DBMS Assignment B2

1. Select all documents where the Designation field has the value "Programmer" and the value of the salary field is greater than 30000.

```
> db.empdb.find({$and:[{Designation:"Programmer"},{Salary:{$gt:30000}}]}).pretty()
{
        "_id" : ObjectId("5fe1115a0b4d2650a1422cdc"),
        "Empid" : 2,
        "Name" : {
                "Fname" : "Dhruvil",
                "Lname" : "Shah"
        },
        "Company_Name" : "VM ware",
        "Salary" : 65000,
        "Designation" : "Programmer",
        "Age" : 20,
        "Expertise" : [
                "mongoDB",
                "python",
                "scala"
        ],
        "DOB" : ISODate("2000-03-28T00:00:00Z"),
        "Email_id" : "dhruvilshah@gmail.com",
        "Contact" : "2222222222",
        "Address" : {
                "city" : "auragabad",
                "Pincode" : "434323"
        }
```

```
}
{
    "_id" : ObjectId("5fe1115b0b4d2650a1422ce1"),
    "Empid" : 7,
    "Name" : {
        "Fname" : "Vikas",
        "Lname" : "Gupta"
    },
    "Company_Name" : "IBM",
    "Salary" : 35000,
    "Designation" : "Programmer",
    "Age" : 30,
    "Expertise" : [
        "mongoDB",
        "Mysql",
        "Cassandra"
    ],
    "DOB" : ISODate("1990-04-22T00:00:00Z"),
    "Email_id" : "vikasgupta@gmail.com",
    "Contact" : "7777777777",
    "Address" : {
        "city" : "indore",
        "Pincode" : "453434"
    }
}
```


2. Creates a new document if no document in the employee collection contains

```
>db.empdb.update({Designation:"Tester",Company_Name:"TCS",Age:20},{Designation:"Tester",
Company_Name:"TCS",Salary:50000,Age:25,Expertise:["JAVA","C#"]},{upsert:true})
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
```

3. Selects all documents in the collection where the field age has a value less than 30 or the value of the salary field is greater than 40000.

```
> db.empdb.find({$or:[{Age:{$lt:30}},{Salary:{$gt:40000}}]}).pretty()
{
        "_id" : ObjectId("5fe1115a0b4d2650a1422cdc"),
        "Empid" : 2,
        "Name" : {
                "Fname" : "Dhruvil",
                "Lname" : "Shah"
        },
        "Company_Name" : "VM ware",
        "Salary" : 65000,
        "Designation" : "Programmer",
        "Age" : 20,
        "Expertise" : [
                "mongoDB",
                "python",
                "scala"
        ],
        "DOB" : ISODate("2000-03-28T00:00:00Z"),
        "Email_id" : "dhruvilshah@gmail.com",
        "Contact" : "2222222222",
        "Address" : {
                "city" : "auragabad",
                "Pincode" : "434323"
        }
}
{
        "_id" : ObjectId("5fe1115a0b4d2650a1422cdd"),
```

```
        "Empid" : 3,
        "Name" : {
                "Fname" : "Gaurav",
                "Lname" : "Verma"
        },
        "Company_Name" : "Infosys",
        "Salary" : 45000,
        "Designation" : "Designer",
        "Age" : 20,
        "Expertise" : [
                "Mysql",
                "R language",
                "UI/UX"
        ],
        "DOB" : ISODate("2000-03-09T00:00:00Z"),
        "Email_id" : "gauravverma@gmail.com",
        "Contact" : "3333333333",
        "Address" : {
                "city" : "mumbai",
                "Pincode" : "343243"
        }
}
{
        "_id" : ObjectId("5fe1115b0b4d2650a1422cdf"),
        "Designation" : "Tester",
        "Company_Name" : "TCS",
        "Salary" : 52000,
        "Age" : 25,
        "Expertise" : [
```

```
            "JAVA",
            "C#"
        ]
    }
    {
        "_id" : ObjectId("5fe1115b0b4d2650a1422ce0"),
        "Empid" : 6,
        "Name" : {
            "Fname" : "Pooja",
            "Lname" : "Patel"
        },
        "Company_Name" : "GB lab",
        "Salary" : 20000,
        "Designation" : "Tester",
        "Age" : 22,
        "Expertise" : [
            "Cpp",
            "mongoDB",
            "Cloud"
        ],
        "DOB" : ISODate("1998-05-23T00:00:00Z"),
        "Email_id" : "poojapatel@gmail.com",
        "Contact" : "6666666666",
        "Address" : {
            "city" : "banglore",
            "Pincode" : "545343"
        }
    }
    {
```

```
        "_id" : ObjectId("5fe1115b0b4d2650a1422ce2"),
        "Empid" : 8,
        "Name" : {
                "Fname" : "Gita",
                "Lname" : "Rao"
        },
        "Company_Name" : "TCS",
        "Salary" : 70000,
        "Designation" : "Designer",
        "Age" : 41,
        "Expertise" : [
                "Sqlite",
                "R language",
                "JavaScript"
        ],
        "DOB" : ISODate("1969-05-24T00:00:00Z"),
        "Email_id" : "gitarao@gmail.com",
        "Contact" : "8888888888",
        "Address" : {
                "city" : "Gaya",
                "Pincode" : "654343"
        }
}
{
        "_id" : ObjectId("5fe117be0b4d2650a1422ce4"),
        "Empid" : 1,
        "Name" : {
                "Fname" : "Shreyas",
                "Lname" : "Chaudhari"
```

```
        },
        "Company_Name" : "Nvidia",
        "Salary" : 50000,
        "Designation" : "Developer",
        "Age" : 20,
        "Expertise" : [
            "mongoDB",
            "MySQL",
            "Java"
        ],
        "DOB" : ISODate("2000-06-09T00:00:00Z"),
        "Email_id" : "chaudharishreyas21@gmail.com",
        "Contact" : "1111111111",
        "Address" : {
            "city" : "pune",
            "Pincode" : "411001"
        }
}
{
        "_id" : ObjectId("5fe117c30b4d2650a1422ce6"),
        "Empid" : 4,
        "Name" : {
            "Fname" : "Sudesh",
            "Lname" : "Pawar"
        },
        "Company_Name" : "capgemini",
        "Salary" : 60000,
        "Designation" : "Developer",
        "Age" : 21,
```

```
        "Expertise" : [
                "JavaScript",
                "YACC",
                "DSA"
        ],
        "DOB" : ISODate("1999-11-29T00:00:00Z"),
        "Email_id" : "sudeshpawar@gmail.com",
        "Contact" : "4444444444",
        "Address" : {
                "city" : "nagpur",
                "Pincode" : "656444"
        }
}
```


4. Matches all documents where the value of the field Address is an embedded document that contains only the field city with the value "Pune" and the field Pin_code with the value "411001".

```
> db.empdb.aggregate([{$match:{$and:[{"Address.city":"pune"},{"Address.Pincode":"411001"}]}}]).pretty()
{
        "_id" : ObjectId("5fe117be0b4d2650a1422ce4"),
        "Empid" : 1,
        "Name" : {
                "Fname" : "Shreyas",
                "Lname" : "Chaudhari"
        },
        "Company_Name" : "Nvidia",
        "Salary" : 50000,
        "Designation" : "Developer",
        "Age" : 20,
```

```
        "Expertise" : [
                "mongoDB",
                "MySQL",
                "Java"
        ],
        "DOB" : ISODate("2000-06-09T00:00:00Z"),
        "Email_id" : "chaudharishreyas21@gmail.com",
        "Contact" : "1111111111",
        "Address" : {
                "city" : "pune",
                "Pincode" : "411001"
        }
}
```

5. Finds all documents with Company_name: "TCS" and modifies their salary field by 2000.

```
> db.empdb.update({Company_Name:"TCS"},{$inc:{Salary:2000}})
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
```

6. Find documents where Designation is not equal to "Developer".

```
> db.empdb.find({Designation:{$ne:"Developer"}}).pretty()
{
        "_id" : ObjectId("5fe1115a0b4d2650a1422cdc"),
        "Empid" : 2,
        "Name" : {
                "Fname" : "Dhruvil",
                "Lname" : "Shah"
        },
        "Company_Name" : "VM ware",
        "Salary" : 65000,
        "Designation" : "Programmer",
        "Age" : 20,
        "Expertise" : [
                "mongoDB",
                "python",
                "scala"
        ],
        "DOB" : ISODate("2000-03-28T00:00:00Z"),
        "Email_id" : "dhruvilshah@gmail.com",
```

```
    "Contact" : "2222222222",
    "Address" : {
        "city" : "auragabad",
        "Pincode" : "434323"
    }
}
{
    "_id" : ObjectId("5fe1115a0b4d2650a1422cdd"),
    "Empid" : 3,
    "Name" : {
        "Fname" : "Gaurav",
        "Lname" : "Verma"
    },
    "Company_Name" : "Infosys",
    "Salary" : 45000,
    "Designation" : "Designer",
    "Age" : 20,
    "Expertise" : [
        "Mysql",
        "R language",
        "UI/UX"
    ],
    "DOB" : ISODate("2000-03-09T00:00:00Z"),
    "Email_id" : "gauravverma@gmail.com",
    "Contact" : "3333333333",
    "Address" : {
        "city" : "mumbai",
        "Pincode" : "343243"
    }
}
{
    "_id" : ObjectId("5fe1115b0b4d2650a1422cdf"),
    "Designation" : "Tester",
    "Company_Name" : "TCS",
    "Salary" : 52000,
    "Age" : 25,
    "Expertise" : [
        "JAVA",
        "C#"
    ]
}
{
    "_id" : ObjectId("5fe1115b0b4d2650a1422ce0"),
    "Empid" : 6,
```

```
        "Name" : {
                "Fname" : "Pooja",
                "Lname" : "Patel"
        },
        "Company_Name" : "GB lab",
        "Salary" : 20000,
        "Designation" : "Tester",
        "Age" : 22,
        "Expertise" : [
                "Cpp",
                "mongoDB",
                "Cloud"
        ],
        "DOB" : ISODate("1998-05-23T00:00:00Z"),
        "Email_id" : "poojapatel@gmail.com",
        "Contact" : "6666666666",
        "Address" : {
                "city" : "banglore",
                "Pincode" : "545343"
        }
}
{
        "_id" : ObjectId("5fe1115b0b4d2650a1422ce1"),
        "Empid" : 7,
        "Name" : {
                "Fname" : "Vikas",
                "Lname" : "Gupta"
        },
        "Company_Name" : "IBM",
        "Salary" : 35000,
        "Designation" : "Programmer",
        "Age" : 30,
        "Expertise" : [
                "mongoDB",
                "Mysql",
                "Cassandra"
        ],
        "DOB" : ISODate("1990-04-22T00:00:00Z"),
        "Email_id" : "vikasgupta@gmail.com",
        "Contact" : "7777777777",
        "Address" : {
                "city" : "indore",
                "Pincode" : "453434"
        }
```

```
}
{
        "_id" : ObjectId("5fe1115b0b4d2650a1422ce2"),
        "Empid" : 8,
        "Name" : {
                "Fname" : "Gita",
                "Lname" : "Rao"
        },
        "Company_Name" : "TCS",
        "Salary" : 70000,
        "Designation" : "Designer",
        "Age" : 41,
        "Expertise" : [
                "Sqlite",
                "R language",
                "JavaScript"
        ],
        "DOB" : ISODate("1969-05-24T00:00:00Z"),
        "Email_id" : "gitarao@gmail.com",
        "Contact" : "8888888888",
        "Address" : {
                "city" : "Gaya",
                "Pincode" : "654343"
        }
}
```

7. Find _id, Designation, Address and Name from all documents where Company_name is "Infosys".

```
> db.empdb.find({Company_Name:"Infosys"},{_id:1,Designation:1,Address:1,Name:1}).pretty()
{
        "_id" : ObjectId("5fe1115a0b4d2650a1422cdd"),
        "Name" : {
                "Fname" : "Gaurav",
                "Lname" : "Verma"
        },
        "Designation" : "Designer",
        "Address" : {
                "city" : "mumbai",
                "Pincode" : "343243"
        }
}
```

8. Selects all documents in the employee collection where the value of the Designation is either "Developer" or "Tester".

```
> db.empdb.find({$or:[{Designation:"Developer"},{Designation:"Tester"}]}).pretty()
{
```

```
    "_id" : ObjectId("5fe1115b0b4d2650a1422cdf"),
    "Designation" : "Tester",
    "Company_Name" : "TCS",
    "Salary" : 52000,
    "Age" : 25,
    "Expertise" : [
        "JAVA",
        "C#"
    ]
}
{
    "_id" : ObjectId("5fe1115b0b4d2650a1422ce0"),
    "Empid" : 6,
    "Name" : {
        "Fname" : "Pooja",
        "Lname" : "Patel"
    },
    "Company_Name" : "GB lab",
    "Salary" : 20000,
    "Designation" : "Tester",
    "Age" : 22,
    "Expertise" : [
        "Cpp",
        "mongoDB",
        "Cloud"
    ],
    "DOB" : ISODate("1998-05-23T00:00:00Z"),
    "Email_id" : "poojapatel@gmail.com",
    "Contact" : "6666666666",
    "Address" : {
        "city" : "banglore",
        "Pincode" : "545343"
    }
}
{
    "_id" : ObjectId("5fe117be0b4d2650a1422ce4"),
    "Empid" : 1,
    "Name" : {
        "Fname" : "Shreyas",
        "Lname" : "Chaudhari"
    },
    "Company_Name" : "Nvidia",
    "Salary" : 50000,
    "Designation" : "Developer",
```

```
        "Age" : 20,
        "Expertise" : [
                "mongoDB",
                "MySQL",
                "Java"
        ],
        "DOB" : ISODate("2000-06-09T00:00:00Z"),
        "Email_id" : "chaudharishreyas21@gmail.com",
        "Contact" : "1111111111",
        "Address" : {
                "city" : "pune",
                "Pincode" : "411001"
        }
}
{
        "_id" : ObjectId("5fe117c30b4d2650a1422ce6"),
        "Empid" : 4,
        "Name" : {
                "Fname" : "Sudesh",
                "Lname" : "Pawar"
        },
        "Company_Name" : "capgemini",
        "Salary" : 60000,
        "Designation" : "Developer",
        "Age" : 21,
        "Expertise" : [
                "JavaScript",
                "YACC",
                "DSA"
        ],
        "DOB" : ISODate("1999-11-29T00:00:00Z"),
        "Email_id" : "sudeshpawar@gmail.com",
        "Contact" : "4444444444",
        "Address" : {
                "city" : "nagpur",
                "Pincode" : "656444"
        }
}
```

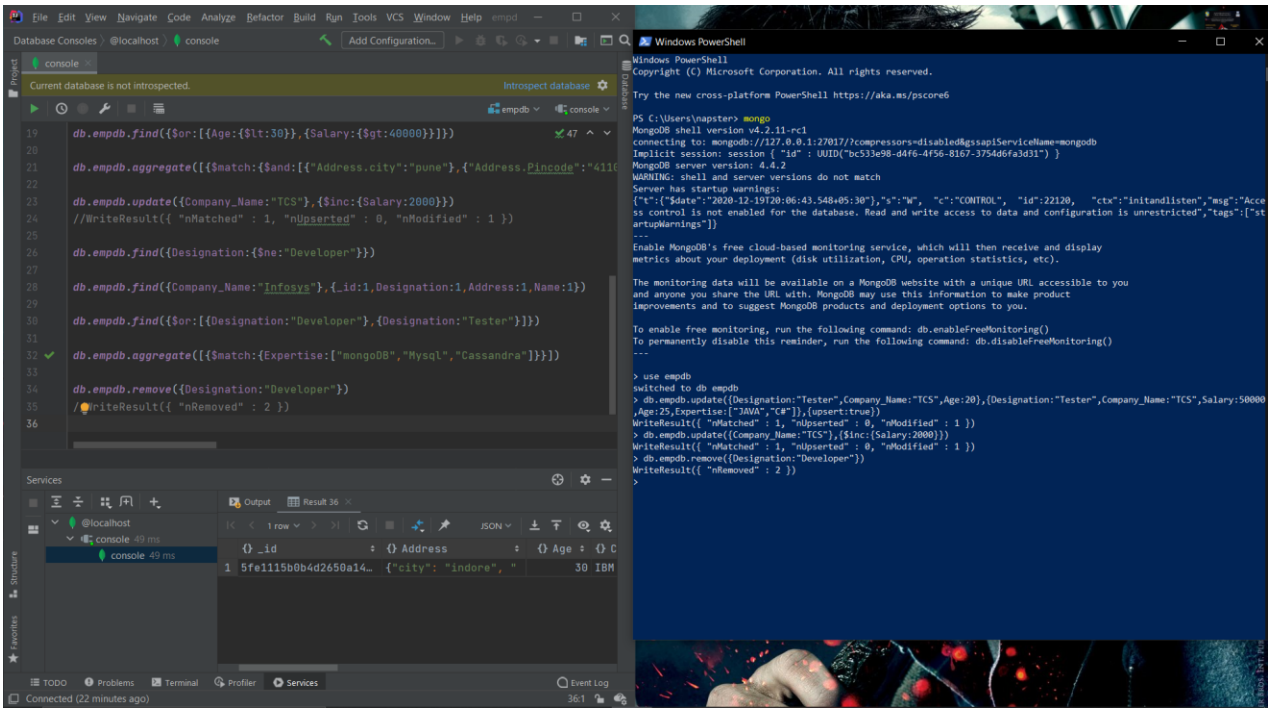

9. Find all document with Exact Match on an Array having Expertise: ['Mongodb','Mysql', 'Cassandra']

```
> db.empdb.aggregate([{$match:{Expertise:["mongoDB","Mysql","Cassandra"]}}]).pretty()
{
        "_id" : ObjectId("5fe1115b0b4d2650a1422ce1"),
        "Empid" : 7,
```

```
    "Name" : {
        "Fname" : "Vikas",
        "Lname" : "Gupta"
    },
    "Company_Name" : "IBM",
    "Salary" : 35000,
    "Designation" : "Programmer",
    "Age" : 30,
    "Expertise" : [
        "mongoDB",
        "Mysql",
        "Cassandra"
    ],
    "DOB" : ISODate("1990-04-22T00:00:00Z"),
    "Email_id" : "vikasgupta@gmail.com",
    "Contact" : "7777777777",
    "Address" : {
        "city" : "indore",
        "Pincode" : "453434"
    }
}
```

10. Drop Single documents where designation="Developer"

```
> db.empdb.remove({Designation:"Developer"})
WriteResult({ "nRemoved" : 2 })
```



MES College of Engineering Pune-01

Department of Computer Engineering

Name of Student: Dhruvil Shah	**Class: TE Comp 1**
Semester/Year: 5th/2020	**Roll No: 047**
Date of Performance:	**Date of Submission:**
Examined By:	**Experiment No: Part B-02**

GROUP: B ASSIGNMENT NO: 02

AIM:

A. Design and Develop MongoDB Queries using CRUD operations. (Use CRUD operations, SAVE method, logical operators).

B. Design and Implement any 5 query using MongoDB.

C. Create simple objects and array objects using JSON.

OBJECTIVES:

- To develop basic, intermediate and advanced Database programming skills.
- To develop basic Database administration skill.

APPRATUS:

- Operating System recommended: 64-bit Open source Linux or its derivative
- Front End: Java/PHP/Python
- Backend: MongDB

IMPLEMENTATION:

A. Create Empdb database

B. Create Employee collection by considering following Fields:

i. Empid: Number
ii. Name: Embedded Doc (FName, LName)
iii. Company Name: String
iv. Salary: Number
v. Designation: String
vi. Age: Number
vii. Expertise: Array
viii. DOB: String or Date
ix. Email id: String
x. Contact: String

xi. Address: Array of Embedded Doc (PAddr, LAddr)

C. Insert at least 10 documents in Employee Collection and execute following statements:

1. Select all documents where the Designation field has the value "Programmer" and the value of the salary field is greater than 30000.
2. Creates a new document if no document in the employee collection contains
3. {Designation: "Tester", Company_name: "TCS", Age: 25}
4. Selects all documents in the collection where the field age has a value less than 30 or the value of the salary field is greater than 40000.
5. Matches all documents where the value of the field Address is an embedded document that contains only the field city with the value "Pune" and the field Pin_code with the value "411001".
6. Finds all documents with Company_name: "TCS" and modifies their salary field by 2000.
7. Find documents where Designation is not equal to "Developer".
8. Find _id, Designation, Address and Name from all documents where Company_name is "Infosys".
9. Selects all documents in the employee collection where the value of the Designation is either "Developer" or "Tester".
10. Find all document with Exact Match on an Array having Expertise: ['Mongodb','Mysql', 'Cassandra']
11. Drop Single documents where designation="Developer"

CONCLUSION:

QUESTIONS:

1. What is NoSQL and enlist its benefits.
2. Shows the relationship of RDBMS terminology with MongoDB.
3. Explain CRUD operations in MongoDB database with suitable Example
4. What are Advantages of MongoDB over RDBMS?
5. Enlist Basic datatypes of MongoDB.
6. What is different between SAVE and UPDATE method.
7. What is ObjectId in Mongodb?
8. Explain different method to insert document in Mongodb.

Q1 What is No SQL and enlist it benefits.

Ans NoSQL databases are non tabular, and store data differently than relational databases (tables). NOSQL databases come in variety of types based on their data model. They provide flexible schemas and scale easily with large amounts of data and higher user loads.

Benefits :

1] NoSQL databases never follow the relational model.
2] Never provide tables with flat fixed-column records.
3] Work with self contained aggregates.
4] Doesn't require Object-relational mapping and data normalization

Q2 Show the relationship of RDBMS terminology with Mongo DB.

Ans

RDBMS	Mongo DB
Database	Database
Table	Collection
Tuple / Row	Document
Column	Field
Table Join	Embedded Documents
Primary key	Primary key
Database Server and client	
MySQL / oracle	mongod
mysql / sqlplus	mongo

Q3 Explain CRUD operations in MongoDB database with suitable example

Ans **Create :**

Create or insert operations add new documents to the collection

eg db. collection . insert one ()

Read :

Read operations retrieve documents from collections

eg. db. collection . find ()

Update :

Update operations modify existing documents in a collection

eg. db. collection. Update One ().

Delete :

Delete operations remove documents from a collection MongoDB provides the following methods to delete documents of a collection

eg. db. collection. delete One ().

Q4 What are advantages of MongoDB over RDBMS ?

Ans The advantages of MongoDB over RDBMS are:

1] Structure of a single object is clear

2] No complex joins.

3] Deep query ability
4] Schema Less
5] Tuning
6] Ease of scale out
7] Use internal memory for storing the working set, enabling faster access of data.

Q5 Enlist basic datatype of Mongo DB.

Ans Basic Datatypes of Mongo DB are:
1] String
2] Integer
3] Boolean
4] Timestamp
5] Object
6] NULL
7] Symbol
8] Data
9] Object ID.

Q6 What is the difference between SAVE and UPDATE method

Ans SAVE():
The save method is an "original" hibernate method that does not conform to the JPA specification.

UPDATE():
The update method is an "original" hibernate method that was

present long before the merge method was added

If the identifier doesn't exist SAVE method will work and UPDATE will not work and the identifier does exist then UPDATE method will work.

SAVE : will create new identifier.
UPDATE : will modify the existing data and not create new identifier.

Q7 What is ObjectId in MongoDB?

Ans Every document in the collection has an "_id" field that is used to uniquely identify the document in a particular collection it acts as the primary key for the documents in the collection "_id" field can be used in any format and the default format is ObjectId on the document.
An ObjectId is a 12 byte Field of BSON type

Timestamp (4)	Machine ID (3)	Process Id (2)	Increment (3)

Q8 Explain different methods to insert documents

Ans To insert a document in MongoDB, you need to use insert() and save()
Insert Method : db.collection_name.insert(document)
Save Method : db.collection_name.save(document).