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Experiment 5

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Subject Name: Advanced Internet Programming Lab **Subject Code:** 24CAP-652

Aim/Overview of the practical: Implement CRUD operation with database on NodeJS with MongoDB/MySQL

Task to be done:

Set Up Environment
- Install Node.js and necessary packages (Express.js, Mongoose, Body-parser, CORS).
- Set up MongoDB Atlas or MySQL as the database.

Create Project Structure
- Organize files into routes, models, controllers, and config.

Establish Database Connection
- Connect Node.js to MongoDB using Mongoose or MySQL using mysql2.

Implement CRUD Operations
- **Create**: Add a new record to the database.
- **Read**: Fetch all or specific records from the database.
- **Update**: Modify existing records.
- **Delete**: Remove records from the database.

Set Up API Routes
- Use Express.js to handle API endpoints for CRUD operations.

Code for experiment/practical:

Index.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>MongoDB User List</title>
    <link rel="stylesheet" href="style.css" />
  </head>
  <body>
    <h1>MongoDB User List</h1>
    <input type="text" id="name" placeholder="Enter Name" />
    <input type="email" id="email" placeholder="Enter Email" />
    <button onclick="addUser()">Add User</button>
    <button onclick="updateUser()" id="updateBtn" style="display: none">
      Update User
    </button>
    <h2>Users:</h2>
    <table>
      <thead>
        <tr>
          <th>Name</th>
          <th>Email</th>
          <th>Actions</th>
```

```
    </tr>
  </thead>
  <tbody id="userTable"></tbody>
</table>
<script>
  let editingUserId = null;
  async function fetchUsers() {
    const response = await fetch("/get-users");
    const users = await response.json();
    document.getElementById("userTable").innerHTML = users
      .map(
        (user) =>
          `<tr>
                <td>${user.name}</td>
                <td>${user.email}</td>
                <td class="actions">
                   <button class="edit" onclick="editUser('${user._id}', '${user.name}', '${user.email}')">Edit</button>
                   <button class="delete" onclick="deleteUser('${user._id}')">Delete</button>
                </td>
            </tr>`
      )
      .join("");
  }
  async function addUser() {
    const name = document.getElementById("name").value;
    const email = document.getElementById("email").value;
    if (!name || !email) {
      alert("Please enter both name and email.");
      return;
    }
    await fetch("/add-user", {
      method: "POST",
      headers: { "Content-Type": "application/json" },
      body: JSON.stringify({ name, email }),
    });
    document.getElementById("name").value = "";
    document.getElementById("email").value = "";
    fetchUsers();
  }
  async function deleteUser(id) {
    await fetch(`/delete-user/${id}`, { method: "DELETE" });
    fetchUsers();
  }
  function editUser(id, name, email) {
    document.getElementById("name").value = name;
    document.getElementById("email").value = email;
    editingUserId = id;
    document.getElementById("updateBtn").style.display = "inline-block";
  }
  async function updateUser() {
    const name = document.getElementById("name").value;
    const email = document.getElementById("email").value;
    if (!name || !email) {
      alert("Please enter both name and email.");
      return;
    }
    await fetch(`/update-user/${editingUserId}`, {
      method: "PUT",
      headers: { "Content-Type": "application/json" },
```

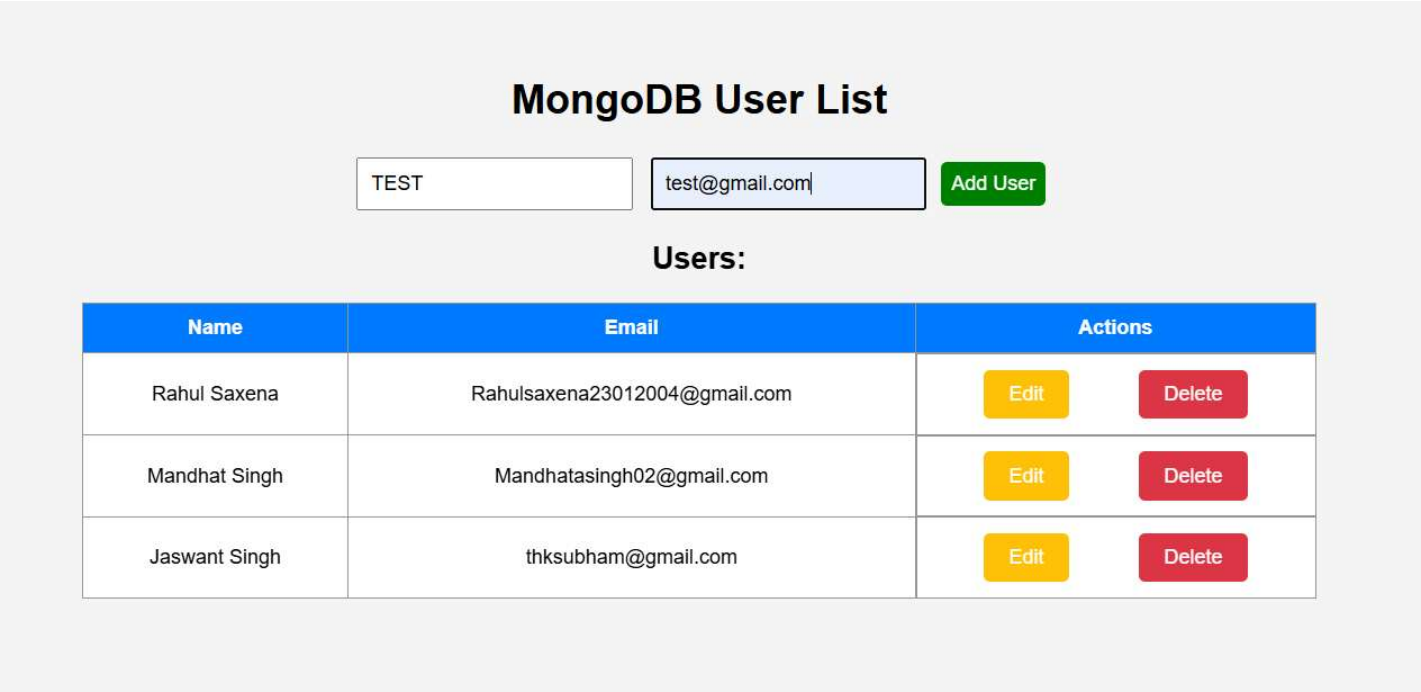
```
        body: JSON.stringify({ name, email }),
      });

      document.getElementById("name").value = "";
      document.getElementById("email").value = "";
      document.getElementById("updateBtn").style.display = "none";
      editingUserId = null;
      fetchUsers();
    }
    window.onload = fetchUsers;
  </script>
 </body>
</html>
```

Server.js

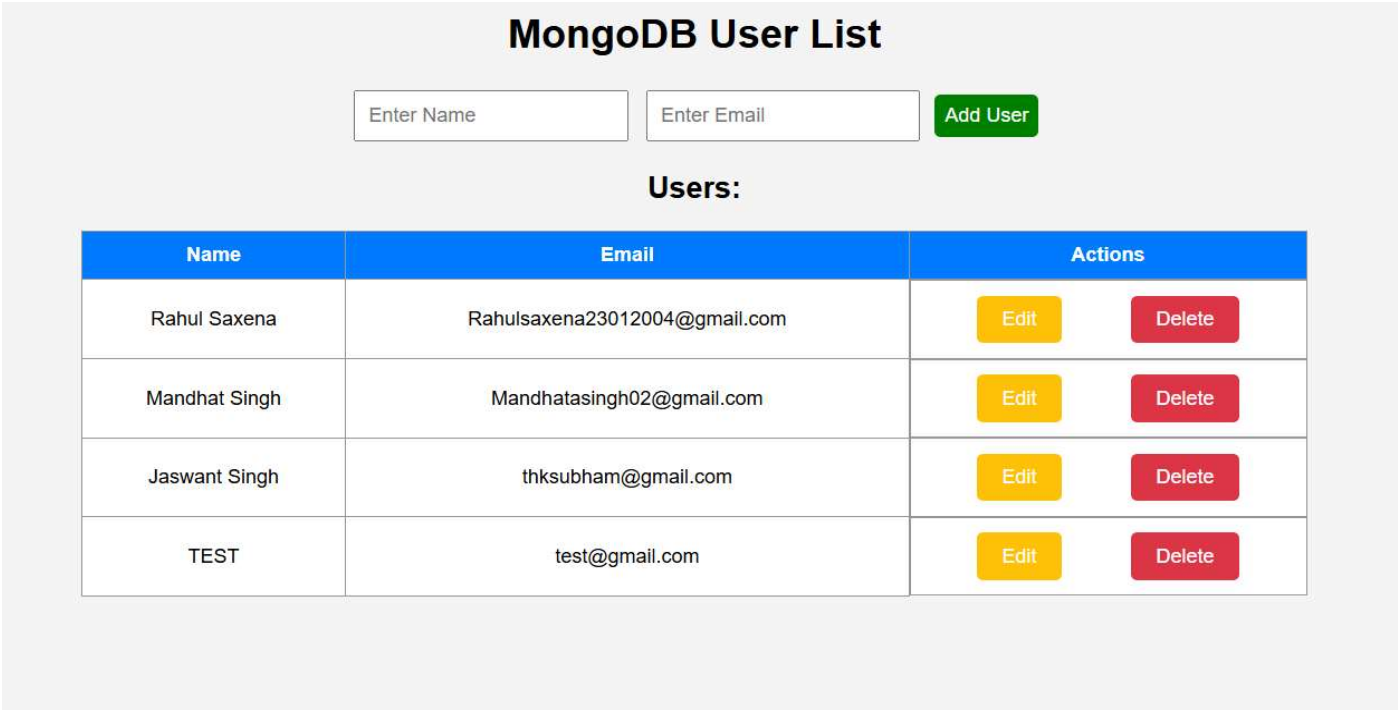
```
const express = require("express");
const mongoose = require("mongoose");
const cors = require("cors");

const app = express();
const PORT = 3000;

// MongoDB Connection
const mongoURI = "mongodb+srv://saxenaa332:iDjFy0RktXGwSwcP@experiment5.sn4mj.mongodb.net";
mongoose.connect(mongoURI, { useNewUrlParser: true, useUnifiedTopology: true })
 .then(() => console.log("MongoDB connected"))
 .catch(err => console.log(err));
app.use(cors());
app.use(express.json());
app.use(express.static("public"));
const UserSchema = new mongoose.Schema({
 name: String,
 email: String
});
const User = mongoose.model("User", UserSchema);
app.get("/", (req, res) => {
 res.sendFile(__dirname + "/public/index.html");
});
app.get("/get-users", async (req, res) => {
 const users = await User.find();
 res.json(users);
});
app.post("/add-user", async (req, res) => {
 const { name, email } = req.body;
 const newUser = new User({ name, email });
 await newUser.save();
 res.json({ message: "User added successfully!" });
});
app.delete("/delete-user/:id", async (req, res) => {
 await User.findByIdAndDelete(req.params.id);
 res.json({ message: "User deleted successfully!" });
});
app.put("/update-user/:id", async (req, res) => {
 const { name, email } = req.body;
 await User.findByIdAndUpdate(req.params.id, { name, email });
 res.json({ message: "User updated successfully!" });
});
app.listen(PORT, () => console.log(`Server running on http://localhost:${PORT}`));
```

Output:

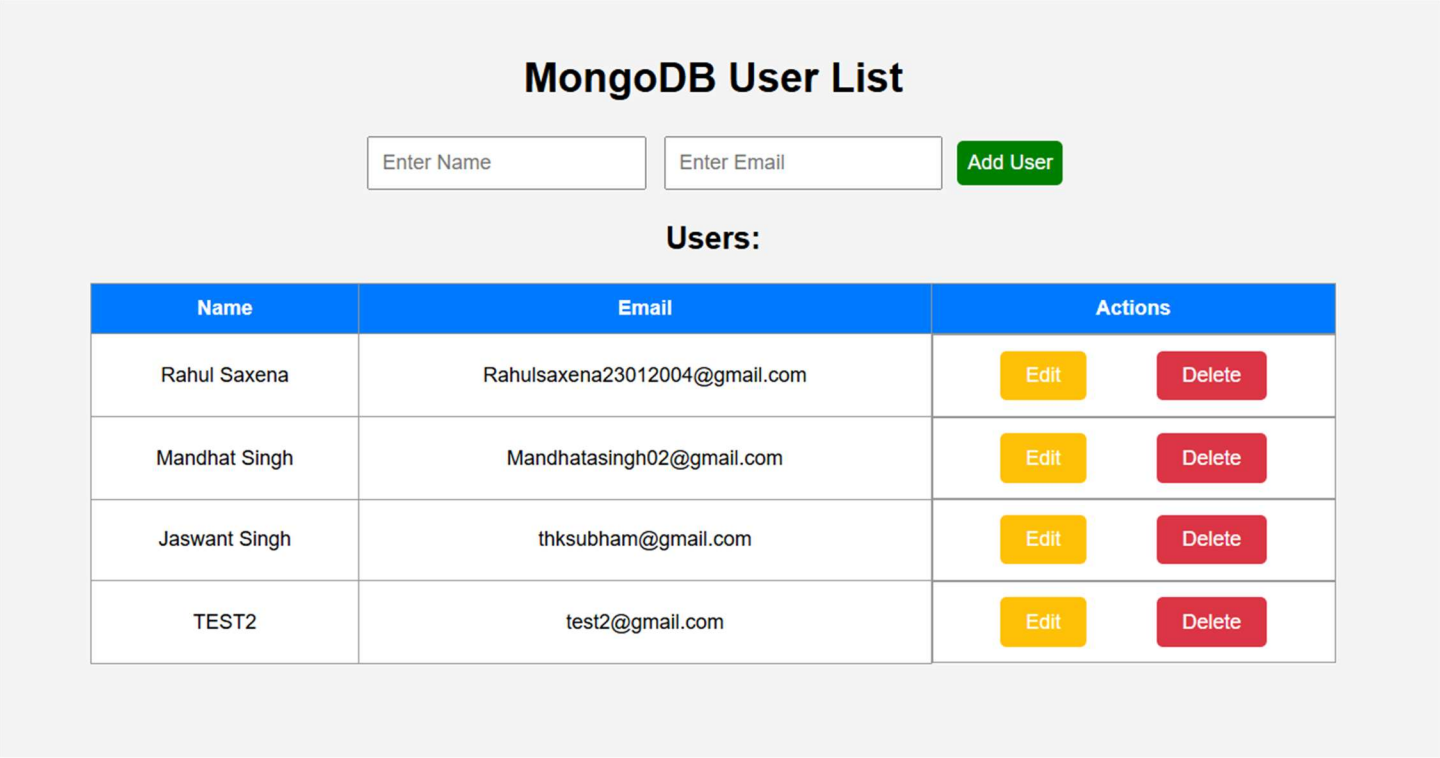
CREATE



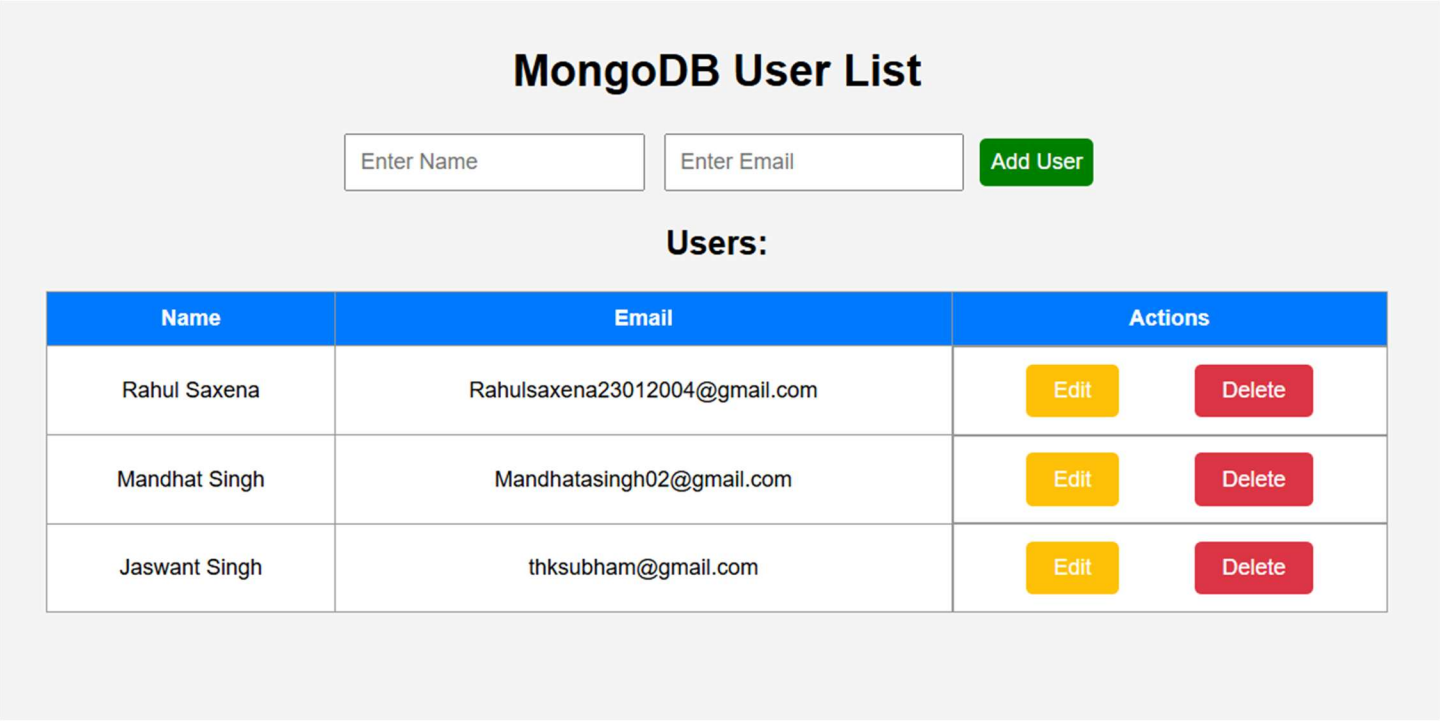
READ



Update



Delete



Learning outcomes:

- **Understand Node.js and Express.js**
  - Learn how to create a backend using Express.js.
- **Database Connectivity**
  - Learn how to connect Node.js with MongoDB (Mongoose) or MySQL.
- **RESTful API Development**
  - Learn to create API routes for handling requests.
- **Perform CRUD Operations**
  - Gain hands-on experience in database operations.
- **Error Handling & Validation**
  - Learn to handle request errors and validate input data.

Evaluation Grid:

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Demonstration and Performance		5
2.	Worksheet		10
3.	Post Lab Quiz		5