

Aim:

- A. To install and configure React and use basic props, components and JSX
- B. To understand Basic State and Events in React
- C. To develop a single page application in react using Router.
- D. To create Controlled and Uncontrolled forms using react js.
- E. To create a simple interactive UI using Material UI

Theory:

React Js – ReactJS is a declarative, efficient, and flexible JavaScript library for building reusable UI components. It is an open-source, componentbased front-end library which is responsible only for the view layer of the application. It was initially developed and maintained by Facebook and later used in its products like WhatsApp & Instagram.

The main objective of ReactJS is to develop User Interfaces (UI) that improves the speed of the apps. It uses virtual DOM (JavaScript object), which improves the performance of the app. The JavaScript virtual DOM is faster than the regular DOM. We can use ReactJS on the client and server-side as well as with other frameworks. It uses component and data patterns that improve readability and helps to maintain larger apps

Components –

A Component is one of the core building blocks of React. In other words, we can say that every application you will develop in React will be made up of pieces called components. Components make the task of building UIs much easier. You can see a UI broken down into multiple individual pieces called components and work on them independently and merge them all in a parent component which will be your final UI.

Props –

Props are a type of object where the value of attributes of a tag is stored. The word “props” implies “properties”, and its working functionality is quite similar to HTML attributes. Basically, these props components are read-only components. In ReactJS, the data can be passed from one component to another component using these props, similar to how the arguments are passed in a function. Inside the component, we can add the attributes called props; however, we cannot change or modify props inside the component as they are immutable

Component State –

React components has a built-in state object. The state object is where you store property values that belongs to the component. When the state object changes, the component re-renders.

Difference between props and state is props get passed to the component (similar to

function parameters) whereas state is managed within the component (similar to variables declared within a function).

Events –

Just like HTML DOM events, react can perform actions based on user events. React has the same events as HTML: click, change, mouseover etc. React events are written in camelCase and their event handlers are written inside curly braces.

Router –

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.

- 1) Installing React Router: React Router can be installed via npm in your React application. To install the React Router use the following command in ur project directory: `npm install --save react-router-dom` or `npm i react-router-dom`
- 2) Components of React Router: The Components of React Router Are as follows: i. : It is used for handling the dynamic URL. ii. : It is used for handling the static request.

Forms In React –

Forms are an integral part of any modern web application. It allows the users to interact with the application as well as gather information from the users. React offers a stateful, reactive approach to build a form. The component rather than the DOM usually handles the React form. In React, the form is usually implemented by using controlled components.

There are mainly two types of form input in React.

1. Uncontrolled Forms: It is similar to the traditional HTML form inputs. Here, the form data is handled by the DOM itself. It maintains their own state and will be updated when the input value changes.
2. Controlled Forms: A controlled component is bound to a value, and its changes will be handled in code by using event-based callbacks. Here, the input form element is handled by the react itself rather than the DOM. Controlled components have functions that govern the data passing into them on every onChange event occurs. This data is then saved to state and updated with `setState()` method. It makes component have better control over the form elements and data.

Material UI –

Material-UI (MUI) is a CSS framework that provides React Components out-of the-

box. MUI makes it possible to use different components to create a UI for a company's web and mobile apps. Google uses Material Design to guarantee that no matter how users interact with the products they use, they will have a consistent experience.

Output:

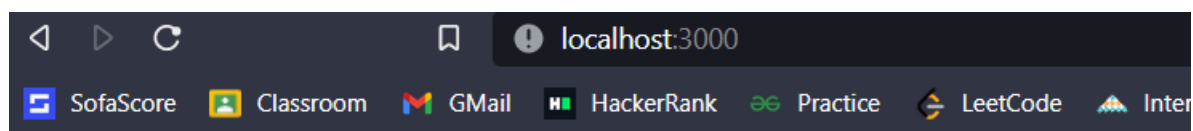
4A

```
function App() {
  return (
    <div className="App">
      <header className="App-header">

        <p>
          <h1> Hello !! This is Basic React App. </h1>
        </p>
      </header>
    </div>
  );
}

function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}

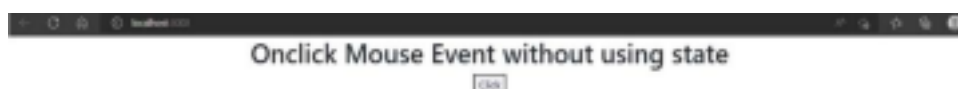
export default App;
```

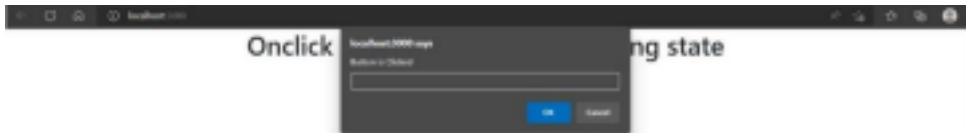


Hello !! This is Basic React App.

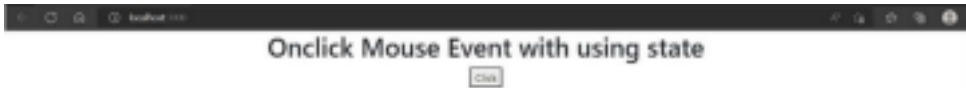
4B

Using Onclick Mouse Event without using state:





Using Onclick Mouse Event along with state:



4C



4D

Controlled Form:



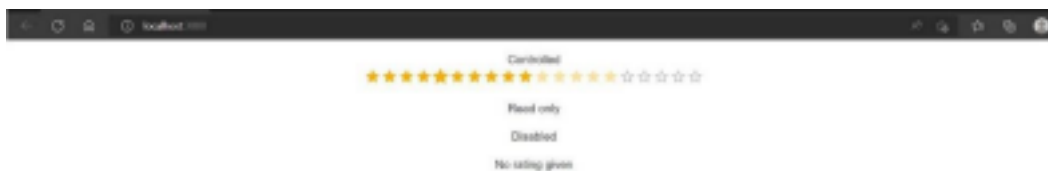
A screenshot of a web browser displaying a controlled form. The form contains three input fields: 'Name' with the value 'Rohan', 'Email' with the value '2020rphan.singh@vsnl.ac', and 'Message' with the value 'Hello'. A 'Submit' button is located below the message field.

Uncontrolled Form:



A screenshot of a web browser displaying an uncontrolled form. The form contains three input fields: 'Name' with the value 'Rohan', 'Email' with the value '2020rphan.singh@vsnl.ac', and 'Message' with the value 'Hello, form 2'. A 'Submit' button is located below the message field.

4E



A screenshot of a web browser displaying a star rating component. The component shows 10 stars, with the first 5 stars filled and the remaining 5 stars empty. Below the stars are labels: 'Controlled', 'Fixed only', 'Disabled', and 'No rating given'.

Conclusion:

Thus we,

- Installed and configured React Js and implemented and learnt about basic props, components.
- Learnt about Basic States and Events in React.
- Developed a single page application in react using Router.
- Learnt about Controlled and Uncontrolled forms using React JS.
- Created a simple interactive UI using Material UI.