

Lab 12 – NoSQL using MongoDB

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Questions:

Note: For each Question, you are required to write the Query as well as attach a screenshot of the output. Make sure your screenshots include the executed query.

1. Display all students.

```
db.students.find({})
```

```
{ "_id" : ObjectId("673f0e60a3720f36b0fa1da2"), "FirstName" : "Hina", "LastName" : "Baig", "CGPA" : 3.5,
  { "_id" : ObjectId("673f0e60a3720f36b0fa1da3"), "FirstName" : "Karim", "LastName" : "Khan", "CGPA" : 3.2,
  { "_id" : ObjectId("673f0e60a3720f36b0fa1da4"), "FirstName" : "Abid", "LastName" : "Kasim", "CGPA" : 2.9,
  { "_id" : ObjectId("673f0e60a3720f36b0fa1da5"), "FirstName" : "Zainab", "LastName" : "Karim", "CGPA" : 3.1,
  { "_id" : ObjectId("673f0e60a3720f36b0fa1da6"), "FirstName" : "Kumar", "LastName" : "Rani", "CGPA" : 2.8,
  { "_id" : ObjectId("673f0e60a3720f36b0fa1da7"), "FirstName" : "Fahim", "LastName" : "Alam", "CGPA" : 3.7
```

2. Display all the students with CS major.

```
db.students.find({ Major: "CS" })
```

```
,
  { "_id" : ObjectId("673f10ac3435667ae6a2e4e4"), "FirstName" : "Hina", "Last
  { "_id" : ObjectId("673f10ac3435667ae6a2e4e7"), "FirstName" : "Zainab", "L
```

3. Display all the students with SDP major.

```
db.students.find({ Major: "SDP" })
```

```
{ "_id" : ObjectId("673f10ebe86be82b22f63133"), "FirstName" : "Abid", "LastName" : "Kasim", "CGPA" : 2.9, "M
```

4. Display all the students from Karachi City.

```
db.students.find({ "Address.City": "Karachi" })
```

```
{ "_id" : ObjectId("673f11984555bf75a2675222"), "FirstName" : "Karim", "LastName" : "Khan", "CGPA" : 3.2, "Major" : "EE", "Address" : { "Street" :
  { "_id" : ObjectId("673f11984555bf75a2675223"), "FirstName" : "Abid", "LastName" : "Kasim", "CGPA" : 2.9, "Major" : "SDP", "Address" : { "Street" :
  { "_id" : ObjectId("673f11984555bf75a2675224"), "FirstName" : "Zainab", "LastName" : "Karim", "CGPA" : 3.1, "Major" : "CS", "Address" : { "Street"
```

5. Display all the students not from Karachi City.

```
db.students.find({ "Address.City": { $ne: "Karachi" } })
{
  "_id" : ObjectId("673f12896ee128b9287b8679"), "FirstName" : "Hina", "LastName" : "Baig", "CGPA" : 3.5, "Major" : "EE", "Address" : { "Street" : "Off Nishtar Road", "City" : "Karachi" }
}
{
  "_id" : ObjectId("673f12896ee128b9287b867d"), "FirstName" : "Kumar", "LastName" : "Rani", "CGPA" : 2.8, "Major" : "SDP", "Address" : { "Street" : "ST-2, North Nazimabad", "City" : "Karachi" }
}
{
  "_id" : ObjectId("673f12896ee128b9287b867e"), "FirstName" : "Fahim", "LastName" : "Alam", "CGPA" : 3.7, "Major" : "EE", "Address" : { "Street" : "Malik Park Islam", "City" : "Karachi" }
}
```

6. Display all the students having CGPA more than 3.

```
db.students.find({ CGPA: { $gt: 3 } })
{
  "_id" : ObjectId("673f135d8e3a6e653bce8020"), "FirstName" : "Hina", "LastName" : "Baig", "CGPA" : 3.5, "Major" : "EE", "Address" : { "Street" : "Off Nishtar Road", "City" : "Karachi" }
}
{
  "_id" : ObjectId("673f135d8e3a6e653bce8021"), "FirstName" : "Karim", "LastName" : "Khan", "CGPA" : 3.2, "Major" : "SDP", "Address" : { "Street" : "ST-2, North Nazimabad", "City" : "Karachi" }
}
{
  "_id" : ObjectId("673f135d8e3a6e653bce8023"), "FirstName" : "Zainab", "LastName" : "Karim", "CGPA" : 3.1, "Major" : "EE", "Address" : { "Street" : "Malik Park Islam", "City" : "Karachi" }
}
{
  "_id" : ObjectId("673f135d8e3a6e653bce8025"), "FirstName" : "Fahim", "LastName" : "Alam", "CGPA" : 3.7, "Address" : { "Street" : "Malik Park Islam", "City" : "Karachi" }
}
```

7. Display all the students having CGPA equal to 3.5

```
db.students.find({ CGPA: 3.5 })
{
  "_id" : ObjectId("673f13a2d65bda831ab8d663"), "FirstName" : "Hina", "LastName" : "Baig", "CGPA" : 3.5, "Major" : "EE", "Address" : { "Street" : "Off Nishtar Road", "City" : "Karachi" }
}
```

8. Display all the students from Karachi with a CS Major.

```
db.students.find({ "Address.City": "Karachi", Major: "CS" })
{
  "_id" : ObjectId("673f145bda0b174ac5f7284d"), "FirstName" : "Zainab", "LastName" : "Karim", "CGPA" : 3.1, "Major" : "CS", "Address" : { "Street" : "Malik Park Islam", "City" : "Karachi" }
}
```

9. Display all the students for the SDP and EE majors.

```
db.students.find({ Major: { $in: ["SDP", "EE"] } })
{
  "_id" : ObjectId("673f15fcd53877db7a5003c"), "FirstName" : "Karim", "LastName" : "Khan", "CGPA" : 3.2, "Major" : "EE", "Address" : { "Street" : "Off Nishtar Road", "City" : "Karachi" }
}
{
  "_id" : ObjectId("673f15fcd53877db7a5003d"), "FirstName" : "Abid", "LastName" : "Kasim", "CGPA" : 2.9, "Major" : "SDP", "Address" : { "Street" : "ST-2, North Nazimabad", "City" : "Karachi" }
}
{
  "_id" : ObjectId("673f15fcd53877db7a5003f"), "FirstName" : "Kumar", "LastName" : "Rani", "CGPA" : 2.8, "Major" : "EE", "Address" : { "Street" : "Malik Park Islam", "City" : "Karachi" }
}
```

10. Display only the first and last name of all students

Result: FirstName, LastName

```
db.students.find({}, { FirstName: 1, LastName: 1, _id: 0 })
```

```
{ "FirstName" : "Hina", "LastName" : "Baig" }
{ "FirstName" : "Karim", "LastName" : "Khan" }
{ "FirstName" : "Abid", "LastName" : "Kasim" }
{ "FirstName" : "Zainab", "LastName" : "Karim" }
{ "FirstName" : "Kumar", "LastName" : "Rani" }
{ "FirstName" : "Fahim", "LastName" : "Alam" }
```

11. Display only the first name, last name, and city for all students.

Result: FirstName, LastName, City

```
db.students.find({}, { FirstName: 1, LastName: 1, "Address.City": 1, _id: 0 })
{ "FirstName" : "Hina", "LastName" : "Baig", "Address" : { "City" : "Faisalabad" } }
{ "FirstName" : "Karim", "LastName" : "Khan", "Address" : { "City" : "Karachi" } }
{ "FirstName" : "Abid", "LastName" : "Kasim", "Address" : { "City" : "Karachi" } }
{ "FirstName" : "Zainab", "LastName" : "Karim", "Address" : { "City" : "Karachi" } }
{ "FirstName" : "Kumar", "LastName" : "Rani", "Address" : { "City" : "Lahore" } }
{ "FirstName" : "Fahim", "LastName" : "Alam", "Address" : { "City" : "Hunza" } }
```

12. Display only the first name, last name for all the students with CGPA greater than or equal to 3.5 (without Object IDs)

```
db.students.find({ CGPA: { $gte: 3.5 } }, { FirstName: 1, LastName: 1, _id: 0 })
{ "FirstName" : "Hina", "LastName" : "Baig" }
{ "FirstName" : "Fahim", "LastName" : "Alam" }
```

13. Insert a student record with the following information (refer to manual)

```
db.students.insertOne({FirstName: "Fatima", LastName: "Tariq",
                        Phone: "03124567891",
                        Address:{
                            Street: "Zainab Street Saddar",
                            City: "Karachi"
                        }
})
{
  "acknowledged" : true,
  "insertedId" : ObjectId("673f17b7d565aeb1d7c345d9")
}
```

14. Display all the student who do not have major property.

```
db.students.find({ Major: { $exists: false } })
{ "_id" : ObjectId("673f1865896324f19f1ff57a"), "FirstName" : "Fahim", "LastName" : "Alam", "CGPA" : 3.7, "Address" : { "Street" :
◀
```

15. Insert the following students using insertMany (refer to manual)

```
db.students.insertMany([ { FirstName: "Zahid", LastName: "Hakim", Major: "CS" },
  { FirstName: "Ayesha", LastName: "Asif" },
  { FirstName: "Faheem", LastName: "Faiz", Phone: "0213456789" }
])

{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("673f1908d4c63cf7b22b1c6f"),
    ObjectId("673f1908d4c63cf7b22b1c70"),
    ObjectId("673f1908d4c63cf7b22b1c71")
  ]
}
```

16. Display all the students have taken the CS355 course.

```
db.students.find({ "Courses.course_id": "CS355" })
{ "_id" : ObjectId("673f1a382f0a77fec807ab4b"), "FirstName" : "Karim", "LastName" : "Khan", "CGPA" : 3.2, "Major" : "EE", "Address" : { "Street" : " Off Nishter Road", "City" : "
{ "_id" : ObjectId("673f1a382f0a77fec807ab4d"), "FirstName" : "Zainab", "LastName" : "Karim", "CGPA" : 3.1, "Major" : "CS", "Address" : { "Street" : "3-Khalid Centre, Wahdat Road
```

17. Display all the students have not taken the CS355 course.

```
db.students.find({ "Courses.course_id": { $ne: "CS355" } })
{ "_id" : ObjectId("673f1ab9b5d04e9115a489b1"), "FirstName" : "Hina", "LastName" : "Baig", "CGPA" : 3.5, "Major" : "CS", "Address" : { "Street" : "Puran Nagar", "
{ "_id" : ObjectId("673f1ab9b5d04e9115a489b3"), "FirstName" : "Abid", "LastName" : "Kasim", "CGPA" : 2.9, "Major" : "SDP", "Address" : { "Street" : "ST-2, North N
{ "_id" : ObjectId("673f1ab9b5d04e9115a489b5"), "FirstName" : "Kumar", "LastName" : "Rani", "CGPA" : 2.8, "Major" : "EE", "Address" : { "Street" : "Malik Park Isl
{ "_id" : ObjectId("673f1ab9b5d04e9115a489b6"), "FirstName" : "Fahim", "LastName" : "Alam", "CGPA" : 3.7, "Address" : { "Street" : "Wilbert Squares", "City" : "Hu
```

18. Increment the CGPA of all students by 0.1.

```
db.students.updateMany({}, { $inc: { CGPA: 0.1 } })  
{ "acknowledged" : true, "matchedCount" : 6, "modifiedCount" : 6 }
```

19. Set the CGPA of all students to 0.1

```
db.students.updateMany({}, { $set: { CGPA: 0.1 } })  
{ "acknowledged" : true, "matchedCount" : 6, "modifiedCount" : 6 }
```

20. Introduce a new attribute Minor for the students with the value CH

```
db.students.updateMany({}, { $set: { Minor: "CH" } })  
{ "acknowledged" : true, "matchedCount" : 6, "modifiedCount" : 6 }
```

21. Add a new course all students with the following information (refer to manual)

```
db.students.updateMany({}, { $push: { Courses: { courseId: "CH101",  
  courseName: "Liberal Core",  
  credits: 1 } } })  
{ "acknowledged" : true, "matchedCount" : 6, "modifiedCount" : 6 }
```

22. Delete all the students with CGPA less than 3.0

```
db.students.deleteMany({ CGPA: { $lt: 3.0 } })  
{ "acknowledged" : true, "deletedCount" : 2 }
```