**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: { 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' }

]