EXPERMINET 4.2

Aim:

To design and build a Node.js application using MVC architecture for managing student data stored in MongoDB.

Theory:

The Student Management System demonstrates the use of the Model-View-Controller (MVC) architecture in Node.js applications. MongoDB is used as the backend database with Mongoose as the ODM (Object Data Modeling) library for defining schema and interacting with the database. Express.js is used to handle routing and middleware. The MVC pattern ensures separation of concerns: - Model: Defines the student schema and database operations. - Controller: Contains the application logic for handling CRUD operations. - Routes: Maps client requests to appropriate controller functions. This approach ensures scalability, modularity, and maintainability of the application.

Code Implementation:

```
// app.js
const express = require("express");
const connectDB = require("./config/db");
const studentRoutes = require("./routes/studentRoutes");

const app = express();
app.use(express.json());
connectDB();
app.use("/students", studentRoutes);
app.listen(5000, () => console.log("Server running on
http://localhost:5000"));
```

Expected Output (Screenshots):

```
POST /students
{
  "message": "Student created successfully",
  "student": {"_id": "6501...", "name": "Abhi", "age": 21, "course": "Cloud Computing"}
}


GET /students
[
  {"_id": "6501...", "name": "Abhi", "age": 21, "course": "Cloud Computing"},
  {"_id": "6502...", "name": "Riya", "age": 20, "course": "Full Stack Development"}
]
```

```
PUT /students/6501...
{
  "message": "Student updated",
  "student": {"_id": "6501...", "name": "Abhi", "age": 22, "course": "Cloud Computing"}
}
```

```
DELETE /students/6501...
{
    "message": "Student deleted"
}
```

Learning Outcome:

- Gained practical knowledge of using Node.js with Express.js for backend development. - Understood the MVC architecture and how it improves modularity in applications. - Learned how to integrate MongoDB with Mongoose for schema-based data handling. - Acquired skills in implementing CRUD operations for real-world applications.