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Class : D15A

Roll no. : 42

Experiment – 7: MongoDB

1) **Aim:** To study CRUD operations in MongoDB
2) **Problem Statement:**

   A) Create a new database to storage student details of IT dept(Name, Roll no, class name) and perform the following on the database

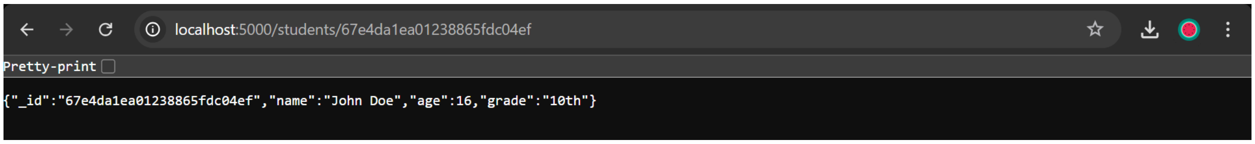
      a) Insert one student details
      b) Insert at once multiple student details
      c) Display student for a particular class
      d) Display students of specific roll no in a class
      e) Change the roll no of a student
      f) Delete entries of particular student

   B) Create a set of RESTful endpoints using Node.js, Express, and Mongoose for handling student data operations.
   The endpoints should support:

   - Retrieve a list of all students.
   - Retrieve details of an individual student by ID.
   - Add a new student to the database.
   - Update details of an existing student by ID.
   - Delete a student from the database by ID.

   Connect the server to MongoDB using Mongoose, and store student data with attributes: name, age, and grade.

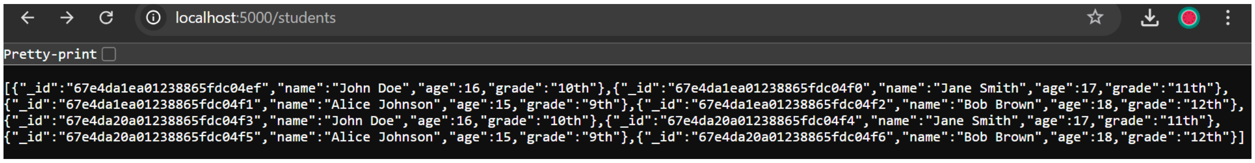
3) **Output:**



localhost:5000/students/67e4da1ea01238865fdc04ef

Pretty-print □

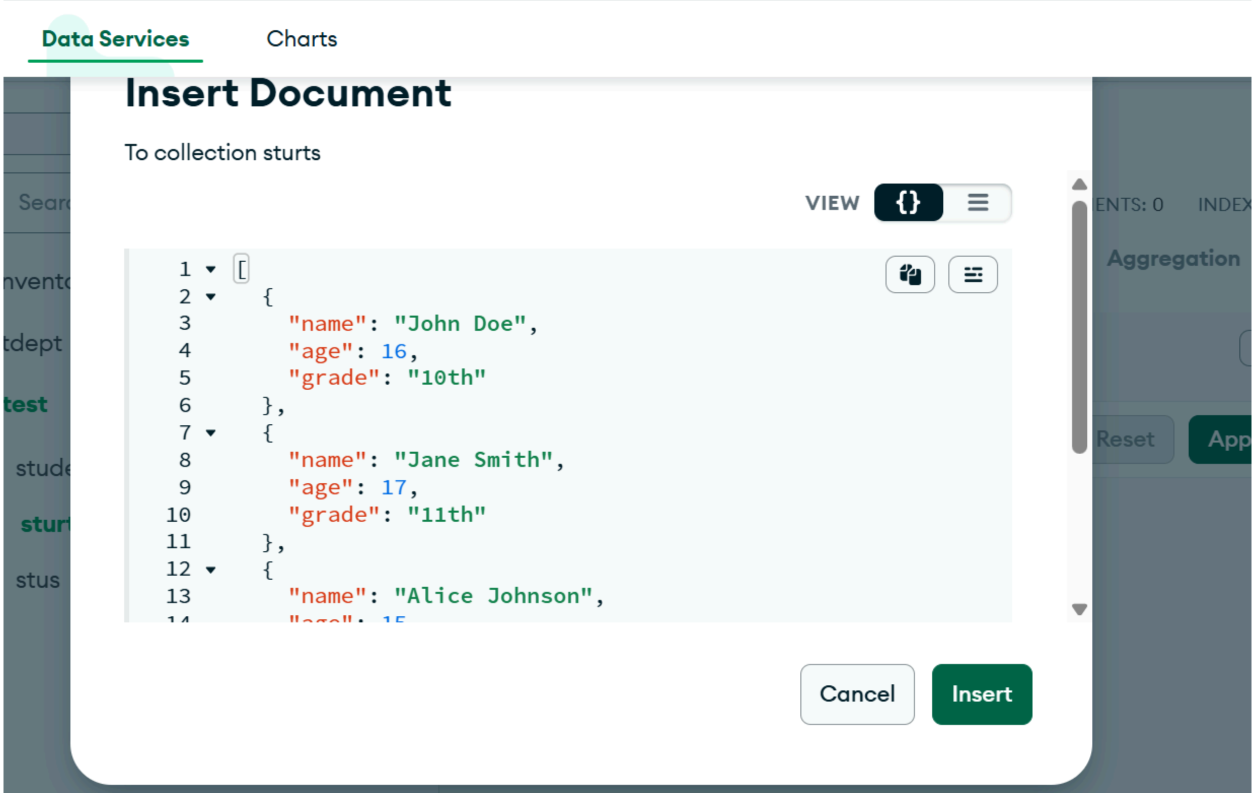
```
{"_id":"67e4da1ea01238865fdc04ef","name":"John Doe","age":16,"grade":"10th"}
```



localhost:5000/students

Pretty-print □

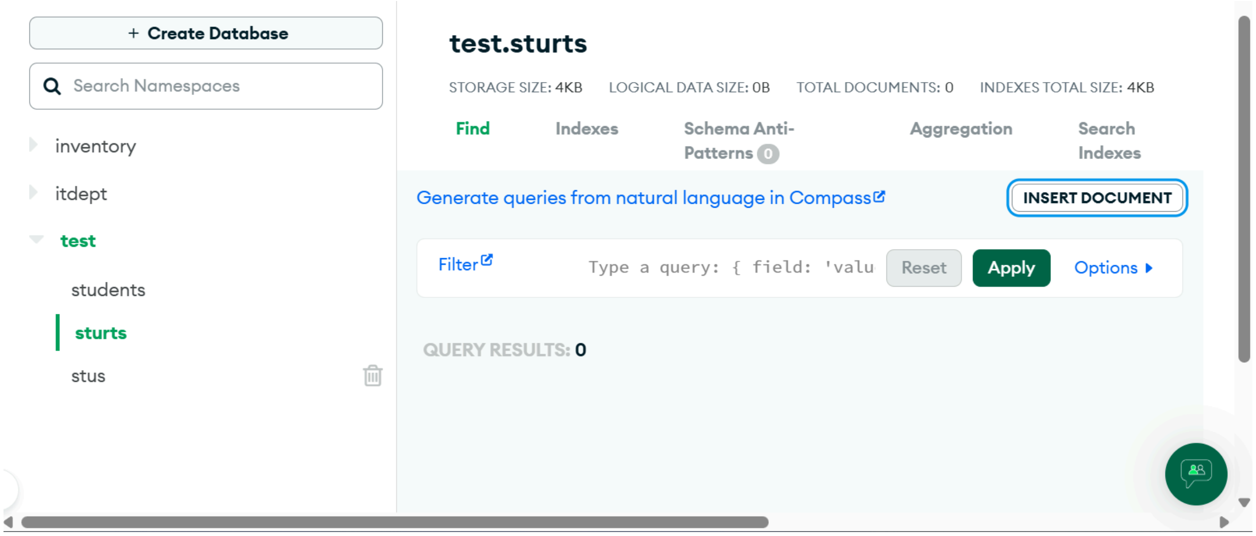
```
[{"_id":"67e4da1ea01238865fdc04ef","name":"John Doe","age":16,"grade":"10th"},{"_id":"67e4da1ea01238865fdc04f0","name":"Jane Smith","age":17,"grade":"11th"},
{"_id":"67e4da1ea01238865fdc04f1","name":"Alice Johnson","age":15,"grade":"9th"},{"_id":"67e4da1ea01238865fdc04f2","name":"Bob Brown","age":18,"grade":"12th"},
{"_id":"67e4da20a01238865fdc04f3","name":"John Doe","age":16,"grade":"10th"},{"_id":"67e4da20a01238865fdc04f4","name":"Jane Smith","age":17,"grade":"11th"},
{"_id":"67e4da20a01238865fdc04f5","name":"Alice Johnson","age":15,"grade":"9th"},{"_id":"67e4da20a01238865fdc04f6","name":"Bob Brown","age":18,"grade":"12th"}]
```



Insert Document

To collection sturts

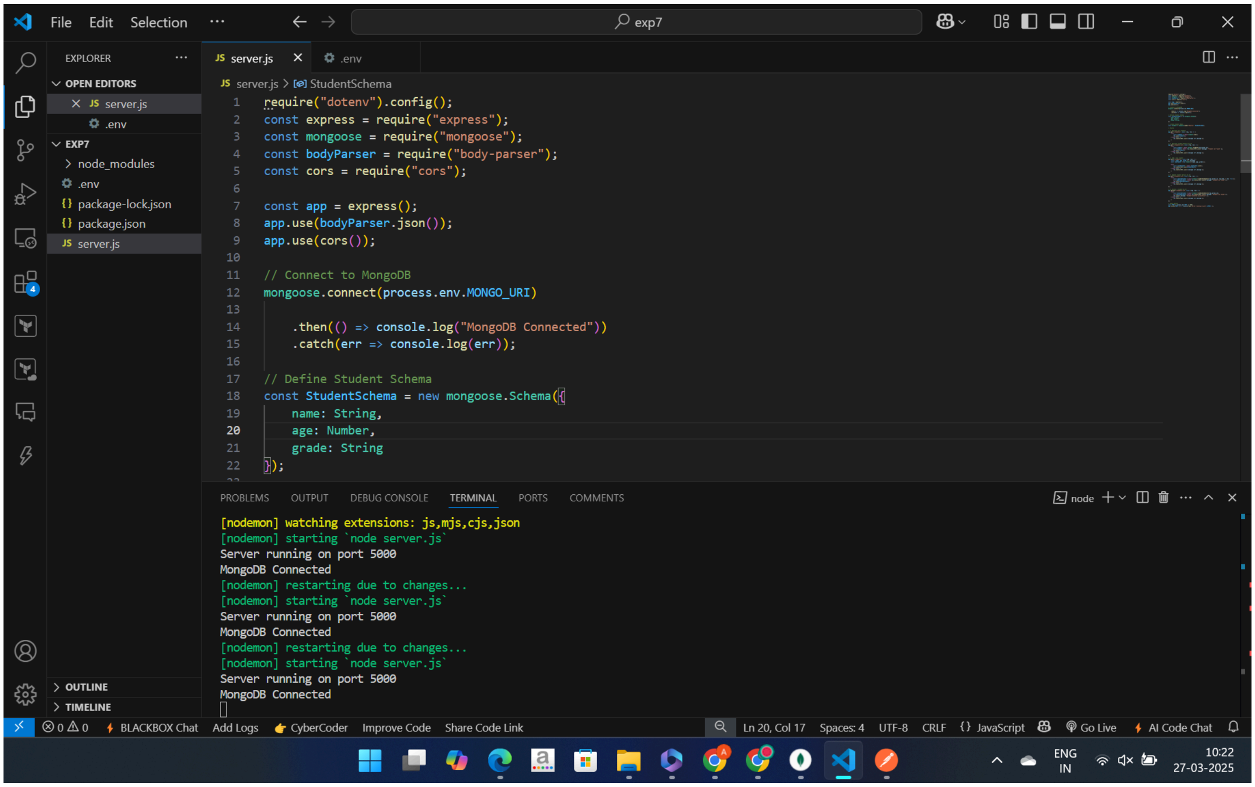
```
[
  {
    "name": "John Doe",
    "age": 16,
    "grade": "10th"
  },
  {
    "name": "Jane Smith",
    "age": 17,
    "grade": "11th"
  },
  {
    "name": "Alice Johnson",
    "age": 15
```



test.sturts

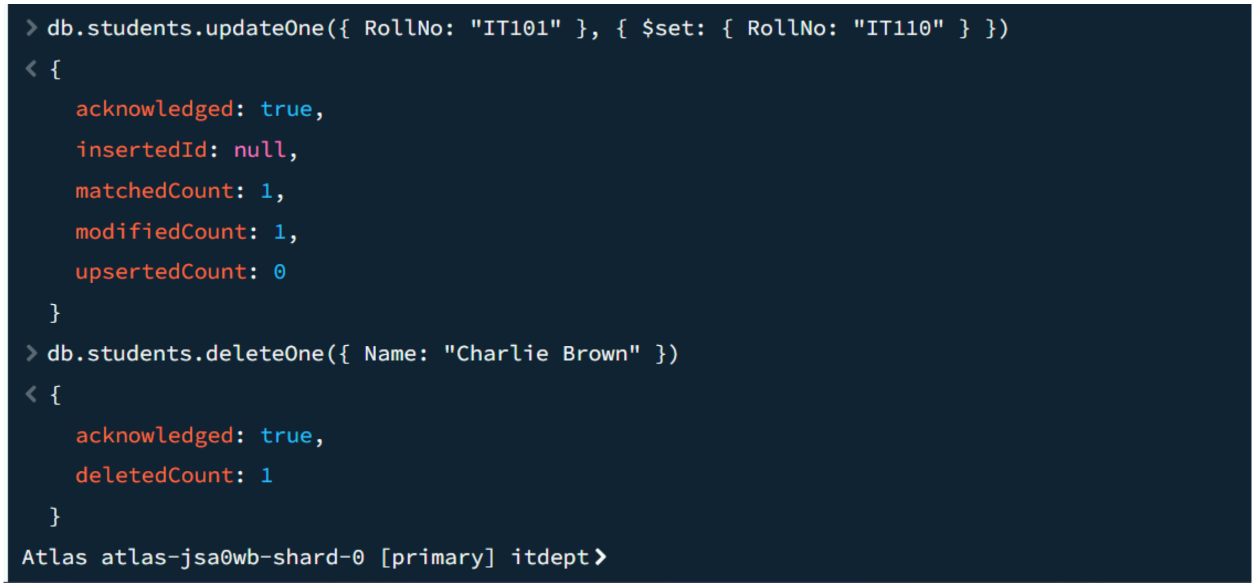
STORAGE SIZE: 4KB   LOGICAL DATA SIZE: 0B   TOTAL DOCUMENTS: 0   INDEXES TOTAL SIZE: 4KB

QUERY RESULTS: 0

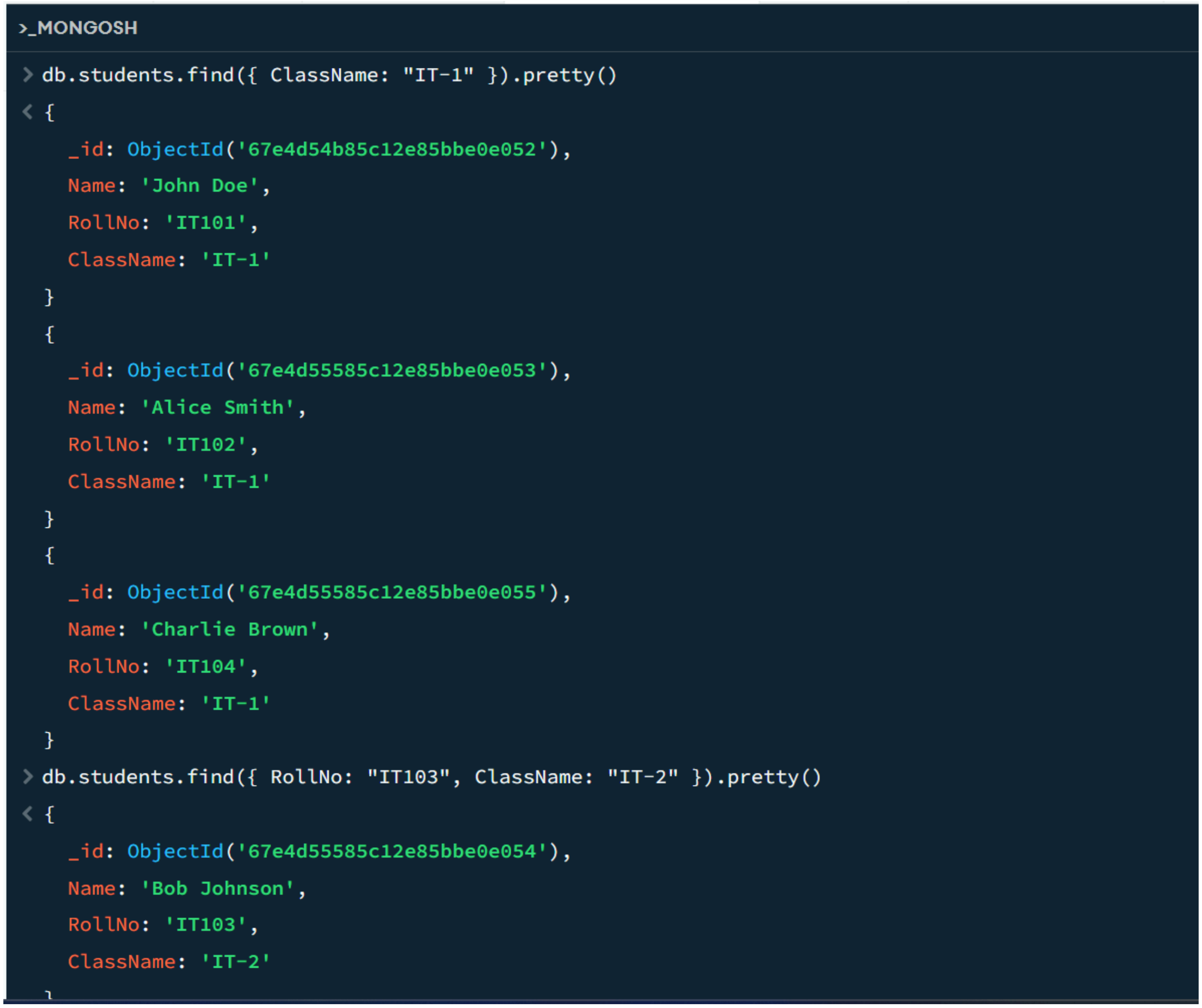


```javascript
require("dotenv").config();
const express = require("express");
const mongoose = require("mongoose");
const bodyParser = require("body-parser");
const cors = require("cors");

const app = express();
app.use(bodyParser.json());
app.use(cors());

// Connect to MongoDB
mongoose.connect(process.env.MONGO_URI)

    .then(() => console.log("MongoDB Connected"))
    .catch(err => console.log(err));

// Define Student Schema
const StudentSchema = new mongoose.Schema({
    name: String,
    age: Number,
    grade: String
});
```

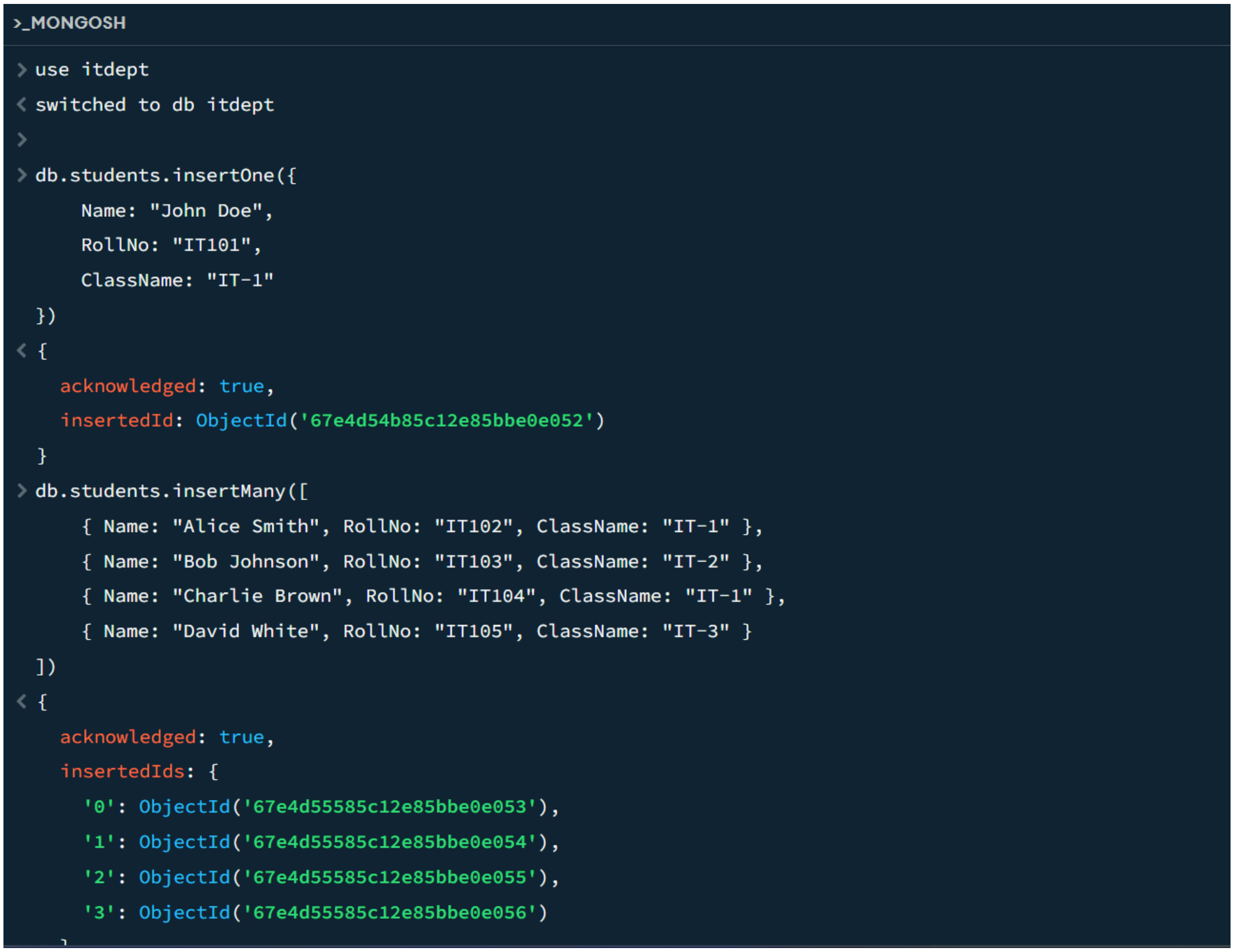
```
[nodemon] watching extensions: js,mjs,cjs,json
[nodemon] starting `node server.js`
Server running on port 5000
MongoDB Connected
[nodemon] restarting due to changes...
[nodemon] starting `node server.js`
Server running on port 5000
MongoDB Connected
[nodemon] restarting due to changes...
[nodemon] starting `node server.js`
Server running on port 5000
MongoDB Connected
```



```
> db.students.updateOne({ RollNo: "IT101" }, { $set: { RollNo: "IT110" } })
< {
    acknowledged: true,
    insertedId: null,
    matchedCount: 1,
    modifiedCount: 1,
    upsertedCount: 0
  }
> db.students.deleteOne({ Name: "Charlie Brown" })
< {
    acknowledged: true,
    deletedCount: 1
  }
Atlas atlas-jsa0wb-shard-0 [primary] itdept>
```

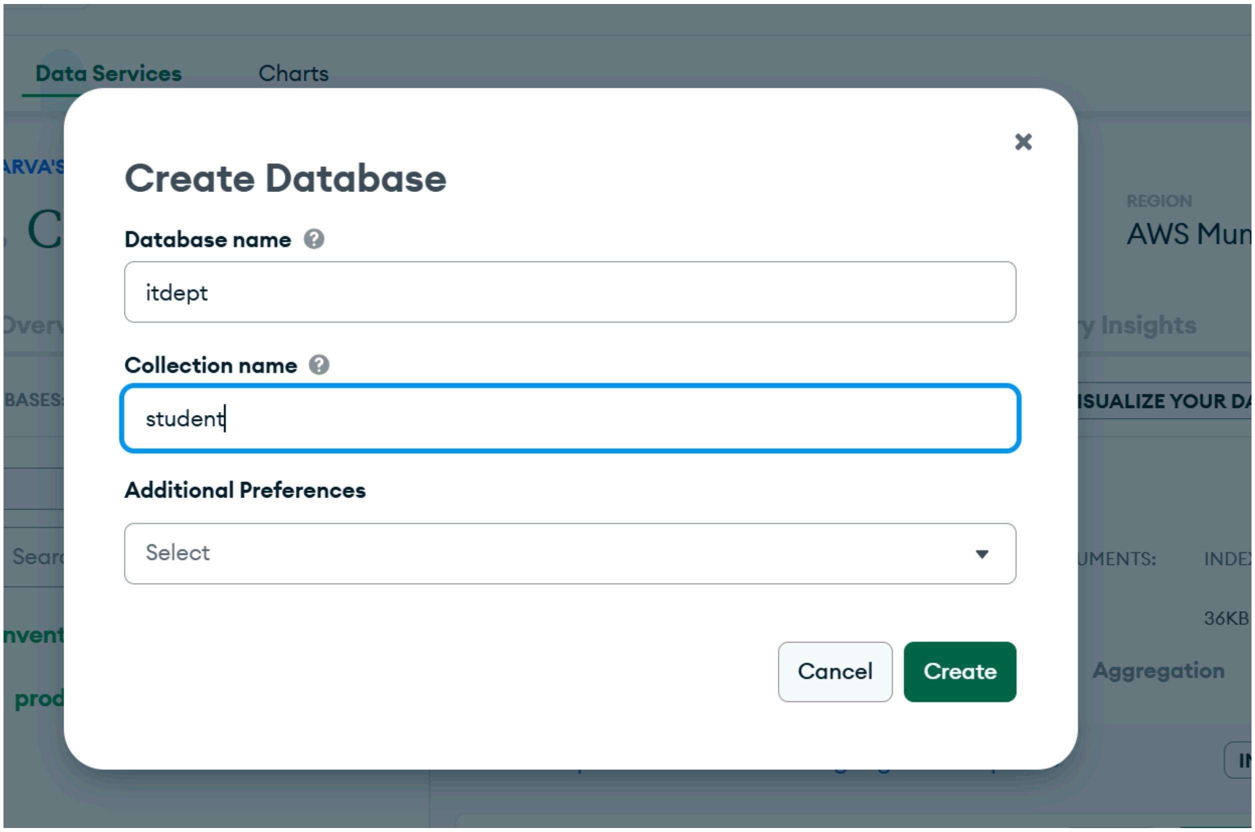


```
> db.students.find({ ClassName: "IT-1" }).pretty()
< {
    _id: ObjectId('67e4d54b85c12e85bbe0e052'),
    Name: 'John Doe',
    RollNo: 'IT101',
    ClassName: 'IT-1'
  }
  {
    _id: ObjectId('67e4d55585c12e85bbe0e053'),
    Name: 'Alice Smith',
    RollNo: 'IT102',
    ClassName: 'IT-1'
  }
  {
    _id: ObjectId('67e4d55585c12e85bbe0e055'),
    Name: 'Charlie Brown',
    RollNo: 'IT104',
    ClassName: 'IT-1'
  }
> db.students.find({ RollNo: "IT103", ClassName: "IT-2" }).pretty()
< {
    _id: ObjectId('67e4d55585c12e85bbe0e054'),
    Name: 'Bob Johnson',
    RollNo: 'IT103',
    ClassName: 'IT-2'
  }
```



>_MONGOSH

```
> use itdept
< switched to db itdept
>
> db.students.insertOne({
      Name: "John Doe",
      RollNo: "IT101",
      ClassName: "IT-1"
  })
< {
    acknowledged: true,
    insertedId: ObjectId('67e4d54b85c12e85bbe0e052')
  }
> db.students.insertMany([
      { Name: "Alice Smith", RollNo: "IT102", ClassName: "IT-1" },
      { Name: "Bob Johnson", RollNo: "IT103", ClassName: "IT-2" },
      { Name: "Charlie Brown", RollNo: "IT104", ClassName: "IT-1" },
      { Name: "David White", RollNo: "IT105", ClassName: "IT-3" }
  ])
< {
    acknowledged: true,
    insertedIds: {
      '0': ObjectId('67e4d55585c12e85bbe0e053'),
      '1': ObjectId('67e4d55585c12e85bbe0e054'),
      '2': ObjectId('67e4d55585c12e85bbe0e055'),
      '3': ObjectId('67e4d55585c12e85bbe0e056')
    }
```



Create Database

Database name: itdept

Collection name: student

Additional Preferences: Select

Conclusion:

In this experiment, we successfully performed CRUD operations in MongoDB and implemented a RESTful API using Node.js, Express, and Mongoose. We learned how to create, read, update, and delete student records both via MongoDB shell commands and API endpoints.