QUADERNO 4

```
// Domanda 1
db.bikeStations.aggregate([
  {
      $group: {
          _id: "$extra.status",
          count: { $sum: 1 }
      }
  },
  {
      $match: {
          _id: { $in: ["online", "offline"] }
      }
  }
]);

// Risposta:
{
  _id: 'offline',
  count: 28
}
{
  _id: 'online',
  count: 33
}


// Domanda 2
db.bikeStations.aggregate([
  {
      $match: {
          "extra.status": { $nin: ["online", "offline"] }
      }
  },
  {
      $count: "stations_with_other_status"
  }
]);

// Risposta:
{
  stations_with_other_status: 4
}


// Domanda 3
db.bikeStations.find(
  { "extra.status": { $nin: ["online", "offline"] } },
  { "extra.status": 1, _id: 0 }
```

```
);

//Risposta:
{
  extra: {
    status: 'maintenance'
  }
}
{
  extra: {
    status: 'maintenance'
  }
}
{
  extra: {
    status: 'maintenance'
  }
}
{
  extra: {
    status: 'maintenance'
  }
}


// Domanda 4
db.bikeStations.find(
  { "extra.status": "online", "extra.score": { $gte: 4 } },
  { 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
db.bikeStations.find(
  {
      "extra.status": "offline",
      $or: [
          { empty_slots: { $gt: 0 } },
          { free_bikes: { $gt: 0 } }
      ]
  },
  { name: 1, empty_slots: 1, free_bikes: 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
db.bikeStations.aggregate([
    {
        $group: {
            _id: null,
            total_reviews: { $sum: "$extra.reviews" }
        }
    }
]);

// Risposta:
{
  _id: null,
  total_reviews: 15311
}

// Domanda 7
db.bikeStations.aggregate([
    {
        $group: {
            _id: "$extra.score",
            station_count: { $sum: 1 }
        }
    },
    {
        $sort: { _id: -1 }
    }
]);

// Risposta:
{
  _id: 4.7,
  station_count: 1
}
{
  _id: 4.5,
  station_count: 2
}
{
```

```
    _id: 4.4,
    station_count: 2
  }
  {
    _id: 4.3,
    station_count: 2
  }
  {
    _id: 4.2,
    station_count: 7
  }
  {
    _id: 4.1,
    station_count: 5
  }
  {
    _id: 4,
    station_count: 9
  }
  {
    _id: 3.9,
    station_count: 9
  }
  {
    _id: 3.8,
    station_count: 1
  }
  {
    _id: 3.7,
    station_count: 2
  }
  {
    _id: 3.6,
    station_count: 1
  }
  {
    _id: 3.5,
    station_count: 4
  }
  {
_id: 3.4,
station_count: 3
  }
  {
    _id: 3.2,
    station_count: 1
  }
  {
    _id: 3,
    station_count: 4
```

```
}
{
  _id: 2.8,
  station_count: 2
}
{
_id: 2.7,
station_count: 1
}
{
  _id: 2.5,
  station_count: 1
}
{
  _id: 2.4,
  station_count: 1
}
{
  _id: 2.1,
  station_count: 1
}


// Domanda 8
db.bikeStations.aggregate([
  {
      $match: { "extra.status": { $in: ["online", "offline"] } }
  },
  {
      $group: {
          _id: "$extra.status",
          average_score: { $avg: "$extra.score" }
      }
  }
]);

// Risposta:
{
  _id: 'online',
  average_score: 3.8454545454545452
}
{
  _id: 'offline',
  average_score: 3.0285714285714285
}

// Domanda 9 (non ho usato mapReduce in quanto non lo conoscevo abbastanza e non ho
trovato documentazione utile al suo utilizzo)
db.bikeStations.aggregate([
  {
      $group: {
```

```
            _id: {
                has_bikes: { $gt: ["$free_bikes", 0] } // true: con bici, false:
senza bici (spacca nei 2 casi)
            },
            average_score: { $avg: "$extra.score" } // calcolo media
        }
    },
    {
        $project: { // uso project per migliore leggibilità dei risultati dei 2 casi
(con relativa media)
            _id: 0,
            has_bikes: { $cond: ["$_id.has_bikes", "with_bikes", "no_bikes"] },
            average_score: 1
        }
    }
]);

// Risposta:
{
    average_score: 3.2305555555555556,
    has_bikes: 'no_bikes'
}
{
    average_score: 3.8758620689655174,
    has_bikes: 'with_bikes'
}

// Domanda 10
db.bikeStations.aggregate([
    {
        $match: {
            "extra.status": "online" // Considera solo le stazioni attive
        }
    },
    {
        $group: {
            _id: {
                has_bikes: { $gt: ["$free_bikes", 0] } // true: con bici, false:
senza bici
            },
            average_score: { $avg: "$extra.score" }
        }
    },
    {
        $project: { // guarda commento sopra (domanda 9)
            _id: 0,
            has_bikes: { $cond: ["$_id.has_bikes", "with_bikes_online",
"no_bikes_online"] },
            average_score: 1
        }
```

```
  }
]);

// Risposta:
{
  average_score: 3.8642857142857143,
  has_bikes: 'with_bikes_online'
}
{
  average_score: 3.7399999999999998,
  has_bikes: 'no_bikes_online'
}

// Domanda 11
// creazione indice location (per usare $near)
db.bikeStations.createIndex({ location: "2dsphere" });
// query
db.bikeStations.find(
  {
    free_bikes: { $gt: 0 },
    location: {
      $near: { // operatore near per calcolo distanza rispetto alle coordinate
        $geometry: { type: "Point", coordinates: [45.07456, 7.69463] }
      }
    }
  },
  { name: 1, free_bikes: 1, _id: 0 }
).limit(3); // trovo solo le 3 più vicine

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

// Domanda 12
// calcolo coordinate di Politecnico 4 per riusarle nella query
const politecnico4 = db.bikeStations.findOne(
  { name: "Politecnico 4" },
  { "location.coordinates": 1, _id: 0 }
).location.coordinates;
// query
```

```
db.bikeStations.find(
  {
      free_bikes: { $gt: 0 },
      location: {
          $near: {
              $geometry: { type: "Point", coordinates: politecnico4 }
          }
      }
  },
  { name: 1, free_bikes: 1, _id: 0 }
).limit(3);

// Risposta:
{
  free_bikes: 9,
  name: 'Politecnico 1'
}
{
  free_bikes: 5,
  name: 'Politecnico 3'
}
{
  free_bikes: 3,
  name: 'Tribunale'
}
```