MERN Stack (MongoDB, Express.js, React, Node.js)

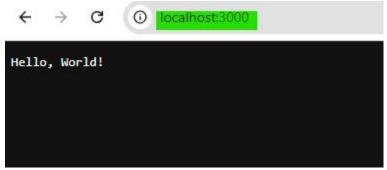
1. Node.js: Write a basic Node.js server that listens on port 3000 and returns a "Hello, World!" message when the root URL is accessed.

Initialized Node Project: npm init -y **CODE:**

```
//MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\1.Node.js\server.js
const http = require('http');

const server = http.createServer((req, res) => {
    res.writeHead(200, { 'Content-Type': 'text/plain' });
    if (req.url === '/') {
        res.end("Hello, World!\n");
    } else {
        res.writeHead(404, { 'Content-Type': 'text/plain' });
        res.end("Not Found\n");
    }
});

server.listen(3000, () => {
    console.log('Server is running on http://localhost:3000');
});
```



2. Express.js: Create a simple REST API using Express.js with a single route /users that returns a JSON list of users.

Initialized Node Project: npm init -y
Installed Packages: express

CODE:

```
// MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\2.Express.js\server.js
const express = require('express');
const app = express();
const users = require("./listOfUsers");

app.get('/users', (req, res) => {
    res.status(200).json(users);
});

app.listen(3000, () => {
    console.log('Server is running on http://localhost:3000');
});
```

Output:

← → C (i) localhost:3000/users

```
Pretty-print 

[{"id":1,"name":"John Doe","email":"john.doe@example.com"},

{"id":2,"name":"Jane Smith","email":"jane.smith@example.com"},

{"id":3,"name":"Mike Johnson","email":"mike.johnson@example.com"},

{"id":4,"name":"Micheal Cook","email":"micheal.cook@example.com"},

{"id":5,"name":"Andrew Hooks","email":"andrew.hooks@example.com"},

{"id":6,"name":"David Marcony","email":"david.marcony@example.com"}]
```

3. React: Build a basic React component that fetches the list of users from the /users API route (from question 2) and displays them in a table.

Created React App: npm create vite@latest

Installed Packages: cors

CODE:

```
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\3.React\client\src\components\Us
import React, { useEffect, useState } from 'react';
function UserData() {
   const [users, setUsers] = useState([]);
   const [loading, setLoading] = useState(true);
   const [error, setError] = useState(null);
   useEffect(() => {
       fetch('http://localhost:3000/users')
           .then((response) => {
               if (!response.ok) {
                   throw new Error('Network response was not ok');
               return response.json();
           })
           .then((data) => {
               setUsers(data);
               setLoading(false);
           })
           .catch((error) => {
               setError(error);
               setLoading(false);
           });
   }, []);
   if (loading) {
       return Loading...;
   if (error) {
```

```
return Error: {error.message};
  return (
      <h1>User List</h1>
      <thead>
          ID
             Name
            Email
          </thead>
        {users.map((user) => (
             {user.id}
               {user.name}
               {user.email}
          ))}
        </div>
  );
export default UserData;
```

```
// MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\2.Express.js\server.js
const cors = require("cors");

const corsOptions = {
    origin: "http://localhost:5173",
    methods: "GET, POST, PUT, DELETE, PATCH, HEAD",
    credentials: true,
};

app.use(cors(corsOptions));
```

User List

ID	Name	Email
1	John Doe	john.doe@example.com
2	Jane Smith	jane.smith@example.com
3	Mike Johnson	mike.johnson@example.com
4	Micheal Cook	micheal.cook@example.com
5	Andrew Hooks	andrew.hooks@example.com
6	David Marcony	david.marcony@example.com

4. MongoDB: Create a MongoDB schema for storing user data (name, email, age), and write a script to insert a new user into the collection.

Initialized Node Project: npm init -y
Installed Packages: mongoose
CODE:

```
// MERN DEVELOPER ASSIGNMENT\1.MERN STACK\4.MongoDB\insertUser.js
const mongoose = require('mongoose');
const User = require('./userModel');
mongoose.connect('mongodb://127.0.0.1:27017/usersDB')
.then(() => {
 console.log('Connected to MongoDB');
}).catch((error) => {
 console.error('Error connecting to MongoDB:', error);
});
const insertUser = async () => {
 try {
   const newUser = new User({
     name: 'Vivek Singh',
     email: 'vivek.singh@example.com',
     age: 25
   });
   const savedUser = await newUser.save();
   console.log('User inserted:', savedUser);
 } catch (error) {
   console.error('Error inserting user:', error);
 } finally {
   mongoose.connection.close();
};
insertUser();
```

```
},
  age: {
    type: Number,
    required: true
}
});

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

module.exports = User;
```

```
PS C:\Users\KIIT\Desktop\LEAMORE\MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\4.MongoDB> node insertUser.js

Connected to MongoDB

User inserted: {
    name: 'Vivek Singh',
    email: 'vivek.singh@example.com',
    age: 25,
    _id: new ObjectId('66f83621c606bb2b2a862996'),
    __v: 0
}

PS C:\Users\KIIT\Desktop\LEAMORE\MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\4.MongoDB>
```

```
mongosh mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000
test> show dbs
admin
                40.00 KiB
amazon
               72.00 KiB
college
               40.00 KiB
config
               72.00 KiB
local
               76.00 KiB
               8.00 KiB
mern admin
relationDemo 288.00 KiB
test
               80.00 KiB
usersDB
                28.00 KiB
wanderlust
              272.00 KiB
               72.00 KiB
whatsapp
test> use usersDB
switched to db usersDB
usersDB> show collections
usersDB> db.users.find()
    _id: ObjectId('66f83621c606bb2b2a862996'),
    name: 'Vivek Singh',
email: 'vivek.singh@example.com',
    age: 25,
usersDB>
```

5. Express.js + MongoDB: Create an Express.js route to fetch a user by their email from the MongoDB database.

Initialized Node Project: npm init -y **Installed Packages:** express, mongoose **CODE:**

```
MERN DEVELOPER ASSIGNMENT\1.MERN STACK\5.Express.jsAndMongoDB\server.js
const express = require("express");
const User = require('./models/user');
require("./database");
const app = express();
app.get('/user/:email', async (req, res) => {
   const email = req.params.email;
   try {
       const user = await User.findOne({ email: email });
       if (!user) {
           return res.status(404).json({ message: 'User not found' });
       res.json(user);
   } catch (error) {
       console.error('Error fetching user:', error);
       res.status(500).json({ message: 'Internal server error' });
});
app.listen(3000, () => {
   console.log('Server is running on http://localhost:3000');
});
```

```
//
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\5.Express.jsAndMongoDB\models\us
er.js
const mongoose = require('mongoose');

const userSchema = new mongoose.Schema({
    name: {
        type: String,
        required: true
    },
    email: {
        type: String,
        required: true,
        unique: true
    },
    age: {
        type: Number,
```

```
required: true
});
const User = mongoose.model('User', userSchema);
module.exports = User;
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\5.Express.jsAndMongoDB\database\
index.js
const mongoose = require('mongoose');
mongoose.connect('mongodb://127.0.0.1:27017/usersDB')
.then(() => {
 console.log('Connected to MongoDB');
}).catch((error) => {
  console.error('Error connecting to MongoDB:', error);
});
Output:
 ← → G
             0 1
Pretty-print 🗌
".id":"66f83621c606bb2b2a862996","name":"Vivek Singh","email":"vivek.singh@example.com","age":25,"__v":0"
 MY_APP / New Request
                                                                         □ Save ∨
                                                                                    Share
                                                                                Send
       Authorization Headers (8) Body Scripts Tests Settings
 onone of form-data x-www-form-urlencoded raw binary GraphQL
                                  This request does not have a body
Body Cookies Headers (7) Test Results
                                                            200 OK - 29 ms - 342 B - (1) es -----
 Pretty
              Preview
                      Visualize
                                                                                  10 Q
  1
  2
         "_id": "66f83621c606bb2b2a862996",
         "name": "Vivek Singh",
  3
         "email": "vivek.singh@example.com",
  4
  5
         "age": 25,
         "__v": 0
```

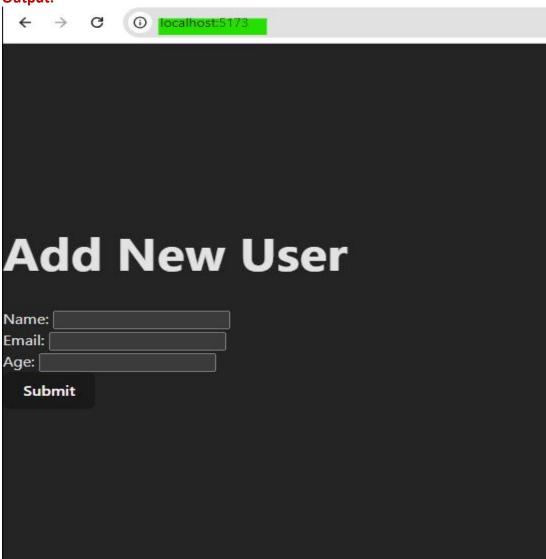
 React + State Management: Build a form component in React that allows users to submit their name, email, and age. On submission, send the data to the backend API and update the state to display the new user.

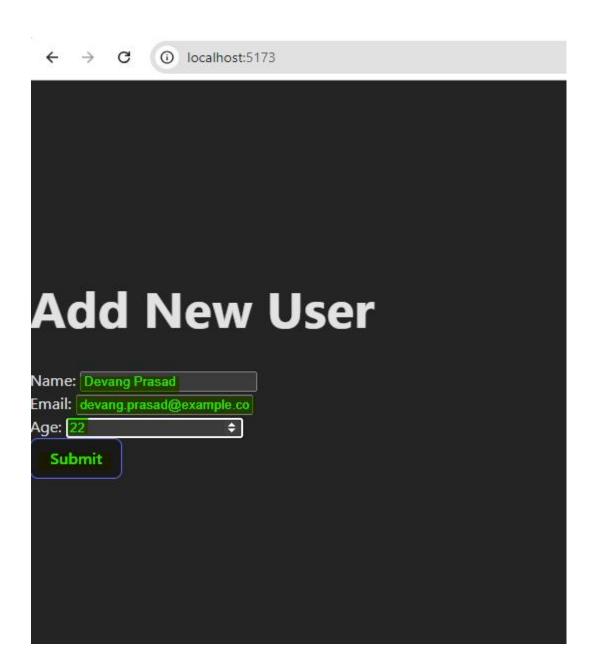
```
Initialized Node Project: npm init -y
Installed Packages: express, mongoose, cors
Created React App: npm create vite@latest
CODE:
```

```
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\6.ReactAndState_Management\serve
r\server.js
const cors = require("cors");
const corsOptions = {
   origin: "http://localhost:5173",
   methods: "GET, POST, PUT, DELETE, PATCH, HEAD",
   credentials: true,
};
app.use(cors(corsOptions));
app.use(express.json());
app.post('/users', async (req, res) => {
   const { name, email, age } = req.body;
   try {
       const newUser = new User({ name, email, age });
       const savedUser = await newUser.save();
       res.status(201).json(savedUser);
   } catch (error) {
       console.error('Error creating user:', error);
       res.status(500).json({ message: 'Internal server error' });
});
```

```
MERN DEVELOPER ASSIGNMENT\1.MERN STACK\6.ReactAndState Management\clien
t\src\components\Form.jsx
import React, { useState } from 'react';
import User from "./User";
function Form() {
 const [formData, setFormData] = useState({
   name: '',
   email: '',
   age: ''
 });
 const [newUser, setNewUser] = useState(null);
 const [loading, setLoading] = useState(false);
 const [error, setError] = useState(null);
 const handleChange = (e) => {
   const { name, value } = e.target;
   setFormData((prevData) => ({
     ...prevData,
     [name]: value
   }));
 };
 const handleSubmit = async (e) => {
   e.preventDefault();
   setLoading(true);
   try {
     const response = await fetch('http://localhost:3000/users', {
       method: 'POST',
       headers: {
         'Content-Type': 'application/json'
       },
       body: JSON.stringify(formData)
     });
     if (!response.ok) {
       throw new Error('Failed to add user');
     const result = await response.json();
     setNewUser(result);
     setFormData({ name: '', email: '', age: '' });
   } catch (error) {
     setError(error.message);
   } finally {
     setLoading(false);
 };
```

```
return (
   <div>
     <h1>Add New User</h1>
      \{ error \ \&\& \  Error: \ \{ error \}  \} 
     <form onSubmit={handleSubmit}>
       <div>
         <label>Name: </label>
         <input</pre>
           type="text"
           name="name"
           value={formData.name}
           onChange={handleChange}
           required
       </div>
       <div>
         <label>Email: </label>
         <input</pre>
           type="email"
           name="email"
           value={formData.email}
           onChange={handleChange}
           required
       </div>
       <div>
         <label>Age: </label>
         <input</pre>
           type="number"
           name="age"
           value={formData.age}
           onChange={handleChange}
           required
       </div>
       <button type="submit" disabled={loading}>
         {loading ? 'Submitting...' : 'Submit'}
       </button>
     </form>
     {newUser && (
       <User name={newUser.name} email={newUser.email}</pre>
age={newUser.age}/>
     )}
   </div>
 );
```





← → G	① localhost:5173
Add	New User
Name: Email: Age:	
Submit	
New User	Added:
Name: Devang	Prasad
Email: devang.	prasad@example.com
Age: 22	

7. React Routing: Set up React Router in an application to navigate between a Home page and a Users page.

Initialized Node Project: npm init -y

Installed Packages: express, mongoose, cors, react-router-dom

Created React App: npm create vite@latest

CODE:

```
MERN DEVELOPER ASSIGNMENT\1.MERN STACK\7.React Routing\client\src\App.j
SX
import { Route, Routes, Link } from 'react-router-dom';
import Home from './components/Home';
import Users from './components/Users';
function App() {
 return (
     <div>
        <l
            <Link to="/">Home</Link>
           <
            <Link to="/users">Users</Link>
           </nav>
       <Routes>
         <Route path="/" element={<Home />} />
         <Route path="/users" element={<Users />} />
       </Routes>
     </div>
```

```
</>
)
}
export default App
```

```
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\7.React_Routing\client\src\compo
nents\Users.jsx
import React, {    useEffect, useState } from 'react';
function Users() {
   const [users, setUsers] = useState([]);
   const [loading, setLoading] = useState(true);
   const [error, setError] = useState(null);
   useEffect(() => {
       fetch('http://localhost:3000/getallusers')
           .then((response) => {
               if (!response.ok) {
                   throw new Error('Network response was not ok');
               return response.json();
           })
           .then((data) => {
               setUsers(data);
               setLoading(false);
           })
           .catch((error) => {
               setError(error);
               setLoading(false);
           });
   }, []);
   if (loading) {
       return Loading...;
```

```
if (error) {
    return Error: {error.message};
  return (
      <h1>Users Page</h1>
      <thead>
          ID
             Name
             Email
          </thead>
        {users.map((user) => (
             {user.id}
               {user.name}
               {user.email}
          ))}
        );
export default Users;
```



- Home
- Users

Home Page

Welcome to the Home page!

- Home
- Users

Users Page

ID	Name	Email
	Vivek Singh	vivek.singh@example.com
	Rohit Sharma	rohit.sharma@example.com
	Vikram Rathore	vikram.rathore@example.com
	Manisha Yadav	manisha.yadav@example.com
	Vaibhav Sharma	vaibhav.sharma@example.com
	Swati Saini	swati.saini@example.com
	Sumit Yadav	sumit.yadav@example.com
	Manoj Desai	manoj.desai@example.com
	Sheetal Rai	sheetal.rai@example.com
	Ragini Rai	ragini.rai@example.com

8. RESTful API Design: Design and implement a REST API in Express.js for a simple blog application with routes for creating, reading, updating, and deleting blog posts.

Initialized Node Project: npm init -y
Installed Packages: express, mongoose, cors
Routes for CRUD Operation:

- Create a Post (POST /api/blog/posts): Adds a new blog post.
- Get All Posts (GET /api/blog/posts): Retrieves all blog posts.
- Get a Single Post (GET /api/blog/posts/:id): Fetches a specific post by its ID.
- Update a Post (PUT /api/blog/posts/:id): Updates a post by its ID.
- Delete a Post (DELETE /api/blog/posts/:id): Deletes a post by its ID.

CODE:

```
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\8.RESTful_API_Design\server.js
const express = require("express");
const cors = require("cors");
const blogRoute = require("./router/blog-router");
require("./database");
const app = express();
const corsOptions = {
   origin: "http://localhost:5173",
   methods: "GET, POST, PUT, DELETE, PATCH, HEAD",
   credentials: true,
};
app.use(cors(corsOptions));
app.use(express.json());
app.use("/api/blog", blogRoute);
app.listen(3000, () => {
   console.log('Server is running on http://localhost:3000');
});
```

```
//
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\8.RESTful_API_Design\database\in
dex.js
const mongoose = require('mongoose');

mongoose.connect('mongodb://127.0.0.1:27017/blogDB')
.then(() => {
   console.log('Connected to MongoDB');
}).catch((error) => {
   console.error('Error connecting to MongoDB:', error);
});
```

```
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\8.RESTful_API_Design\router\blog
-router.js
const express = require('express');
const router = express.Router();
const blogController = require("../controllers/blog-controller");

router.route("/posts").post(blogController.createNewPost);
router.route("/posts").get(blogController.getAllPosts);
router.route("/posts/:id").get(blogController.getSinglePostById);
router.route("/posts/:id").put(blogController.updatePostById);
router.route("/posts/:id").delete(blogController.deletePostById);
module.exports = router;
```

```
MERN_DEVELOPER_ASSIGNMENT\1.MERN_STACK\8.RESTful_API_Design\controllers
\blog-controller.js
const Post = require("../models/Post");
const createNewPost = async (req, res) => {
   const { title, content, author } = req.body;
   try {
       const newPost = new Post({ title, content, author });
       const savedPost = await newPost.save();
       res.status(201).json(savedPost);
   } catch (error) {
       res.status(500).json({ message: 'Error creating post', error });
};
const getAllPosts = async (req, res) => {
   try {
       const posts = await Post.find();
       res.status(200).json(posts);
   } catch (error) {
       res.status(500).json({ message: 'Error fetching posts', error })
};
const getSinglePostById = async (req, res) => {
       const post = await Post.findById(req.params.id);
       if (!post) return res.status(404).json({ message: 'Post not
found' });
       res.status(200).json(post);
   } catch (error) {
       res.status(500).json({ message: 'Error fetching post', error });
```

```
};
const updatePostById = async (req, res) => {
   const { title, content, author } = req.body;
   try {
       const updatedPost = await Post.findByIdAndUpdate(
           req.params.id,
           { title, content, author },
           { new: true, runValidators: true }
       );
       if (!updatedPost) return res.status(404).json({ message: 'Post
not found' });
       res.status(200).json(updatedPost);
   } catch (error) {
       res.status(500).json({ message: 'Error updating post', error });
};
const deletePostById = async (req, res) => {
   try {
       const deletedPost = await Post.findByIdAndDelete(req.params.id);
       if (!deletedPost) return res.status(404).json({ message: 'Post
not found' });
       res.status(200).json({ message: 'Post deleted successfully' });
   } catch (error) {
       res.status(500).json({ message: 'Error deleting post', error });
};
module.exports = { createNewPost, getAllPosts, getSinglePostById,
updatePostById, deletePostById };
MERN DEVELOPER ASSIGNMENT\1.MERN STACK\8.RESTful API Design\models\Post
const mongoose = require('mongoose');
const postSchema = new mongoose.Schema({
 title: {
   type: String,
   required: true
 },
 content: {
   type: String,
```

required: true

},

author: {

```
type: String,
  required: true
},
createdAt: {
  type: Date,
  default: Date.now
}
});
const Post = mongoose.model('Post', postSchema);
module.exports = Post;
```

