

## LAB ASSIGNMENT – 4

**DATE: 09/02/2026**

**Name:- Snigdha Sucharita Kar**

**RollNo: UG/02/BTCSEAIML/2023/075**

**RegNO: AU/2023/0010993**

**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_AIML075
switched to db college_AIML075
college_AIML075> db.createCollection("StudentList_AIML075")
{ ok: 1 }
college_AIML075> db.StudentList_AIML075.insertMany([{"Roll_No":1, Name:"Amit", Department:"CSE", Semester:4, City:"Kolkata", Marks:78}, {"Roll_No":2, Name:"Neha", Department:"IT", Semester:4, City:"Delhi", 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('6992bb40e14df2efb71e2621'),
    '1': ObjectId('6992bb40e14df2efb71e2622'),
    '2': ObjectId('6992bb40e14df2efb71e2623'),
    '3': ObjectId('6992bb40e14df2efb71e2624'),
    '4': ObjectId('6992bb40e14df2efb71e2625'),
    '5': ObjectId('6992bb40e14df2efb71e2626')
  }
}
```

## Lab Questions

Q1. Display all student records using aggregation.

```
college_AIML075> db.StudentList_AIML075.aggregate([{} $match: {} ])
[
  {
    _id: ObjectId('6992bb40e14df2efb71e2621'),
    Roll_No: 1,
    Name: 'Amit',
    Department: 'CSE',
    Semester: 4,
    City: 'Kolkata',
    Marks: 78
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2622'),
    Roll_No: 2,
    Name: 'Neha',
    Department: 'IT',
    Semester: 4,
    City: 'Delhi',
    Marks: 65
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2623'),
    Roll_No: 3,
    Name: 'Ravi',
    Department: 'CSE',
    Semester: 5,
    City: 'Mumbai',
    Marks: 82
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2624'),
    Roll_No: 4,
    Name: 'Pooja',
    Department: 'ECE',
    Semester: 4,
    City: 'Chennai',
    Marks: 70
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2625'),
    Roll_No: 5,
    Name: 'Karan',
    Department: 'IT',
    Semester: 5,
    City: 'Kolkata',
    Marks: 55
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2626'),
    Roll_No: 6,
    Name: 'Sneha',
    Department: 'CSE',
    Semester: 4,
    City: 'Delhi',
    Marks: 88
  }
]
```

Q2. Display students belonging to CSE department.

```
college_AIML075> db.StudentList_AIML075.aggregate([{$match: { Department: "CSE" }}])
[
  {
    _id: ObjectId('6992bb40e14df2efb71e2621'),
    Roll_No: 1,
    Name: 'Amit',
    Department: 'CSE',
    Semester: 4,
    City: 'Kolkata',
    Marks: 78
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2623'),
    Roll_No: 3,
    Name: 'Ravi',
    Department: 'CSE',
    Semester: 5,
    City: 'Mumbai',
    Marks: 82
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2626'),
    Roll_No: 6,
    Name: 'Sneha',
    Department: 'CSE',
    Semester: 4,
    City: 'Delhi',
    Marks: 88
  }
]
```

### Q3. Display students of semester 4.

```
college_AIML075> db.StudentList_AIML075.aggregate([{$match: { Semester: 4 }}])
[
  {
    _id: ObjectId('6992bb40e14df2efb71e2621'),
    Roll_No: 1,
    Name: 'Amit',
    Department: 'CSE',
    Semester: 4,
    City: 'Kolkata',
    Marks: 78
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2622'),
    Roll_No: 2,
    Name: 'Neha',
    Department: 'IT',
    Semester: 4,
    City: 'Delhi',
    Marks: 65
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2624'),
    Roll_No: 4,
    Name: 'Pooja',
    Department: 'ECE',
    Semester: 4,
    City: 'Chennai',
    Marks: 70
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2626'),
    Roll_No: 6,
    Name: 'Sneha',
    Department: 'CSE',
    Semester: 4,
    City: 'Delhi',
    Marks: 88
  }
]
```

Q4. Display only name and marks of all students.

```
college_AIML075> db.StudentList_AIML075.aggregate([{$project:{_id:0, Name:1,Marks:1}}])  
[  
  {  
    _id: ObjectId('6992bb40e14df2efb71e2622'),  
    Roll_No: 2,  
    Name: 'Neha',  
    Department: 'IT',  
    Semester: 4,  
    City: 'Delhi',  
    Marks: 65  
  },  
  {  
    _id: ObjectId('6992bb40e14df2efb71e2623'),  
    Roll_No: 3,  
    Name: 'Ravi',  
    Department: 'CSE',  
    Semester: 5,  
    City: 'Mumbai',  
    Marks: 82  
  },  
  {  
    _id: ObjectId('6992bb40e14df2efb71e2624'),  
    Roll_No: 4,  
    Name: 'Pooja',  
    Department: 'ECE',  
    Semester: 4,  
    City: 'Chennai',  
    Marks: 70  
  }]
```

Q5. Find the average marks of all students.

```
college_AIML075> db.StudentList_AIML075.aggregate([{$group: {_id: null, AverageMarks: {$avg: "$Marks"} }}])  
[ {_id: null, AverageMarks: 73 } ]
```

Q6. Find total marks scored department-wise.

```
[ { _id: null, TotalMarks: 73 } ]  
college_AIML075> db.StudentList_AIML075.aggregate([  
...   { $group: { _id: "$Department", TotalMarks: { $sum: "$Marks" } } }  
... ])  
[  
  { _id: 'IT', TotalMarks: 120 },  
  { _id: 'CSE', TotalMarks: 248 },  
  { _id: 'ECE', TotalMarks: 70 }  
]
```

Q7. Find average marks department-wise.

```
[  
college_AIML075> db.StudentList_AIML075.aggregate([  
...   { $group: { _id: "$Department", AvgMarks: { $avg: "$Marks" } } }  
... ])  
[  
  { _id: 'IT', AvgMarks: 60 },  
  { _id: 'CSE', AvgMarks: 82.66666666666667 },  
  { _id: 'ECE', AvgMarks: 70 }  
]
```

Q8. Find maximum marks scored in each department.

```
[  
college_AIML075> db.StudentList_AIML075.aggregate([  
...   { $group: { _id: "$Department", MaxMarks: { $max: "$Marks" } } }  
... ])  
[  
  { _id: 'ECE', MaxMarks: 70 },  
  { _id: 'CSE', MaxMarks: 88 },  
  { _id: 'IT', MaxMarks: 65 }  
]
```

Q9. Count number of students in each department.

```

...   { $group: { _id: "$Department", Count: { $sum: 1 } } }
...
[ {
  { _id: 'IT', Count: 2 },
  { _id: 'CSE', Count: 3 },
  { _id: 'ECE', Count: 1 }
]

```

Q10. Display departments having average marks greater than 70.

```

college_AIML075> [
  { _id: 'CSE', AvgMarks: 82.66666666666667 }
]

```

Q11. Sort students by marks in descending order.

```

college_AIML075> db.StudentList_AIML075.aggregate([{ $sort: { Marks: -1 } }])
[
  {
    _id: ObjectId('6992bb40e14df2efb71e2626'),
    Roll_No: 6,
    Name: 'Sneha',
    Department: 'CSE',
    Semester: 4,
    City: 'Delhi',
    Marks: 88
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2623'),
    Roll_No: 3,
    Name: 'Ravi',
    Department: 'CSE',
    Semester: 5,
    City: 'Mumbai',
    Marks: 82
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2621'),
    Roll_No: 1,
    Name: 'Amit',
    Department: 'CSE',
    Semester: 4,
    City: 'Kolkata',
    Marks: 78
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2624'),
    Roll_No: 4,
    Name: 'Pooja',
    Department: 'ECE',
    Semester: 4,
    City: 'Chennai',
    Marks: 70
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2622'),
    Roll_No: 2,
    Name: 'Neha',
    Department: 'IT',
    Semester: 4,
    City: 'Delhi',
    Marks: 65
  },
  {
    _id: ObjectId('6992bb40e14df2efb71e2625'),
    Roll_No: 5,
    Name: 'Karan',
    Department: 'IT',
    Semester: 5,
    City: 'Kolkata',
    Marks: 55
  }
]

```

Q12. Display top 3 students based on marks.

```
college_AIML075> db.StudentList_AIML075.aggregate([{ $sort: { Marks: -1 } }, { $limit: 3 }])  
[  
  {  
    _id: ObjectId('6992bb40e14df2efb71e2626'),  
    Roll_No: 6,  
    Name: 'Sneha',  
    Department: 'CSE',  
    Semester: 4,  
    City: 'Delhi',  
    Marks: 88  
  },  
  {  
    _id: ObjectId('6992bb40e14df2efb71e2623'),  
    Roll_No: 3,  
    Name: 'Ravi',  
    Department: 'CSE',  
    Semester: 5,  
    City: 'Mumbai',  
    Marks: 82  
  },  
  {  
    _id: ObjectId('6992bb40e14df2efb71e2621'),  
    Roll_No: 1,  
    Name: 'Amit',  
    Department: 'CSE',  
    Semester: 4,  
    City: 'Kolkata',  
    Marks: 78  
  }  
]
```

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

```
college_AIML075>  
[  
  { _id: 'CSE', AvgMarks: 82.66666666666667 },  
  { _id: 'ECE', AvgMarks: 70 },  
  { _id: 'IT', AvgMarks: 60 }  
]
```

Q14. Display students belonging to Delhi or Kolkata.

```
college_AIML075> db.StudentList_AIML075.aggregate([{ $match: { City: { $in: ["Delhi", "Kolkata"] } } }])
```

MONGODB COMPASS

MongoDB Compass - localhost:27017/college\_AIML075.StudentList\_AIML075

Connections Edit View Collection Help

**Compass**

My Queries Data Modeling

CONNECTIONS ()

localhost:27017

- admin
- collegeDB
  - Students
  - employees
- collegeDB\_AIML075
  - Students\_AIML075
- college\_AIML075
  - StudentList\_AIML075
- config
- local
- test
  - Employees

Documents 6 Aggregations Schema Indexes 1 Validation

localhost:27017 > college\_AIML075 > StudentList\_AIML075

Generate query Explain Reset Find Options

25 1-6 of 6

`_id: ObjectId('6992bb40e14df2efb71e2621')`  
`Roll_No : 1`  
`Name : "Amit"`  
`Department : "CSE"`  
`Semester : 4`  
`City : "Kolkata"`  
`Marks : 78`

`_id: ObjectId('6992bb40e14df2efb71e2622')`  
`Roll_No : 2`  
`Name : "Neeta"`  
`Department : "IT"`  
`Semester : 4`  
`City : "Delhi"`  
`Marks : 65`

`_id: ObjectId('6992bb40e14df2efb71e2623')`  
`Roll_No : 3`  
`Name : "Ravi"`  
`Department : "CSE"`  
`Semester : 4`

MongoDB Compass - localhost:27017/college\_AIML075.StudentList\_AIML075

Connections Edit View Collection Help

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localhost:27017

- admin
- collegeDB
  - Students
  - employees
- collegeDB\_AIML075
  - Students\_AIML075
- college\_AIML075
  - StudentList\_AIML075
- config
- local
- test
  - Employees

Documents 6 Aggregations Schema Indexes 1 Validation

localhost:27017 > college\_AIML075 > StudentList\_AIML075

Generate query Explain Reset Find Options

25 1-6 of 6

`Semester : 5`  
`City : "Mumbai"`  
`Marks : 82`

`_id: ObjectId('6992bb40e14df2efb71e2624')`  
`Roll_No : 4`  
`Name : "Pooja"`  
`Department : "ECE"`  
`Semester : 4`  
`City : "Chennai"`  
`Marks : 70`

`_id: ObjectId('6992bb40e14df2efb71e2625')`  
`Roll_No : 5`  
`Name : "Karan"`  
`Department : "IT"`  
`Semester : 5`  
`City : "Kolkata"`  
`Marks : 55`

MongoDB Compass - localhost:27017/college\_AIML075.StudentList\_AIML075

Connections Edit View Collection Help

**Compass**

My Queries Data Modeling

CONNECTIONS ()

localhost:27017

- admin
- collegeDB
  - Students
  - employees
- collegeDB\_AIML075
  - Students\_AIML075
- college\_AIML075
  - StudentList\_AIML075
- config
- local
- test
  - Employees

Documents 6 Aggregations Schema Indexes 1 Validation

localhost:27017 > college\_AIML075 > StudentList\_AIML075

Generate query Explain Reset Find Options

25 1-6 of 6

`Semester : 5`  
`City : "Mumbai"`  
`Marks : 82`

`_id: ObjectId('6992bb40e14df2efb71e2624')`  
`Roll_No : 4`  
`Name : "Pooja"`  
`Department : "ECE"`  
`Semester : 4`  
`City : "Chennai"`  
`Marks : 70`

`_id: ObjectId('6992bb40e14df2efb71e2625')`  
`Roll_No : 5`  
`Name : "Karan"`  
`Department : "IT"`  
`Semester : 5`  
`City : "Kolkata"`  
`Marks : 55`