

Aim:CRUD Operations in MongoDB(student Dataset)

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++']  
})
```

```
{  
  acknowledged: true,  
  insertedId: ObjectId('69022ba518ee32fb2865c9c9')  
}
```

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 }  
])
```

```
{  
  acknowledged: true,  
  insertedIds: {  
    '0': ObjectId('69022bb818ee32fb2865c9ca'),  
    '1': ObjectId('69022bb818ee32fb2865c9cb'),  
    '2': ObjectId('69022bb818ee32fb2865c9cc')  
  }  
}
```

Verify count:

```
db.students.countDocuments()
```

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B) READ – Query Documents

Basic read:

db.students.find().pretty()

```
{
  _id: ObjectId('69022ba518ee32fb2865c9c9'),
  rollNo: '22IT001',
  name: 'Swathi',
  branch: 'IT',
  year: 2,
  marks: {
    DS: 84,
    DBMS: 90
  },
  phone: '9876543210',
  skills: [
    'C',
    'C++'
  ]
}
{
  _id: ObjectId('69022bb818ee32fb2865c9ca'),
  rollNo: '22IT002',
  name: 'Shiva',
  branch: 'IT',
  year: 2,
  marks: {
    DS: 91,
    DBMS: 88
  },
}
```

Filter by field:

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

```
{
  _id: ObjectId('69022ba518ee32fb2865c9c9'),
  rollNo: '22IT001',
  name: 'Swathi',
  branch: 'IT',
  year: 2,
  marks: {
    DS: 84,
    DBMS: 90
  },
  phone: '9876543210',
  skills: [
    'C',
    'C++'
  ]
}
{
  _id: ObjectId('69022bb818ee32fb2865c9ca'),
  rollNo: '22IT002',
  name: 'Shiva',
  branch: 'IT',
  year: 2,
  marks: {
    DS: 91,
    DBMS: 88
  },
}
```

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Filter with comparison operators:

db.students.find({ 'marks.DBMS': { \$gte: 85 } }).pretty()

```
{
  _id: ObjectId('69022ba518ee32fb2865c9c9'),
  rollNo: '22IT001',
  name: 'Swathi',
  branch: 'IT',
  year: 2,
  marks: {
    DS: 84,
    DBMS: 90
  },
  phone: '9876543210',
  skills: [
    'C',
    'C++'
  ]
}
```

AND / OR conditions:

db.students.find({ \$and: [{ branch: 'IT' }, { year: 2 }] })

db.students.find({ \$or: [{ branch: 'IT' }, { hostel: true }] })

```
{
  _id: ObjectId('69022ba518ee32fb2865c9c9'),
  rollNo: '22IT001',
  name: 'Swathi',
  branch: 'IT',
  year: 2,
  marks: {
    DS: 84,
    DBMS: 90
  },
  phone: '9876543210',
  skills: [
    'C',
    'C++'
  ]
}
{
  _id: ObjectId('69022bb818ee32fb2865c9ca'),
  rollNo: '22IT002',
  name: 'Shiva',
  branch: 'IT',
  year: 2,
  marks: {
    DS: 91,
    DBMS: 88
  },
}
```

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  
})
```

```
{  
  rollNo: '22IT001',  
  name: 'Swathi',  
  marks: {  
    DBMS: 90  
  }  
}  
{  
  rollNo: '22IT002',  
  name: 'Shiva',  
  marks: {  
    DBMS: 88  
  }  
}
```

```
{  
  rollNo: '22IT003',  
  name: 'Ravi',  
  year: 3  
}  
{  
  rollNo: '22IT001',  
  name: 'Swathi',  
  year: 2  
}  
{  
  rollNo: '22IT002',  
  name: 'Shiva',  
  year: 2  
}
```

C) UPDATE – Modify Documents

Update one document using \$set:

```
db.students.updateOne(  
  { rollNo: '22IT004' },
```

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```
{ $set: { attendance: 90 } }  
)
```

```
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

Increase a numeric field using \$inc:

```
db.students.updateOne(  
  { rollNo: '22IT001' },  
  { $inc: { 'marks.DBMS': 2 } }  
)
```

```
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

Add array values using \$addToSet (avoids duplicates):

```
db.students.updateOne(  
  { rollNo: '22IT002' },  
  { $addToSet: { skills: { $each: ['MongoDB', 'Express'] } } })
```

```
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

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Remove a field using \$unset:

```
db.students.updateMany(  
  { hostel: { $exists: true } },  
  { $unset: { hostel: " } }  
)
```

```
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

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 })
```

```
{  
  acknowledged: true,  
  insertedId: ObjectId('69022f42006df069f9db118e'),  
  matchedCount: 0,  
  modifiedCount: 0,  
  upsertedCount: 1  
}
```

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' })
```

```
{  
  acknowledged: true,  
  deletedCount: 1  
}
```

Delete many documents with a filter (e.g., year < 2):

```
db.students.deleteMany({ year: { $lt: 2 } })
```

```
{  
  acknowledged: true,  
  deletedCount: 1  
}
```

Show remaining documents:

```
db.students.find({}, { _id: 0, rollNo: 1, name: 1, branch: 1, year: 1  
}).sort({ rollNo: 1 })
```

```
{  
  rollNo: '22IT001',  
  name: 'Swathi',  
  branch: 'IT',  
  year: 2  
}
```