1. Insert a new student named "Ankit Tiwari" who is in the 2nd year with subjects "OS" and "DBMS".

```
db.students.insertOne({ _id: 5, name: "Ankit Tiwari", age: 20,
department: "CSE", year: 2, subjects: ["OS", "DBMS"], cgpa: 8.0 });
```

---

2. Retrieve all students in the 3rd year.

```
db.students.find({ year: 3 }).pretty();
```

---

3. Find the student named "Priya Sharma" and display only their name and CGPA.

```
db.students.find({ name: "Priya Sharma" }, { name: 1, cgpa: 1,
_id: 0 });
```

---

4. Update "Rahul Verma" to add "Cyber Security" to his subjects.

```
db.students.updateOne({ name: "Rahul Verma" }, { $push: {
subjects: "Cyber Security" } });
```

---

5. Delete the student "Sneha Singh" from the database.

```
db.students.deleteOne({ name: "Sneha Singh" });
```

---

6. Increase the CGPA of all students by 0.2 points.

```
db.students.updateMany({}, { $inc: { cgpa: 0.2 } });
```

---

7. Fetch all students who have enrolled in the "DSA" subject.

```
db.students.find({ subjects: "DSA" }).pretty();
```

---

8. Insert a new faculty member named "Dr. Manish Gupta", an Assistant Professor with 5 years of experience, teaching "AI".

```
db.faculty.insertOne({ _id: 105, name: "Dr. Manish Gupta",
age: 35, department: "CSE", designation: "Assistant
Professor", experience: 5, courses_taught: ["AI"] });
```

---

9. Find all faculty members who have more than 10 years of experience.

```
db.faculty.find({ experience: { $gt: 10 } }).pretty();
```

10. Update Dr. Vikram Sinha's designation from HOD to Dean.

```
db.faculty.updateOne({ name: "Dr. Vikram Sinha" }, { $set: {
designation: "Dean" } });
```

11. Count the total number of students in the CSE department.

```
db.students.countDocuments({ department: "CSE" });
```

12. Find the average CGPA of all students.

```
db.students.aggregate([
  { $group: { _id: null, avgCGPA: { $avg: "$cgpa" } } }
]);
```

13. Get the youngest student in the CSE department.

```
db.students.find().sort({ age: 1 }).limit(1);
```

14. Retrieve faculty members who teach both "OS" and "Networks".

```
db.faculty.find({ courses_taught: { $all: ["OS", "Networks"] }
}).pretty();
```

15. Find students who have more than 2 subjects enrolled.

```
db.students.find({ subjects: { $size: { $gt: 2 } }
}).pretty();
```

16. Retrieve the student with the highest CGPA.

```
db.students.find().sort({ cgpa: -1 }).limit(1);
```

17. Find the faculty member with the most years of experience.

```
db.faculty.find().sort({ experience: -1 }).limit(1);
```

---

18. Sort students by CGPA in descending order.

```
db.students.find().sort({ cgpa: -1 });
```

---

19. Group students by year of study and count how many are in each year.

```
db.students.aggregate([
   { $group: { _id: "$year", count: { $sum: 1 } } }
]);
```

---

20. Get the total number of faculty members who have more than 15 years of experience.

```
db.faculty.countDocuments({ experience: { $gt: 15 } });
```