AIM: TO DEMONSTRATE CRUD OPERATIONS ON MONGODB

**A) CREATE – Insert Documents**

Create the collection and insert sample student records.

Insert one document:  
db.students.insertOne({  
  rollNo: '22IT001', name: 'Swathi', branch: 'IT', year: 2,  
  marks: { DS: 84, DBMS: 90 }, phone: '9876543210', skills: ['C', 'C++']  
})

Insert many documents:  
db.students.insertMany([  
  { rollNo: '22IT002', name: 'Shiva', branch: 'IT', year: 2, marks: { DS: 91, DBMS: 88 }, skills: ['JS', 'Node'] },  
  { rollNo: '22IT003', name: 'Ravi', branch: 'CSE', year: 3, marks: { DS: 77, DBMS: 81 }, hostel: true },  
  { rollNo: '22IT004', name: 'Kiran', branch: 'ECE', year: 1, marks: { DS: 73, DBMS: 79 }, attendance: 86 }  
])

Verify count:  
db.students.countDocuments()

**B) READ – Query Documents**

Basic read:  
db.students.find().pretty()

Filter by field:  
db.students.find({ branch: 'IT' }).pretty()

Filter with comparison operators:  
db.students.find({ 'marks.DBMS': { $gte: 85 } }).pretty()

AND / OR conditions:  
db.students.find({ $and: [ { branch: 'IT' }, { year: 2 } ] })  
db.students.find({ $or: [ { branch: 'IT' }, { hostel: true } ] })

Projection (select specific fields):  
db.students.find({ branch: 'IT' }, { \_id: 0, rollNo: 1, name: 1, 'marks.DBMS': 1 })

Sorting and limiting:  
db.students.find({}, { \_id: 0, rollNo: 1, name: 1, year: 1 }).sort({ year: -1, rollNo: 1 }).limit(3)

Regex search (name starts with 'S'):  
db.students.find({ name: { $regex: /^S/i } }, { \_id: 0, name: 1, rollNo: 1 })

**C) UPDATE – Modify Documents**

Update one document using $set:  
db.students.updateOne(  
  { rollNo: '22IT004' },  
  { $set: { attendance: 90 } }  
)

Increase a numeric field using $inc:  
db.students.updateOne(  
  { rollNo: '22IT001' },  
  { $inc: { 'marks.DBMS': 2 } }  
)

Add array values using $addToSet (avoids duplicates):  
db.students.updateOne(  
  { rollNo: '22IT002' },  
  { $addToSet: { skills: { $each: ['MongoDB', 'Express'] } } }  
)

Remove a field using $unset:  
db.students.updateMany(  
  { hostel: { $exists: true } },  
  { $unset: { hostel: '' } }  
)

Upsert (update if exists, else insert):  
db.students.updateOne(  
  { rollNo: '22IT005' },  
  { $set: { name: 'Meena', branch: 'IT', year: 1, marks: { DS: 68, DBMS: 72 } } },  
  { upsert: true }  
)

Replace an entire document (be careful – fields not provided are lost):  
db.students.replaceOne(  
  { rollNo: '22IT003' },  
  { rollNo: '22IT003', name: 'Ravi Kumar', branch: 'CSE', year: 3, marks: { DS: 80, DBMS: 83 } }  
)

**D) DELETE – Remove Documents**

Delete one document by roll number:  
db.students.deleteOne({ rollNo: '22IT005' })

Delete many documents with a filter (e.g., year < 2):  
db.students.deleteMany({ year: { $lt: 2 } })

Show remaining documents:  
db.students.find({}, { \_id: 0, rollNo: 1, name: 1, branch: 1, year: 1 }).sort({ rollNo: 1 })