ { totalReviews: 15311 } ]
```

### Domanda 7:

Query:

```
db.getCollection('BikeStations').aggregate(
  {
    $group: {
      _id: '$extra.score',
      numberOfStations: { $count: {} }
    }
  },
  {
    $project: {
      score: '$_id',
      numberOfStations: 1,
      _id: 0
    }
  }
);
```

```
},  
{ $sort: { score: -1 } }  
);
```

Risposta:

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

## Domanda 8:

Query:

```
db.getCollection('BikeStations').aggregate(  
db.getCollection('BikeStations').aggregate(  
  {  
    $match: {  
      $or: [  
        { 'extra.status': 'online' },  
        { 'extra.status': 'offline' }  
      ]  
    }  
  },  
  {
```

```

    $group: {
      _id: '$extra.status',
      avgScore: { $avg: '$extra.score' }
    }
  },
  {
    $project: {
      type: '$_id',
      avgScore: 1,
      _id: 0
    }
  }
};

```

Risposta:

```

[
  { avgScore: 3.8454545454545452, type: 'online' },
  { avgScore: 3.0285714285714285, type: 'offline' }
]

```

## Domanda 9:

Query:

```

db.getCollection('BikeStations').aggregate([
  {
    $group: {
      _id: {
        has_bikes: { $cond: { if: { $gt: ["$free_bikes", 0] }, then: "con_bici",
else: "senza_bici" } }
      },
      avg_score: { $avg: "$extra.score" }
    }
  },
  {
    $project: {
      _id: 0,
      category: "$_id.has_bikes",
      avg_score: 1
    }
  }
]);

```

Risposta:

```

[
  { avg_score: 3.2305555555555556, category: 'senza_bici' },

```

```
[ { avg_score: 3.8758620689655174, category: 'con_bici' } ]
```

### Domanda 10:

Query:

```
db.getCollection('BikeStations').aggregate([
  {
    $match: { "extra.status": "online" }
  },
  {
    $group: {
      _id: {
        has_bikes: { $cond: { if: { $gt: ["$free_bikes", 0] }, then: "con_bici",
else: "senza_bici" } }
      },
      avg_score: { $avg: "$extra.score" }
    }
  },
  {
    $project: {
      _id: 0,
      category: "$_id.has_bikes",
      avg_score: 1
    }
  }
]);
```

Risposta:

```
[
  { avg_score: 3.7399999999999998, category: 'senza_bici' },
  { avg_score: 3.8642857142857143, category: 'con_bici' }
]
```

### Domanda 11:

Query:

```
db.getCollection('BikeStations').aggregate([
  {
    $geoNear: {
      near: { type: "Point", coordinates: [45.07456, 7.69463] },
      distanceField: "distance",
      spherical: true,
      query: { free_bikes: { $gt: 0 } }
    }
  }
]);
```

```

    }
  },
  {
    $project: {
      name: 1,
      free_bikes: 1,
      _id: 0
    }
  },
  {
    $limit: 3
  }
]);

```

Risposta:

```

[
  { free_bikes: 5, name: 'Palermo 2' },
  { free_bikes: 5, name: 'Castello 1' },
  { free_bikes: 4, name: 'San Francesco da Paola' }
]

```

## Domanda 12:

Query:

```

db.BikeStations.aggregate([
  {
    $match: { "name": "Politecnico 4" }
  },
  {
    $project: {
      location: 1
    }
  },
  {
    $lookup: {
      from: "BikeStations",
      let: { politecnico_coordinates: "$location.coordinates" },
      pipeline: [
        {
          $geoNear: {
            near: { type: "Point", coordinates: "$$politecnico_coordinates" },
            distanceField: "distance",
            spherical: true,
            query: { free_bikes: { $gt: 0 } }
          }
        }
      ]
    }
  }
]);

```



```

    },
    {
      $project: {
        name: 1,
        free_bikes: 1,
        _id: 0
      }
    },
    {
      $limit: 3
    }
  ],
  as: "nearby"
}
},
{
  $unwind: "$nearby"
},
{
  $replaceRoot: { newRoot: "$nearby" }
}
])

```

Risposta:

```

[
  { free_bikes: 9, name: 'Politecnico 1' },
  { free_bikes: 5, name: 'Politecnico 3' },
  { free_bikes: 3, name: 'Tribunale' }
]

```