3

3.1 Query: db.restaurants.find({cuisine: "Chinese", borough: "Queens" }).count()

Result: 728

3.2 Query: db.restaurants.find().sort({"grades.score":-1}).limit(1)

Result: "restaurant\_id" : "40372466", score: 131

3.3 Query: db.restaurants.updateMany({"borough":"Manhattan"}, {$push: {"grades":{"grade":"A", "score": 7, date: ISODate()}}})

Result: { "acknowledged" : true, "matchedCount" : 10259, "modifiedCount" : 10259 }

3.4 Query: db.restaurants.find({"grades.8.score":{$lt:7}}, {"\_id":0, "name":1})

Result: { "name" : "Silver Krust West Indian Restaurant" },

{ "name" : "Pure Food" }

3.5 Query: db.restaurants.find({"cuisine":"Seafood", "grades.grade":"B", "grades.date":{$gt:new Date("2014-02-01"), $lt:new Date("2014-03-01")}},{"\_id":1, "borough":1}).count()

Result: 46

4

4.1

Query: db.restaurants.find({"name":"Glorious food"}).explain("allPlansExecution")

Index: db.restaurants.createIndex({"name":1})

Result: Before creating index: executionTimeMillis: 18, totalDocsExamined: 25359

After creating index: first executionTimeMillis: 9, totalDocsExamined:1; next executionTimeMillis: 0

4.2

Query: db.restaurants.dropIndex("name\_1")

Result: { "nIndexesWas" : 2, "ok" : 1 }

4.3

Query:db.restaurants.find({ restaurant\_id: "41098650" }, { \_id: 0, borough: 1 })

Index:db.restaurants.createIndex({restaurant\_id:1})

Result: Before creating index: executionTimeMillis: 18, totalDocsExamined: 25359

After creating index: first executionTimeMillis: 9, totalDocsExamined:1

4.4

Index: db.restaurants.createIndex({cuisine:1},{partialFilterExpression:{borough:{$eq:"Staten Island"}}})

Result:

db.restaurants.find({ borough: "Staten Island", name: "Bagel Land" }):executionTimeMillis: 19, totalDocsExamined : 25359, stage : "COLLSCAN",

db.restaurants.find({ borough: "Queens", cuisine: "Pizza" }):executionTimeMillis: 19, totalDocsExamined: 25359, stage : "COLLSCAN",

db.restaurants.find({ borough: "Staten Island", cuisine: "American" }):First execution:executionTimeMillis: 9, totalDocsExamined: 244, stage: "FETCH"; next:executionTimeMills:0

4.5

Query: db.restaurants.find({"grades.8.score":{$lt:7}}, {"\_id":0, "name":1})

Index: db.restaurants.createIndex({"grades.8.score":1},{partialFilterExpression:{"grades.8.score":{$lt:7}}})

Results: Before creating index:executionTimeMillis : 101, totalDocsExamined: 25359, stage: "COLLSCAN"

After creating index:db.restaurants.find({"grades.8.score":{$lt:7}}, {"\_id":0, "name":1}): executionTimeMillis: 28, totalDocsExamined : 2, stage: "FETCH"

Sources:

https://docs.mongodb.com/manual/tutorial/query-arrays/,

https://metanit.com/nosql/mongodb/2.4.php