

# Lab 12 – NoSQL using MongoDB

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## Questions:

Note: For each Question, you are required to write the Query as well as attach a screenshot of the output. Make sure your screenshots include the executed query.

### 1. Display all students.

db.students.find({})

The screenshot shows the MongoDB Compass interface. The query editor on the left contains the following code:

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}, 'Phone': '3233389064'}
8 ])
9
10
11
12
13
14
15
16 db.students.find({})
```

The output pane on the right shows the result of the query, which is a JSON array of student documents. The first document is expanded, showing the following details:

- \_id: ObjectId('691d88961305b65e686b128c')
- FirstName: 'Hina'
- LastName: 'Baig'
- CGPA: 3.5
- Major: 'CS'
- Address: { Street: 'Puran Nagar', City: 'Faisalabad', Province: 'Punjab', Country: 'Pakistan' }
- Phone: '3233389064'
- Courses: [ { course\_id: 'CS101', course\_name: 'Pfun', credits: 4 }, { course\_id: 'CS121', course\_name: 'OOP', credits: 4 } ]

### 2. Display all the students with CS major.

db.students.find({'Major': 'CS'})

The screenshot shows the MongoDB Compass interface. The query editor on the left contains the following code:

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}, 'Phone': '3233389064'}
8 ])
9
10
11
12
13
14
15
16 db.students.find({'Major': 'CS'})
```

The output pane on the right shows the result of the query, which is a JSON array of student documents. The first document is expanded, showing the following details:

- \_id: ObjectId('691d890c265e8b94ca6b128c')
- FirstName: 'Hina'
- LastName: 'Baig'
- CGPA: 3.5
- Major: 'CS'
- Address: { Street: 'Puran Nagar', City: 'Faisalabad', Province: 'Punjab', Country: 'Pakistan' }
- Phone: '3233389064'
- Courses: [ { course\_id: 'CS101', course\_name: 'Pfun', credits: 4 }, { course\_id: 'CS121', course\_name: 'OOP', credits: 4 } ]

### 3. Display all the students with SDP major.

db.students.find({'Major': 'SDP'})

MongoDB ⓘ

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishtar Road', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}}
8 ])
9
10
11
12
13
14
15
16 db.students.find({'Major': 'SDP'})
```

Output

```
{
  _id: ObjectId('691d895e7401775be6b128e'),
  FirstName: 'Abid',
  LastName: 'Kasim',
  CGPA: 2.9,
  Major: 'SDP',
  Address: {
    Street: 'ST-2, North Nazimabad,',
    City: 'Karachi',
    Province: 'Sindh',
    Country: 'Pakistan'
  },
  Phone: '9221-6678442',
  Courses: [
    { course_id: 'CS411', course_name: 'AI', credits: 3 },
    { course_id: 'CS121', course_name: 'OOP', credits: 4 },
    { course_id: 'CS411', course_name: 'AI', credits: 3 }
  ]
}
```

mycompiler\_mongodb>

### 4. Display all the students from Karachi City.

db.students.find({'Address.City' : 'Karachi'})

MongoDB ⓘ

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishtar Road', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}}
8 ])
9
10
11
12
13
14
15
16 db.students.find({'Address.City' : 'Karachi'})
```

Output

```
{
  _id: ObjectId('691d895e7401775be6b128f'),
  FirstName: 'Abid',
  LastName: 'Kasim',
  CGPA: 2.9,
  Major: 'SDP',
  Address: {
    Street: 'ST-2, North Nazimabad,',
    City: 'Karachi',
    Province: 'Sindh',
    Country: 'Pakistan'
  },
  Phone: '9221-6678442',
  Courses: [
    { course_id: 'CS411', course_name: 'AI', credits: 3 },
    { course_id: 'CS121', course_name: 'OOP', credits: 4 },
    { course_id: 'CS411', course_name: 'AI', credits: 3 }
  ]
},
{
  _id: ObjectId('691d8a54feb6cc3a5e6b128f'),
  FirstName: 'Zainab',
  LastName: 'Karim',
  CGPA: 3.1,
  Major: 'CS',
  Address: {
    Street: '3-Khalid Centre, Wahdat',
    City: 'Faisalabad',
    Province: 'Punjab',
    Country: 'Pakistan'
  },
  Phone: '9221-6678442',
  Courses: [
    { course_id: 'CS411', course_name: 'AI', credits: 3 },
    { course_id: 'CS121', course_name: 'OOP', credits: 4 },
    { course_id: 'CS411', course_name: 'AI', credits: 3 }
  ]
}
```

## 5. Display all the students not from Karachi City.

`db.students.find({'Address.City' : {$ne : 'Karachi'}})`

MongoDB

1  
2 db.students.insertMany([  
3 {'FirstName':'Hina', 'LastName':'Baig','CGPA':3.5,'Major':'CS','Address':{'Street':'Puran Nagar','City': 'Faisalabad',  
4 ,  
5 {'FirstName':'Karim', 'LastName':'Khan','CGPA':3.2,'Major':'EE','Address':{'Street':' Off Nishtar Road','City':  
6 ,  
7 {'FirstName':'Abid', 'LastName':'Kasim','CGPA':2.9,'Major':'SDP','Address':{'Street':'ST-2, North Nazimabad','City':  
8 ,  
9 {'FirstName':'Zainab', 'LastName':'Karim','CGPA':3.1,'Major':'CS','Address':{'Street':'3-Khalid Centre, Wahdat Road','City':  
10 ,  
11 {'FirstName':'Kumar', 'LastName':'Rani','CGPA':2.8,'Major':'EE','Address':{'Street':'Malik Park Islam','City':  
12 ,  
13 {'FirstName':'Fahim', 'LastName':'Alam','CGPA':3.7,'Address':{'Street':'Wilbert Squares','City': 'Hunza','Province': 'Punjab',  
14 ]})  
15  
16 db.students.find({'Address.City' : {\$ne : 'Karachi'}})

Output  
mycompiler\_mongodb>  
mycompiler\_mongodb> [  
{  
 \_id: ObjectId('691d8ca27dc9de9e826b128c'),  
 FirstName: 'Hina',  
 LastName: 'Baig',  
 CGPA: 3.5,  
 Major: 'CS',  
 Address: {  
 Street: 'Puran Nagar',  
 City: 'Faisalabad',  
 Province: 'Punjab',  
 Country: 'Pakistan'  
 },  
 Phone: '3233389064',  
 Courses: [  
 { course\_id: 'CS101', course\_name: 'Pfun', credits: 4 },  
 { course\_id: 'CS121', course\_name: 'OOP', credits: 4 }  
 ],  
},  
{

## 6. Display all the students having CGPA more than 3.

`db.students.find({'CGPA' : {$gt: 3.0}})`

MongoDB

1  
2 db.students.insertMany([  
3 {'FirstName':'Hina', 'LastName':'Baig','CGPA':3.5,'Major':'CS','Address':{'Street':'Puran Nagar','City': 'Faisalabad',  
4 ,  
5 {'FirstName':'Karim', 'LastName':'Khan','CGPA':3.2,'Major':'EE','Address':{'Street':' Off Nishtar Road','City':  
6 ,  
7 {'FirstName':'Abid', 'LastName':'Kasim','CGPA':2.9,'Major':'SDP','Address':{'Street':'ST-2, North Nazimabad','City':  
8 ,  
9 {'FirstName':'Zainab', 'LastName':'Karim','CGPA':3.1,'Major':'CS','Address':{'Street':'3-Khalid Centre, Wahdat Road','City':  
10 ,  
11 {'FirstName':'Kumar', 'LastName':'Rani','CGPA':2.8,'Major':'EE','Address':{'Street':'Malik Park Islam','City':  
12 ,  
13 {'FirstName':'Fahim', 'LastName':'Alam','CGPA':3.7,'Address':{'Street':'Wilbert Squares','City': 'Hunza','Province': 'Punjab',  
14 ]})  
15  
16 db.students.find({'CGPA' : {\$gt: 3.0}})

Output  
},  
Phone: '9221-7733790',  
Courses: [  
 { course\_id: 'CH111', course\_name: 'PMAS', credits: 3 },  
 { course\_id: 'CS355', course\_name: 'DB', credits: 4 }  
,  
{  
 \_id: ObjectId('691d8d14b8a2b49ff96b128f'),  
 FirstName: 'Zainab',  
 LastName: 'Karim',  
 CGPA: 3.1,  
 Major: 'CS',  
 Address: {  
 Street: '3-Khalid Centre, Wahdat Road',  
 City: 'Karachi',  
 Province: 'Sindh',  
 Country: 'Pakistan'  
 },  
 Phone: '021-4412625',  
 Courses: [  
 { course\_id: 'CS101', course\_name: 'Pfun', credits: 4 },  
 { course\_id: 'CS121', course\_name: 'OOP', credits: 4 }  
 ],  
},  
{

## 7. Display all the students having CGPA equal to 3.5

`db.students.find({'CGPA' : {$eq: 3.5}})`

MongoDB

1  
2 db.students.insertMany([  
3 {'FirstName':'Hina', 'LastName':'Baig','CGPA':3.5,'Major':'CS','Address':{'Street':'Puran Nagar','City': 'Faisalabad',  
4 ,  
5 {'FirstName':'Karim', 'LastName':'Khan','CGPA':3.2,'Major':'EE','Address':{'Street':' Off Nishtar Road','City':  
6 ,  
7 {'FirstName':'Abid', 'LastName':'Kasim','CGPA':2.9,'Major':'SDP','Address':{'Street':'ST-2, North Nazimabad','City':  
8 ,  
9 {'FirstName':'Zainab', 'LastName':'Karim','CGPA':3.1,'Major':'CS','Address':{'Street':'3-Khalid Centre, Wahdat Road','City':  
10 ,  
11 {'FirstName':'Kumar', 'LastName':'Rani','CGPA':2.8,'Major':'EE','Address':{'Street':'Malik Park Islam','City':  
12 ,  
13 {'FirstName':'Fahim', 'LastName':'Alam','CGPA':3.7,'Address':{'Street':'Wilbert Squares','City': 'Hunza','Province': 'Punjab',  
14 ]})  
15  
16 db.students.find({'CGPA' : {\$eq: 3.5}})

Output  
{  
 \_id: ObjectId('691d8d40c6f10b0d16b128c'),  
 FirstName: 'Hina',  
 LastName: 'Baig',  
 CGPA: 3.5,  
 Major: 'CS',  
 Address: {  
 Street: 'Puran Nagar',  
 City: 'Faisalabad',  
 Province: 'Punjab',  
 Country: 'Pakistan'  
 },  
 Phone: '3233389064',  
 Courses: [  
 { course\_id: 'CS101', course\_name: 'Pfun', credits: 4 },  
 { course\_id: 'CS121', course\_name: 'OOP', credits: 4 }  
 ],  
},  
{

## 8. Display all the students from Karachi with a CS Major.

`db.students.find({'$and': [{'Address.City': 'Karachi'}, {'Major': 'CS'}]})`

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Nazimabad', 'Province': 'Sindh', 'Country': 'Pakistan'}},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}}
8 ])
9
10 db.students.find({'$and': [{'Address.City': 'Karachi'}, {'Major': 'CS'}]})
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91
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93
94
95
96
97
98
99
100
```

Output

```
mycompiler_mongodb>
mycompiler_mongodb> [
  {
    _id: ObjectId('691d8df995f7e75faf6b128f'),
    FirstName: 'Zainab',
    LastName: 'Karim',
    CGPA: 3.1,
    Major: 'CS',
    Address: {
      Street: '3-Khalid Centre, Wahdat Road',
      City: 'Karachi',
      Province: 'Sindh',
      Country: 'Pakistan'
    },
    Phone: '021-4412625',
    Courses: [
      { course_id: 'CS355', course_name: 'DB', credits: 4 },
      { course_id: 'CS101', course_name: 'Pfun', credits: 4 }
    ]
  }
]
mycompiler_mongodb>
```

## 9. Display all the students for the SDP and EE majors.

`db.students.find({'$or': [{'Major': 'SDP'}, {'Major': 'EE'}]})`

MongoDB

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Nazimabad', 'Province': 'Sindh', 'Country': 'Pakistan'}},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}}
8 ])
9
10 db.students.find({'$or': [{'Major': 'SDP'}, {'Major': 'EE'}]})
11
12
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20
21
22
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81
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88
89
90
91
92
93
94
95
96
97
98
99
100
```

Output

```
mycompiler_mongodb>
mycompiler_mongodb> [
  {
    _id: ObjectId('691d8e61fb59c9ff9336b1290'),
    FirstName: 'Kumar',
    LastName: 'Rani',
    CGPA: 2.8,
    Major: 'EE',
    Address: {
      Street: 'Malik Park Islam',
      City: 'Lahore',
      Province: 'Punjab',
      Country: 'Pakistan'
    },
    Phone: '042-7113284',
    Courses: [ { course_id: 'CS101', course_name: 'Pfun', credits: 4 } ]
  },
  {
    _id: ObjectId('691d8f29fa3cd1390b6b128c'),
    FirstName: 'Hina',
    LastName: 'Baig'
  },
  {
    _id: ObjectId('691d8f29fa3cd1390b6b128d'),
    FirstName: 'Karim',
    LastName: 'Khan'
  },
  {
    _id: ObjectId('691d8f29fa3cd1390b6b128e'),
    FirstName: 'Abid',
    LastName: 'Kasim'
  },
  {
    _id: ObjectId('691d8f29fa3cd1390b6b128f'),
    FirstName: 'Zainab',
    LastName: 'Karim'
  }
]
mycompiler_mongodb>
[Execution complete with exit code 0]
```

## 10. Display only the first and last name of all students

Result: FirstName, LastName

`db.students.find({}, {'FirstName': 1, 'LastName': 1})`

MongoDB

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Nazimabad', 'Province': 'Sindh', 'Country': 'Pakistan'}},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}}
8 ])
9
10 db.students.find({}, {'FirstName': 1, 'LastName': 1})
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```

Output

```
mycompiler_mongodb>
mycompiler_mongodb> [
  {
    _id: ObjectId('691d8f29fa3cd1390b6b128c'),
    FirstName: 'Hina',
    LastName: 'Baig'
  },
  {
    _id: ObjectId('691d8f29fa3cd1390b6b128d'),
    FirstName: 'Karim',
    LastName: 'Khan'
  },
  {
    _id: ObjectId('691d8f29fa3cd1390b6b128e'),
    FirstName: 'Abid',
    LastName: 'Kasim'
  },
  {
    _id: ObjectId('691d8f29fa3cd1390b6b128f'),
    FirstName: 'Zainab',
    LastName: 'Karim'
  }
]
mycompiler_mongodb>
```

11. Display only the first name, last name, and city for all students.

Result: FirstName, LastName, City

```
db.students.find({}, {'FirstName': 1, 'LastName': 1, 'Address.City': 1})
```

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '9221-7733790'},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '9221-6788888'},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '359-99997'},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}, 'Phone': '359-99997'}
8 ])
9
10
11
12
13
14
15 db.students.find({}, {'FirstName': 1, 'LastName': 1, 'Address.City': 1})
```

Output

```
FirstName: 'Karim',
LastName: 'Khan',
Address: { City: 'Karachi' },
},
{
  _id: ObjectId('691d8f4ce0bf1d7d306b128e'),
  FirstName: 'Abid',
  LastName: 'Kasim',
  Address: { City: 'Karachi' },
},
{
  _id: ObjectId('691d8f4ce0bf1d7d306b128f'),
  FirstName: 'Zainab',
  LastName: 'Karim',
  Address: { City: 'Karachi' },
},
{
  _id: ObjectId('691d8f4ce0bf1d7d306b1290'),
  FirstName: 'Kumar',
  LastName: 'Rani',
  Address: { City: 'Lahore' },
},
{
  _id: ObjectId('691d8f4ce0bf1d7d306b1291'),
  FirstName: 'Fahim',
  LastName: 'Alam',
  Address: { City: 'Hunza' },
}
```

12. Display only the first name, last name for all the students with CGPA greater than or equal to 3.5 (without Object IDs)

```
db.students.find({'CGPA' : {$gte: 3.5}}, {'_id': 0, 'FirstName': 1, 'LastName': 1})
```

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '9221-7733790'},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '9221-6788888'},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '359-99997'},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}, 'Phone': '359-99997'}
8 ])
9
10
11
12
13
14
15 db.students.find({'CGPA' : {$gte: 3.5}}, {'_id': 0, 'FirstName': 1, 'LastName': 1})
```

Output

```
mycompiler_mongodb>
mycompiler_mongodb> ... ..
acknowledged: true,
insertedIds: {
  '0': ObjectId('691d8fee55fd028ae06b128c'),
  '1': ObjectId('691d8fee55fd028ae06b128d'),
  '2': ObjectId('691d8fee55fd028ae06b128e'),
  '3': ObjectId('691d8fee55fd028ae06b128f'),
  '4': ObjectId('691d8fee55fd028ae06b1290'),
  '5': ObjectId('691d8fee55fd028ae06b1291')
}
mycompiler_mongodb>
mycompiler_mongodb> [
  { FirstName: 'Hina', LastName: 'Baig' },
  { FirstName: 'Fahim', LastName: 'Alam' }
]
mycompiler_mongodb>
```

13. Insert a student record with the following information (refer to manual)

```
db.students.insert({'FirstName': 'Fatima', 'LastName': 'Tariq', 'Phone': '03124567891', 'Address': {'Street': 'Zainab Street Saddar', 'City': 'Karachi'}})
```

```
1
2
3 {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '3233389064', 'Country': 'Pakistan'}, 'Phone': '3233389064'},
4
5 {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '9221-7733790'},
6
7 {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '9221-6788888'},
8
9 {'Street': '3-Khalid Centre, Wahdat Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '359-99997'},
10
11 {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
12
13 {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}, 'Phone': '359-99997'}
14
15
16 {'03124567891', 'Address': {'Street': 'Zainab Street Saddar', 'City': 'Karachi'}}
17
```

Output

```
CGPA: 3.7,
Address: {
  Street: 'Wilbert Squares',
  City: 'Hunza',
  Province: 'Gilgit-Baltistan',
  Country: 'Pakistan'
},
Phone: '359-99997'
},
{
  _id: ObjectId('691d91323051faa80a6b1292'),
  FirstName: 'Fatima',
  LastName: 'Tariq',
  Phone: '03124567891',
  Address: { Street: 'Zainab Street Saddar', City: 'Karachi' },
}
mycompiler_mongodb>
[Execution complete with exit code 0]
```

14. Display all the student who do not have major property.

db.students.find({'Major': {'\$exists': 0}})

MongoDB

1  
2 db.students.insertMany([  
3 {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisla  
4 ,  
5 {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City':  
6 ,  
7 {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'C  
8 ,  
9 {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat I  
10 ,  
11 {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City':  
12 ,  
13 {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Provin  
14 ]})  
15  
16 db.students.find({'Major': {'\$exists': 0}})  
17

Run Save

Output

```
mycompiler_mongodb>  
mycompiler_mongodb> [  
  {  
    _id: ObjectId('691d91d5e537e546626b1291'),  
    FirstName: 'Fahim',  
    LastName: 'Alam',  
    CGPA: 3.7,  
    Address: {  
      Street: 'Wilbert Squares',  
      City: 'Hunza',  
      Province: 'Gilgit-Baltistan',  
      Country: 'Pakistan'  
    },  
    Phone: '359-99997'  
  }  
]  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

15. Insert the following students using insertMany (refer to manual)

db.students.insertMany([{'FirstName': 'Zahid', 'LastName': 'Hakim', 'Major': 'CS'},  
{'FirstName': 'Ayesha', 'LastName': 'Asif'}, {'FirstName': 'Faheem', 'LastName': 'Faiz',  
'Phone': '0213456789'}])

1  
2  
3 b', 'Country': 'Pakistan', 'Phone': '3233389064', 'Courses': [{'course\_id': 'CS101', 'course\_name': 'Pfun', 'credits': 4},  
4  
5 indh', 'Country': 'Pakistan', 'Phone': '9221-7733790', 'Courses': [{'course\_id': 'CH111', 'course\_name': 'PMAS', 'credits  
6  
7 ice': 'Sindh', 'Country': 'Pakistan', 'Phone': '9221-6678442', 'Courses': [{'course\_id': 'CS411', 'course\_name': 'AI', 'cre  
8  
9 Province': 'Sindh', 'Country': 'Pakistan', 'Phone': '021-4412625', 'Courses': [{'course\_id': 'CS355', 'course\_name': 'DB  
10  
11 jab', 'Country': 'Pakistan', 'Phone': '042-7113284', 'Courses': [{'course\_id': 'CS101', 'course\_name': 'Pfun', 'credits':  
12  
13 'Country': 'Pakistan', 'Phone': '359-99997'}  
14  
15  
16 rstName': 'Faheem', 'LastName': 'Faiz', 'Phone': '0213456789'}])  
17

Run Save

Output

```
mycompiler_mongodb>  
mycompiler_mongodb> [  
  {  
    _id: ObjectId('691d92fb21a6c9d42a6b1292'),  
    FirstName: 'Zahid',  
    LastName: 'Hakim',  
    Major: 'CS'  
  },  
  {  
    _id: ObjectId('691d92fb21a6c9d42a6b1293'),  
    FirstName: 'Ayesha',  
    LastName: 'Asif'  
  },  
  {  
    _id: ObjectId('691d92fb21a6c9d42a6b1294'),  
    FirstName: 'Faheem',  
    LastName: 'Faiz',  
    Phone: '0213456789'  
  }  
]  
mycompiler_mongodb>  
[Execution complete with exit code 0]
```

## 16. Display all the students have taken the CS355 course.

db.students.find({'Courses.course\_id': 'CS355'})

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '9921-7733790'},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}, 'Phone': '099-9999999'}
8 ])
9
10
11
12
13
14
15
16 db.students.find({'Courses.course_id': 'CS355'})
```

Output

```
{
  '_id': ObjectId('691d93747cc81f8bcc6b1291'),
  'FirstName': 'Karim',
  'LastName': 'Khan',
  'CGPA': 3.2,
  'Major': 'EE',
  'Address': {
    'Street': 'Off Nishter Road',
    'City': 'Karachi',
    'Province': 'Sindh',
    'Country': 'Pakistan'
  },
  'Phone': '9221-7733790',
  'Courses': [
    { 'course_id': 'CH111', 'course_name': 'PMAS', 'credits': 3 },
    { 'course_id': 'CS355', 'course_name': 'DB', 'credits': 4 }
  ]
}
```

## 17. Display all the students have not taken the CS355 course.

db.students.find({'Courses.course\_id': {'\$ne': 'CS355'}})

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '9921-7733790'},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}, 'Phone': '099-9999999'}
8 ])
9
10
11
12
13
14
15
16 db.students.find({'Courses.course_id': {'$ne': 'CS355'}})
```

Output

```
{
  '_id': ObjectId('691d93b1e37add50376b1291'),
  'FirstName': 'Fahim',
  'LastName': 'Alam',
  'CGPA': 3.7,
  'Address': {
    'Street': 'Wilbert Squares',
    'City': 'Hunza',
    'Province': 'Gilgit-Baltistan',
    'Country': 'Pakistan'
  },
  'Phone': '099-9999999',
  'Courses': [ { 'course_id': 'CS101', 'course_name': 'Pfun', 'credits': 4 } ]
}
```

## 18. Increment the CGPA of all students by 0.1.

db.students.updateMany({}, {\$inc : {'CGPA': 0.1}})

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '9921-7733790'},
3   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
4   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
5   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
6   {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Lahore', 'Province': 'Punjab', 'Country': 'Pakistan'}, 'Phone': '042-7113284'},
7   {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'}, 'Phone': '099-9999999'}
8 ])
9
10
11
12
13
14
15
16 db.students.updateMany({}, {$inc : {'CGPA': 0.1}})
17
```

Output

```
InsertedIds: {
  '0': ObjectId('691d946eac3869e1086b128c'),
  '1': ObjectId('691d946eac3869e1086b128d'),
  '2': ObjectId('691d946eac3869e1086b128e'),
  '3': ObjectId('691d946eac3869e1086b128f'),
  '4': ObjectId('691d946eac3869e1086b1290'),
  '5': ObjectId('691d946eac3869e1086b1291')
}
mycompiler_mongodb>
mycompiler_mongodb> {
  acknowledged: true,
  insertedId: null,
  matchedCount: 6,
  modifiedCount: 6,
  upsertedCount: 0
}
mycompiler_mongodb>
[Execution complete with exit code 0]
```

## 19. Set the CGPA of all students to 0.1

```
db.students.updateMany({}, {$set : {'CGPA': 0.1}})
```

MongoDB ⓘ

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'},
3   },
4   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'},
5   },
6   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'},
7   },
8   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'},
9   },
10  {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'},
11  },
12  {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'},
13  })
14
15 db.students.updateMany({}, {$set : {'CGPA': 0.1}})
16 db.students.find({})
17
18
```

Output

```
{
  '_id': ObjectId('691d94a6ad4d4cb97a6b128e'),
  'FirstName': 'Abid',
  'LastName': 'Kasim',
  'CGPA': 0.1,
  'Major': 'SDP',
  'Address': {
    'Street': 'ST-2, North Nazimabad',
    'City': 'Karachi',
    'Province': 'Sindh',
    'Country': 'Pakistan'
  },
  'Phone': '9221-7733790',
  'Courses': [
    { 'course_id': 'CH111', 'course_name': 'PMAS', 'credits': 3 },
    { 'course_id': 'CS355', 'course_name': 'DB', 'credits': 4 }
  ]
}
```

## 20. Introduce a new attribute Minor for the students with the value CH

```
db.students.updateMany({}, {$set : {'Minor': "CH"}})
```

MongoDB ⓘ

```
1 db.students.insertMany([
2   {'FirstName': 'Hina', 'LastName': 'Baig', 'CGPA': 3.5, 'Major': 'CS', 'Address': {'Street': 'Puran Nagar', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'},
3   },
4   {'FirstName': 'Karim', 'LastName': 'Khan', 'CGPA': 3.2, 'Major': 'EE', 'Address': {'Street': 'Off Nishter Road', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'},
5   },
6   {'FirstName': 'Abid', 'LastName': 'Kasim', 'CGPA': 2.9, 'Major': 'SDP', 'Address': {'Street': 'ST-2, North Nazimabad', 'City': 'Karachi', 'Province': 'Sindh', 'Country': 'Pakistan'},
7   },
8   {'FirstName': 'Zainab', 'LastName': 'Karim', 'CGPA': 3.1, 'Major': 'CS', 'Address': {'Street': '3-Khalid Centre, Wahdat', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'},
9   },
10  {'FirstName': 'Kumar', 'LastName': 'Rani', 'CGPA': 2.8, 'Major': 'EE', 'Address': {'Street': 'Malik Park Islam', 'City': 'Faisalabad', 'Province': 'Punjab', 'Country': 'Pakistan'},
11  },
12  {'FirstName': 'Fahim', 'LastName': 'Alam', 'CGPA': 3.7, 'Address': {'Street': 'Wilbert Squares', 'City': 'Hunza', 'Province': 'Gilgit-Baltistan', 'Country': 'Pakistan'},
13  })
14
15 db.students.updateMany({}, {$set : {'Minor': "CH"}})
16 db.students.find({})
17
18
```

Output

```
{
  '_id': ObjectId('691d960973b8c675496b128d'),
  'FirstName': 'Karim',
  'LastName': 'Khan',
  'CGPA': 3.2,
  'Major': 'EE',
  'Address': {
    'Street': 'Off Nishter Road',
    'City': 'Karachi',
    'Province': 'Sindh',
    'Country': 'Pakistan'
  },
  'Phone': '3233389064',
  'Courses': [
    { 'course_id': 'CS101', 'course_name': 'Pfun', 'credits': 4 },
    { 'course_id': 'CS121', 'course_name': 'OOP', 'credits': 4 }
  ],
  'Minor': 'CH'
}
```

## 21. Add a new course all students with the following information (refer to manual)

```
db.students.updateMany({}, {$push : {'Courses': {'course_id' : 'CH101', 'course_name' : 'Liberal Core', 'credits': 1}}})
```



MongoDB
Run
Save

```

1 db.students.insertMany([
2   {'FirstName':'Hina', 'LastName':'Baig','CGPA':3.5,'Major':'CS','Address':{'Street':'Puran Nagar','City': 'Faisla
3   },
4   {'FirstName':'Karim', 'LastName':'Khan','CGPA':3.2,'Major':'EE','Address':{'Street':' Off Nishter Road','City':
5   },
6   {'FirstName':'Abid', 'LastName':'Kasim','CGPA':2.9,'Major':'SDP','Address':{'Street':'ST-2, North Nazimabad','C
7   },
8   {'FirstName':'Zainab', 'LastName':'Karim','CGPA':3.1,'Major':'CS','Address':{'Street':'3-Khalid Centre, Wahdat
9   },
10  {'FirstName':'Kumar', 'LastName':'Rani','CGPA':2.8,'Major':'EE','Address':{'Street':'Malik Park Islam','City':
11  },
12  {'FirstName':'Fahim', 'LastName':'Alam','CGPA':3.7,'Address':{'Street':'Wilbert Squares','City': 'Hunza','Provi
13  })
14 ])
15
16 db.students.updateMany({}, {$push: {'Courses': {'course_id': 'CH101', 'course_name': 'Liberal Core', 'credit
17 db.students.find({})
18

```

**Output**

```

courses: [
  { course_id: 'CS101', course_name: 'Pfun', credits: 4 },
  { course_id: 'CH101', course_name: 'Liberal Core', credits: 1 }
]
{
  _id: ObjectId('691d9b323fbf039f1b6b1291'),
  FirstName: 'Fahim',
  LastName: 'Alam',
  CGPA: 3.7,
  Address: {
    Street: 'Wilbert Squares',
    City: 'Hunza',
    Province: 'Gilgit-Baltistan',
    Country: 'Pakistan'
  },
  Phone: '350-99997',
  Courses: [ { course_id: 'CH101', course_name: 'Liberal Core', credits: 1 } ]
}
mycompiler_mongodb>

```

## 22. Delete all the students with CGPA less than 3.0

db.students.deleteMany({'CGPA' : {\$lt: 3.0}})

```

1 db.students.insertMany([
2   {'FirstName':'Hina', 'LastName':'Baig','CGPA':3.5,'Major':'CS','Address':{'Street':'Puran Nagar','City': 'Faisla
3   },
4   {'FirstName':'Karim', 'LastName':'Khan','CGPA':3.2,'Major':'EE','Address':{'Street':' Off Nishter Road','City':
5   },
6   {'FirstName':'Abid', 'LastName':'Kasim','CGPA':2.9,'Major':'SDP','Address':{'Street':'ST-2, North Nazimabad','C
7   },
8   {'FirstName':'Zainab', 'LastName':'Karim','CGPA':3.1,'Major':'CS','Address':{'Street':'3-Khalid Centre, Wahdat
9   },
10  {'FirstName':'Kumar', 'LastName':'Rani','CGPA':2.8,'Major':'EE','Address':{'Street':'Malik Park Islam','City':
11  },
12  {'FirstName':'Fahim', 'LastName':'Alam','CGPA':3.7,'Address':{'Street':'Wilbert Squares','City': 'Hunza','Provi
13  })
14 ])
15
16 db.students.deleteMany({'CGPA' : {$lt: 3.0}})
17 db.students.find({})

```

**Output**

```

mycompiler_mongodb>
mycompiler_mongodb> ... .. {
  acknowledged: true,
  insertedIds: {
    '0': ObjectId('691d9c1e73e5ba4d886b128c'),
    '1': ObjectId('691d9c1e73e5ba4d886b128d'),
    '2': ObjectId('691d9c1e73e5ba4d886b128e'),
    '3': ObjectId('691d9c1e73e5ba4d886b128f'),
    '4': ObjectId('691d9c1e73e5ba4d886b1290'),
    '5': ObjectId('691d9c1e73e5ba4d886b1291')
  }
}
mycompiler_mongodb>
mycompiler_mongodb> { acknowledged: true, deletedCount: 2 }
mycompiler_mongodb> [
  {
    _id: ObjectId('691d9c1e73e5ba4d886b128c'),
    FirstName: 'Hina',
    LastName: 'Baig',

```