

React Lab Session 1

1. Introduction

React is a popular JavaScript library for building user interfaces (UIs) for web applications. It was developed by Facebook and is widely used in the industry. React follows a component-based architecture, which means that UIs are divided into reusable, self-contained components.

The main concept in React is the virtual DOM (Document Object Model), which is a lightweight representation of the actual DOM. React uses the virtual DOM to efficiently update and render components in response to changes in application state. When the state of a component changes, React compares the virtual DOM with the real DOM and only updates the necessary parts, minimizing performance bottlenecks.

React promotes a declarative programming paradigm, where you describe what you want your UI to look like based on the current state of your application, and React takes care of updating the UI accordingly. This makes it easier to reason about how your UI will behave and simplifies the process of building complex UIs.

To use React, you typically write components using JSX (JavaScript XML), which is an extension to JavaScript that allows you to write HTML-like code within your JavaScript files. JSX makes it easy to describe the structure and appearance of your UI components. React components can also be written using plain JavaScript, but JSX is the preferred approach for most React developers.

React is often used in conjunction with other tools and libraries, such as React Router for handling routing in single-page applications, and Redux or MobX for managing application state. It can be used to build both single-page applications and complex, interactive UIs.

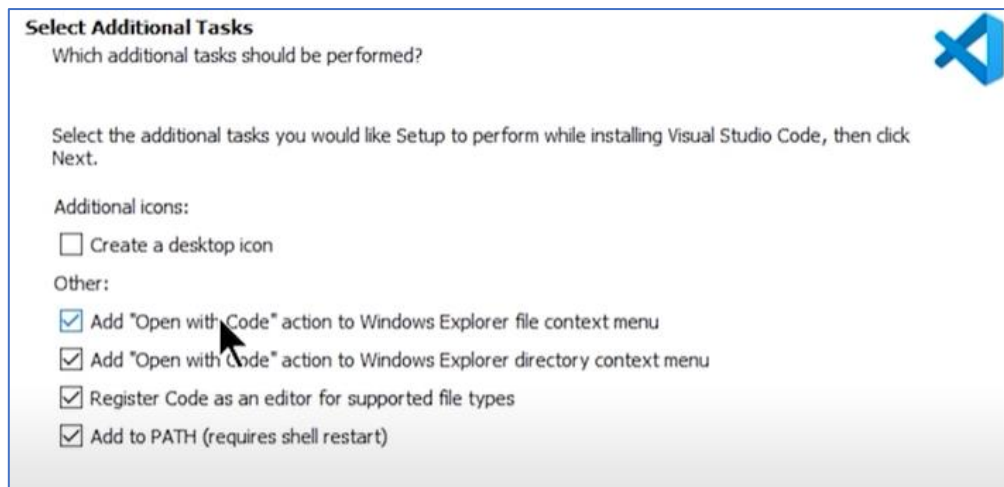
To get started with React, you need to set up a development environment that includes Node.js and a package manager like npm or Yarn. You can then create a new React project using tools like Create React App, which sets up a basic project structure and configuration for you. From there, you can start building your UI components and defining their behavior.

Overall, React is a powerful and flexible library for building dynamic and responsive user interfaces. It has a large and active community, which means there are plenty of resources, tutorials, and open-source components available to help you in your React development journey.

2. Installation

- a) Download and install Node.js from <https://nodejs.dev/en/download/> site.

- b) Download and install Visual Studio Code from <https://code.visualstudio.com/download> site. Keep in mind that during the installation of the software check all options shown in figure below:



- c) Check that nodejs has been successfully installed in your computer by typing cmd and opening command prompt and typing the following:

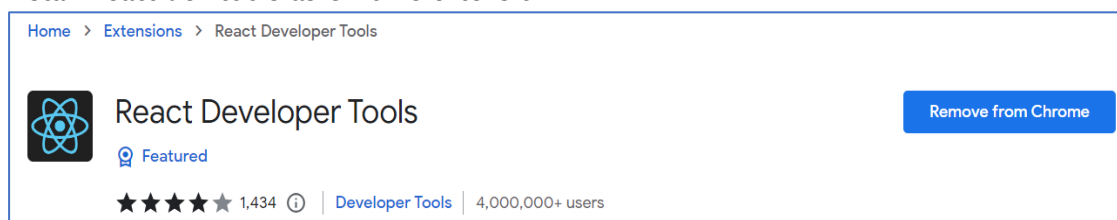
```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22621.1848]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>node --version
v18.12.1

C:\Windows\System32>npm --version
8.19.2

C:\Windows\System32>
```

- d) Install React dev tools as Chrome extension.

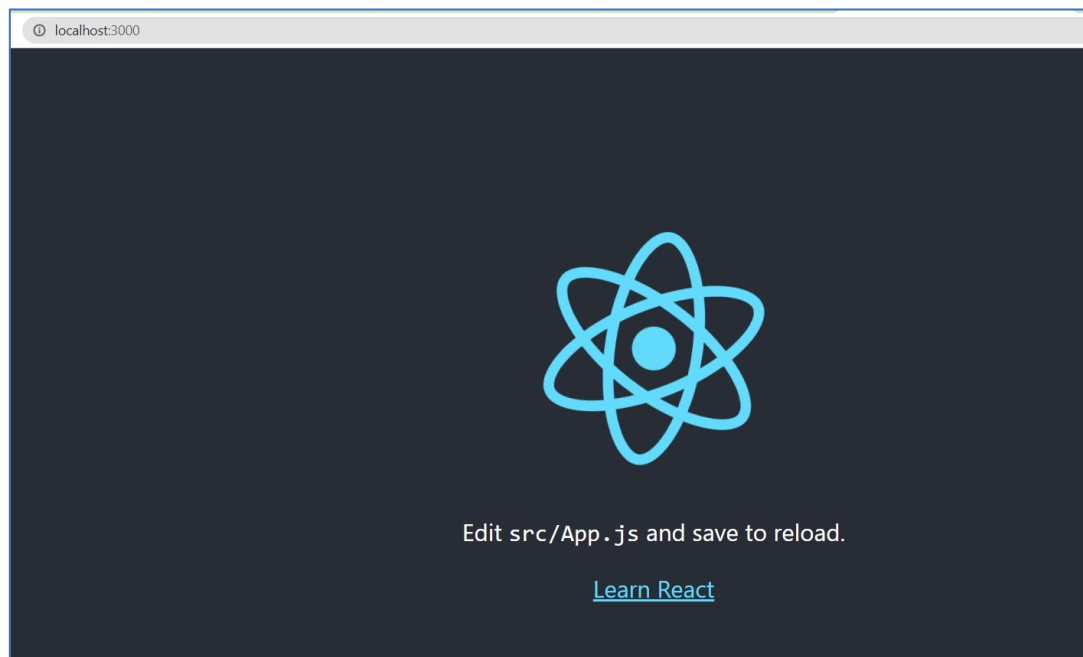


- e) Open vs code and install the following extensions:
- Thunder Client (alternate to Postman)
 - ES7 React/Redux/GraphQL/React-Native snippets.
 - Brackets pairs colorizer
 - Auto Rename Tag
 - Live Server
 - Prettier- Code formatter

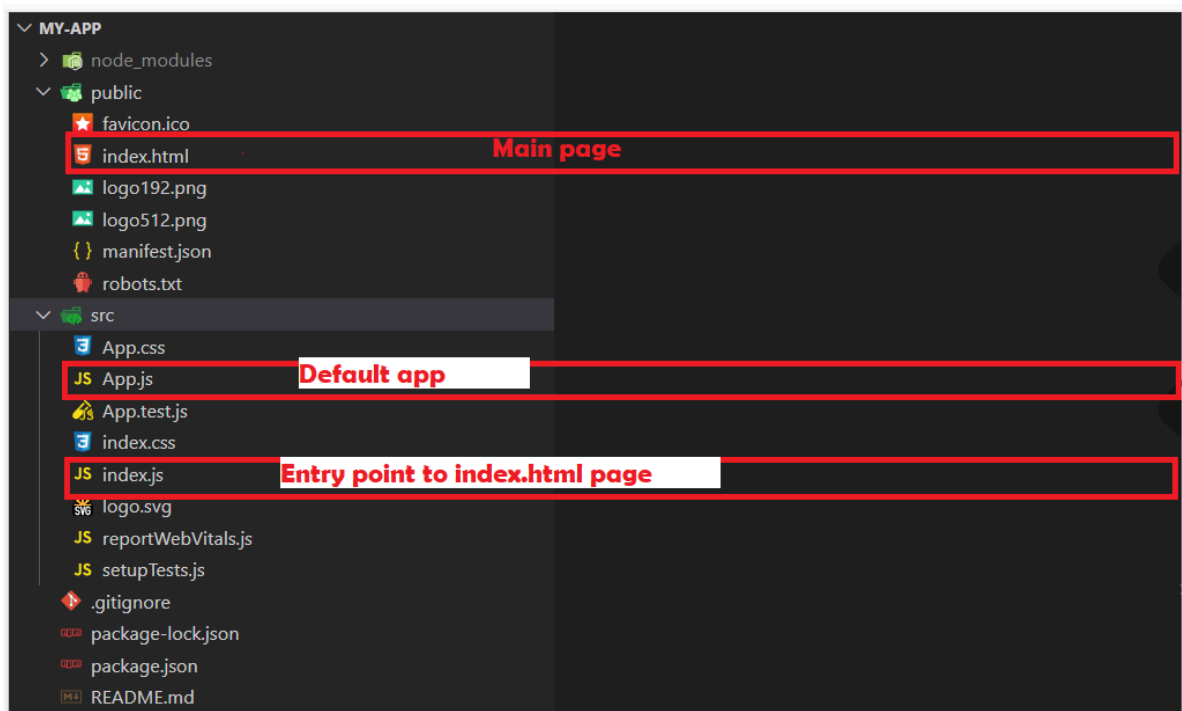
3. Create React App

- a) Open a folder using VS code
- b) In the terminal type:
 - a. `npx create-react-app my-app`
 - b. `cd my-app`
 - c. `npm start`

You will see the following in the browser.



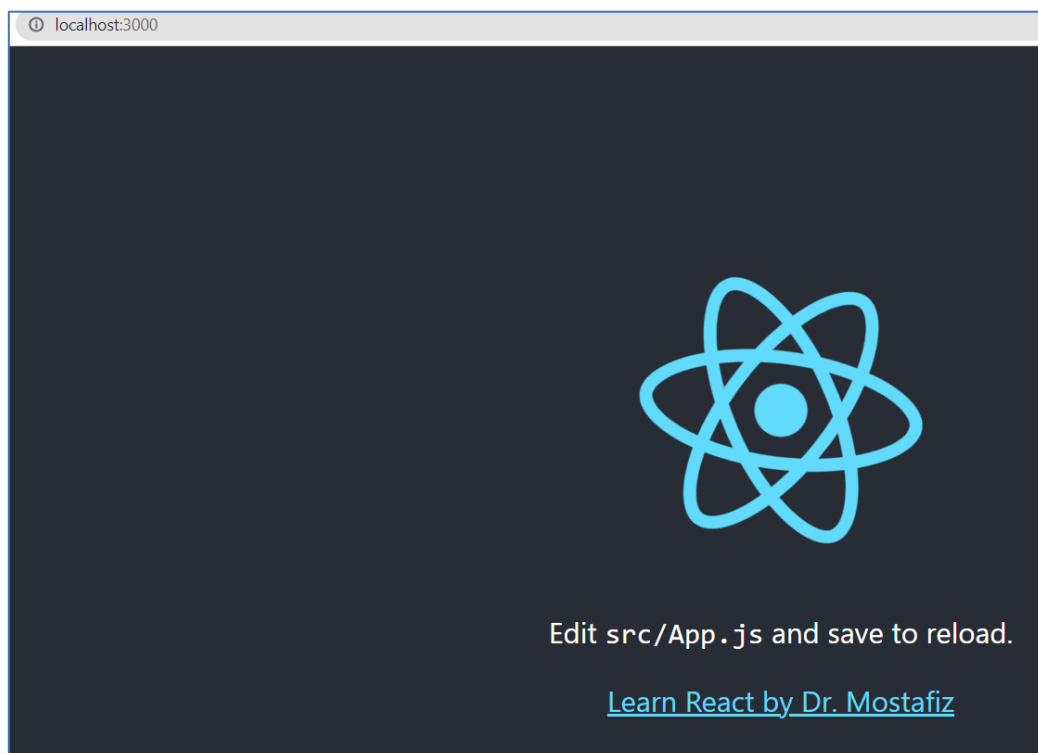
- c) Now we will see the following file structure in the app:



d) The code in the app.js file as:

```
src > JS App.js > App
1 import logo from './logo.svg';
2 import './App.css';
3
4 function App() {
5   return (
6     <div className="App">
7       <header className="App-header">
8         <img src={logo} className="App-logo" alt="logo" />
9         <p>
10          Edit <code>src/App.js</code> and save to reload.
11        </p>
12        <a
13          className="App-link"
14          href="https://reactjs.org"
15          target="_blank"
16          rel="noopener noreferrer"
17        >
18          Learn React
19        </a>/.App-link
20      </header>/.App-header
21    </div>/.App
22  );
23 }
24
25 export default App;
26
```

e) Now we just simply made a small change in the code of *Learn React* to *Learn React by Dr. Mostafiz*. The output will be as follows:



--- ENJOY ---