Name:- Chayan Das
RollNo: UG/02/BTCSECSF/2023/020
RegNO: AU/2023/0009869
Section :'E'

Schema

{ roll_no, name, department, semester, city, marks }

Initial Data

Roll No	Name	Department	Semester	City	Marks
1	Amit	CSE	4	Kolkata	78
2	Neha	IT	4	Delhi	65
3	Ravi	CSE	5	Mumbai	82
4	Pooja	ECE	4	Chennai	70
5	Karan	IT	5	Kolkata	55
6	Sneha	CSE	4	Delhi	88

Database Name: college_`YourRollNo`
Collection Name: studentList_`YourRollno`

```
test> use college_CSF_020
switched to db college_CSF_020
college_CSF_020>
```

```
college_CSF_020> db.createCollection("studentList_CSF_020")
[baseline-browser-mapping] The data in this module is over two months old.
{ ok: 1 }
```

```
college_CSF_020> db.studentList_CSF_020.insertMany([{roll_no:1,name:"Amit",department:"CSE",semester:4,city:"Kolkata",marks:78},{roll_no:2,name:"Neha",department:"IT",semester:4,city:"Delh
i",marks:65},{roll_no:3,name:"Ravi",department:"CSE",semester:5,city:"Mumbai",marks:82},{roll_no:4,name:"Pooja",department:"ECE",semester:4,city:"Chennai",marks:70},{roll_no:5,name:"Karan"
,department:"IT",semester:5,city:"Kolkata",marks:55},{roll_no:6,name:"Sneha",department:"CSE",semester:4,city:"Delhi",marks:88}])
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId('698989fff3e133b31da81525'),
    '1': ObjectId('698989fff3e133b31da81526'),
    '2': ObjectId('698989fff3e133b31da81527'),
    '3': ObjectId('698989fff3e133b31da81528'),
    '4': ObjectId('698989fff3e133b31da81529'),
    '5': ObjectId('698989fff3e133b31da8152a')
  }
}
```

Lab Questions

Q1. Display all student records using aggregation.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$match:{}}])
[
  {
    _id: ObjectId('698989fff3e133b31da81525'),
    roll_no: 1,
    name: 'Amit',
    department: 'CSE',
    semester: 4,
    city: 'Kolkata',
    marks: 78
  },
  {
    _id: ObjectId('698989fff3e133b31da81526'),
    roll_no: 2,
    name: 'Neha',
    department: 'IT',
    semester: 4,
    city: 'Delhi',
    marks: 65
  },
  {
    _id: ObjectId('698989fff3e133b31da81527'),
    roll_no: 3,
    name: 'Ravi',
    department: 'CSE',
    semester: 5,
    city: 'Mumbai',
    marks: 82
  },
  {
    _id: ObjectId('698989fff3e133b31da81528'),
    roll_no: 4,
    name: 'Pooja',
    department: 'ECE',
    semester: 4,
    city: 'Chennai',
    marks: 70
  },
  {
    _id: ObjectId('698989fff3e133b31da81529'),
    roll_no: 5,
    name: 'Karan',
    department: 'IT',
    semester: 5,
    city: 'Kolkata',
    marks: 55
  },
  {
    _id: ObjectId('698989fff3e133b31da8152a'),
    roll_no: 6,
    name: 'Sneha',
    department: 'CSE',
    semester: 4,
    city: 'Delhi',
    marks: 88
  }
]
```

Q2. Display students belonging to CSE department.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$match:{department:"CSE"}}])
[
  {
    _id: ObjectId('698989fff3e133b31da81525'),
    roll_no: 1,
    name: 'Amit',
    department: 'CSE',
    semester: 4,
    city: 'Kolkata',
    marks: 78
  },
  {
    _id: ObjectId('698989fff3e133b31da81527'),
    roll_no: 3,
    name: 'Ravi',
    department: 'CSE',
    semester: 5,
    city: 'Mumbai',
    marks: 82
  },
  {
    _id: ObjectId('698989fff3e133b31da8152a'),
    roll_no: 6,
    name: 'Sneha',
    department: 'CSE',
    semester: 4,
    city: 'Delhi',
    marks: 88
  }
]
```

Q3. Display students of semester 4.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$match:{semester:4}}])
[
  {
    _id: ObjectId('698989fff3e133b31da81525'),
    roll_no: 1,
    name: 'Amit',
    department: 'CSE',
    semester: 4,
    city: 'Kolkata',
    marks: 78
  },
  {
    _id: ObjectId('698989fff3e133b31da81526'),
    roll_no: 2,
    name: 'Neha',
    department: 'IT',
    semester: 4,
    city: 'Delhi',
    marks: 65
  },
  {
    _id: ObjectId('698989fff3e133b31da81528'),
    roll_no: 4,
    name: 'Pooja',
    department: 'ECE',
    semester: 4,
    city: 'Chennai',
    marks: 70
  },
  {
    _id: ObjectId('698989fff3e133b31da8152a'),
    roll_no: 6,
    name: 'Sneha',
    department: 'CSE',
    semester: 4,
    city: 'Delhi',
    marks: 88
  }
]
college_CSF_020>
```

Q4. Display only name and marks of all students.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$project:{_id:0,name:1,marks:1}}])
[
  { name: 'Amit', marks: 78 },
  { name: 'Neha', marks: 65 },
  { name: 'Ravi', marks: 82 },
  { name: 'Pooja', marks: 70 },
  { name: 'Karan', marks: 55 },
  { name: 'Sneha', marks: 88 }
]
```

Q5. Find the average marks of all students.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$group:{_id:null,averageMarks:{$avg:"$marks"}}}])
[ { _id: null, averageMarks: 73 } ]
college_CSF_020>
```

Q6. Find total marks scored department-wise.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$group:{_id:"$department",totalMarks:{$sum:"$marks"}}}])
[
  { _id: 'ECE', totalMarks: 70 },
  { _id: 'CSE', totalMarks: 248 },
  { _id: 'IT', totalMarks: 120 }
]
```

Q7. Find average marks department-wise.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$group:{_id:"$department",averageMarks:{$avg:"$marks"}}}])
[
  { _id: 'ECE', averageMarks: 70 },
  { _id: 'CSE', averageMarks: 82.66666666666667 },
  { _id: 'IT', averageMarks: 60 }
]
```

Q8. Find maximum marks scored in each department.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$group:{_id:"$department",maxMarks:{$max:"$marks"}}}])
[
  { _id: 'IT', maxMarks: 65 },
  { _id: 'CSE', maxMarks: 88 },
  { _id: 'ECE', maxMarks: 70 }
]
```

Q9. Count number of students in each department.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$group:{_id:"$department",studentCount:{$sum:1}}}])
[
  { _id: 'ECE', studentCount: 1 },
  { _id: 'CSE', studentCount: 3 },
  { _id: 'IT', studentCount: 2 }
]
```

Q10. Display departments having average marks greater than 70.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$group:{_id:"$department",averageMarks:{$avg:"$marks"}}},{$match:{averageMarks:{$gt:70}}}])
[ { _id: 'CSE', averageMarks: 82.66666666666667 } ]
```

Q11. Sort students by marks in descending order.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$sort:{marks:-1}}])
[
  {
    _id: ObjectId('698989fff3e133b31da8152a'),
    roll_no: 6,
    name: 'Sneha',
    department: 'CSE',
    semester: 4,
    city: 'Delhi',
    marks: 88
  },
  {
    _id: ObjectId('698989fff3e133b31da81527'),
    roll_no: 3,
    name: 'Ravi',
    department: 'CSE',
    semester: 5,
    city: 'Mumbai',
    marks: 82
  },
  {
    _id: ObjectId('698989fff3e133b31da81525'),
    roll_no: 1,
    name: 'Amit',
    department: 'CSE',
    semester: 4,
    city: 'Kolkata',
    marks: 78
  },
  {
    _id: ObjectId('698989fff3e133b31da81528'),
    roll_no: 4,
    name: 'Pooja',
    department: 'ECE',
    semester: 4,
    city: 'Chennai',
    marks: 70
  },
  {
    _id: ObjectId('698989fff3e133b31da81526'),
    roll_no: 2,
    name: 'Neha',
    department: 'IT',
    semester: 4,
    city: 'Delhi',
    marks: 65
  },
  {
    _id: ObjectId('698989fff3e133b31da81529'),
    roll_no: 5,
    name: 'Karan',
    department: 'IT',
    semester: 5,
    city: 'Kolkata',
    marks: 55
  }
]
```

Q12. Display top 3 students based on marks.

```
[college_CSF_020> db.studentList_CSF_020.aggregate([{$sort:{marks:-1}},{$limit:3}])
[
  {
    _id: ObjectId('698989fff3e133b31da8152a'),
    roll_no: 6,
    name: 'Sneha',
    department: 'CSE',
    semester: 4,
    city: 'Delhi',
    marks: 88
  },
  {
    _id: ObjectId('698989fff3e133b31da81527'),
    roll_no: 3,
    name: 'Ravi',
    department: 'CSE',
    semester: 5,
    city: 'Mumbai',
    marks: 82
  },
  {
    _id: ObjectId('698989fff3e133b31da81525'),
    roll_no: 1,
    name: 'Amit',
    department: 'CSE',
    semester: 4,
    city: 'Kolkata',
    marks: 78
  }
]
```

Q13. Display department-wise average marks sorted in descending order.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$group:{_id:"$department",averageMarks:{$avg:"$marks"}}},{$sort:{averageMarks:-1}}])
[
  { _id: 'CSE', averageMarks: 82.66666666666667 },
  { _id: 'ECE', averageMarks: 70 },
  { _id: 'IT', averageMarks: 60 }
]
```

Q14. Display students belonging to Delhi or Kolkata.

```
college_CSF_020> db.studentList_CSF_020.aggregate([{$match:{city:{$in:["Delhi","Kolkata"]}}}])
[
  {
    _id: ObjectId('698989fff3e133b31da81525'),
    roll_no: 1,
    name: 'Amit',
    department: 'CSE',
    semester: 4,
    city: 'Kolkata',
    marks: 78
  },
  {
    _id: ObjectId('698989fff3e133b31da81526'),
    roll_no: 2,
    name: 'Neha',
    department: 'IT',
    semester: 4,
    city: 'Delhi',
    marks: 65
  },
  {
    _id: ObjectId('698989fff3e133b31da81529'),
    roll_no: 5,
    name: 'Karan',
    department: 'IT',
    semester: 5,
    city: 'Kolkata',
    marks: 55
  },
  {
    _id: ObjectId('698989fff3e133b31da8152a'),
    roll_no: 6,
    name: 'Sneha',
    department: 'CSE',
    semester: 4,
    city: 'Delhi',
    marks: 88
  }
]
```

MONGODB COMPASS

Search connections

localhost:27017
- admin
- collegeDB
  - employees
  - students
- collegeDB_020
  - students_020
- college_CSF_020
  - **studentList_CSF_020**
- config
- local
  - startup_log

Type a query: { field: 'value' } or **Generate query**

ADD DATA ▾   UPDATE   DELETE   EXPORT DATA ▾   EXPORT CODE

_id: ObjectId('698989fff3e133b31da81525')
roll_no : 1
name : "Amit"
department : "CSE"
semester : 4
city : "Kolkata"
marks : 78

_id: ObjectId('698989fff3e133b31da81526')
roll_no : 2
name : "Neha"
department : "IT"
semester : 4
city : "Delhi"
marks : 65

_id: ObjectId('698989fff3e133b31da81527')
roll_no : 3
name : "Ravi"
department : "CSE"
semester : 5
city : "Mumbai"
marks : 82

_id: ObjectId('698989fff3e133b31da81528')
roll_no : 4
name : "Pooja"
department : "ECE"
semester : 4
city : "Chennai"
marks : 70

_id: ObjectId('698989fff3e133b31da81529')
roll_no : 5
name : "Karan"
department : "IT"
semester : 5
city : "Kolkata"
marks : 55