

LAB # 10

Frontend development with React js and connect with backend

OBJECTIVE:

To develop a user interface using **React.js** and establish communication with the **backend server** using APIs.

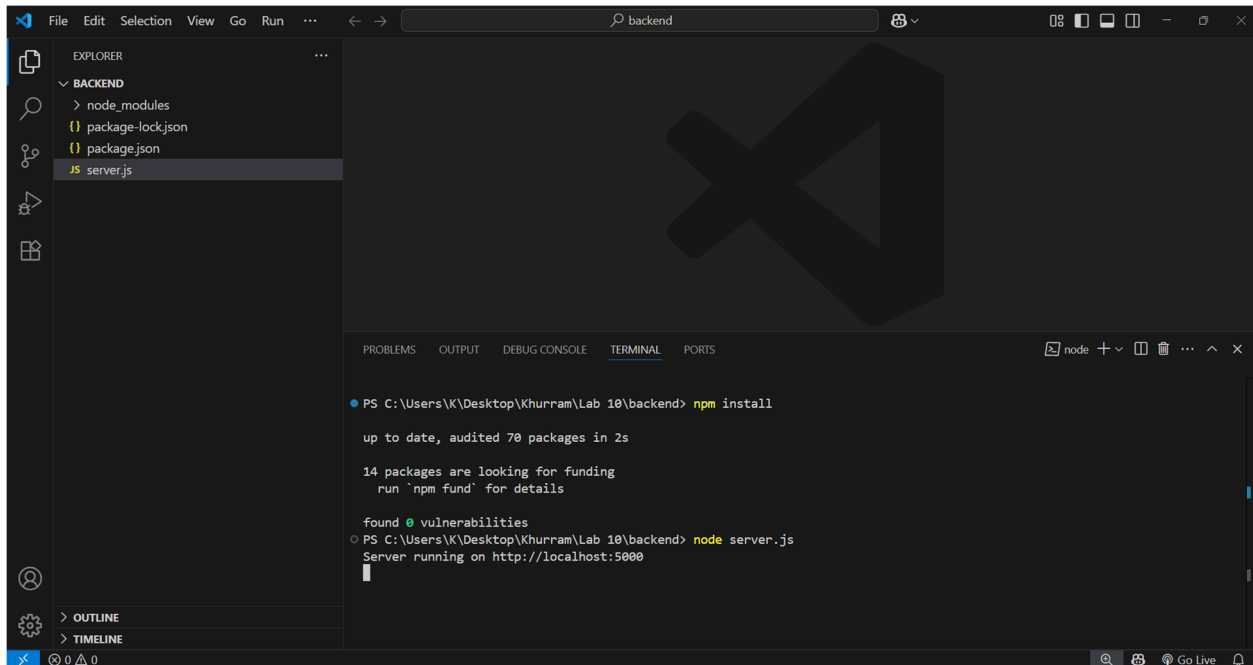
Open “backend” folder in vs code.

Open terminal and run these commands:

npm install

node server.js

Your screen will look like this:



The screenshot shows the Visual Studio Code interface with the 'backend' folder open in the Explorer. The file 'server.js' is selected. The Terminal panel at the bottom shows the following output:

```
PS C:\Users\K\Desktop\Khurram\Lab 10\backend> npm install

up to date, audited 70 packages in 2s

14 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
PS C:\Users\K\Desktop\Khurram\Lab 10\backend> node server.js
Server running on http://localhost:5000
```

Now create another folder “frontend”, outside of the backend folder.

Your screen will look like this:

Name	Date modified	Type	Size
backend	6/14/2025 6:53 PM	File folder	
frontend	6/14/2025 7:23 PM	File folder	

Now open this “frontend” folder in another window of vs code.

So basically you have two vs code windows open, one for the “backend”, and one for the “frontend” folder.

While backend running, we will develop frontend:

So open the vs code window of the “frontend” folder and type the following command:

npm create vite@latest

This command will create vite react project. You will be ask for some project details:

Project name:

.

Select a framework:

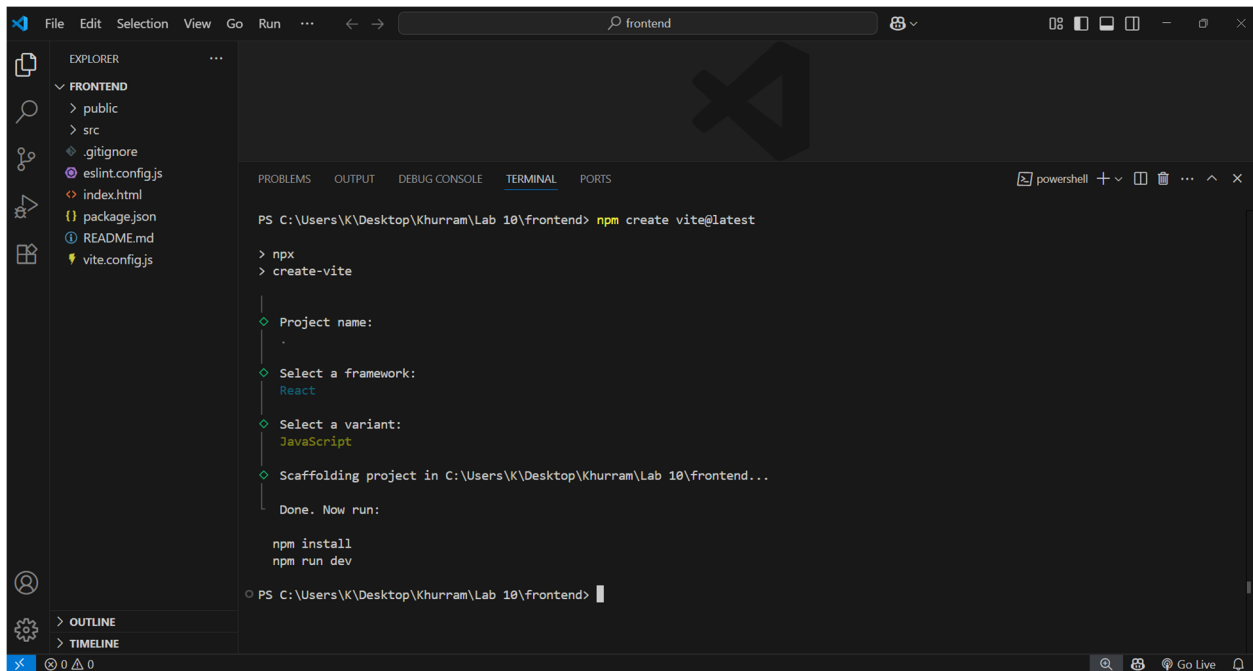
React

Select a variant:

JavaScript

Now your react project is created.

You will see screen like this:

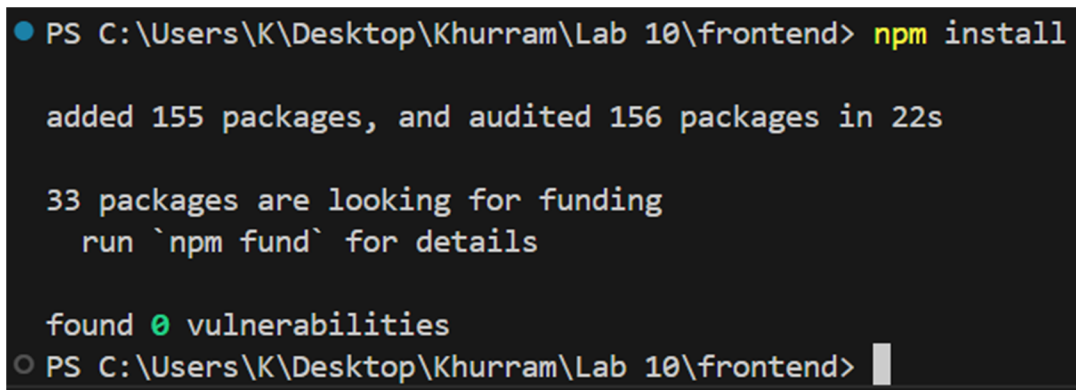
A screenshot of the Visual Studio Code (VS Code) interface. The Explorer sidebar on the left shows a file tree for a project named 'FRONTEND' located at 'C:\Users\K\Desktop\Khurram\Lab 10\frontend'. The files listed are: public, src, .gitignore, eslint.config.js, index.html, package.json, README.md, and vite.config.js. The main editor area is dark-themed and shows a terminal window with the following content:

```
PS C:\Users\K\Desktop\Khurram\Lab 10\frontend> npm create vite@latest  
  
> npx  
> create-vite  
  
◇ Project name:  
  .  
◇ Select a framework:  
  React  
◇ Select a variant:  
  JavaScript  
◇ Scaffolding project in C:\Users\K\Desktop\Khurram\Lab 10\frontend...  
  Done. Now run:  
  
  npm install  
  npm run dev  
  
PS C:\Users\K\Desktop\Khurram\Lab 10\frontend>
```

Now run this command:

npm install

The terminal will look like this:

A screenshot of a terminal window showing the output of the 'npm install' command. The text is as follows:

```
PS C:\Users\K\Desktop\Khurram\Lab 10\frontend> npm install  
  
added 155 packages, and audited 156 packages in 22s  
  
33 packages are looking for funding  
  run `npm fund` for details  
  
found 0 vulnerabilities  
PS C:\Users\K\Desktop\Khurram\Lab 10\frontend>
```

Now run this command:

npm run dev

The terminal will look like this:

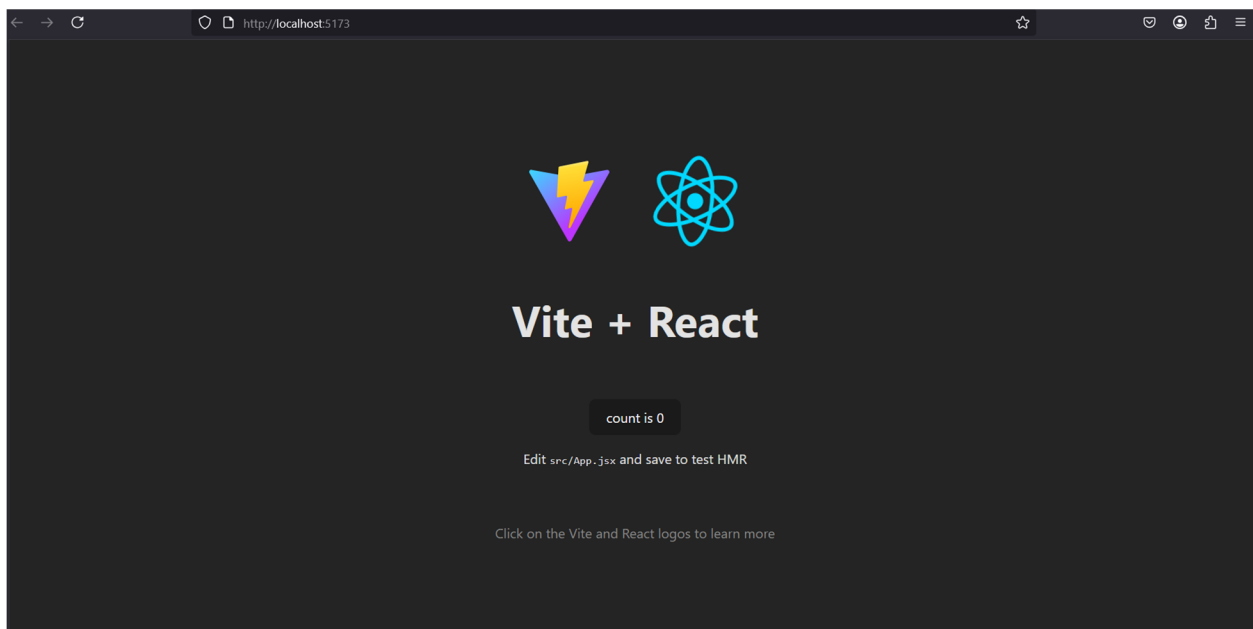
```
VITE v6.3.5 ready in 533 ms

→ Local:   http://localhost:5173/
→ Network: use --host to expose
→ press h + enter to show help
```

Open this link in browser:

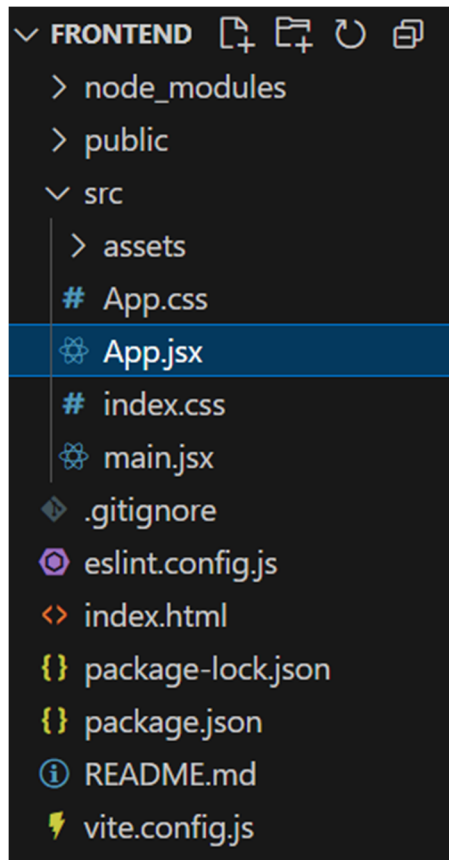
<http://localhost:5173/>

You will see screen like this:



React app is running.

Now open “App.jsx” file:



Now delete old code of App.jsx file,

And paste this new code in “App.jsx” file:

App.jsx:

```
// React ko import kar rahe hain
// useState or useEffect react k hook hain,
// hook aik tarah k features hain react k
import React, { useState, useEffect } from 'react';

// App component start ho raha hai
function App() {
  // Ye state sab users k data ko store karne k liye
  const [users, setUsers] = useState([]);

  // Ye state naya username save karne k liye
  const [username, setUsername] = useState("");

  // Ye state update ke liye selected user ka id save karta hai
  const [editId, setEditId] = useState(null);
```

```

// Component jab first time load ho to data fetch karo
useEffect(() => {
  fetchUsers();
}, []);

// Sab users k data ko backend se fetch karo
const fetchUsers = async () => {
  const res = await fetch("http://localhost:5000/api/get");
  const data = await res.json();
  setUsers(data); // Data ko state mai save karo
};

// New user create karne ka function
const handleCreate = async () => {
  // Backend ko POST request send kar rahe hain
  const res = await fetch("http://localhost:5000/api/post", {
    method: "POST",
    headers: {
      "Content-Type": "application/json"
    },
    body: JSON.stringify({ username })
  });
  await res.json(); // Response ko ignore kar rahe hain is case mein
  setUsername(""); // Input field clear karo
  fetchUsers(); // Dubara se data fetch karo
};

// Kisi user ko update karne ka function
const handleUpdate = async () => {
  await fetch(`http://localhost:5000/api/put/${editId}`, {
    method: "PUT",
    headers: {
      "Content-Type": "application/json"
    },
    body: JSON.stringify({ username })
  });
  setUsername(""); // Input field clear karo
  setEditId(null); // Edit mode khatam karo
  fetchUsers(); // Dubara se data fetch karo
};

// Delete request bhejne ka function
const handleDelete = async (id) => {
  await fetch(`http://localhost:5000/api/delete/${id}`, {

```

```

        method: "DELETE"
    });
    fetchUsers(); // Data refresh karo
};

// Jab edit button pe click ho to form ko update mode mai le aao
const startEdit = (user) => {
    setUsername(user.username); // Input field mai username dikhaye
    setEditId(user.id);         // Edit mode ke liye id set karo
};

// JSX return ho raha hai, jo UI show karega
return (
    <div>
        <h1>Username Manager</h1>

        {/* Input field jahan user username type karega */}
        <input
            type="text"
            value={username}
            onChange={(e) => setUsername(e.target.value)}
            placeholder="Enter username"
        />

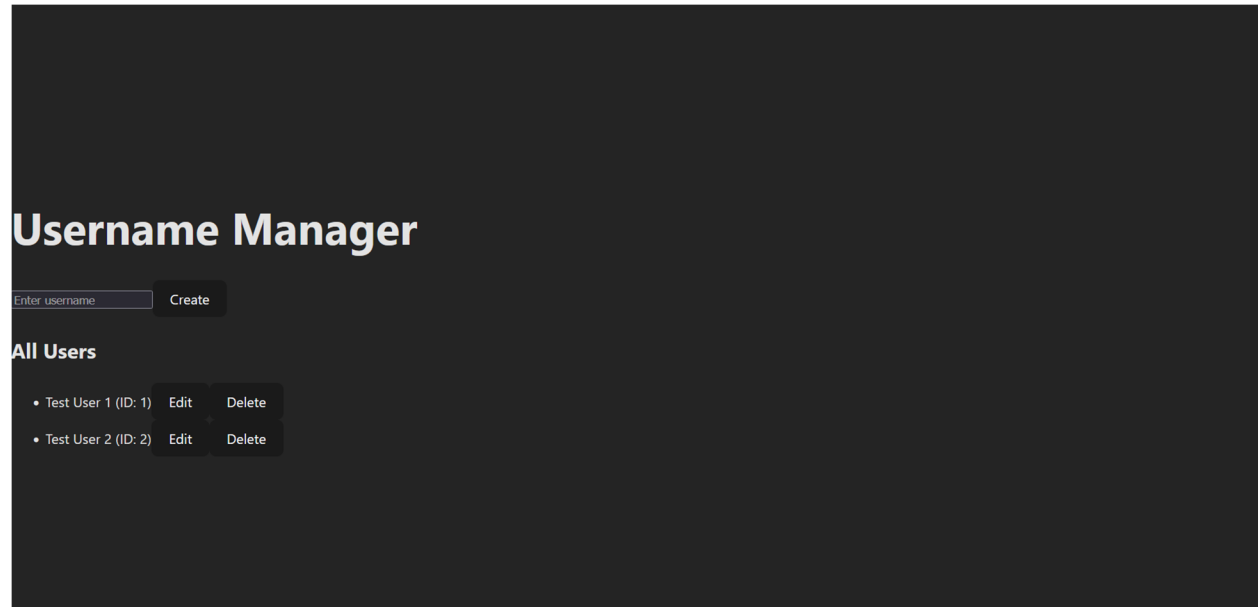
        {/* Agar edit mode mai hain to update button dikhao */}
        {editId ? (
            <button onClick={handleUpdate}>Update</button>
        ) : (
            <button onClick={handleCreate}>Create</button>
        )}

        <h2>All Users</h2>
        <ul>
            {/* Har user ko list mai show karna */}
            {users.map((user) => (
                <li key={user.id}>
                    {user.username} (ID: {user.id})
                    {/* Edit button */}
                    <button onClick={() => startEdit(user)}>Edit</button>
                    {/* Delete button */}
                    <button onClick={() => handleDelete(user.id)}>Delete</button>
                </li>
            ))}
        </ul>
    </div>

```

```
);  
}  
  
// App component ko export kar rahe hain  
export default App;
```

Now web app looks like this:



(Website looks like this due to react css)

Find this lab and its code on my GitHub:

<https://github.com/software-engineer-bse/Introduction-to-Software-Engineering-ITSE-Labs>

Task:

1. Create a frontend for calculator by using vite react and connect it with backend.