

What is React?

React is a **JavaScript library** developed by **Facebook** for building **user interfaces (UIs)**, especially for **single-page applications (SPAs)**.

It allows you to:

- Build **reusable UI components**
 - Create dynamic and interactive web apps
 - Update the UI **efficiently** when data changes
-

□ Core Concepts in React

1. Components

- Components are **building blocks** of a React app.
- They can be **functional** or **class-based**.
- Example:

```
function Welcome() {  
  return <h1>Hello, React!</h1>;  
}
```

2. JSX (JavaScript XML)

- JSX allows you to write **HTML in JavaScript**.
- It's not required, but it makes code more readable.

```
const element = <h1>Hello, world!</h1>;
```

3. Props (Properties)

- Props are like **function arguments** passed to components.

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

```
// Usage  
<Welcome name="Alice" />
```

4. State

- State is **data** that can change over time.
- Managed inside components (especially functional components using `useState` hook).

```
import { useState } from 'react';

function Counter() {
  const [count, setCount] = useState(0);

  return (
    <div>
      <p>Count: {count}</p>
      <button onClick={() => setCount(count + 1)}>Increase</button>
    </div>
  );
}
```

5. Event Handling

- Like HTML, but with camelCase syntax and JavaScript functions.

```
function handleClick() {
  const handleClick = () => {
    alert("Button clicked!");
  };

  return <button onClick={handleClick}>Click me</button>;
}
```

□ File Structure (Typical Project)

```
my-app/
├── public/
├── src/
│   ├── App.js      # Main component
│   ├── index.js    # Entry point
│   └── components/ # Reusable components
```

□ Tools You Need

- **Node.js** and **npm** installed
- Create app using:

```
npx create-react-app my-app
cd my-app
npm start
```

□ React Hooks (Intro)

React Hooks let you use state and lifecycle features in **functional components**.

- `useState()` – for state
- `useEffect()` – for side effects (e.g. fetching data)

Example:

```
import { useEffect, useState } from 'react';

function Timer() {
  const [seconds, setSeconds] = useState(0);

  useEffect(() => {
    const timer = setInterval(() => setSeconds(s => s + 1), 1000);
    return () => clearInterval(timer);
  }, []);

  return <p>Timer: {seconds}s</p>;
}
```

□ Summary Checklist

Concept	Description
Components	Reusable UI pieces
JSX	Write HTML-like code in JS
Props	Pass data to components
State	Manage internal data
Events	Handle user interactions
Hooks	Use features in functional components

Let's build a simple React app that displays two pages using React Router:

□ Goal

We'll create:

- **Home Page:** "Welcome to the Home Page"
 - **About Page:** "About Us"
 - A **navigation bar** to switch between pages
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□ Step-by-Step Guide

□ 1. Set up React App

If you haven't already:

```
npx create-react-app two-page-app
cd two-page-app
```

□ 2. Install React Router

```
npm install react-router-dom
```

□ 3. Create Folder and Components

In the `src/` directory, create:

```
src/
├── App.js
├── index.js
├── pages/
│   ├── Home.js
│   └── About.js
└── components/
    └── Navbar.js
```

□ src/pages/Home.js

```
import React from 'react';

function Home() {
  return (
    <div>
      <h1>Home Page</h1>
      <p>Welcome to the Home Page</p>
    </div>
  );
}

export default Home;
```

□ src/pages/About.js

```
import React from 'react';

function About() {
  return (
    <div>
      <h1>About Page</h1>
      <p>About Us</p>
    </div>
  );
}

export default About;
```

□ src/components/Navbar.js

```
import React from 'react';
import { Link } from 'react-router-dom';

function Navbar() {
  return (
    <nav style={{ marginBottom: "20px" }}>
      <Link to="/" style={{ marginRight: "10px" }}>Home</Link>
      <Link to="/about">About</Link>
    </nav>
  );
}

export default Navbar;
```

□ src/App.js

```
import React from 'react';
import { BrowserRouter as Router, Routes, Route } from 'react-router-dom';
import Home from './pages/Home';
import About from './pages/About';
```

```
import Navbar from './components/Navbar';

function App() {
  return (
    <Router>
      <div>
        <Navbar />
        <Routes>
          <Route path="/" element={<Home />} />
          <Route path="/about" element={<About />} />
        </Routes>
      </div>
    </Router>
  );
}

export default App;
```

□ src/index.js

```
import React from 'react';
import ReactDOM from 'react-dom/client';
import App from './App';

const root = ReactDOM.createRoot(document.getElementById('root'));
root.render(
  <React.StrictMode>
    <App />
  </React.StrictMode>
);
```

□ Final Output

- Open browser at <http://localhost:3000>
 - You'll see the **Home Page**
 - Click on **About** to go to the **About Page**
 - Navigation bar lets you switch between pages
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□ Summary

Page	URL	Content
Home	/	Welcome to the Home Page
About	/about	About Us