Web Lab Exercise15

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Professor	Jenila Livingston M
Subject	Web Programming
Slot	L15+L16+L19+L20
Venue	AB3 – 202

1. You are developing a React application that consists of multiple functional components
(Header, Content, and Footer). The main App component organizes these components
and displays them on the screen.
(i) Your task is to define and export an App component that contains multiple components:
a. A Header component that receives a title as a prop.
b. A Content component that displays a random joke when a button is clicked.
c. A Footer component that displays a static footer message.
(ii) Import and render the App component in index.js using ReactDOM.render(). Ensure the index.html file has a root element where React will mount the application.

I. App.jsx

```
import './App.css'
import Header from './Header'
import Footer from './Footer'
import MainContent from './MainContent'
function App() {
 return (
   <div className='top'>
     <Header title="Satyaprakash Swain 22BCE1351"></Header>
     <MainContent></MainContent>
     <Footer></Footer>
   </div>
 )
}
export default App
```

II. Header.jsx

```
function Header({title}){
   return(
       <header className="head">
           <h1>{title}</h1>
       </header>
   );


}
```

```
export default Header;

```

III. MainContent.jsx

```
import { useState } from "react";
function MainContent(){

   const [joke,setJoke] = useState("");

   const showJoke = ()=>{
       setJoke("Why do programmers prefer dark mode? Because light
attracts bugs!")
   }
   return(
       <main>
           <div>
               <button onClick={showJoke}>Display Joke</button>
               {joke && <p>{joke}</p>}
           </div>
       </main>
   );
}
export default MainContent;
```

IV. Footer.jsx

```
function Footer(){
   return(
       <footer>
           <h1>&copy; Vellore Intstitute of Techonology</h1>
       </footer>
   );
}
export default Footer;
```

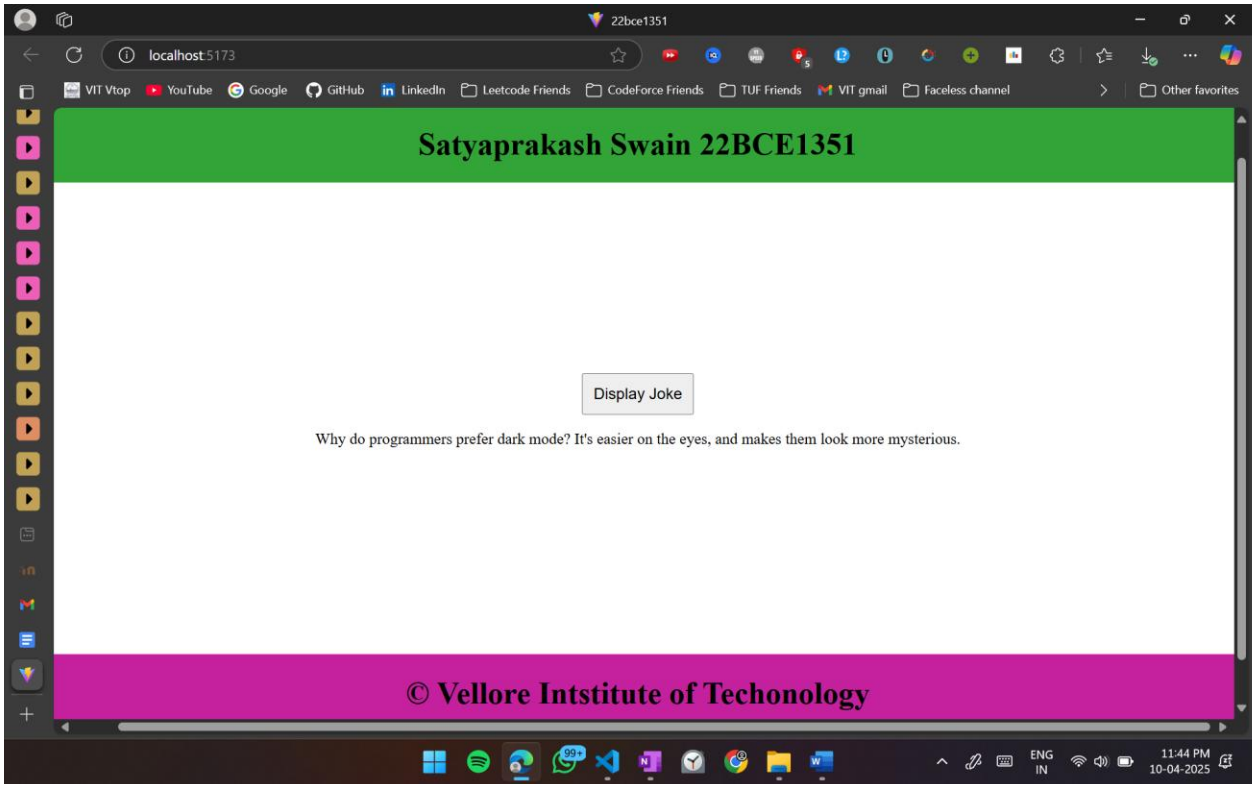
V. index.css

```css
body{
  margin: 0px;
  }
 .top{
  padding: 0px;
  margin: 0px;
  background-color: white;
  min-height: 100vh;
  width: 100vw;
  display: flex;
  flex-direction: column;
  color: black;
 }
 header{
  background-color: rgb(50, 164, 56);
  text-align: center;
 }


 main{
  flex: 1;
  display: flex;
  align-items: center;
  justify-content: center ;


 }


 main div{
  display: flex;
  flex-direction: column;
  align-items: center;
  justify-content: center;
 }
 button{
  padding: 10px;
  font-size: medium;
 }
 footer{
  background-color: rgb(197, 33, 159);
  text-align: center;
 }
```



Satyaprakash Swain 22BCE1351

Display Joke

Why do programmers prefer dark mode? It's easier on the eyes, and makes them look more mysterious.

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2. Styling in React – Inline CSS:

- **Create a StyledButton component that applies inline CSS for background color, padding, and font size.**

I. StyledButton.jsx

```jsx
function StyledButton(){

   return(
       <button style={{backgroundColor:"pink",
padding:"20px",color:"black",fontSize:"30px"}}>Click Me</button>
   );
}
export default StyledButton
```

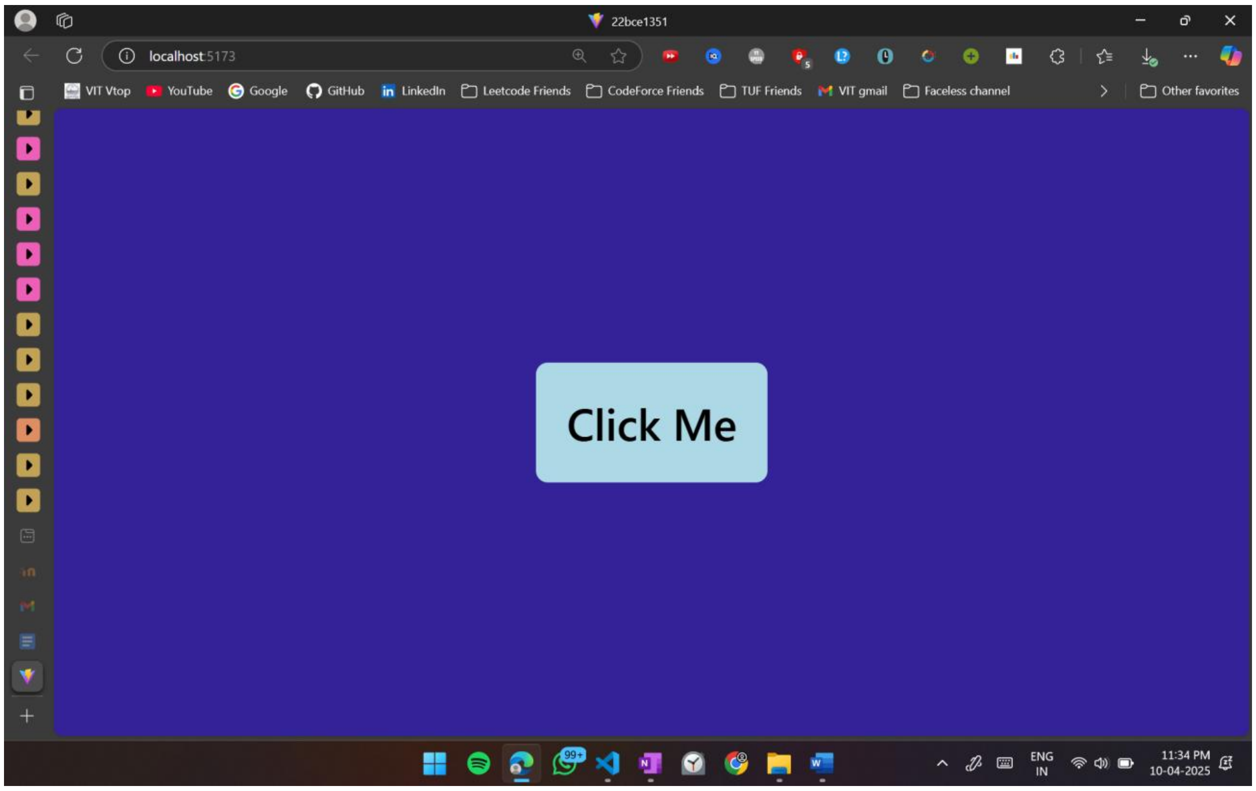
II. App.jsx

```
import './App.css'
import StyledButton from './StyledButton'
function App() {
 return (
   <>
   <StyledButton></StyledButton>
   </>
 )
}
export default App
```

III. Index.css

```
:root {
  font-family: system-ui, Avenir, Helvetica, Arial, sans-serif;
  line-height: 1.5;
  font-weight: 400;

  color-scheme: light dark;
  color: rgba(255, 255, 255, 0.87);
  background-color: #342299;

  font-synthesis: none;
  text-rendering: optimizeLegibility;
  -webkit-font-smoothing: antialiased;
  -moz-osx-font-smoothing: grayscale;
}

a {
  font-weight: 500;
  color: #30325b;
  text-decoration: inherit;
}
a:hover {
  color: #535bf2;
}

body {
  margin: 0;
  display: flex;
  place-items: center;
  min-width: 320px;
  min-height: 100vh;
}
```

```css
h1 {
  font-size: 3.2em;
  line-height: 1.1;
}

button {
  border-radius: 8px;
  border: 1px solid transparent;
  padding: 0.6em 1.2em;
  font-size: 1em;
  font-weight: 500;
  font-family: inherit;
  background-color: #7e1212;
  cursor: pointer;
  transition: border-color 0.25s;
}
button:hover {
  border-color: #646cff;
}
button:focus,
button:focus-visible {
  outline: 4px auto -webkit-focus-ring-color;
}

@media (prefers-color-scheme: light) {
  :root {
    color: #213547;
    background-color: #ffffff;
  }
  a:hover {
    color: #747bff;
  }
  button {
    background-color: #f9f9f9;
  }
}
```


22bce1351
localhost:5173
VIT Vtop
YouTube
Google
GitHub
LinkedIn
Leetcode Friends
CodeForce Friends
TUF Friends
VIT gmail
Faceless channel
Other favorites
Click Me
ENG IN
11:34 PM
10-04-2025

3. Styling in React – Internal CSS:

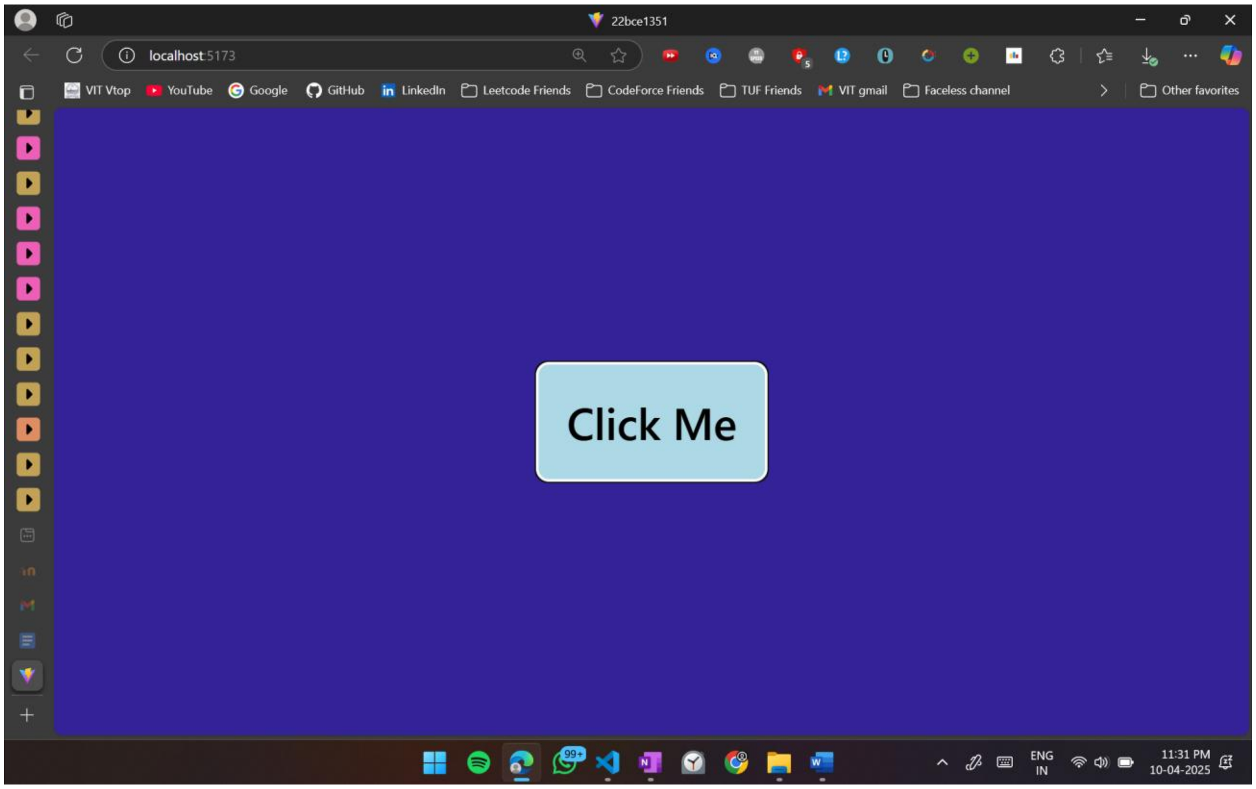
- **Modify the StyledButton component to include an internal <style> tag within the component for styling.**

I. StyledButton.jsx

```
function StyledButton(){
   const btnStyle = {
       backgroundColor:"lightblue",
       padding:"20px",
       color:"black",
       fontSize:"30px"
   }
   return(
       <button style={btnStyle}>Click Me</button>
   );
}
export default StyledButton
```

II. App.jsx

```
import './App.css'
import StyledButton from './StyledButton'
function App() {
  return (
    <>
    <StyledButton></StyledButton>
    </>
  )
}

export default App
```



4. Styling in React – External CSS:

- **Create a separate styles.css file and apply external styling to the StyledButton component by importing the CSS file.**

I. StyledButton.jsx

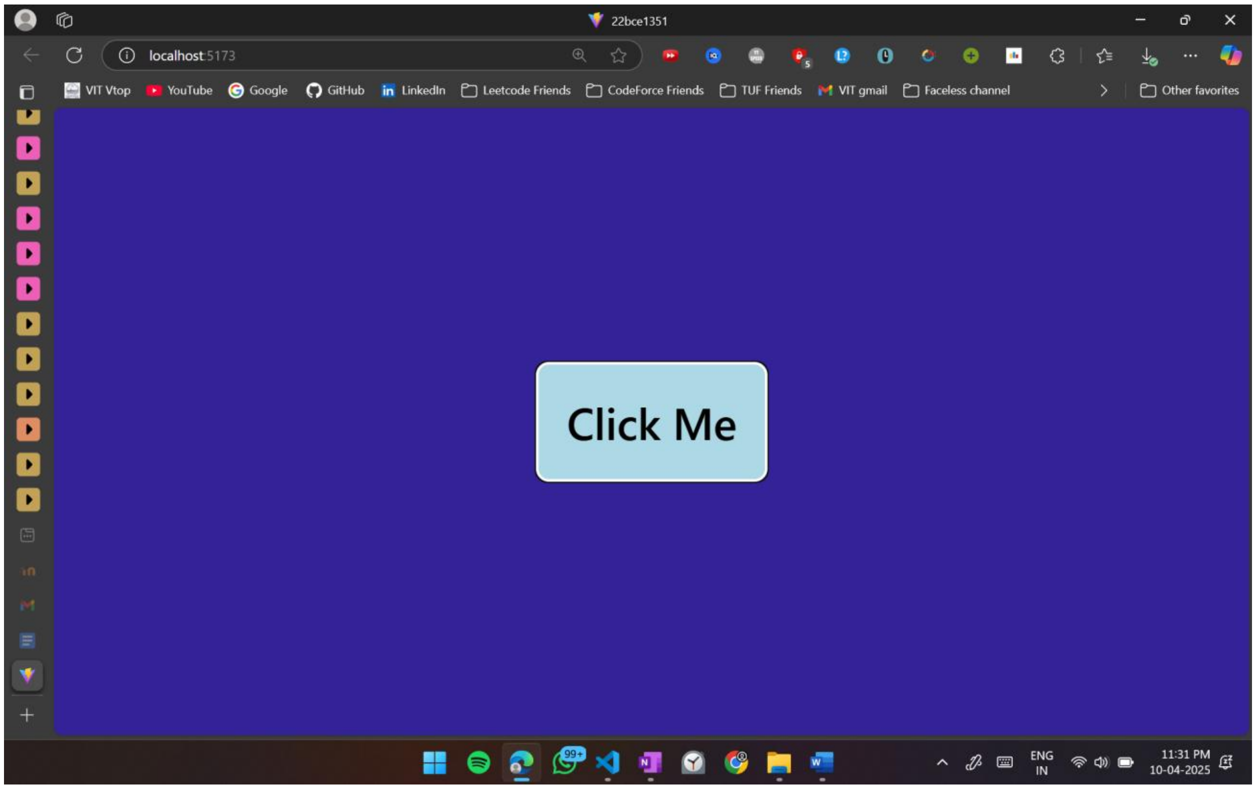
```
import '../Button/style.css'
function StyledButton(){
    return(
        <button className='button'>Click Me</button>
    );
}
export default StyledButton;
```

II. style.css

```
.button {
    background-color:lightblue;
    padding:20px;
    color:black;
    font-size:30px;
}
```

III. App.jsx

```
import './App.css'
import StyledButton from './Button/StyledButton'
function App() {
 return (
   <>
   <StyledButton></StyledButton>
   </>
 )
}
export default App
```



5. Develop a LifecycleDemo class component that logs messages at each stage of its lifecycle
o Lifecycle (constructor, componentDidMount, componentDidUpdate, and componentWillUnmount).
o Implement a button to update the state and trigger componentDidUpdate().
o Unmount the component dynamically to observe the effect of componentWillUnmount()

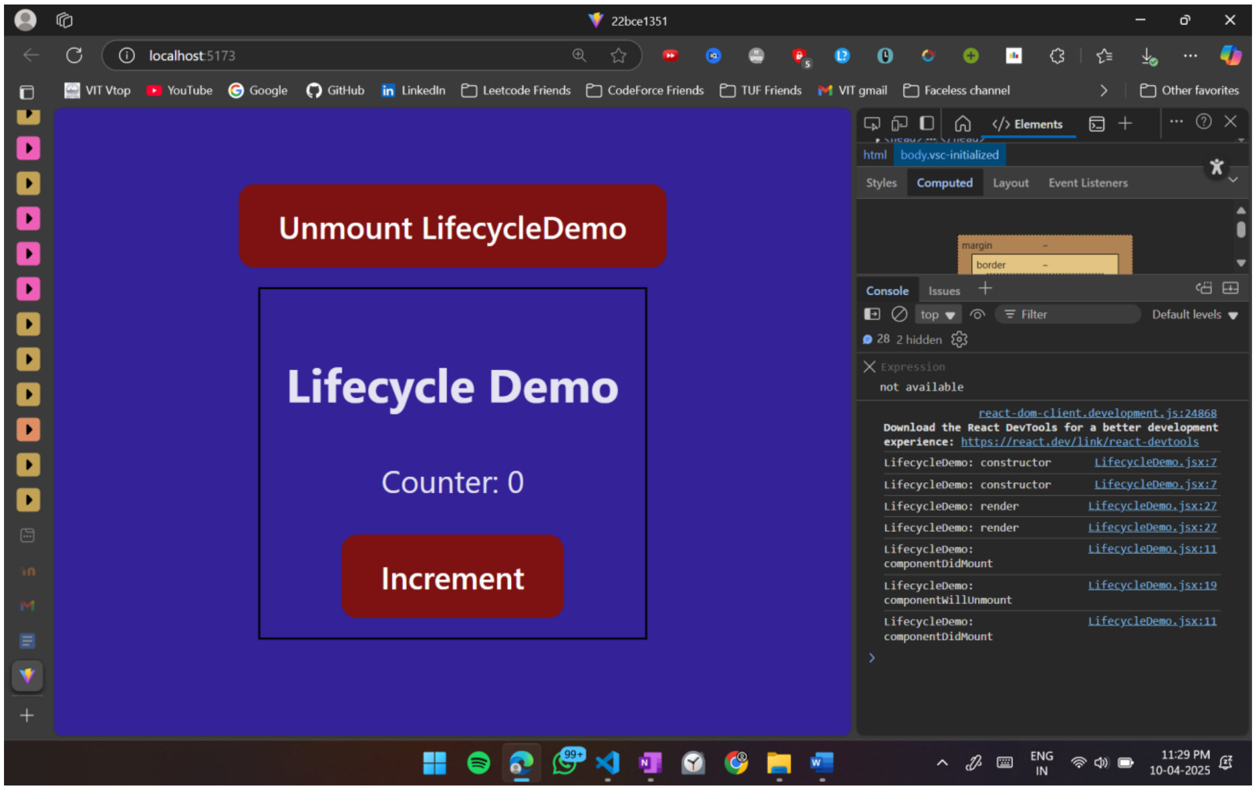
I. LifecycleDemo.jsx

```
import React, { Component } from "react";

class LifecycleDemo extends Component {
 constructor(props) {
   super(props);
   this.state = { counter: 0 };
   console.log("LifecycleDemo: constructor");
 }

 componentDidMount() {
   console.log("LifecycleDemo: componentDidMount");
 }

 componentDidUpdate(prevProps, prevState) {
   console.log("LifecycleDemo: componentDidUpdate");
 }

 componentWillUnmount() {
   console.log("LifecycleDemo: componentWillUnmount");
 }

 increment = () => {
   this.setState((prevState) => ({ counter: prevState.counter + 1 }));
 };

 render() {
   console.log("LifecycleDemo: render");
   return (
     <div style={{ border: "1px solid black", padding: "10px", margin:
"10px" }}>
       <h2>Lifecycle Demo</h2>
       <p>Counter: {this.state.counter}</p>
```

```
        <button onClick={this.increment}>Increment</button>
      </div>
    );
  }
}

export default LifecycleDemo;
```

II. App.jsx

```
import { useState } from "react";
import LifecycleDemo from "./LifecycleDemo";
import "./App.css";

function App() {
 const [showDemo, setShowDemo] = useState(true);

 const toggleDemo = () => {
   setShowDemo((prev) => !prev);
 };

 return (
   <>
     <button onClick={toggleDemo}>
       {showDemo ? "Unmount LifecycleDemo" : "Mount LifecycleDemo"}
     </button>
     {showDemo && <LifecycleDemo />}
   </>
 );
}

export default App;
```



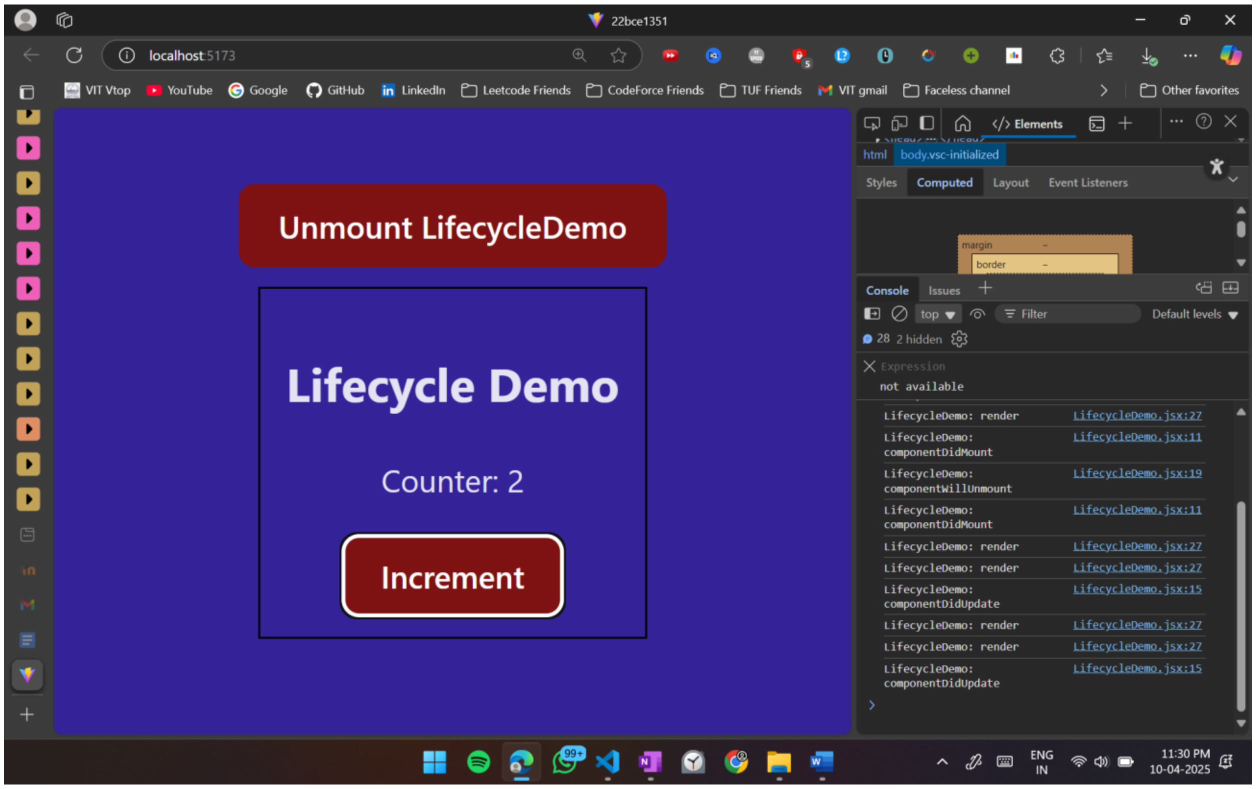
Unmount LifecycleDemo

Lifecycle Demo

Counter: 0

Increment

```
react-dom-client.development.js:24868
Download the React DevTools for a better development
experience: https://react.dev/link/react-devtools
LifecycleDemo: constructor                LifecycleDemo.jsx:7
LifecycleDemo: constructor                LifecycleDemo.jsx:7
LifecycleDemo: render                     LifecycleDemo.jsx:27
LifecycleDemo: render                     LifecycleDemo.jsx:27
LifecycleDemo:                            LifecycleDemo.jsx:11
componentDidMount
LifecycleDemo:                            LifecycleDemo.jsx:19
componentWillUnmount
LifecycleDemo:                            LifecycleDemo.jsx:11
componentDidMount
```



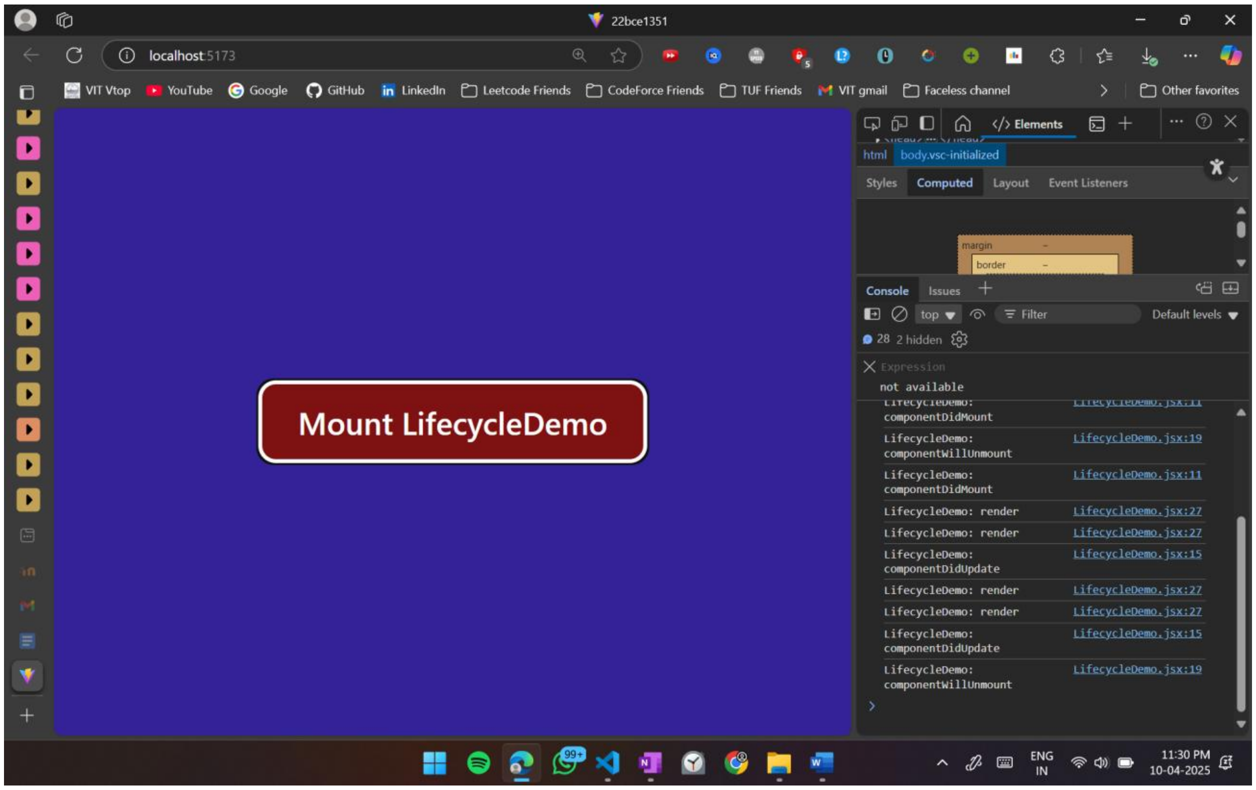
Unmount LifecycleDemo

Lifecycle Demo

Counter: 2

Increment

```
LifecycleDemo: render                     LifecycleDemo.jsx:27
LifecycleDemo:                            LifecycleDemo.jsx:11
componentDidMount
LifecycleDemo:                            LifecycleDemo.jsx:19
componentWillUnmount
LifecycleDemo:                            LifecycleDemo.jsx:11
componentDidMount
LifecycleDemo: render                     LifecycleDemo.jsx:27
LifecycleDemo: render                     LifecycleDemo.jsx:27
LifecycleDemo:                            LifecycleDemo.jsx:15
componentDidUpdate
LifecycleDemo: render                     LifecycleDemo.jsx:27
LifecycleDemo: render                     LifecycleDemo.jsx:27
LifecycleDemo:                            LifecycleDemo.jsx:15
componentDidUpdate
```



```
not available
LifecycleDemo:
componentDidMount                       LifecycleDemo.jsx:11
LifecycleDemo:                          LifecycleDemo.jsx:19
componentWillUnmount
LifecycleDemo:                          LifecycleDemo.jsx:11
componentDidMount
LifecycleDemo: render                   LifecycleDemo.jsx:27
LifecycleDemo: render                   LifecycleDemo.jsx:27
LifecycleDemo:                          LifecycleDemo.jsx:15
componentDidUpdate
LifecycleDemo: render                   LifecycleDemo.jsx:27
LifecycleDemo: render                   LifecycleDemo.jsx:27
LifecycleDemo:                          LifecycleDemo.jsx:15
componentDidUpdate
LifecycleDemo:                          LifecycleDemo.jsx:19
componentWillUnmount
```

6. React Props:

- **Design a Parent component that sends a message prop to a Child component.**
- **Ensure the Child component properly receives and displays the message.**

I. Parent.jsx

```
import Child from "./Child";

function Parent() {
 return (
   <div>
     <h2>Parent Component</h2>
     <Child message="Hello from the Parent!" />
   </div>
 );
}
export default Parent;
```

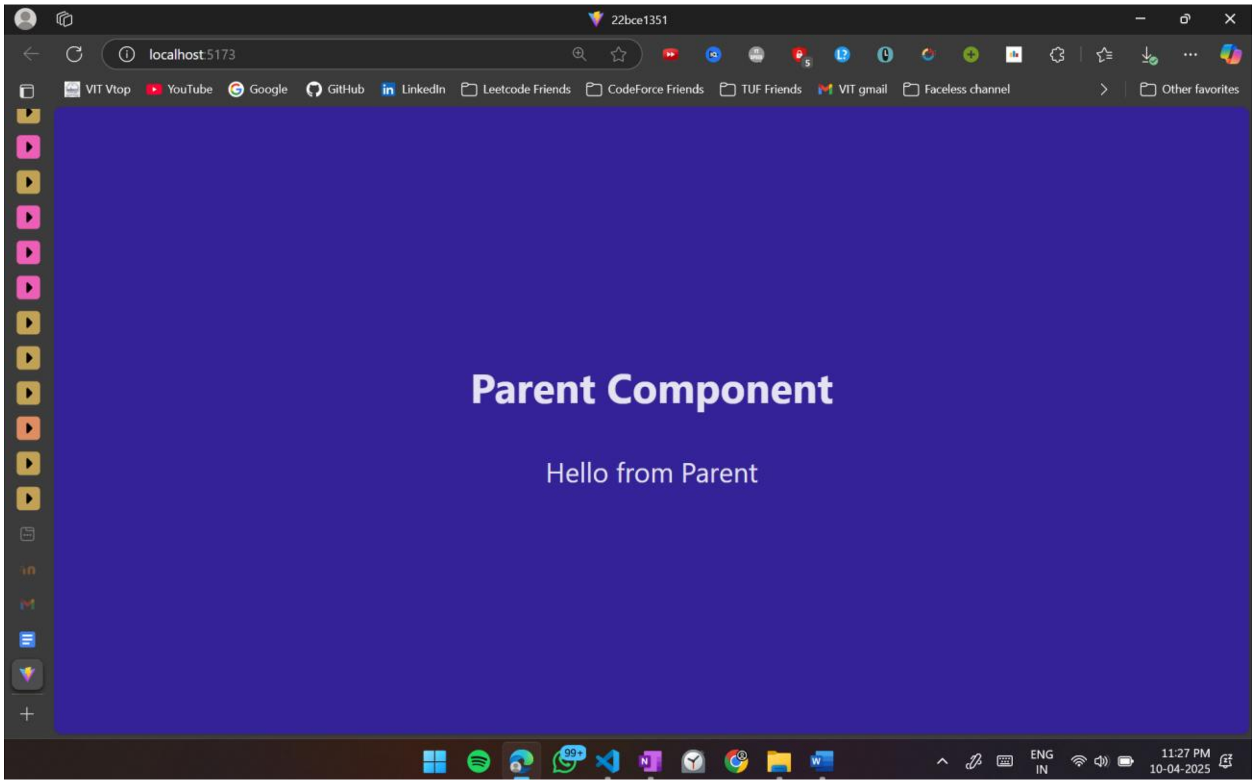
II. Child.jsx

```
function Child({ message }) {
   return <p>{message}</p>;
 }
```

```
  export default Child;
```

III. App.jsx

```
import "./App.css";
import Parent from "./Parent";
function App() {
 return (
   <>
     <Parent></Parent>
   </>
 );
}

export default App;
```



Parent Component

Hello from Parent

7. React Props Validation:

- **Modify the Child component to validate the message prop using prop-types.**
- **Ensure that the prop is required and of type string.**

I. Parent.jsx

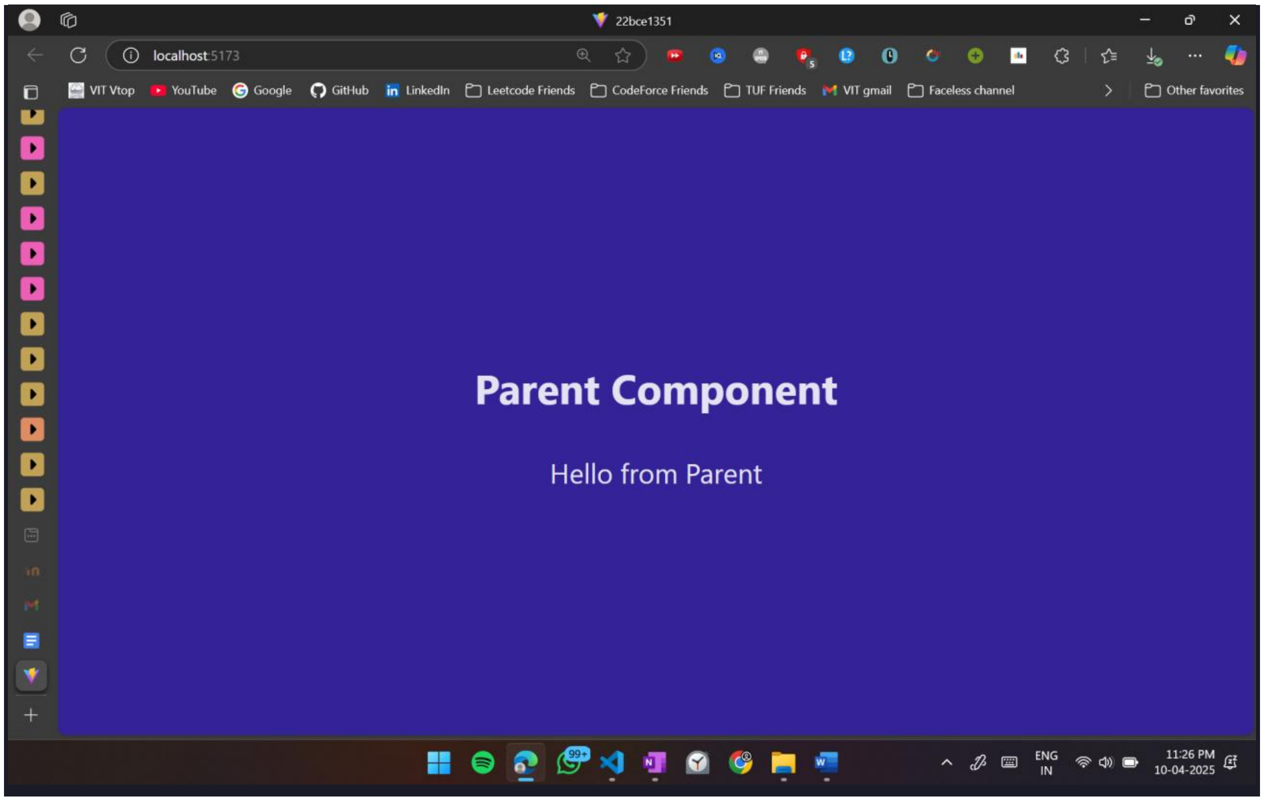
```
import Child from "./Child";

function Parent() {
 return (
   <div>
     <h2>Parent Component</h2>
     <Child message="Hello from the Parent!" />
   </div>
 );
}
export default Parent;
```

II. Child.jsx

```
import PropTypes from 'prop-types'
function Child({ message }) {
   return <p>{message}</p>;
 }
Child.propTypes = {
   message: PropTypes.string
}
export default Child;
```

III. App.jsx

```
import "./App.css";
import Parent from "./Parent";
function App() {
 return (
   <>
     <Parent></Parent>
   </>
 );
}
export default App;
```



Parent Component

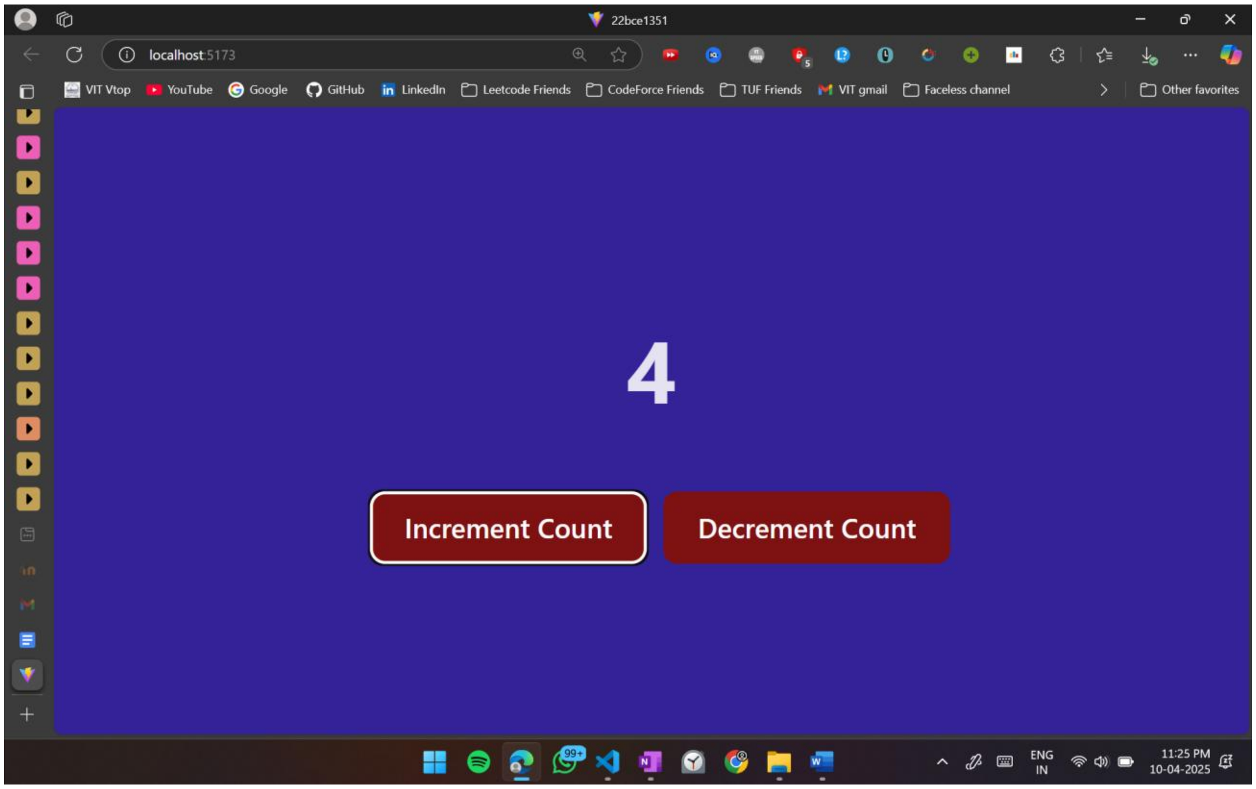
Hello from Parent

8. State Hooks: (useState and useReducer)

- **Create a React component called Counter using the useState() hook. The component should display a count with two buttons: Increase and Decrease.**
- **Modify the component to use the useReducer() hook instead of useState(), handling increment and decrement actions efficiently.**

I. Counter.jsx using useState()

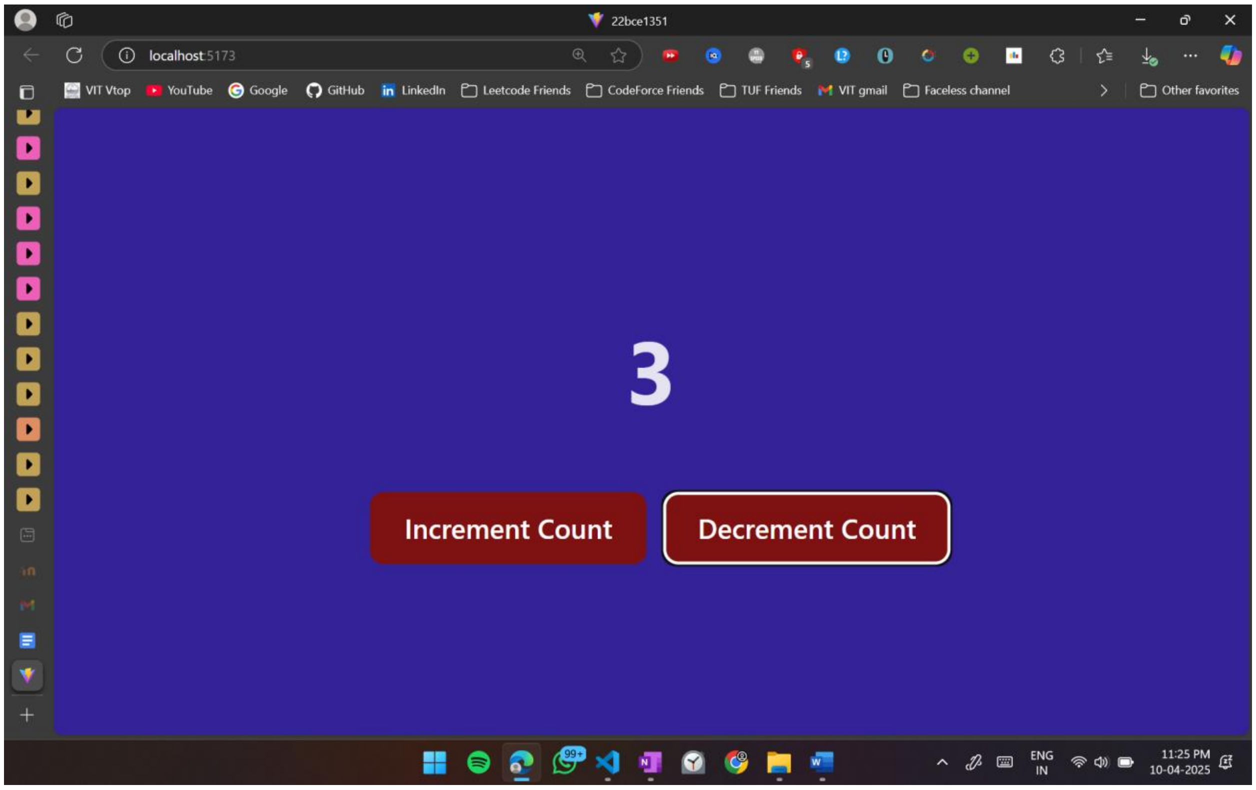
```
import React,{useState} from 'react';
function Counter(){
   const [count,setCount] = useState(0);

   const incrementCount = ()=>{
       setCount(count+1);
   }
   const decrementCount = ()=>{
       setCount(c=>c-1);
   }
   return(
       <div>
           <h1>{count}</h1>
           <div>
               <button onClick={incrementCount}
style={{margin:"10px"}}>Increment Count</button>
               <button onClick={decrementCount}>Decrement Count</button>
           </div>
       </div>
   );
}
export default Counter;
```



II.	Counter.jsx using useReducer

```
import React,{useReducer} from 'react';
function Counter(){
   const reducer = (state,action)=>{
       switch (action){
           case "increment":
               return state+1;
           case "decrement":
               return state-1;
           default:
               return state;
       }
   }
   const [count,dispatch] = useReducer(reducer, 0);

   return(
       <div>
           <h1>{count}</h1>
           <div>
               <button onClick={()=>dispatch("increment")}
style={{margin:"10px"}}>Increment Count</button>
```

```
                    <button onClick={()=>dispatch("decrement")}>Decrement
Count</button>
               </div>
          </div>
    );
}
export default Counter;
```



9. Effect Hooks (useEffect):

- **Develop a React component that fetches and displays a random joke from an API when the component mounts.**
- **Add functionality to refresh the joke when a button is clicked.**

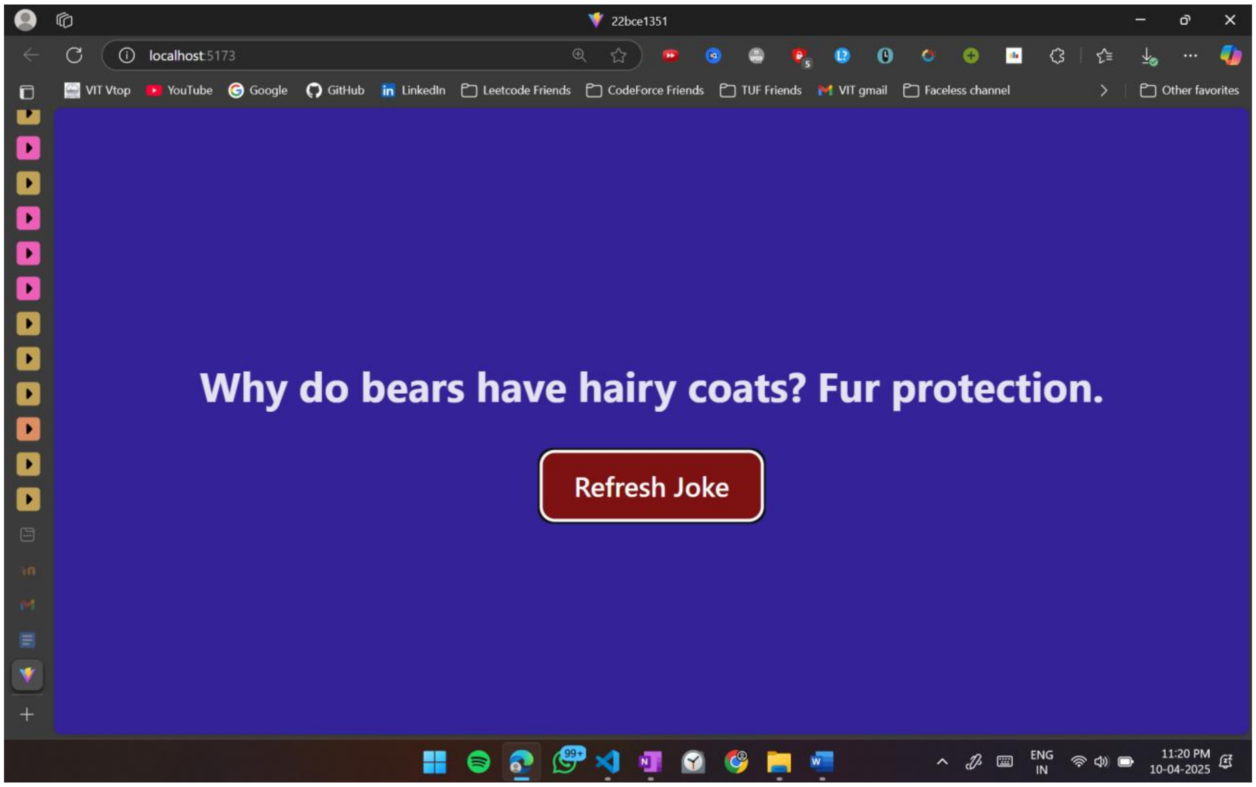
I. Joke.jsx

```
import React,{useEffect, useState} from 'react';
function Joke(){
   const [joke,setJoke] = useState("");

   const fetchJoke = async() => {
       try {
           const response = await fetch("https://official-joke-
api.appspot.com/random_joke");
           const data = await response.json();
           setJoke(`${data.setup} ${data.punchline}`);
         } catch (error) {
           console.error(error);
           setJoke("Failed to fetch a joke.");
         }
   };

   useEffect(()=>{
       fetchJoke();
   },[])

   return(
       <div>
           <h2>{joke}</h2>

           <button onClick={fetchJoke}>Refresh Joke</button>
       </div>
   );
}
export default Joke
```

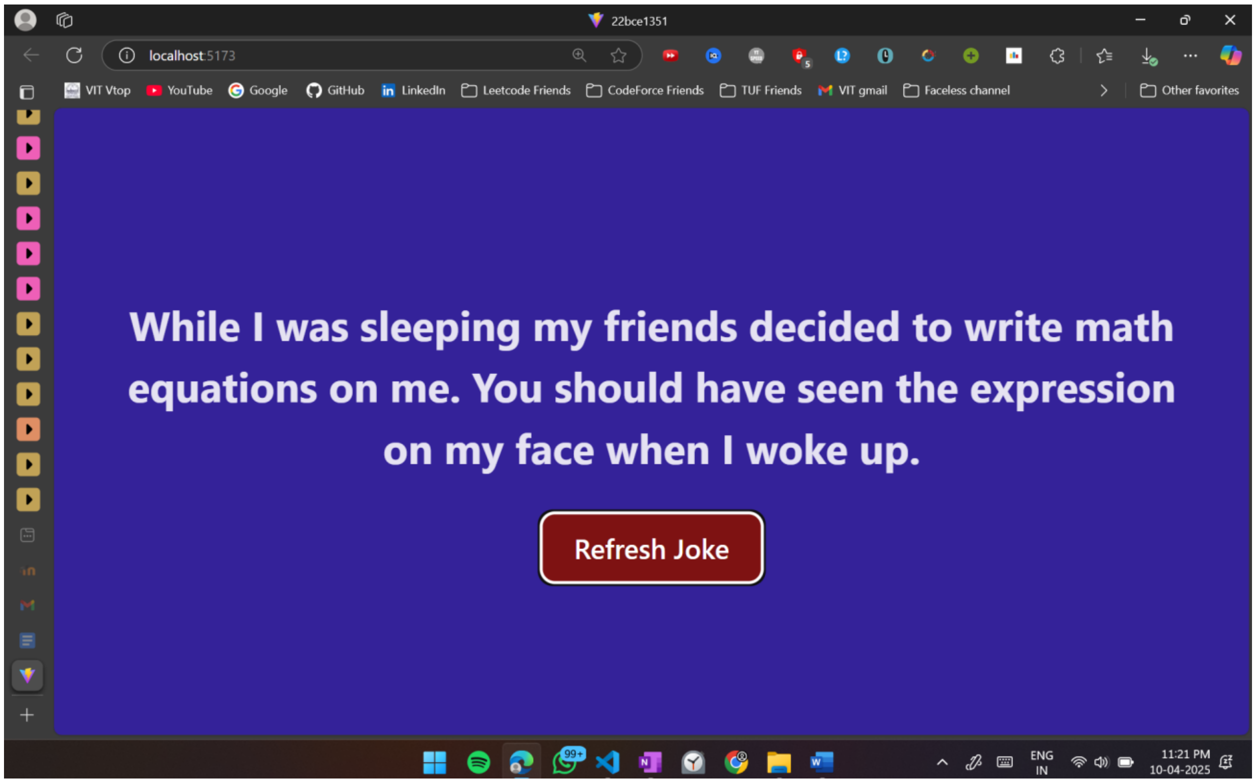
II. App.jsx

```
import "./App.css";
import Joke from "./Joke";
function App() {
 return (
   <Joke></Joke>
```

```
  );
}
export default App;
```



Why do bears have hairy coats? Fur protection.


While I was sleeping my friends decided to write math equations on me. You should have seen the expression on my face when I woke up.

10. Ref Hooks (useRef):

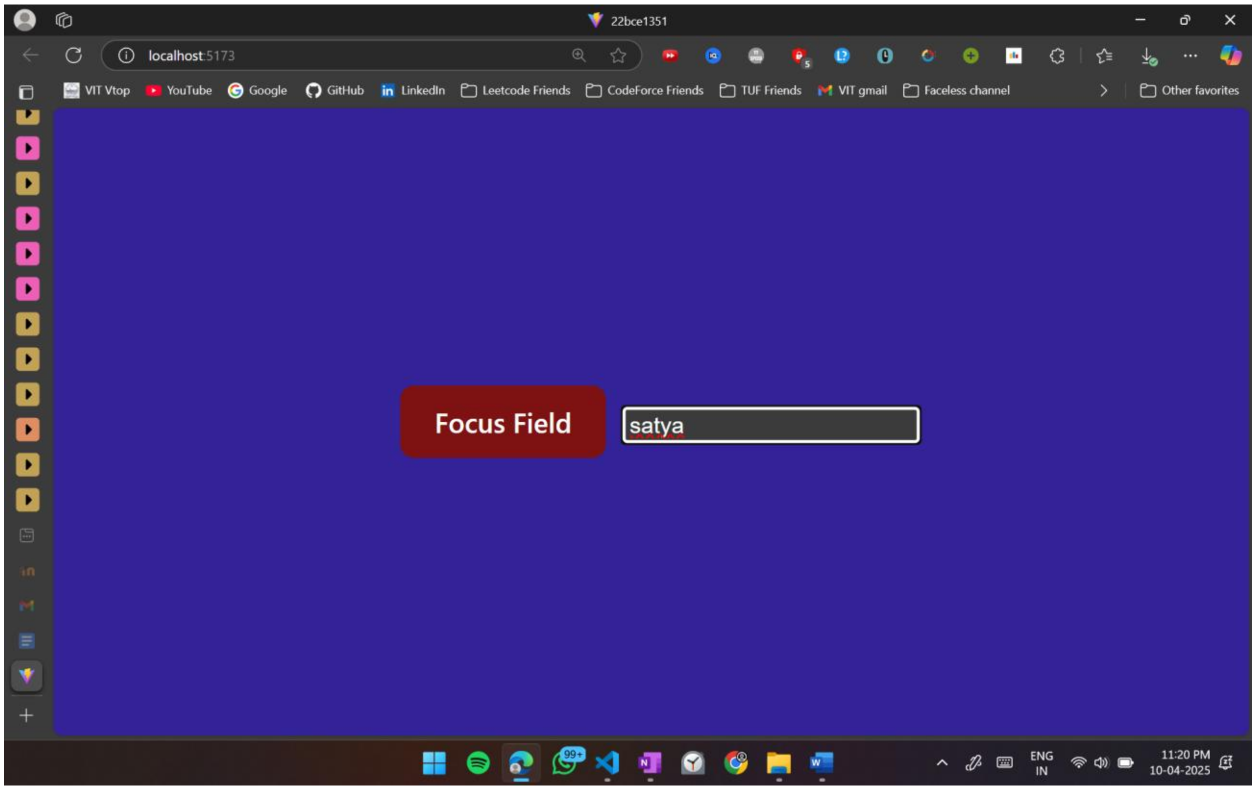
- **Build a simple form with an input field and a button.**
- **When the button is clicked, the input field should automatically get focused using the useRef() hook.**

I. Focus.jsx

```
import React,{useRef} from "react";

function Focus(){

    const inputRef = useRef("");

    const focusField = (inputRef)=>{
        inputRef.current.focus();
    }
    return(
        <div>
            <button onClick={() => focusField(inputRef)}
style={{margin:"10px"}}>Focus Field</button>
            <input type="text" ref={inputRef}/>
        </div>
    );
}
export default Focus;
```

II. App.jsx

```
import "./App.css";
import Focus from "./Focus";
function App() {
 return (
    <>
    <Focus></Focus>
    </>
 );
}

export default App;
```



11. Context Hooks (useContext):

- **Create a React application where the theme (dark or light mode) is shared across multiple components using useContext().**
- **Implement a button to toggle between dark and light themes.**

ThemeContext.jsx

```
import React, { createContext, useState, useContext } from "react";

const ThemeContext = createContext();

export function ThemeProvider({ children }) {
 const [theme, setTheme] = useState("light");
 const toggleTheme = () =>
   setTheme((prevTheme) => (prevTheme === "light" ? "dark" : "light"));

 return (
   <ThemeContext.Provider value={{ theme, toggleTheme }}>
     {children}
   </ThemeContext.Provider>
 );
}

export function useTheme() {
 return useContext(ThemeContext);
}
```

ThemeToggle.jsx

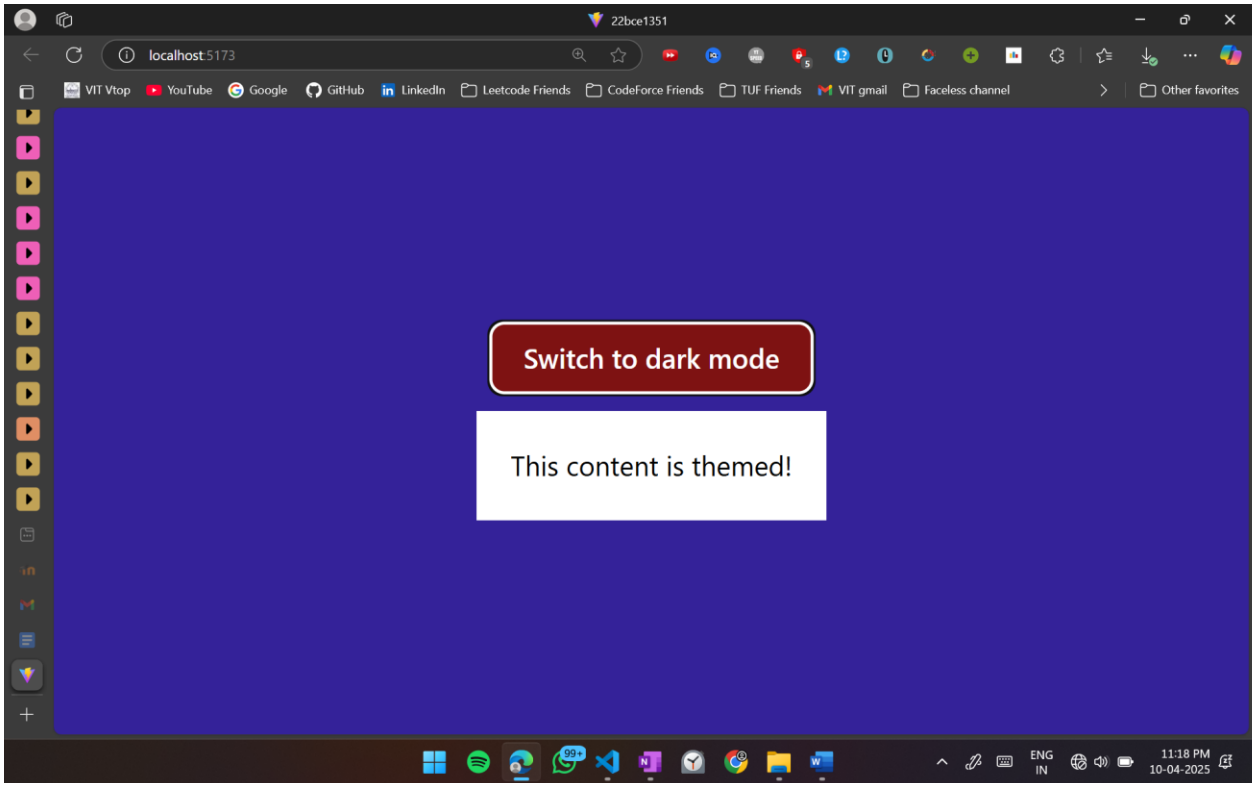
```
import React from "react";
import { useTheme } from "./ThemeContext";

function ThemeToggle() {
 const { theme, toggleTheme } = useTheme();

 return (
   <button onClick={toggleTheme}>
     Switch to {theme === "light" ? "dark" : "light"} mode
   </button>
 );
}

export default ThemeToggle;
```

ThemedContent.jsx

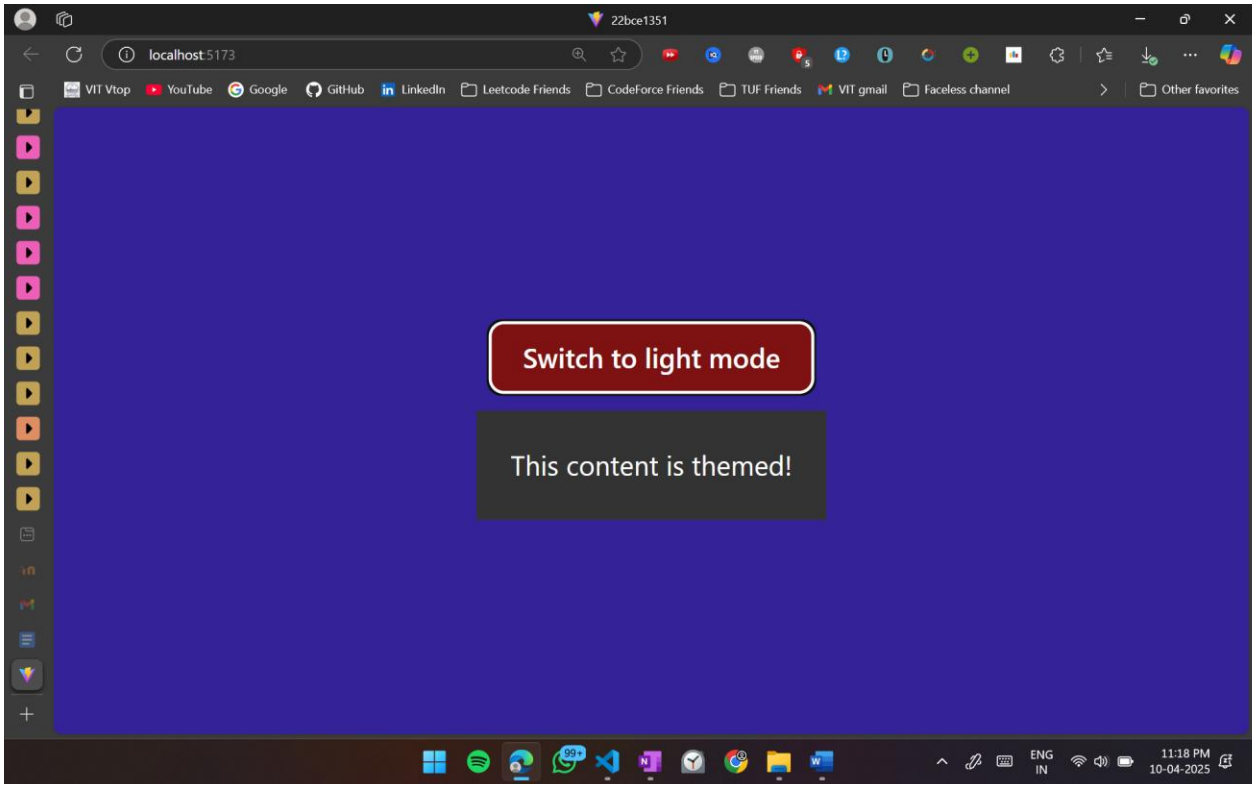
```
import React from "react";
import { useTheme } from "./ThemeContext";

function ThemedContent() {
 const { theme } = useTheme();
 const style = {
   backgroundColor: theme === "light" ? "#fff" : "#333",
   color: theme === "light" ? "#000" : "#fff",
   padding: "20px",
   marginTop: "10px",
 };

 return <div style={style}>This content is themed!</div>;
}

export default ThemedContent;
```

App.jsx

```
import "./App.css";
import { ThemeProvider } from "./ThemeContext";
import ThemeToggle from "./ThemeToggle";
import ThemedContent from "./ThemedContent";

function App() {
 return (
   <ThemeProvider>
     <ThemeToggle />
     <ThemedContent />
   </ThemeProvider>
 );
}

export default App;
```



This content is themed!



This content is themed!

12. Passing Values from a Form Using useState and useRef(i)

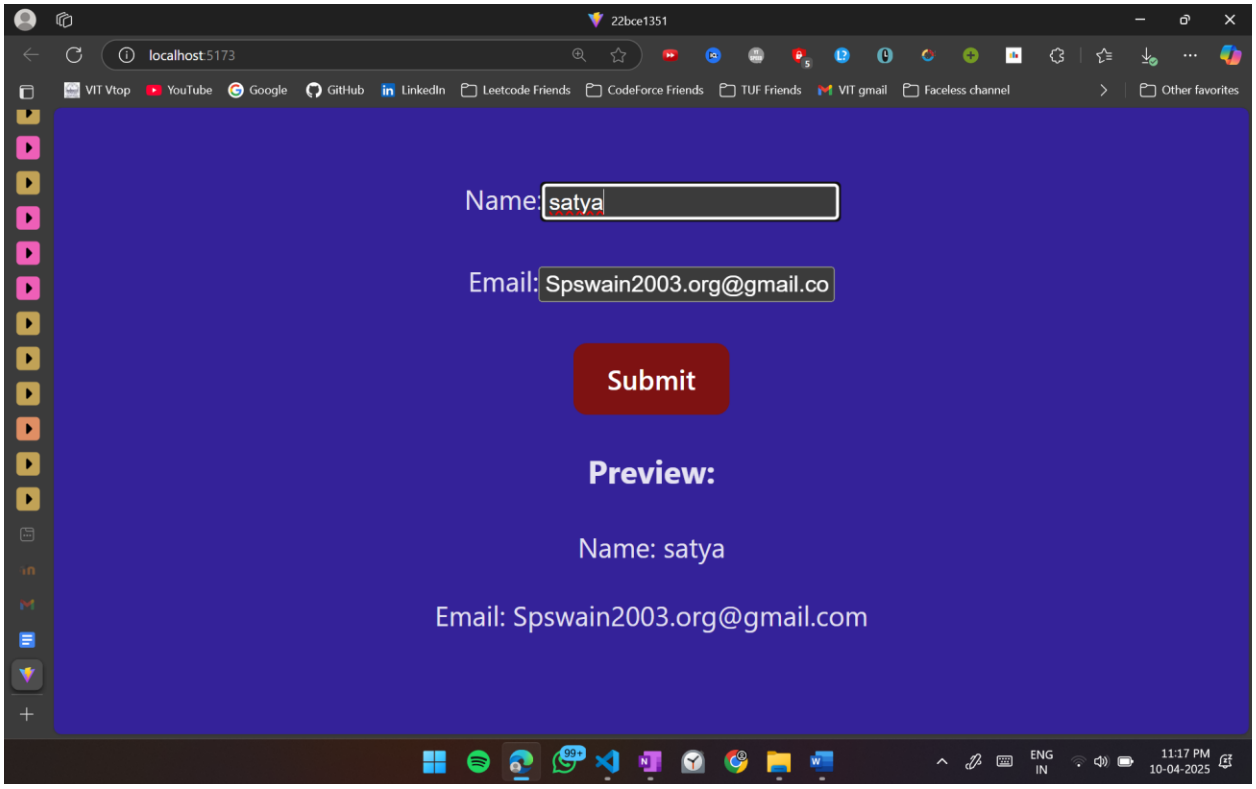
(i) Create a form with fields for Name and Email. Use useState to manage input values and display them dynamically.

- **Create a new React component.**
- **Use useState to track form values.**
- **Display the values dynamically as the user types.**
- **Submit the form and prevent default page reload.**

Form.jsx

```
import { useState } from "react";
function Form() {
 const [name, setName] = useState("");
 const [email, setEmail] = useState("");

 const handleSubmit = (e) => {
   e.preventDefault();
   console.log("Submitted Name:", name);
   console.log("Submitted Email:", email);
 };

 return (
   <form onSubmit={handleSubmit}>
       <label>
         Name:
         <input
           type="text"
           value={name}
           onChange={(e) => setName(e.target.value)}
         />
       </label>
       <br />
       <br />
       <label>
         Email:
         <input
           type="email"
           value={email}
           onChange={(e) => setEmail(e.target.value)}
         />
       </label>
       <br />
       <br />
```

```
      <button type="submit">Submit</button>
      <section>
        <h3>Preview:</h3>
        <p>Name: {name}</p>
        <p>Email: {email}</p>
      </section>
    </form>
  );
}
export default Form;
```



Name: satya

Email: Spswain2003.org@gmail.co

Preview:

Name: satya

Email: Spswain2003.org@gmail.com

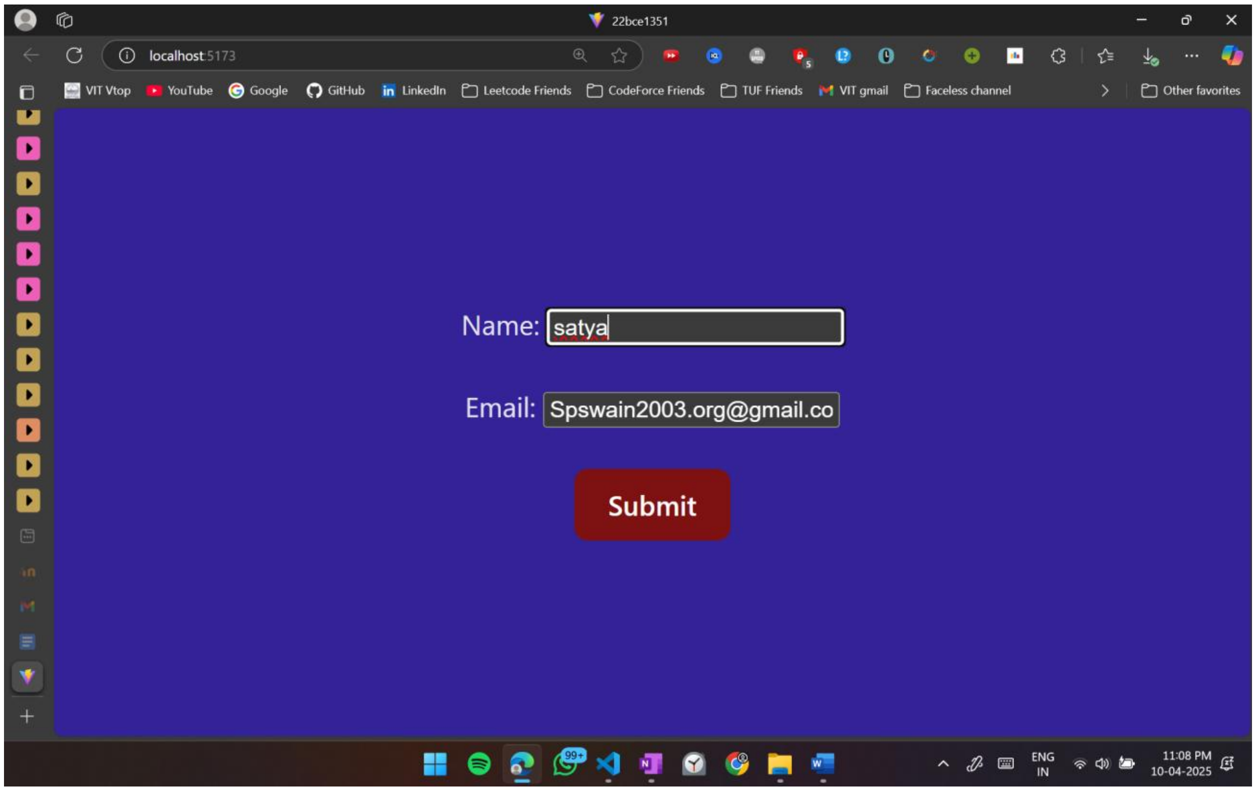
(ii) Create the same form but use useRef to retrieve values on form submission without managing state updates.

- **Create a new React component.**
- **Use useRef to get form values.**
- **Display values only when the form is submitted.**

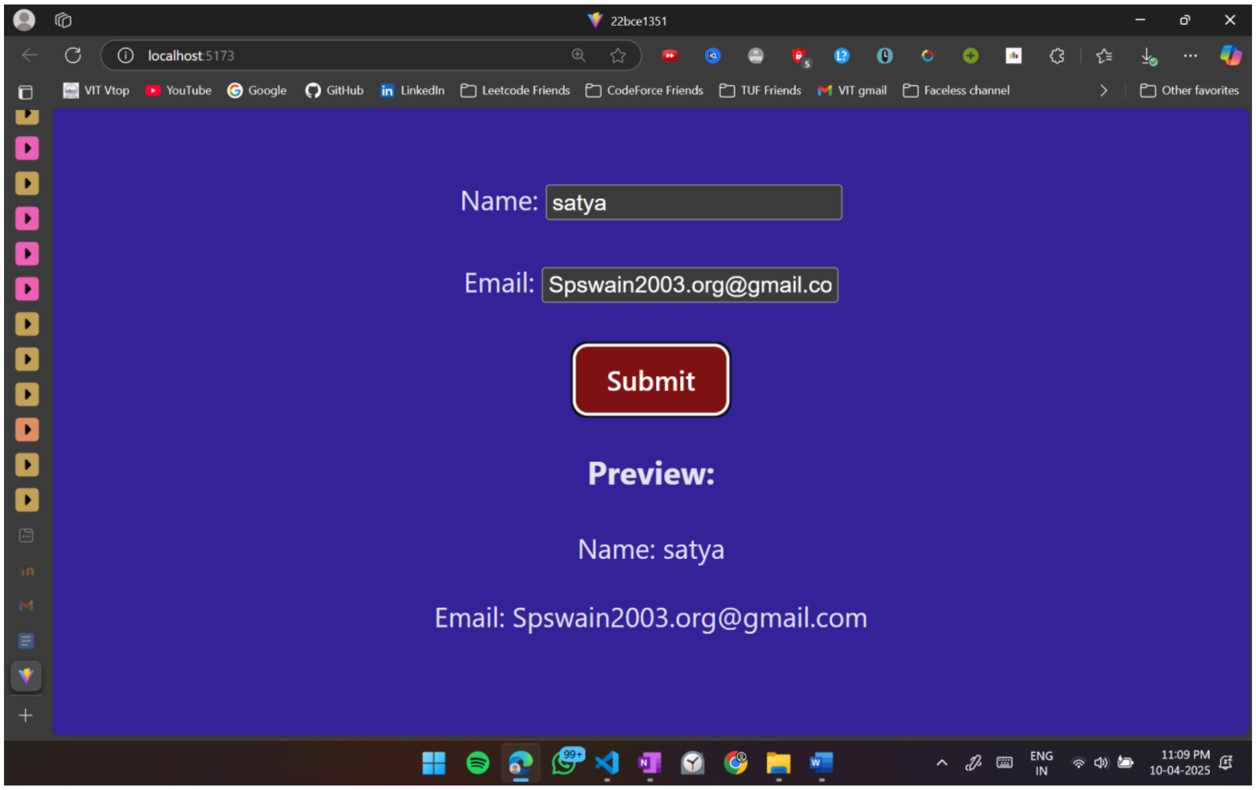
NewForm.jsx

```jsx
import { useRef, useState } from "react";

function NewForm() {
 const nameRef = useRef(null);
 const emailRef = useRef(null);
 const [submittedData, setSubmittedData] = useState(null);

 const handleSubmit = (e) => {
   e.preventDefault();
   const name = nameRef.current.value;
   const email = emailRef.current.value;
   setSubmittedData({ name, email });
 };

 return (
   <form onSubmit={handleSubmit}>
     <label>
       Name:{" "}
       <input
         type="text"
         ref={nameRef}
         placeholder="Enter your name"
       />
     </label>
     <br />
     <br />
     <label>
       Email:{" "}
       <input
         type="email"
         ref={emailRef}
         placeholder="Enter your email"
       />
     </label>
     <br />
     <br />
     <button type="submit">Submit</button>
     {submittedData && (
       <section>
```

```
         <h3>Preview:</h3>
         <p>Name: {submittedData.name}</p>
         <p>Email: {submittedData.email}</p>
       </section>
     )}
   </form>
 );
}

export default NewForm;
```


Name: satya

Email: Spswain2003.org@gmail.co


Name: satya

Email: Spswain2003.org@gmail.co

Preview:

Name: satya

Email: Spswain2003.org@gmail.com