Experiment 1

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1. Aim:

Full Stack Development (MERN). The primary aim of this experiment is to provide students or developers with an understanding of full-stack development involving MongoDB, Node.js, React, and Express.

1. Problem 1.1.1: Give understanding of MongoDB, Nodejs, React, Express.
2. Problem 1.1.2: Create a Frontend design of Login/Signup pages and create a backend of it.
3. Problem 1.1.3: Test the Backend API Using Postman

2. Objective:

- Understand the fundamentals of MongoDB, Node.js, React, and Express
- Create a functional frontend for Login/Signup pages
- Develop a backend using Express and MongoDB
- Test the backend API using Postman

3. Implementation/Code:

Backend:

- mkdir backend cd backend
- npm init -y npm install
- express mongoose cors bcryptjs jsonwebtoken

Server.js

```
const express = require('express');
```

```
const mongoose = require('mongoose');
const cors = require('cors');
const dotenv = require('dotenv');
const authRoutes = require('./routes/authRoutes');

dotenv.config();

const app = express();
app.use(express.json());  // to parse JSON bodies
app.use(cors());  // to handle CORS

// Connect to MongoDB
const mongoose = require('mongoose');

const userSchema = new mongoose.Schema({
  email: { type: String, required: true, unique: true },
  password: { type: String, required: true }
});

const User = mongoose.model('User', userSchema);

module.exports = User;


app.use('/api', authRoutes);
```

```
// Start Server
const port = 5000;
app.listen(port, () => {
  console.log(`Server running on http://localhost:${port}`);
});
```

Users.js

```
const mongoose = require('mongoose');
const UserSchema = new mongoose.Schema({
  email: { type: String, required: true, unique: true },
  password: { type: String, required: true },
});

module.exports = mongoose.model('User', UserSchema);
```

authRoutes.js

```
// Signup Route
router.post('/signup', async (req, res) => {
    const { email, password } = req.body;
```

```
    try {
      const existingUser = await User.findOne({ email });
      if (existingUser) {
        return res.status(400).json({ message: 'User already exists' });
      }

      const hashedPassword = await bcrypt.hash(password, 10);
      const newUser = new User({ email, password: hashedPassword });
      await newUser.save();

      res.status(201).json({ message: 'User created successfully' });
    } catch (error) {
      console.error('Signup error:', error); // Log error to console
      res.status(500).json({ message: 'Server error', error: error.message }); // Include
the error message in the response
    }
  });
  router.post('/login', async (req, res) => {
```

```
  const { email, password } = req.body;


  try {
    const user = await User.findOne({ email });
    if (!user) {
      return res.status(404).json({ message: 'User not found' });
    }


    const isMatch = await bcrypt.compare(password, user.password);
    if (!isMatch) {
      return res.status(400).json({ message: 'Invalid credentials' });
    }


    const token = jwt.sign({ userId: user._id }, process.env.JWT_SECRET, { expiresIn: '1h' });
    res.json({ message: 'Login successful', token });
  } catch (error) {
    console.error('Login error:', error); // Log error to console
```

```
    res.status(500).json({ message: 'Server error', error: error.message }); // Include the error message in the response
  }
});
```

my-auth-app:

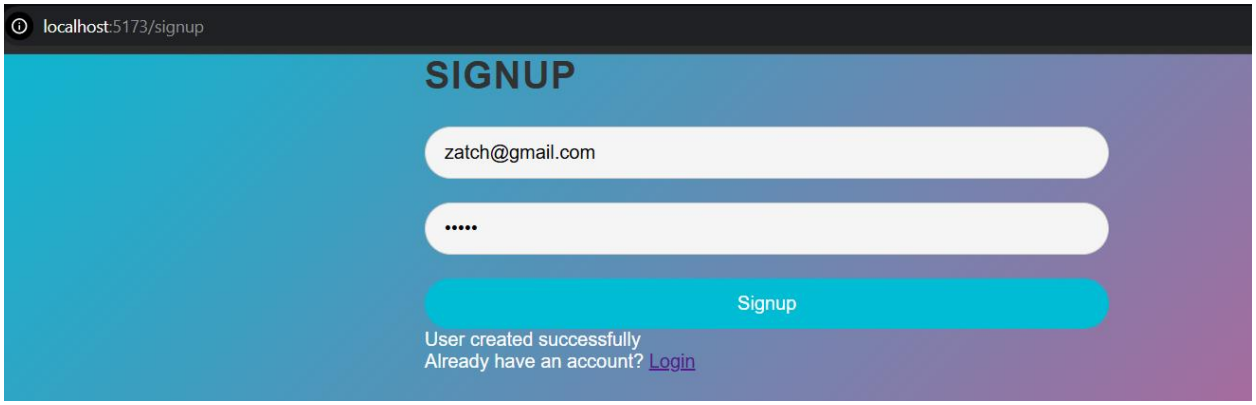
- npm create vite@latest my-auth-app --template react
- cd my-auth-app
- npm install

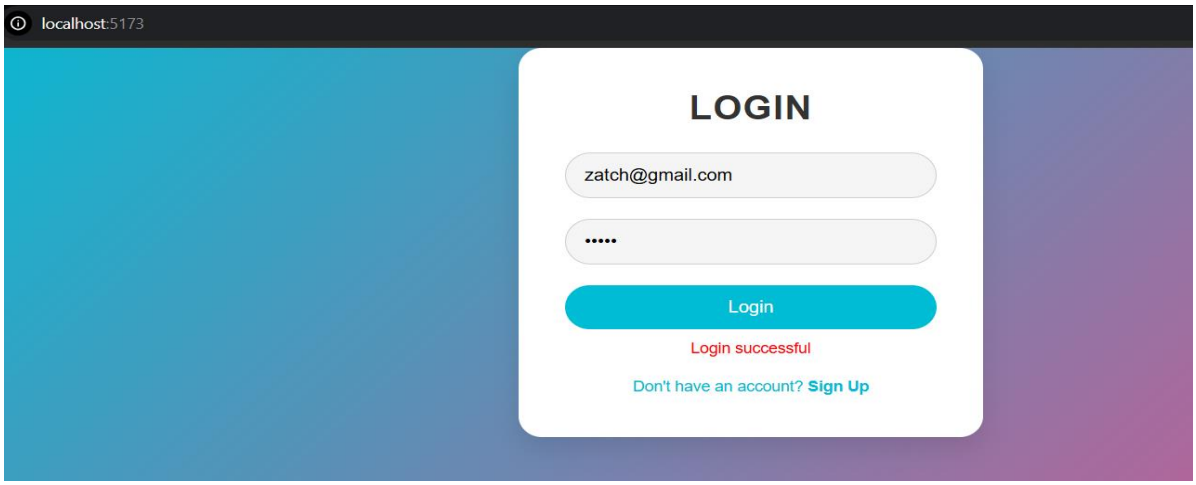
App.jsx:

```
import React from 'react';
import { BrowserRouter as Router, Routes, Route } from 'react-router-dom';
import Login from './Login';
import Signup from './Signup';
// In App.js or index.js
import './index.css';
import './app.css';


const App = () => {
  return (
```

```
    <Router>
      <div className="App">
        {/* <h1>Authentication App</h1> */}
        <Routes>
          <Route path="/" element={<Login />} />
          <Route path="/signup" element={<Signup />} />
        </Routes>
      </div>
    </Router>
  );
};


export default App;
```

4. Output:





5. Learning Outcome:

- Design user-friendly forms for user login and registration using React..
- Learn how each technology works individually and how they integrate to form a full-stack application.
- Set up a server with Express to handle HTTP requests for user registration and login
- Verify that the backend API functions as expected by testing the registration and login endpoints with Postman