TP3 - NOSQL MONGODB RESTAURANT INSPECTIONS

Manon GARDIN

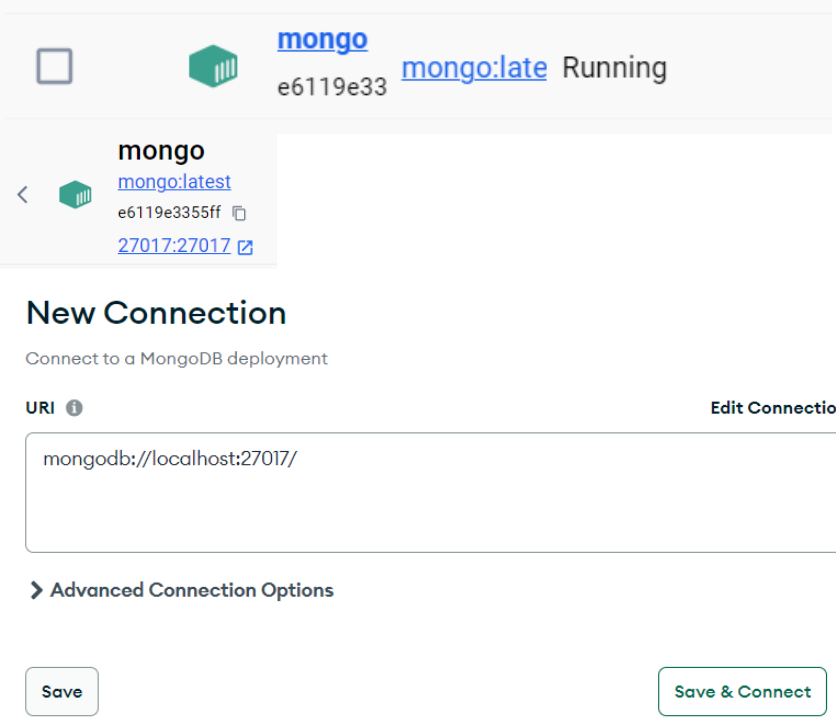
Matias OTTENSEN

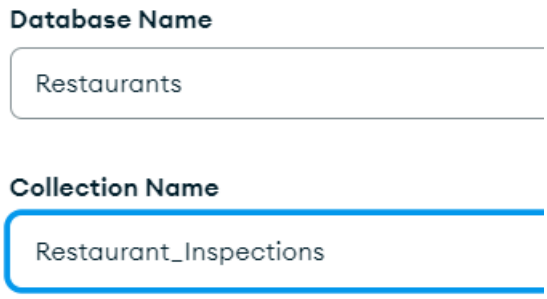
Alexandre GARNIER

Tiphaine KACHKACHI

Create the Database

After running our container for MongoDb we can connect ourselves to mongodbCompass (or in the mongodb CLI)





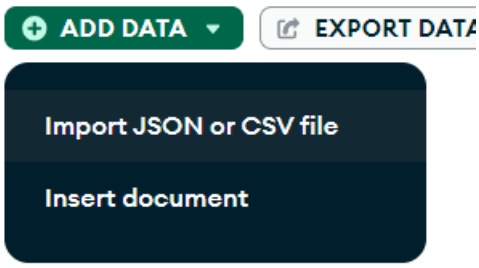
If we were to do it using the Cli of mongodb we could do

```
mongosh mongodb://127.0.0.
Please enter a MongoDB connection string (Default: mongodb://localhost/): 27017
27017
Current Mongosh Log ID: 65c81baafdd9ccf499c9e8be
Connecting to:          mongodb://127.0.0.1:27017/27017?directConnection=true&serve
osh+2.1.4
Using MongoDB:          7.0.5
Using Mongosh:          2.1.4
```

To connect ourselves to the database

Import the data

To import our data we can directly use the button :



All objects were added to our database !

```
_id: ObjectId('65d267870ef262c0d3336919')
address : Object
borough : "Bronx"
cuisine : "Bakery"
grades : Array (5)
name : "Morris Park Bake Shop"
restaurant_id : "30075445"
```

```
_id: ObjectId('65d267870ef262c0d333691a')
address : Object
```

Queries

Since our dataset is a difficult one, we are going to do 8 easy queries, 1 complex and 1 hard.

Easy Queries

Query 1 : To find all Bakery restaurants

In the filter section :

{cuisine: 'Bakery'}

Filter {cuisine: 'Bakery'} Generate query Explain Reset Find Options

Results :

```
_id: ObjectId('65d267870ef262c0d3336919')
▸ address : Object
borough : "Bronx"
cuisine : "Bakery"
▸ grades : Array (5)
name : "Morris Park Bake Shop"
restaurant_id : "30075445"
```

```
▸ _id: ObjectId('65d267870ef262c0d333693b')
▸ address : Object
borough : "Manhattan"
cuisine : "Bakery"
▸ grades : Array (5)
name : "Olive'S"
restaurant_id : "40363151"
```

```
_id: ObjectId('65d267870ef262c0d3336a7a')
▸ address : Object
borough : "Brooklyn"
cuisine : "Bakery"
```

We got 691 results : 121 – 140 of 691

Query 2 : Find all restaurants that are located on Park Avenue in Brooklyn

Filter
```
{
    "address.street": "Park Avenue",
    "borough": "Brooklyn"
}
```

Filter {"address.street": "Park Avenue" }

```
{
  "address.street": "Park Avenue",
  "borough": "Brooklyn"
}
```

Results :

```
_id: ObjectId('65d267870ef262c0d3336c52')
▾ address : Object
    building : "537"
  ▸ coord : Object
    street : "Park Avenue"
    zipcode : "11205"
  borough : "Brooklyn"
  cuisine : "Spanish"
▸ grades : Array (5)
  name : "Charle'S Corner Restaurant & Deli"
  restaurant_id : "40392285"
```

```
▸ _id: ObjectId('65d267880ef262c0d3338170')
▸ address : Object
  borough : "Brooklyn"
  cuisine : "American "
```

We had few results :

1 – 4 of 4

Query 3 : To find all restaurants who have been graded at least 6 times

To do so we can do an aggregation :

```
[{
   $match: {
     $expr: { $gte: [{ $size: "$grades" }, 6] }
   }
}]
```

The $match is trying to find to find items who will be having the following characteristics. $size returns the number of elements in an array. Here we look for the numbers of grades in 'grades' and we want them to be equal of higher than 6. We do that with $gte which stands for 'greater than or equal' operator.

```
[{
    $match: {
      $expr: { $gte: [{ $size: "$grades" }, 6] }
    }
}]
```

Results (sample displayed) :

PIPELINE OUTPUT

Sample of 10 documents

```
  _id: ObjectId('65d267870ef262c0d3336920')
▸ address : Object
  borough : "Brooklyn"
  cuisine : "Delicatessen"
▸ grades : Array (6)
  name : "Wilken'S Fine Food"
  restaurant_id : "40356483"
```

```
  _id: ObjectId('65d267870ef262c0d3336930')
▸ address : Object
  borough : "Manhattan"
  cuisine : "Chicken"
▸ grades : Array (6)
  name : "Harriet'S Kitchen"
  restaurant_id : "40362098"
```

Query 4 : List all types of Restaurants and how many of them are they, descending order (aggregation)

```
[
  {
    $group: {
      _id: "$cuisine",
      count: { $sum: 1 }
    }
  },
  {
    $sort: { count: -1 }
  }
]
```

```
1  [
2    {
3      $group: {
4        _id: "$cuisine",
5        count: { $sum: 1 }
6      }
7    },
8    {
9      $sort: { count: -1 }
10   }
11 ]
12
```

$group to group the results
We count the numbers of id of cuisine.
$sort : is where we choose the order of display (descending -> -1)

Results (not everything is on the screen) :

PIPELINE OUTPUT

Sample of 20 documents

```
_id: "American "
count : 6181
```

```
_id: "Chinese"
count : 2418
```

```
_id: "Café/Coffee/Tea"
count : 1214
```

```
_id: "Pizza"
count : 1163
```

```
_id: "Italian"
count : 1069
```

Query 5 : Find all restaurants that were graded at least once in 2012

```
{
   "grades": {
     $elemMatch: {
       "date": {
         $gte: new Date("2012-01-01"),
         $lt: new Date("2013-01-01")
       }
     }
   }
 }
```

Filter

```
{
    "grades": {
      $elemMatch: {
        "date": {
          $gte: new Date("2012-01-01"),
          $lt: new Date("2013-01-01")
        }
      }
    }
  }
```

$elemMatch : look for at least one element where …
$gte : greater than and equal to
$lt : less than

Results :

```
▾ 3: Object
    date : 2012-05-08T00:00:00.000+00:00
    grade : "A"
    score : 12
  name : "Wendy'S"
  restaurant_id : "30112340"
```

```
  _id: ObjectId('65d267870ef262c0d333691b')
▸ address : Object
  borough : "Manhattan"
  cuisine : "Irish"
▾ grades : Array (4)
  ▸ 0: Object
  ▸ 1: Object
  ▾ 2: Object
      date : 2012-07-31T00:00:00.000+00:00
      grade : "A"
```

We have a lot of restaurants with a grade from 2012 !

1 – 20 of 15825

Query 6 : Count how many distinct streets there are within a borough. (aggregation)

```
[
  {
    $group: {
      _id: {
        borough: "$borough",
        street: "$address.street"
      }
    }
  },
  {
    $group: {
      _id: "$_id.borough",
      count: { $sum: 1 }
    }
  },
  {
    $sort: { count: -1 }
  }
]
```

```
[
  {
    $group: {
      _id: {
        borough: "$borough",
        street: "$address.street"
      }
    }
  },
  {
    $group: {
      _id: "$_id.borough",
      count: { $sum: 1 }
    }
  },
  {
    $sort: { count: -1 }
  }
]
```

Results :

```
_id: "Manhattan"
count : 1035
```

```
_id: "Brooklyn"
count : 707
```

```
_id: "Queens"
count : 645
```

```
_id: "Bronx"
count : 455
```

```
_id: "Staten Island"
count : 176
```

Query 7 : The restaurant who has the oldest grade (aggregation)

```
[
  {
    $match: {
      "grades.date": { $exists: true, $ne: null }
    }
  },
  {
```

```
    $addFields: {
      oldestGrade: { $min: "$grades.date" }
    }
  },
  {
    $sort: {
      oldestGrade: 1
    }
  },
  {
    $limit: 1
  }
]
```

```
[
  {
    $match: {
      "grades.date": { $exists: true, $ne: null }
    }
  },
  {
    $addFields: {
      oldestGrade: { $min: "$grades.date" }
    }
  },
  {
    $sort: {
      oldestGrade: 1
    }
  },
  {
    $limit: 1
  }
]
```

We only want the ‘older’ restaurant, so we limit our results to one ($limit)

Result :

```
  _id: ObjectId('65d267880ef262c0d3338237')
▸ address : Object
  borough : "Manhattan"
  cuisine : "Latin (Cuban, Dominican, Puerto
            Rican, South & Central American)"
▸ grades : Array (4)
  name : "El Rancho Los Compadres"
  restaurant_id : "41190515"
  oldestGrade : 2010-08-26T00:00:00.000+00:00
```

From 2010 !

Query 8 : The street (and its borough) that holds the most restaurants. (aggregation)

```
[
 {
  $group: {
   _id: { borough: "$borough", street: "$address.street" },
   boroughName: { $first: "$borough" },
   streetName: { $first: "$address.street" },
   count_of_restaurants: { $sum: 1 }
  }
 },
 {
  $sort: { count_of_restaurants: -1 }
 },
 {
  $limit: 1
 }
]
```

```
[
  {
    $group: {
      _id: { borough: "$borough", street: "$address.street" },
      boroughName: { $first: "$borough" },
      streetName: { $first: "$address.street" },
      count_of_restaurants: { $sum: 1 }
    }
  },
  {
    $sort: { count_of_restaurants: -1 }
  },
  {
    $limit: 1
  }
]
```

Result :

```
▸ _id: Object
  boroughName : "Manhattan"
  streetName : "Broadway"
  count_of_restaurants : 615
```

Complex Query

Query : List of restaurants that had a good first review and a 'bad' last one

```
[
  {
    $unwind: "$grades"
  },
  {
    $group: {
      _id: "$_id",
      name: { $first: "$name" },
      initialGrade: { $first: "$grades.grade" },
      initialDate: { $min: "$grades.date" },
      latestGrade: { $last: "$grades.grade" },
      latestDate: { $max: "$grades.date" }
    }
  },
  {
    $match: {
      $expr: {
        $and: [
          { $eq: ["$initialGrade", "A"] },
          { $in: ["$latestGrade", ["B", "C"]] }
        ]
      }
    }
  }
]
```


```
[
  {
    $unwind: "$grades"
  },
  {
    $group: {
      _id: "$_id",
      name: { $first: "$name" },
      initialGrade: { $first: "$grades.grade" },
      initialDate: { $min: "$grades.date" },
      latestGrade: { $last: "$grades.grade" },
      latestDate: { $max: "$grades.date" }
    }
  },
  {
    $match: {
      $expr: {
        $and: [
          { $eq: ["$initialGrade", "A"] },
          { $in: ["$latestGrade", ["B", "C"]] }
        ]
      }
    }
  }
]
```

PIPELINE OUTPUT

Sample of 20 documents

```
_id: ObjectId('65d2678b0ef262c0d333b6c0')
name : "Port Authority Food Court"
initialGrade : "A"
initialDate : 2013-09-24T00:00:00.000+00:00
latestGrade : "B"
latestDate : 2014-08-15T00:00:00.000+00:00
```

```
_id: ObjectId('65d2678a0ef262c0d33394ba')
name : "Traif"
initialGrade : "A"
initialDate : 2011-09-22T00:00:00.000+00:00
latestGrade : "B"
latestDate : 2014-01-08T00:00:00.000+00:00
```

```
_id: ObjectId('65d2678a0ef262c0d333981b')
name : "Fried Dumpling Jie Jie Sheng"
initialGrade : "A"
initialDate : 2011-08-11T00:00:00.000+00:00
```

Hard Query

Query : The name and number of grades attributed to restaurants, order by the worst graded restaurants ever (aggregation) !

```
[{
   $unwind: "$grades"
  },
  {
    $group: {
      _id: "$_id",
      name: { $first: "$name" },
      numA: { $sum: { $cond: [{ $eq: ["$grades.grade", "A"] }, 1, 0] } },
      numB: { $sum: { $cond: [{ $eq: ["$grades.grade", "B"] }, 1, 0] } },
      numC: { $sum: { $cond: [{ $eq: ["$grades.grade", "C"] }, 1, 0] } }
    }
  },
 {
    $sort: {
      numC: -1,
      numB: -1,
      numA: -1

    }
  }
]
```

```
[{
      $unwind: "$grades"
    },
    {
      $group: {
        _id: "$_id",
        name: { $first: "$name" },
        numA: { $sum: { $cond: [{ $eq: ["$grades.grade", "A"] }, 1, 0] } },
        numB: { $sum: { $cond: [{ $eq: ["$grades.grade", "B"] }, 1, 0] } },
        numC: { $sum: { $cond: [{ $eq: ["$grades.grade", "C"] }, 1, 0] } }
      }
    },
   {
      $sort: {
        numC: -1,
        numB: -1,
        numA: -1

      }
    }
  ]


```

Results :

PIPELINE OUTPUT OUTPUT O

Sample of 20 documents

```
_id: ObjectId('65d2678a0ef262c0d3339fe1')
name : "Red Chopstick"
numA : 0
numB : 0
numC : 6
```

```
_id: ObjectId('65d267890ef262c0d33391a2')
name : "Bella Vita"
numA : 0
numB : 3
numC : 4
```

```
_id: ObjectId('65d267890ef262c0d333939a')
name : "Amici 36"
numA : 2
numB : 1
numC : 4
```

How is Chopstick still in business ?