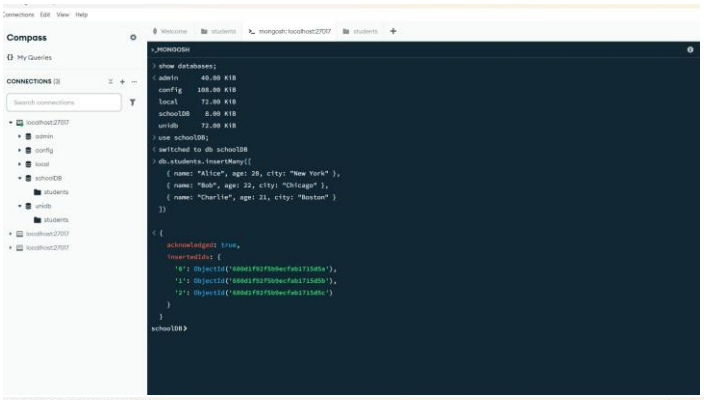
IT2234 (p) Web Service and Server Technologies.
University of Vavuniya
Faculty of Applied science
Department of physical science
2021/ICT/84

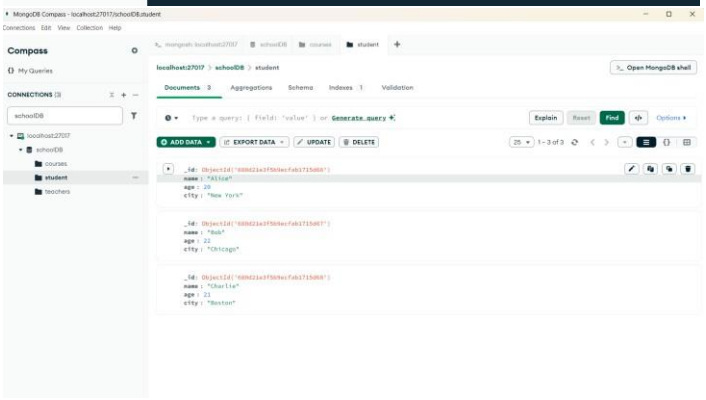
1. Create the database schoolDB

2. Create collections students, courses and teachers. Insert documents

Students collection

```
db.students.insertMany([
  { name: "Alice", age: 20, city: "New York" },
  { name: "Bob", age: 22, city: "Chicago" },
  { name: "Charlie", age: 21, city: "Boston" }
])
```

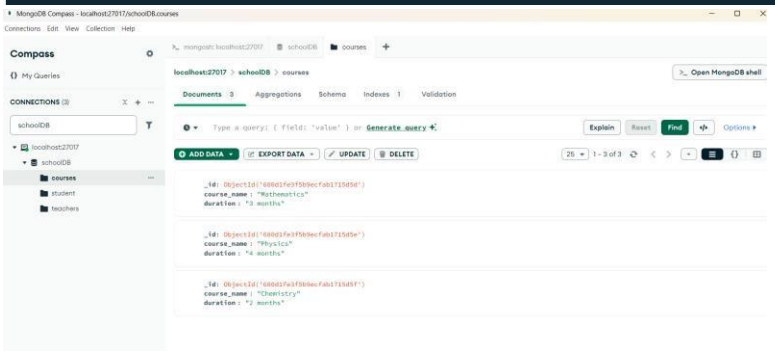




Courses collection

```
db.courses.insertMany([
  { course_name: "Mathematics", duration: "3 months" },
  { course_name: "Physics", duration: "4 months" },
  { course_name: "Chemistry", duration: "2 months" }
])
```

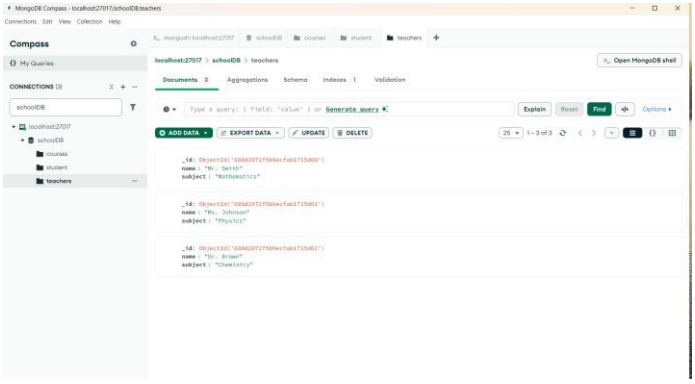
```
  }
> db.courses.insertMany([
    { course_name: "Mathematics", duration: "3 months" },
    { course_name: "Physics", duration: "4 months" },
    { course_name: "Chemistry", duration: "2 months" }
  ])
< {
    acknowledged: true,
    insertedIds: {
      '0': ObjectId('680d1fe3f5b9ecfab1715d5d'),
      '1': ObjectId('680d1fe3f5b9ecfab1715d5e'),
      '2': ObjectId('680d1fe3f5b9ecfab1715d5f')
    }
  }
```



Teachers collections

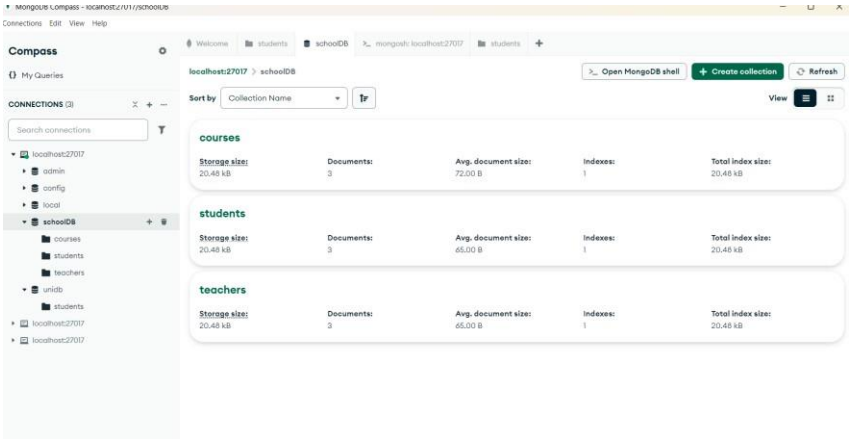
```
db.teachers.insertMany([
  { name: "Mr. Smith", subject: "Mathematics" },
  { name: "Ms. Johnson", subject: "Physics" },
  { name: "Dr. Brown", subject: "Chemistry" }
])
```

```
> db.teachers.insertMany([
    { name: "Mr. Smith", subject: "Mathematics" },
    { name: "Ms. Johnson", subject: "Physics" },
    { name: "Dr. Brown", subject: "Chemistry" }
  ])
< {
    acknowledged: true,
    insertedIds: {
      '0': ObjectId('680d2072f5b9ecfab1715d60'),
      '1': ObjectId('680d2072f5b9ecfab1715d61'),
      '2': ObjectId('680d2072f5b9ecfab1715d62')
    }
  }
> show collections;
< courses
  students
  teachers
schoolDB>
```



Questions.

i) Show all students

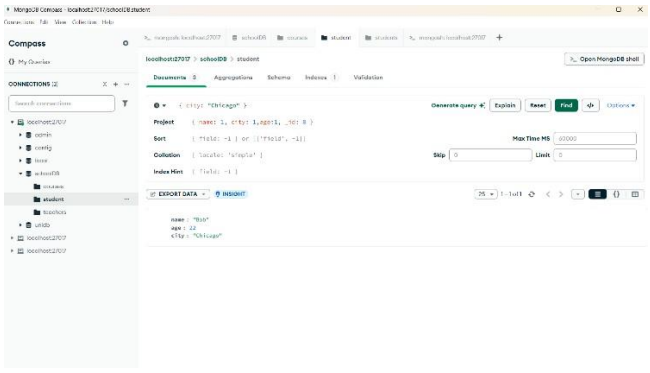


ii) Find students who live in “Chicago”

db.student.find({ city: "Chicago" })

Box	Code
Filter	`{ city: "Chicago" }`
Project	`{ name: 1, city: 1, age:1, _id: 0 }`

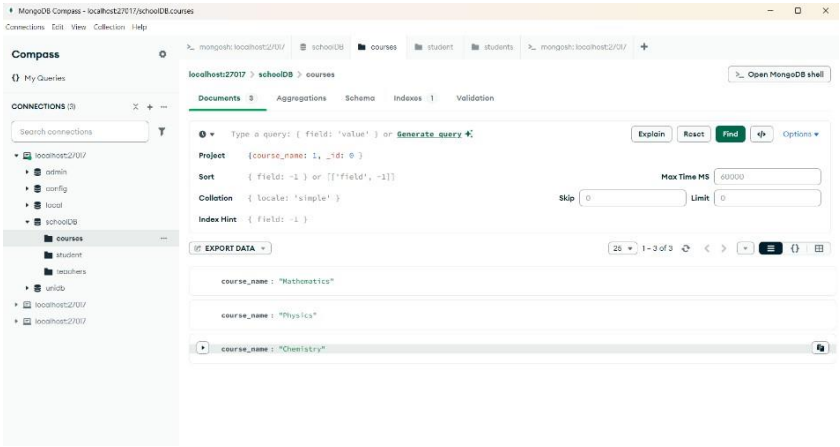
- **Filter** = "which documents you want"
- **Project** = "which fields you want to show"



iii) List all course names

db.courses.find({}, { course_name: 1, _id: 0 })

```
}
> db.courses.find({}, { course_name: 1, _id: 0 })
< {
    course_name: 'Mathematics'
  }
  {
    course_name: 'Physics'
  }
  {
    course_name: 'Chemistry'
  }
schoolDB>
```

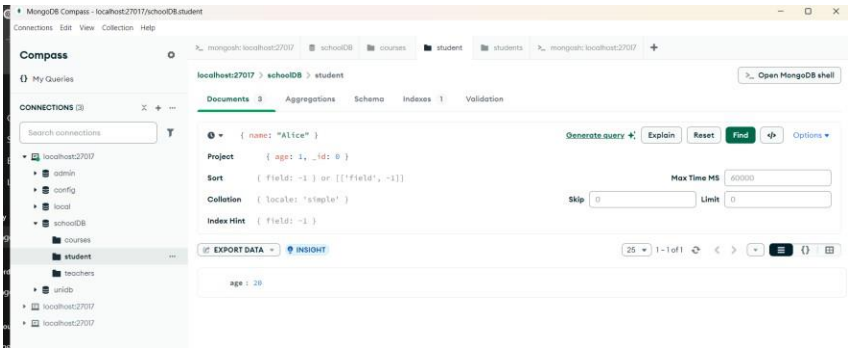


iv) Find the age of Alice

db.students.find({ name: "Alice" }, { age: 1, _id: 0 })

```
> db.courses.find({}, { course_name: 1, _id: 0 })
< {
    course_name: 'Mathematics'
  }
  {
    course_name: 'Physics'
  }
  {
    course_name: 'Chemistry'
  }
> db.students.find({ name: "Alice" }, { age: 1, _id: 0 })
<
> db.student.find({ name: "Alice" }, { age: 1, _id: 0 })
< {
    age: 20
  }
```

Box	What to write
Filter	`{ name: "Alice" }`
Project	`{ age: 1, _id: 0 }`



v) Update Bob's city to "San Francisco"

```
db.students.updateOne(
 { name: "Bob" },
 { $set: { city: "San Francisco" } }
)
```

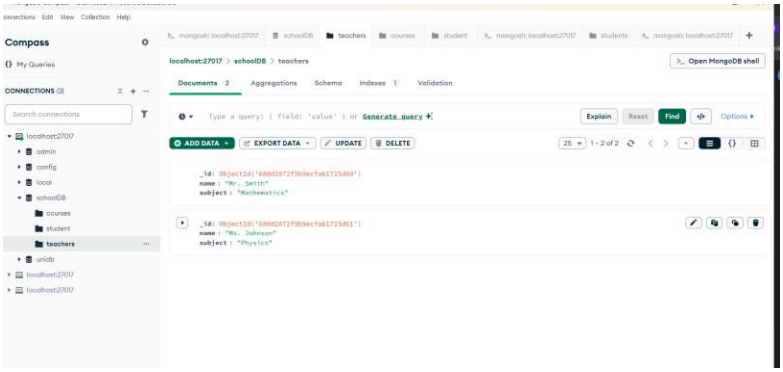
```
> db.students.updateOne(
    { name: "Bob" },
    { $set: { city: "San Francisco" } }
  )
< {
    acknowledged: true,
    insertedId: null,
    matchedCount: 0,
    modifiedCount: 0,
    upsertedCount: 0
  }
schoolDB>
```

vi) Delete the teacher "Dr. Brown".

```
db.teachers.deleteOne({ name: "Dr. Brown" })
```

```
> db.teachers.deleteOne({ name: "Dr. Brown" })
< {
    acknowledged: true,
    deletedCount: 1
  }
schoolDB>
```

Refresh



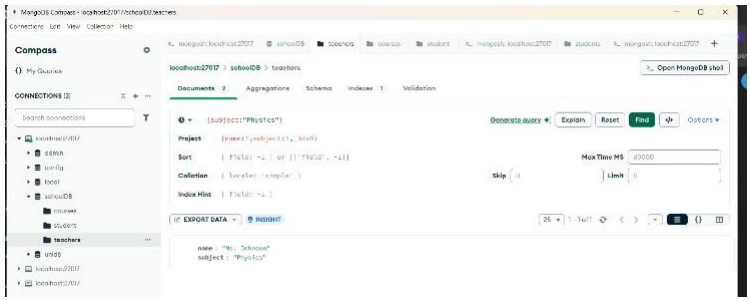
vii) Find teachers who teach "Physics"

db.teachers.find({ subject: "Physics" })

```
  }
> db.teachers.find({ subject: "Physics" })
< {
    _id: ObjectId('680d2072f5b9ecfab1715d61'),
    name: 'Ms. Johnson',
    subject: 'Physics'
  }
schoolDB>
```

Filter - {subject:"Physics"}

Project - {name:1,subject:1,_id:0}



viii) Add a new student named "David" aged 23 from "Miami"

db.students.insertOne({ name: "David", age: 23, city: "Miami" })

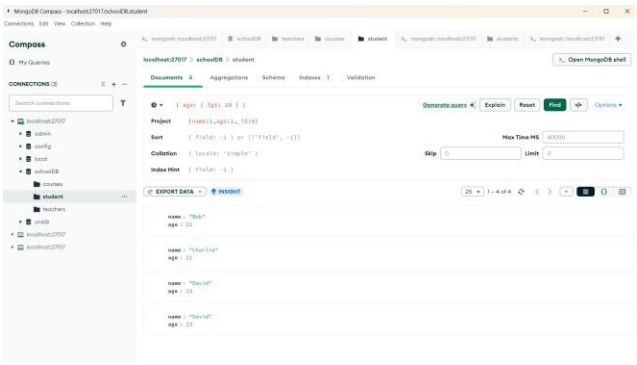
```
> db.student.insertOne({ name: "David", age: 23, city: "Miami" })
< {
    acknowledged: true,
    insertedId: ObjectId('680de13b971813dca281b137')
  }
schoolDB>
```

ix) Find students whose age is greater than 20

db.students.find({ age: { $gt: 20 } })

```
> db.student.find({ age: { $gt: 20 } })
< {
    _id: ObjectId('680d21e3f5b9ecfab1715d67'),
    name: 'Bob',
    age: 22,
    city: 'Chicago'
  }
  {
    _id: ObjectId('680d21e3f5b9ecfab1715d68'),
    name: 'Charlie',
    age: 21,
    city: 'Boston'
  }
  {
    _id: ObjectId('680de13b971813dca281b137'),
    name: 'David',
    age: 23,
    city: 'Miami'
  }
  {
```

Filter - { age: { $gt: 20 } }
Project - {name:1,age:1,_id:0}



x) Sort students by age ascending

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

```
>_MONGOSH
> db.student.find().sort({ age: 1 })
< {
    _id: ObjectId('680d21e3f5b9ecfab1715d66'),
    name: 'Alice',
    age: 20,
    city: ' NewYork'
  }
  {
    _id: ObjectId('680d21e3f5b9ecfab1715d68'),
    name: 'Charlie',
    age: 21,
    city: 'Boston'
  }
  {
    _id: ObjectId('680d21e3f5b9ecfab1715d67'),
    name: 'Bob',
    age: 22,
    city: 'Chicago'
  }
  {
    _id: ObjectId('680de13b971813dca281b137'),
    name: 'David',
    age: 23,
    city: 'Miami'
  }
  {
    _id: ObjectId('680de1ad971813dca281b138'),
    name: 'David',
    age: 23
```