E-commerce Catalogue with Nested Documents (MongoDB & Node.js)

Project Overview

Learn how to design and build a Node.js application using MVC architecture to manage student data stored in MongoDB.

This experiment teaches:

- **Separation of concerns (Model-View-Controller)**
- **Backend code organization**
- **CRUD operations using Mongoose**

Technologies Used

- Node.js
- Express.js
- MongoDB
- Mongoose
- Postman (for API testing)

Folder Structure

student-management/

|

├─ models/

| └─ Student.js

├─ controllers/

| └─ studentController.js

├─ routes/

| └─ studentRoutes.js

├─ server.js

└─ package.json

Initialization

1. Initialize Node.js Project

npm init -y

2. Install Dependencies

npm install express mongoose

npm install --save-dev nodemon

Code

1. models/Student.js

```
const mongoose = require('mongoose');
const studentSchema = new mongoose.Schema({
name: { type: String, required: true },
age: { type: Number, required: true },
course: { type: String, required: true }
});
module.exports = mongoose.model('Student', studentSchema);
```

2. controllers/studentController.js

```
const Student = require('../models/Student');
exports.getAllStudents = async (req, res) => {
  try {
    const students = await Student.find();
    res.status(200).json(students);
  } catch (err) {
    res.status(500).json({ message: err.message });
  }
};

exports.getStudentById = async (req, res) => {
  try {
```

```
        const student = await Student.findById(req.params.id);
        if (!student) return res.status(404).json({ message: 'Student not found' });
        res.status(200).json(student);
    } catch (err) {
        res.status(500).json({ message: err.message });
    }
};

exports.createStudent = async (req, res) => {
    const student = new Student({
        name: req.body.name,
        age: req.body.age,
        course: req.body.course
    });
    try {
        const newStudent = await student.save();
        res.status(201).json(newStudent);
    } catch (err) {
        res.status(400).json({ message: err.message });
    }
};

exports.updateStudent = async (req, res) => {
    try {
        const student = await Student.findByIdAndUpdate(req.params.id, req.body, { new: true
});
        if (!student) return res.status(404).json({ message: 'Student not found' });
        res.status(200).json(student);
    } catch (err) {
        res.status(400).json({ message: err.message });
```

```
  }
};
exports.deleteStudent = async (req, res) => {
try {
const student = await Student.findByIdAndDelete(req.params.id);
if (!student) return res.status(404).json({ message: 'Student not found' });
res.status(200).json({ message: 'Student deleted', student });
} catch (err) {
res.status(500).json({ message: err.message });
}
};
```

3. routes/studentRoutes.js

```
const express = require('express');
const router = express.Router();
const studentController = require('../controllers/studentController');
router.get('/', studentController.getAllStudents);
router.get('/:id', studentController.getStudentById);
router.post('/', studentController.createStudent);
router.put('/:id', studentController.updateStudent);
router.delete('/:id', studentController.deleteStudent);
module.exports = router;
```

4. server.js

```
const express = require('express');
const mongoose = require('mongoose');
const studentRoutes = require('./routes/studentRoutes');
const app = express();
const PORT = 3000;
// Middleware
app.use(express.json());
```

```
// Routes
app.use('/students', studentRoutes);
// MongoDB Connection
mongoose.connect('mongodb://127.0.0.1:27017/studentDB', { useNewUrlParser: true,
useUnifiedTopology: true })
.then(() => console.log('MongoDB connected'))
.catch(err => console.log(err));
// Start Server


app.listen(PORT, () => {
   console.log(`Server running on http://localhost:${PORT}`);
});
```

5. package.json

```
{
  "name": "student-management",
  "version": "1.0.0",
  "main": "server.js",
  "scripts": {
    "start": "node server.js",
    "dev": "nodemon server.js"
  },
  "dependencies": {
    "express": "^4.18.2",
    "mongoose": "^7.3.4"
  },
  "devDependencies": {
    "nodemon": "^3.0.1"
  }
```

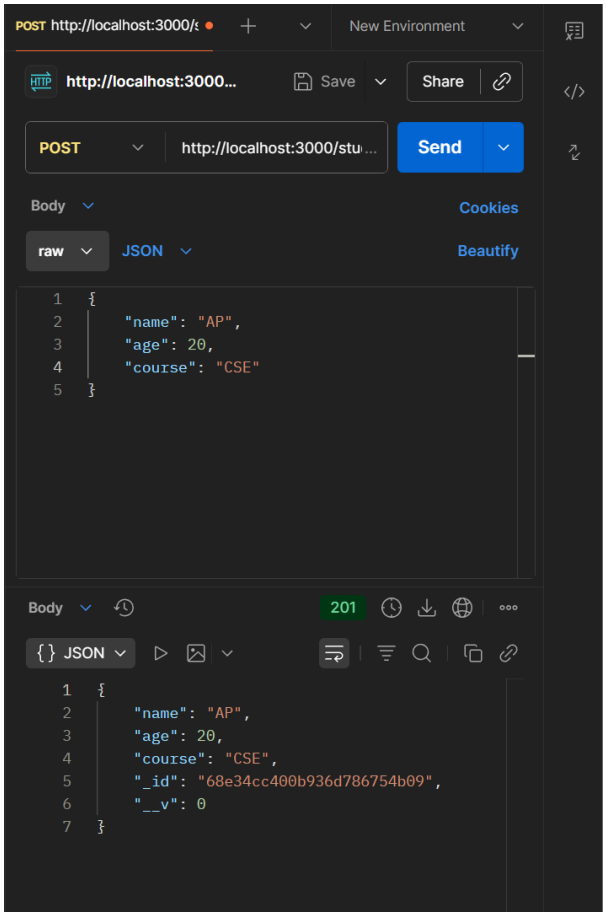
}

API Endpoints

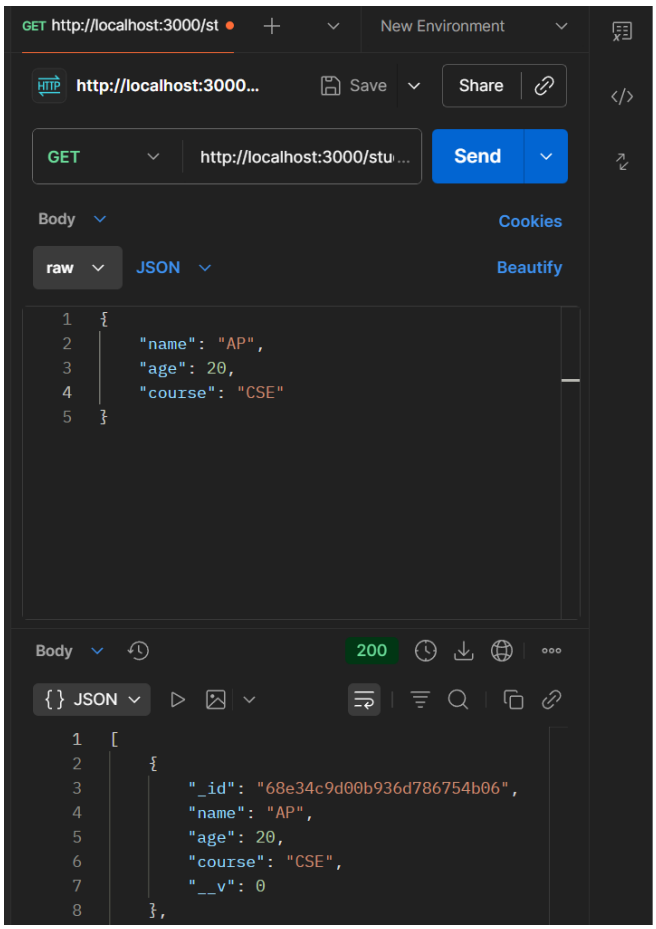
Method	Endpoint	Description
GET	/students	Get all students
GET	/students/:id	Get a student by ID
POST	/students	Add a new student
PUT	/students/:id	Update student by ID
DELETE	/students/:id	Delete student by ID

Screen Shots

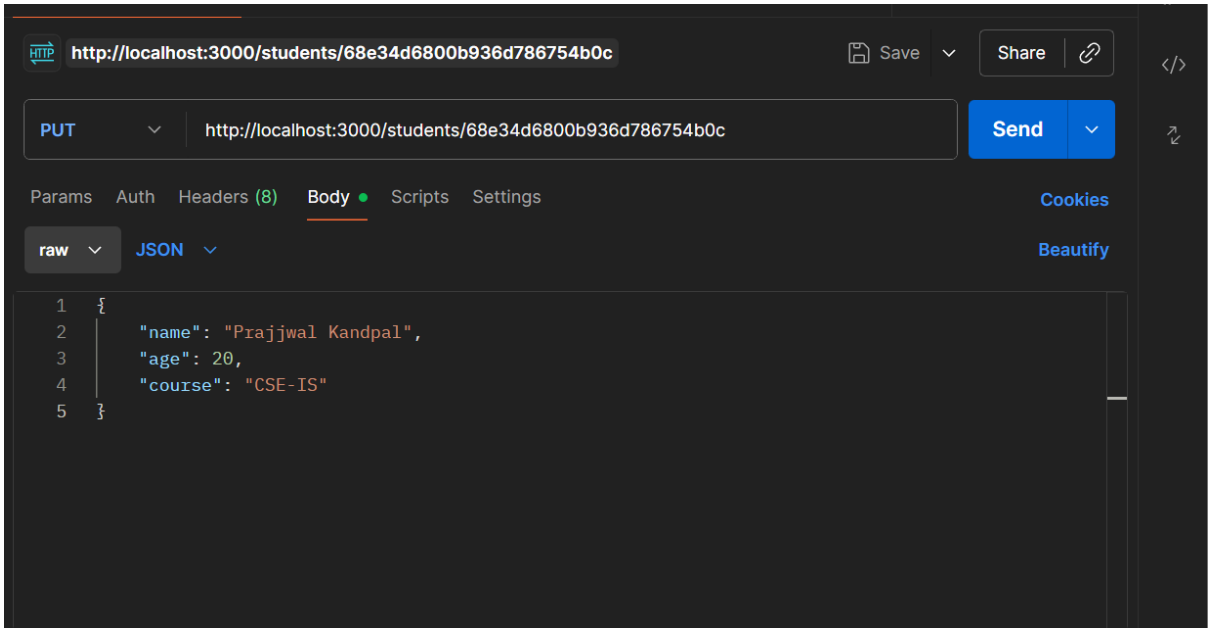
1. Add a new product (POST)



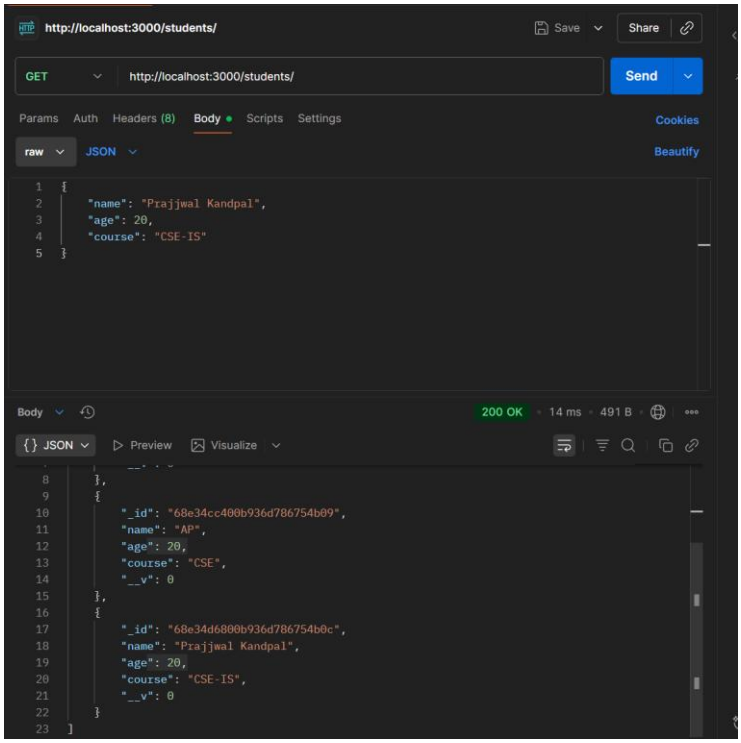
2. Get all products



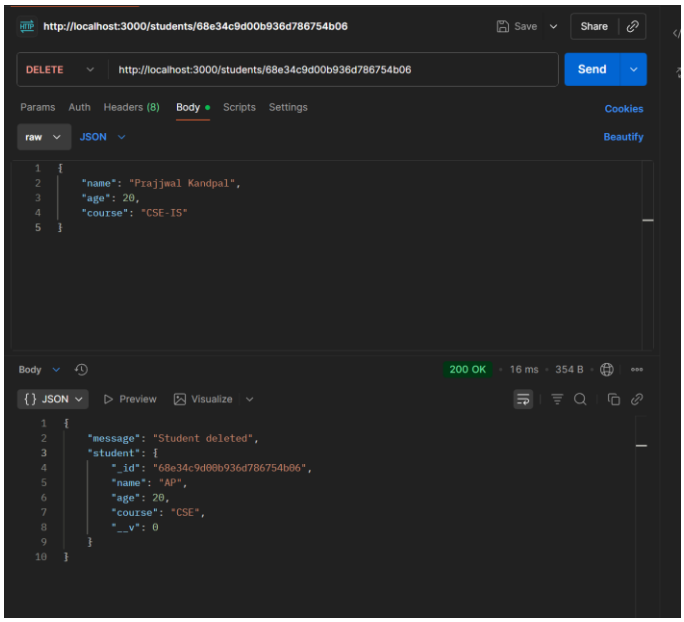
3. PUT (UPDATE ENTRIES)



4. UPDATED GET



5. DELETE DATA



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