**Experiment 5:**

Execute Aggregation operations ($avg, $min,$max, $push, $addToSet etc.).

db.students.insertMany([

{

\_id: 62,

name: "Rahul",

age: 24,

department: "AIML",

subjects: [

{ name: "Math", score: 85 },

{ name: "AI", score: 90 },

{ name: "DBMS", score: 78 }

],

attendance: [92, 88, 85, 90, 95],

projects: ["AI Chatbot", "Big Data Analysis"]

},

{

\_id: 63,

name: "Sneha",

age: 23,

department: "CSE",

subjects: [

{ name: "Math", score: 95 },

{ name: "AI", score: 92 },

{ name: "DBMS", score: 88 }

],

attendance: [98, 99, 97, 95, 96],

projects: ["Cyber Security", "Machine Learning"]

}

{

\_id: 64,

name: "Amit",

age: 24,

department: "AIML",

subjects: [

{ name: "Math", score: 85 },

{ name: "AI", score: 90 },

{ name: "DBMS", score: 78 }

],

attendance: [92, 88, 85, 90, 95],

joined: new Date("2023-01-10")

},

{

\_id: 65,

name: "Sneha",

age: 23,

department: "CSE",

subjects: [

{ name: "Math", score: 95 },

{ name: "AI", score: 92 },

{ name: "DBMS", score: 88 }

],

attendance: [98, 99, 97, 95, 96],

joined: new Date("2023-02-15")

},

{

\_id: 66,

name: "Rohan",

age: 22,

department: "AIML",

subjects: [

{ name: "Math", score: 80 },

{ name: "AI", score: 85 },

{ name: "DBMS", score: 79 }

],

attendance: [85, 87, 88, 86, 89],

joined: new Date("2023-03-20")

}

])

**Using $avg – Find Average Score of Students**

**Calculate the average score across all subjects for each student.**

db.students.aggregate([

{

$project: {

name: 1,

avgScore: { $avg: "$subjects.score" }

}

}

])

**Using $min – Find Minimum Score of Each Student**

**Find the lowest score for each student.**

db.students.aggregate([

{

$project: {

name: 1,

minScore: { $min: "$subjects.score" }

}

}

])

**Using $max – Find Maximum Score of Each Student**

**Find the highest score for each student.**

db.students.aggregate([

{

$project: {

name: 1,

maxScore: { $max: "$subjects.score" }

}

}

])

**Using $push – Group Students by Department and List Their Names**

**Group students by department and collect their names in an array.**

db.students.aggregate([

{

$group: {

\_id: "$department",

studentNames: { $push: "$name" }

}

}

])

**Using $addToSet – List Unique Projects in Each Department**

**Group students by department and list all unique projects.**

db.students.aggregate([

{

$group: {

\_id: "$department",

uniqueProjects: { $addToSet: "$projects" }

}

}

])

**Using $sum – Total Score of Each Student**

**Calculate the total score across all subjects for each student.**

db.students.aggregate([

{

$project: {

name: 1,

totalScore: { $sum: "$subjects.score" }

}

}

])

**Using $sum – Count the Total Number of Students in Each Department**

**Group students by department and count how many are in each.**

db.students.aggregate([

{

$group: {

\_id: "$department",

totalStudents: { $sum: 1 }

}

}

])

**Using $first – Find the First Student Who Joined Each Department**

**Find the earliest joined student in each department.**

db.students.aggregate([

{ $sort: { joined: 1 } }, // Sort by join date (earliest first)

{

$group: {

\_id: "$department",

firstJoinedStudent: { $first: "$name" },

firstJoinDate: { $first: "$joined" }

}

}

])

**Using $last – Find the Most Recently Joined Student in Each Department**

**Find the latest joined student in each department.**

db.students.aggregate([

{ $sort: { joined: 1 } }, // Sort by join date (earliest first)

{

$group: {

\_id: "$department",

lastJoinedStudent: { $last: "$name" },

lastJoinDate: { $last: "$joined" }

}

}

])

**Using $count – Count the Total Students in the Collection**

db.students.aggregate([

{ $count: "totalStudents" }

])