St. Francis Institute of Technology
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Class: TE IT A & B   **Academic Year: 2023-2024**
Experiment – 10
Design of Single Page Application in React using React Router

1. Aim: To design a single page application in react using react router.

2. Objective: After performing the experiment, the students will be able to understand and design front end applications using react

3. Lab objective mapped: Students will be able to construct front end applications using React (PO3, PO5, PSO3, PSO4)

4. Prerequisite: HTML, CSS, node.js, react

5. Requirements: The following are the requirements –
- PC/Laptop
- Visual Studio Code
- Browser

6. Pre-Experiment Theory:
React Components are independent and reusable bits of code. They serve the same purpose as JavaScript functions, but work in isolation and return HTML.
Components come in two types –
- Class components - A class component must include the extends React.Component statement. This statement creates an inheritance to React.Component, and gives your component access to React.Component's functions. The component also requires a render() method, this method returns HTML.
- Function components - A Function component also returns HTML, and behaves much the same way as a Class component, but Function components can be written using much less code, are easier to understand.

Components can be passed as props, which stands for properties. Props are like function arguments, and you send them into the component as attributes.
We can refer to components inside other components.
React is all about re-using code, and it is recommended to split your components into separate files. To do that, create a new file with a .js file extension and put the code inside it.
Create React App doesn't include page routing. React Router is the most popular solution. React Router is a standard library for routing in React. It enables the navigation among views of various components in a React Application, allows changing the browser URL, and keeps the UI in sync with the URL.

React Router can be installed via npm in your React application. After installing react-router-dom, add its components to your React application.

The main Components of React Router are:

- BrowserRouter - BrowserRouter is a router implementation that uses the HTML5 history API (pushState, replaceState and the popstate event) to keep your UI in sync with the URL. It is the parent component that is used to store all of the other components.
- Route - Route is the conditionally shown component that renders some UI when its path matches the current URL.
- Link - Link component is used to create links to different routes and implement navigation around the application. It works like HTML anchor tag.
- Routes - Rendered anywhere in the app, <Routes> will match a set of child routes from the current location. Whenever the location changes, <Routes> looks through all its child routes to find the best match and renders that branch of the UI. <Route> elements may be nested to indicate nested UI, which also correspond to nested URL paths.

7. Laboratory Exercise:

A. Procedure

- Add following extensions in vs code (Recommended) – Babel JavaScript, JavaScript ES6 Code Snippets, vs code icons
- Install node.js (npm installs automatically)
- Open terminal window (use cmd command)
- Check version of node.js (node -v)
- Check version of npm (npm -v)
- Install react from terminal using following commands -
  - npm install -g create-react-app
  - create-react-app –version
  - d:
  - mkdir <foldername>
  - cd <foldername>
  - create-react-app <projname> (may take a few minutes)
  - cd <projname>
  - npm start (localhost:3000 – react app installed in local system)
- Open vs-code and open the folder.
- Write your code

To view the output, reload the react app
Check output

B. Program Code

Design a single page application in react using react router using the suggestive guidelines
as mentioned below. However, you are free to include other features covered earlier to

make the design more feature rich.

Single Page Application

Internet Programming

Home
Contact
Aboutus

Home tab=>

Topics to be covered

Sr. No.	Topic Name

Contact tab=>

Contact Details like phone no, Location, Email-ID, Address

Aboutus tab=>

One paragraph about the organizers

8. Post Experimental Exercise-

1) What is HashRouter in react?

2) Differentiate between HashRouter and BrowserRouter.

3) Explain the use of basement, window and future properties in HashRouter with the help of an example.

9. Results/Observations/Program output:

Present the program code and output

Code App.js:

```
import logo from './logo.svg'; import Home from
"./Home.jsx" import Navbar from './Navbar.jsx'
import About from './About.jsx' import Contact
from './Contact.jsx' import './App.css';

import { BrowserRouter, Routes, Route } from "react-router-dom";
```

```
function App() { return
  (

    <BrowserRouter>

      <Navbar/>
      <Routes>
        <Route path="/" element={<Home/>}/>
        <Route path="/about" element={<About/>}/>
        <Route path="/contact" element={<Contact/>}/>
      </Routes>
    </BrowserRouter>
  );
}

export default App;
```

Code Home.js:

```
import React from "react"; import
"./App.css";

const Home = () => { return (
    <div className="center">
      <h1>topic to be covered</h1>
      <table width={"50%"} >
        <tr>
          <th style={{width:"20%"}}>Sr. No</th>
          <th style={{width:"80%"}}>Topic Name</th>
        </tr>
        <tr>
            <td></td>
            <td></td>
        </tr>
        <tr>
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            <td></td>
        </tr>
        <tr>
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            <td></td>
        </tr>
        <tr>
            <td></td>
            <td></td>
        </tr>
      </table>
    </div>
  );
};

export default Home;
```

Code About .js:

```
import React from "react"; import
"./App.css";

const About = () => { return (
    <div className="center about">
      <div className="left">
                                                          <img
src="https://media.istockphoto.com/id/587529448/photo/leader-and-ceo.j
pg?s=612x612&w=0&k=20&c=kkWWhklJ5Ak4VJj0YkbfTEgqiwqm_BivQ6LLybAd9yo=" alt="" />
      </div>
      <div className="right">
        <p>
            At Unleash Your Imagination, we are not just a company; we are a vibrant
community of dreamers, creators, and innovators. Our journey began with a simple
</p>
        <h2>Our Story</h2>
        <p>In the heart of innovation, nestled amidst the corridors of creativity,
            Unleash Your Imagination was born. Our story is
one of passion </p>
        <h2>Our Mission</h2>
        <p>
            Our mission is to ignite, nurture, and celebrate creativity in every
individual. .
            </p>
      </div>
    </div>
  );
};

export default About;
```

Code Contact.js:

```
import React from "react"; import
"./App.css";

const Contact = () => { return (
    <div className="center contact">
      <input type="text" placeholder="Enter your name" />
      <input type="email" placeholder="Enter your mail" />
      <input type="number" placeholder="Enter your number" />
      <input type="text" placeholder="Enter location" />
      <textarea rows="5"
        cols="20"
        placeholder="Enter your address here"
      ></textarea>
      <button>Contact me</button>
    </div>
  );
};


export default Contact;
```

Output:

Single Page application

Internet Programming

Home About Contact

Topic To Be Covered

Sr. No	Topic Name

Single Page application

Internet Programming

Home About Contact

At Unleash Your Imagination, we are not just a company; we are a vibrant community of dreamers, creators, and innovators. Our journey began with a simpl

Our Story

In the heart of innovation, nestled amidst the corridors of creativity, Unleash Your Imagination was born. Our story is one of passion

Our Mission

Our mission is to ignite, nurture, and celebrate creativity in every individual. .

Single Page application

Internet Programming

Home   About   Contact

Enter your name

Enter your mail

Enter your number

Enter location

Enter your address here

Contact me

10. Conclusion:

Write what was performed in the experiment

Write which all features of HTML, CSS and React, ReactRouter you used to perform the experiment

11. References:

- https://nodejs.org/en/
- https://www.thapatechnical.com/2020/05/install-reactjs-windows-install-nodejs.html
- https://www.kirupa.com/react/setting_up_react_environment.htm
- https://www.kirupa.com/react/creating_single_page_app_react_using_react_router.htm
- https://youtu.be/tg73NsiQOUE
- https://www.youtube.com/watch?v=8AJ3Kcz5FsM