

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.

```
marks: 65
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, AverageMarks: 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: 'Anit',
    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

