

INF551 LAB: MongoDB

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1.

Query:

```
db.primer.find({"address.street":{"$in":["/south/i,/north/i"]},"name":1,"_id":0,"address.street":1}).sort({name:1}).limit(10)
```

Result:

```
{ "address" : { "street" : "7 Avenue South" }, "name" : "002 Mercury Tacos Llc" }
{ "address" : { "street" : "South      2 Street" }, "name" : "1 Or 8" }
{ "address" : { "street" : "Northern Boulevard" }, "name" : "1.5 Galbi Corp" }
{ "address" : { "street" : "North      7 Street" }, "name" : "16 Handles" }
{ "address" : { "street" : "Northern Boulevard" }, "name" : "1962 Sogongdong Sontofu" }
{ "address" : { "street" : "Park Avenue South" }, "name" : "201 Bar And Restaurant" }
{ "address" : { "street" : "Park Avenue South" }, "name" : "201 Bar And Restaurant" }
{ "address" : { "street" : "Southern Boulevard" }, "name" : "4D" }
{ "address" : { "street" : "South Avenue" }, "name" : "Above Ballroom" }
{ "address" : { "street" : "South Avenue" }, "name" : "Above Rooftop" }
```

2.

Query:

```
db.primer.find({"grades":{"$elemMatch":{"grade":"A","score":{"$gte:20}}}}).count()
```

Result: 5

3.

Query:

```
db.primer.aggregate([{$match:{borough:{"$in":["Brooklyn","Manhattan"]}}},{ $group:{_id:"$cuisine"},{$count:"total"}}])
```

Result:

```
{ "total" : 85 }
```

4.

Query:

```
db.primer.aggregate([{$match:{borough:"Brooklyn"}},{ $group:{_id:"$cuisine",total:{$sum:1}}},{ $sort:{total:-1}},{ $limit:10}])
```

Result:

```
{ "_id" : "American", "total" : 1273 }
{ "_id" : "Chinese", "total" : 763 }
{ "_id" : "Caribbean", "total" : 314 }
{ "_id" : "Pizza", "total" : 296 }
{ "_id" : "Café/Coffee/Tea", "total" : 289 }
{ "_id" : "Other", "total" : 272 }
{ "_id" : "Mexican", "total" : 212 }
```

```
{ "_id" : "Italian", "total" : 192 }
{ "_id" : "Bakery", "total" : 173 }
{ "_id" : "Jewish/Kosher", "total" : 167 }
```

5

Query:

```
db.primer.find({borough:"Brooklyn"}).explain("executionStats")
db.primer.createIndex({borough:1})
db.primer.find({borough:"Brooklyn"}).explain("executionStats")
```

Explanation:

explain() is a diagnostic tools of MongoDB, which outputs information about query execution. Initially, the collection doesn't have an index, and I use explain() to check execution detail, shown below left. Then, I create "borough" as index and use explain again, shown below right. Compared the results of explain(), The executionTimeMillis shows the execution time of query. At first, it takes 12 ms. When created index, it just took 8 ms. That is because index can help save query time. Besides, there is a different in totalDocsExamined. It checked 25359 documents, which are all documents in the collection. While it only checked 6086 times.

```
{
  "queryPlanner" : {
    "plannerVersion" : 1,
    "namespace" : "restaurant.primer",
    "indexFilterSet" : false,
    "parsedQuery" : {
      "borough" : {
        "$eq" : "Brooklyn"
      }
    },
    "winningPlan" : {
      "stage" : "COLLSCAN",
      "filter" : {
        "borough" : {
          "$eq" : "Brooklyn"
        }
      },
      "direction" : "forward"
    },
    "rejectedPlans" : []
  },
  "executionStats" : {
    "executionSuccess" : true,
    "nReturned" : 6086,
    "executionTimeMillis" : 12,
    "totalKeysExamined" : 0,
    "totalDocsExamined" : 25359,
    "executionStages" : {
      "stage" : "COLLSCAN",
      "filter" : {
        "borough" : {
          "$eq" : "Brooklyn"
        }
      }
    },
    "nReturned" : 6086,
    "executionTimeMillisEstimate" : 0,
    "works" : 25361,
    "advanced" : 6086,
    "needTime" : 19274,
    "needYield" : 0,
    "saveState" : 198,
    "restoreState" : 198,
    "isEOF" : 1,

```

```
{
  "queryPlanner" : {
    "plannerVersion" : 1,
    "namespace" : "restaurant.primer",
    "indexFilterSet" : false,
    "parsedQuery" : {
      "borough" : {
        "$eq" : "Brooklyn"
      }
    },
    "winningPlan" : {
      "stage" : "FETCH",
      "inputStage" : {
        "stage" : "IXSCAN",
        "keyPattern" : {
          "borough" : 1
        },
        "indexName" : "borough_1",
        "isMultiKey" : false,
        "multiKeyPaths" : {
          "borough" : []
        },
        "isUnique" : false,
        "isSparse" : false,
        "isPartial" : false,
        "indexVersion" : 2,
        "direction" : "forward",
        "indexBounds" : {
          "borough" : [
            ["Brooklyn"]
          ]
        }
      },
      "rejectedPlans" : []
    },
    "executionStats" : {
      "executionSuccess" : true,
      "nReturned" : 6086,
      "executionTimeMillis" : 8,
      "totalKeysExamined" : 6086,
      "totalDocsExamined" : 6086,
      "executionStages" : {
        "stage" : "FETCH",
        "nReturned" : 6086,
        "executionTimeMillisEstimate" : 0,
        "works" : 6087,

```

```

        "invalidates" : 0,
        "direction" : "forward",
        "docsExamined" : 25359
      },
      "serverInfo" : {
        "host" : "ip-172-31-43-91",
        "port" : 27017,
        "version" : "4.0.17",
        "gitVersion" :
"0bc918c73390f6e4d6349660e4cd233f5900b69a"
      },
      "ok" : 1
    }
  }
}

```

```

        "advanced" : 6086,
        "needTime" : 0,
        "needYield" : 0,
        "saveState" : 47,
        "restoreState" : 47,
        "isEOF" : 1,
        "invalidates" : 0,
        "docsExamined" : 6086,
        "alreadyHasObj" : 0,
        "inputStage" : {
          "stage" : "IXSCAN",
          "nReturned" : 6086,
          "executionTimeMillisEstimate" :
0,
          "works" : 6087,
          "advanced" : 6086,
          "needTime" : 0,
          "needYield" : 0,
          "saveState" : 47,
          "restoreState" : 47,
          "isEOF" : 1,
          "invalidates" : 0,
          "keyPattern" : {
            "borough" : 1
          },
          "indexName" : "borough_1",
          "isMultiKey" : false,
          "multiKeyPaths" : {
            "borough" : [ ]
          },
          "isUnique" : false,
          "isSparse" : false,
          "isPartial" : false,
          "indexVersion" : 2,
          "direction" : "forward",
          "indexBounds" : {
            "borough" : [
"\Brooklyn\""]
          ]
        },
        "keysExamined" : 6086,
        "seeks" : 1,
        "dupsTested" : 0,
        "dupsDropped" : 0,
        "seenInvalidated" : 0
      }
    },
    "serverInfo" : {
      "host" : "ip-172-31-43-91",
      "port" : 27017,
      "version" : "4.0.17",
      "gitVersion" :
"0bc918c73390f6e4d6349660e4cd233f5900b69a"
    },
    "ok" : 1
  }
}

```

6.

Query:

```
db.primer.update({borough:{$ne:"Manhattan"}},{ $set:{ "status":"open"}},{multi:true})
```

Result:

```
WriteResult({ "nMatched" : 15100, "nUpserted" : 0, "nModified" : 15100 })
```