WEB DEVELOPMENT WITH

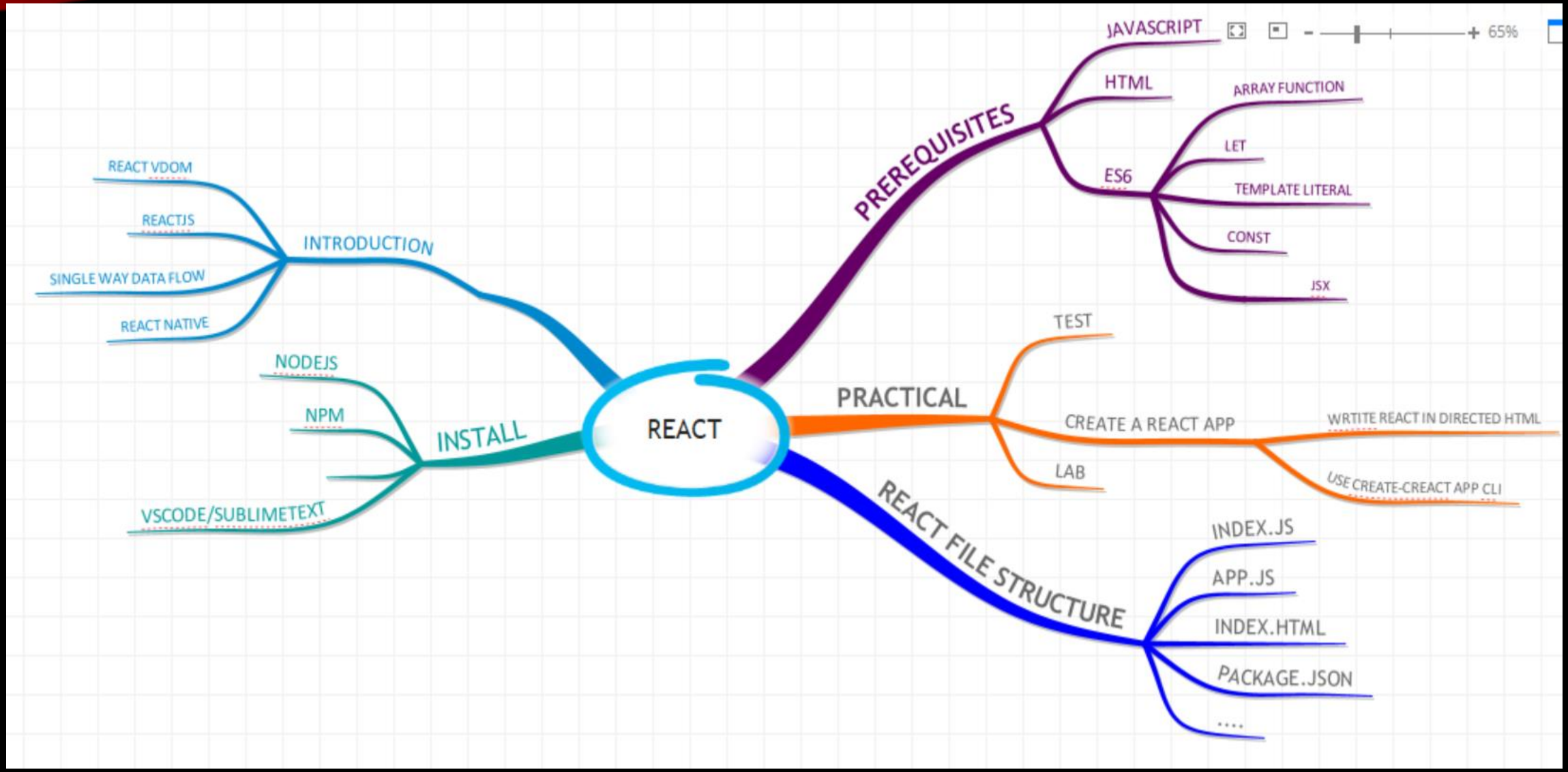
HCMC: 19-9-2020

Presenter : Ngô Phước Nguyên

Session 1

React Introduction

OBJECTIVES


REACT
INTRODUCTION
REACT VDOM
REACTJS
SINGLE WAY DATA FLOW
REACT NATIVE
INSTALL
NODEJS
NPM
VSCODE/SUBLIMETEXT
PREREQUISITES
JAVASCRIPT
HTML
ES6
ARRAY FUNCTION
LET
TEMPLATE LITERAL
CONST
JSX
PRACTICAL
TEST
CREATE A REACT APP
WRTITE REACT IN DIRECTED HTML
USE CREATE-CREACT APP CLI
LAB
REACT FILE STRUCTURE
INDEX.JS
APP.JS
INDEX.HTML
PACKAGE.JSON
....

INTRODUCTION TO REACT

- React is a **JavaScript library** for creating user interfaces by Facebook and Instagram.
- React is a declarative, efficient, and flexible JavaScript library for building user interfaces. It lets you compose complex UIs from small and isolated pieces of code called "**components**".
- React is a front-end library that is responsible for the user interface. It is neither a **whole framework nor a language**. It is an open-source JavaScript library for building the UI (user interface) of an application.

INTRODUCTION TO REACT

- React.js is the most popular front-end “framework” for Web applications.
- In this workshop, we will learn what React.js (or simply React or Reactjs) is and why we should use React.js instead of other JavaScript frameworks like Angular.

WHAT'S REACT ?

Open source library for building user interface.

Not a framework.

Focus on UI.

Rich ecosystem.

WHAT'S REACT ?

- React.js is an open-source JavaScript library that is used for building user interfaces specifically for single-page applications.
- It's used for handling the view layer for web and mobile apps. React also allows us to create reusable UI components.
- React allows developers to create large web applications that can change data, **without reloading the page**. The main purpose of React is to be fast, scalable, and simple.
- It works only on user interfaces in the application. This corresponds to the view in the MVC template.

PREREQUISITES OF REACT

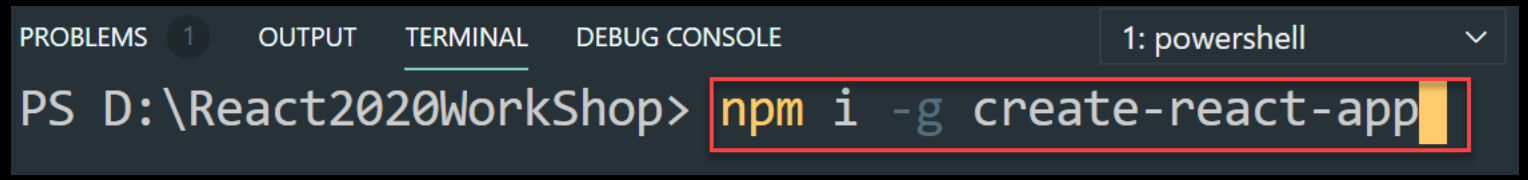
- You should have knowledge of HTML, CSS, and JavaScript fundamentals.
- You should also be aware of ES6 : let & const, arrow functions, template literals, default parameters, object literals, rest and spread operators and destructing assignment.
- Java Script - ‘this’ keyword, filter, map and reduce.

WHY LEARN REACT ?

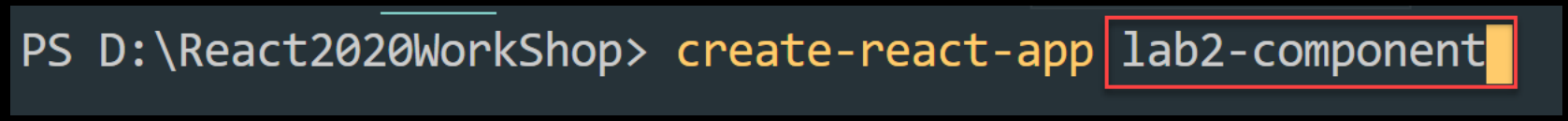
- Created and maintained by Facabook.
- More than 100k starts on GitHub.
- Huge community.
- In demand skillset.

CREATE REACT APP

- In order to create a React application, we will be using the *create-react-app node_module* provided by React. This helps us by creating a consistent folder structure automatically so, that we don't need to care about proper and valid folder structure.



Then we make lab2-component react app



Or

```
PS C:\Users\nguye\OneDrive\Desktop\WorkShopReact> npx create-react-app lab1
npx: installed 98 in 7.11s

Creating a new React app in C:\Users\nguye\OneDrive\Desktop\WorkShopReact\lab1.
```

CREATE REACT APP

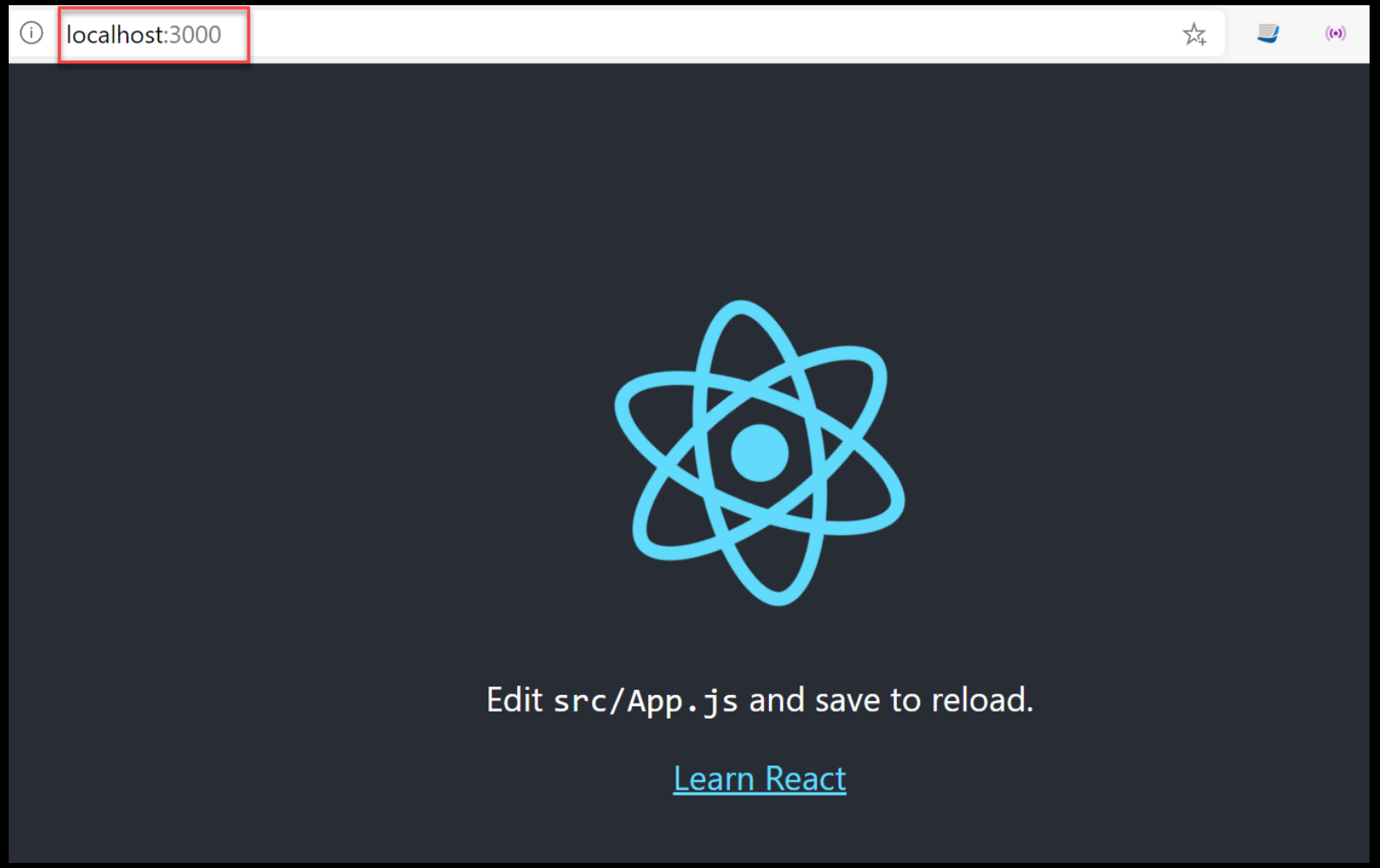

```
  npm test
    Starts the test runner.

  npm run eject
    Removes this tool and copies build dependencies, configuration files
    and scripts into the app directory. If you do this, you can’t go back!

We suggest that you begin by typing:

  cd lab1
  npm start

Happy hacking!
PS C:\Users\nguye\OneDrive\Desktop\WorkShopReact>
```

CREATE REACT APP

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

```
Compiled successfully!

You can now view lab1 in the browser.

  Local:            http://localhost:3000
  On Your Network:  http://192.168.1.5:3000

Note that the development build is not optimized.
To create a production build, use npm run build.
```

RUN THE REACT APPLICATION

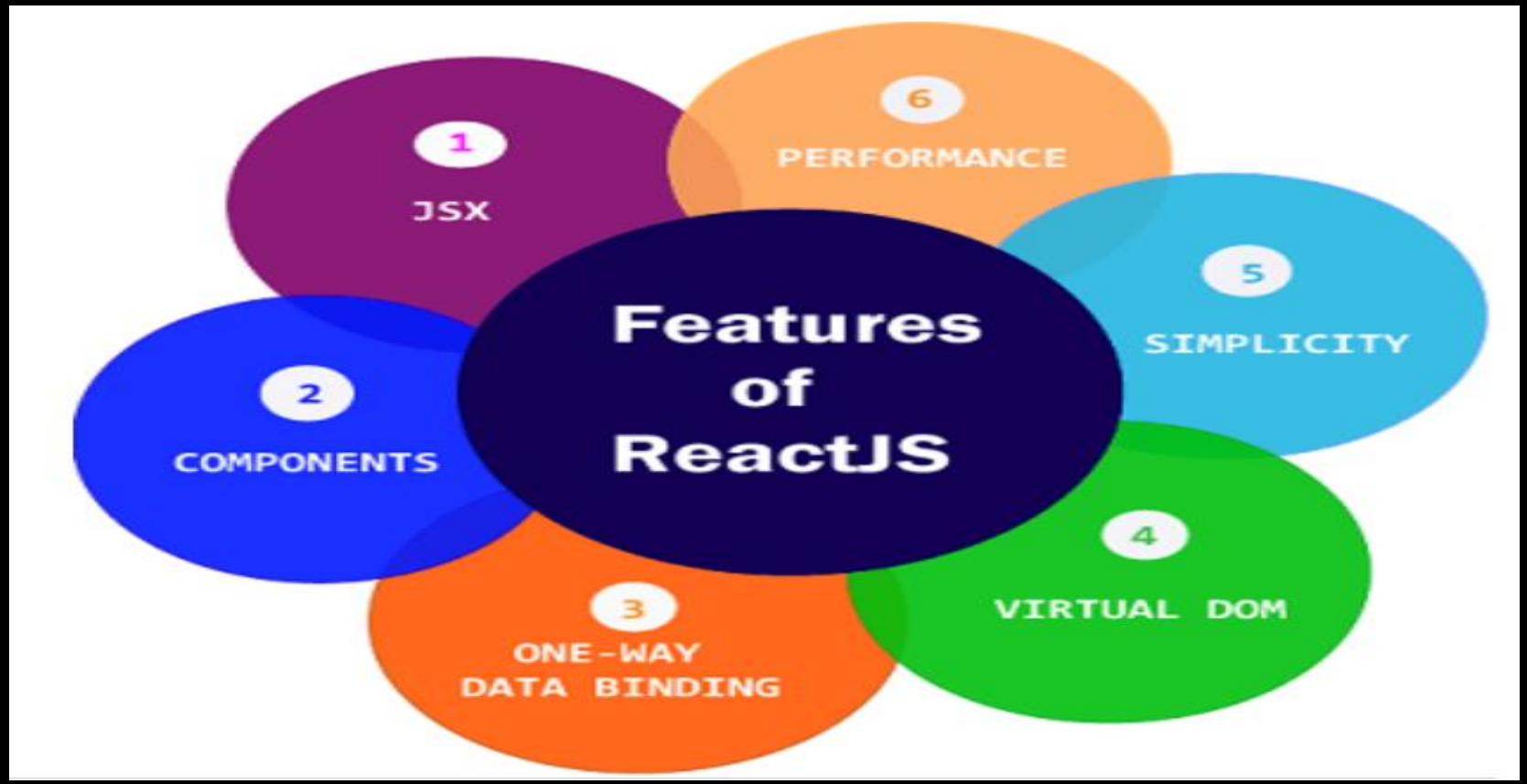


WHAT ARE THE REACT.JS FEATURES?

Let us take a closer look at some important features of React.

- JSX
- React Native
- Single-Way data flow
- Virtual Document Object Model
- Simplicity
- Performance

WHAT ARE THE REACT.JS FEATURES?



INTRODUTION TO JSX

- In React, instead of using regular JavaScript for templating, it uses JSX.
- JSX is a simple JavaScript that allows HTML quoting and uses these HTML tag syntax to render subcomponents.
- HTML syntax is processed into JavaScript calls of React Framework. We can also write in pure old JavaScript.

INTRODUTION TO JSX

- Consider this variable declaration:

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

- This tag syntax is neither a string nor HTML.
- It is called JSX, and it is a syntax extension to JavaScript. We recommend using it with React to describe what the UI should look like.
- JSX may remind you of a template language, but it comes with the full power of JavaScript.
- JSX produces React “elements”.

INTRODUTION TO JSX

JSX

- "JavaScript Syntax Extension"
- Allows us to write HTML-looking code inside of JavaScript.
- Generates React "elements"
- NOT STANDARD JS, WE NEED BABEL

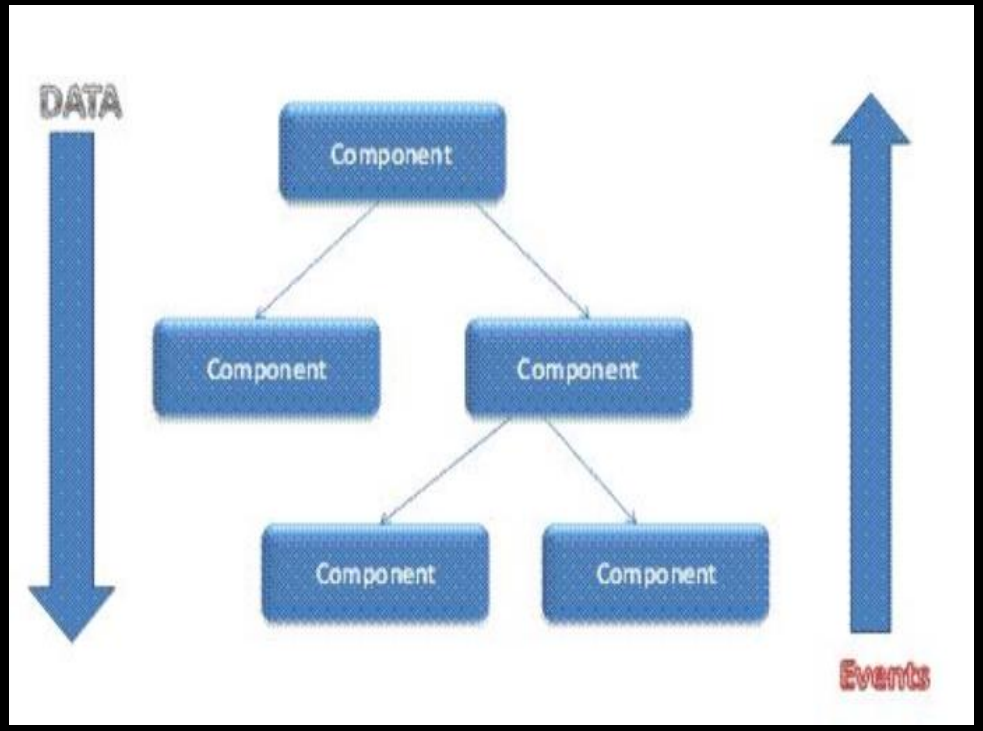
```
function Counter() {
  const [ count, setCount ] = useState(0);

  return (
    <div>
      <p>count: {count}</p>
      <p>Is this JS or HTML??</p>
    </div>
  );
}
```

REACT NATIVE

- React has native libraries that were announced by Facebook in 2015, which provides the react architecture to native applications like IOS, Android and UPD.
- React-native is a mobile apps building framework using only Java script. It uses the same design as React, letting you utilize/include a rich mobile UI library/ declarative components.
- It uses the same fundamental UI building blocks as regular iOS and Android apps. The best part of using react-native is to allow/adopt components written in Objective-C, Java, or Swift.

SINGLE-WAY DATA FLOW

- In React, a set of immutable values are passed to the components renderer as properties in its HTML tags. The component cannot directly modify any properties but can pass a call back function with the help of which we can do modifications.
- This complete process is known as “properties flow down; actions flow up”.



VIRTUAL DOCUMENT OBJECT MODEL

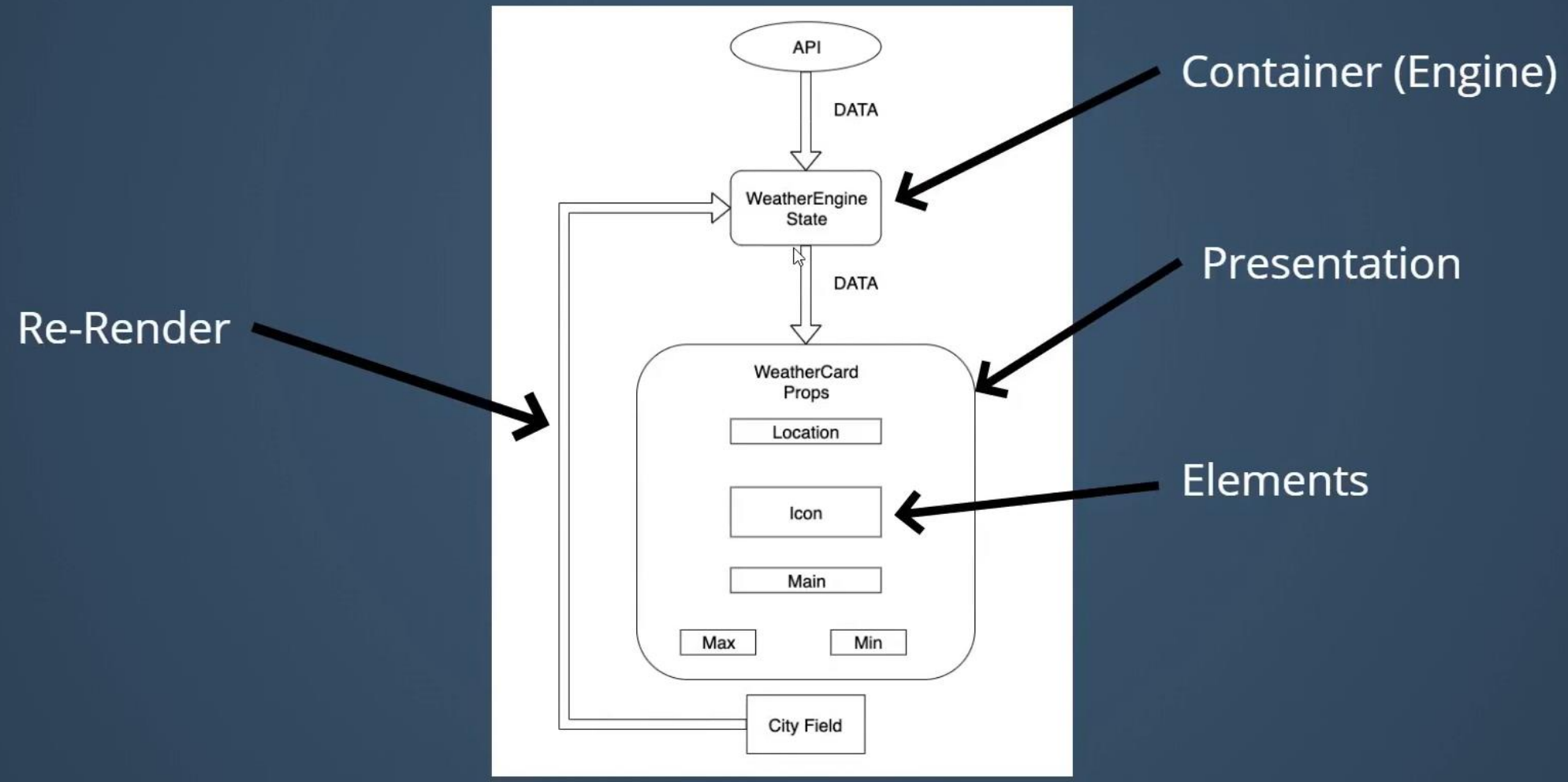
- React creates an in-memory data structure cache which computes the changes made and then updates the browser.
- This allows a special feature that enables the programmer to code as if the whole page is rendered on each change whereas react library only renders components that actually change.
- In React, for every DOM object, there is a corresponding “virtual DOM object.” A virtual DOM object is a *representation* of a DOM object, like a lightweight copy.

VIRTUAL DOCUMENT OBJECT MODEL

- A virtual DOM object has the same properties as a real DOM object, but it lacks the real thing's power to directly change what's on the screen.
- Manipulating the DOM is slow. Manipulating the virtual DOM is much faster, because nothing gets drawn onscreen. Think of manipulating the virtual DOM as editing a blueprint, as opposed to moving rooms in an actual house.

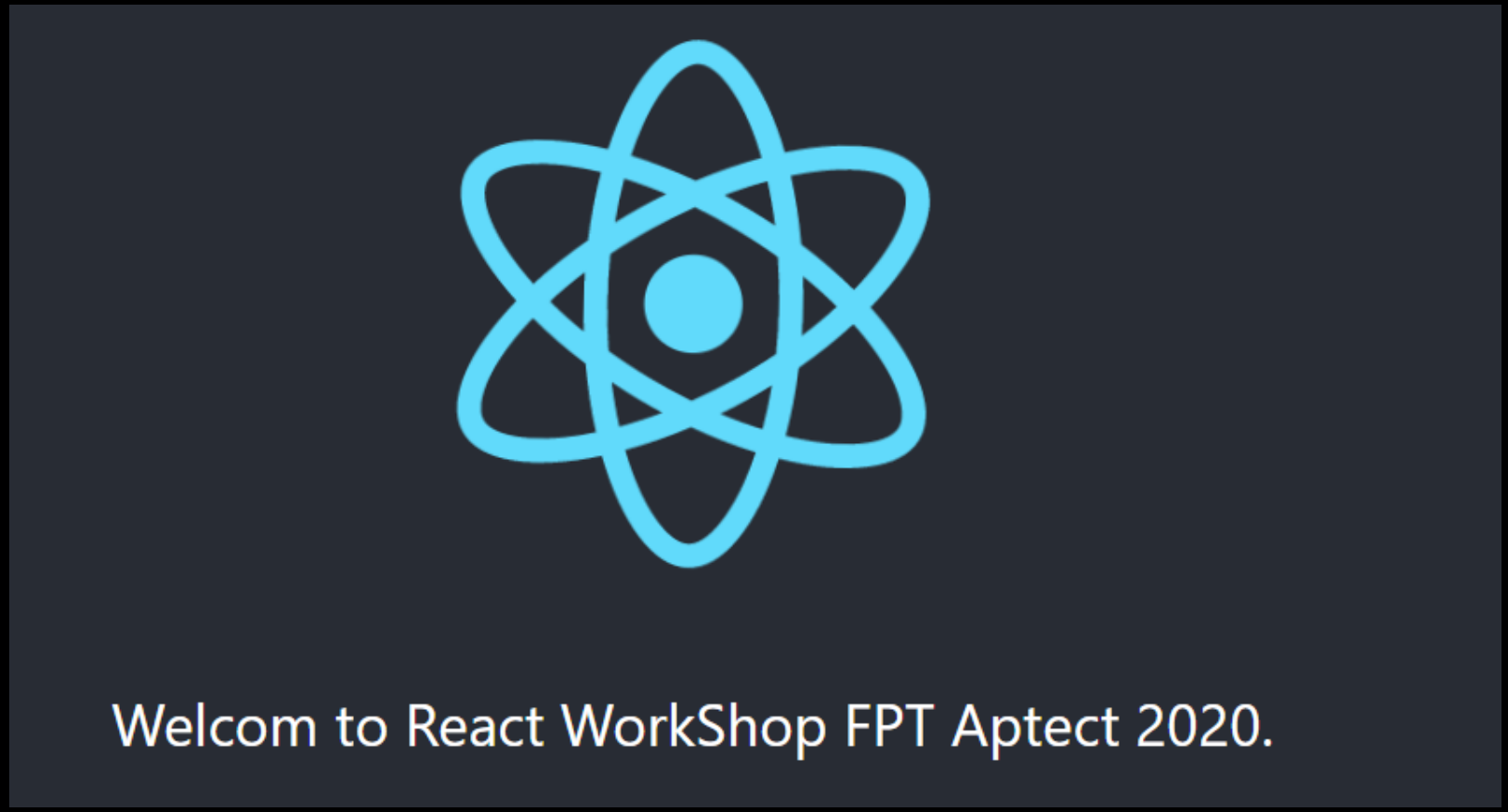
DATA FLOW IN REACT

One direction data flow



ACTIVITY

Create a React app named “Demo”. When the app run, it displays below:



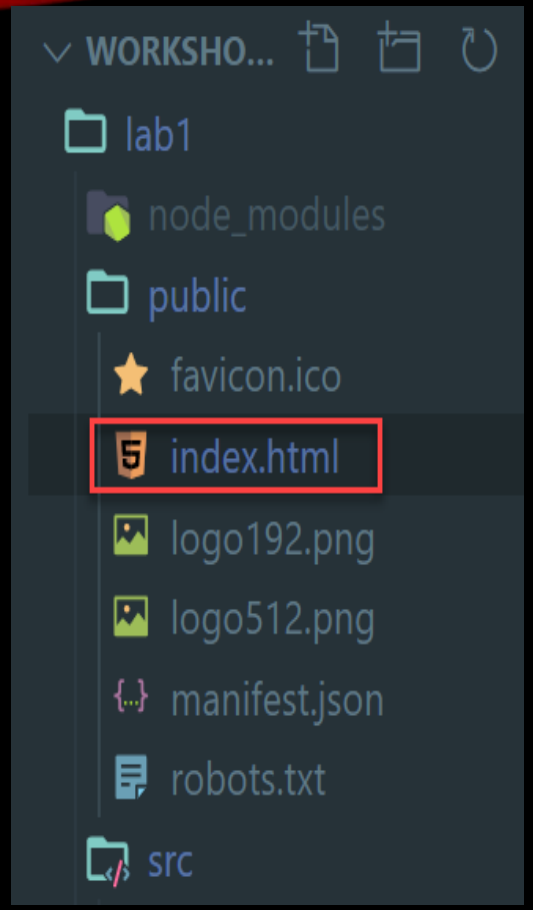
FILE REACT ORGANIZATION

The file-structure example app demonstrates one possible way of organizing you React app.

While there is not necessarily one file structure that is better than another , it is important to keep your files organized.

In React your file structure will grow rapidly considering every component has at least one file associated with it.

FILE REACT ORGANIZATION



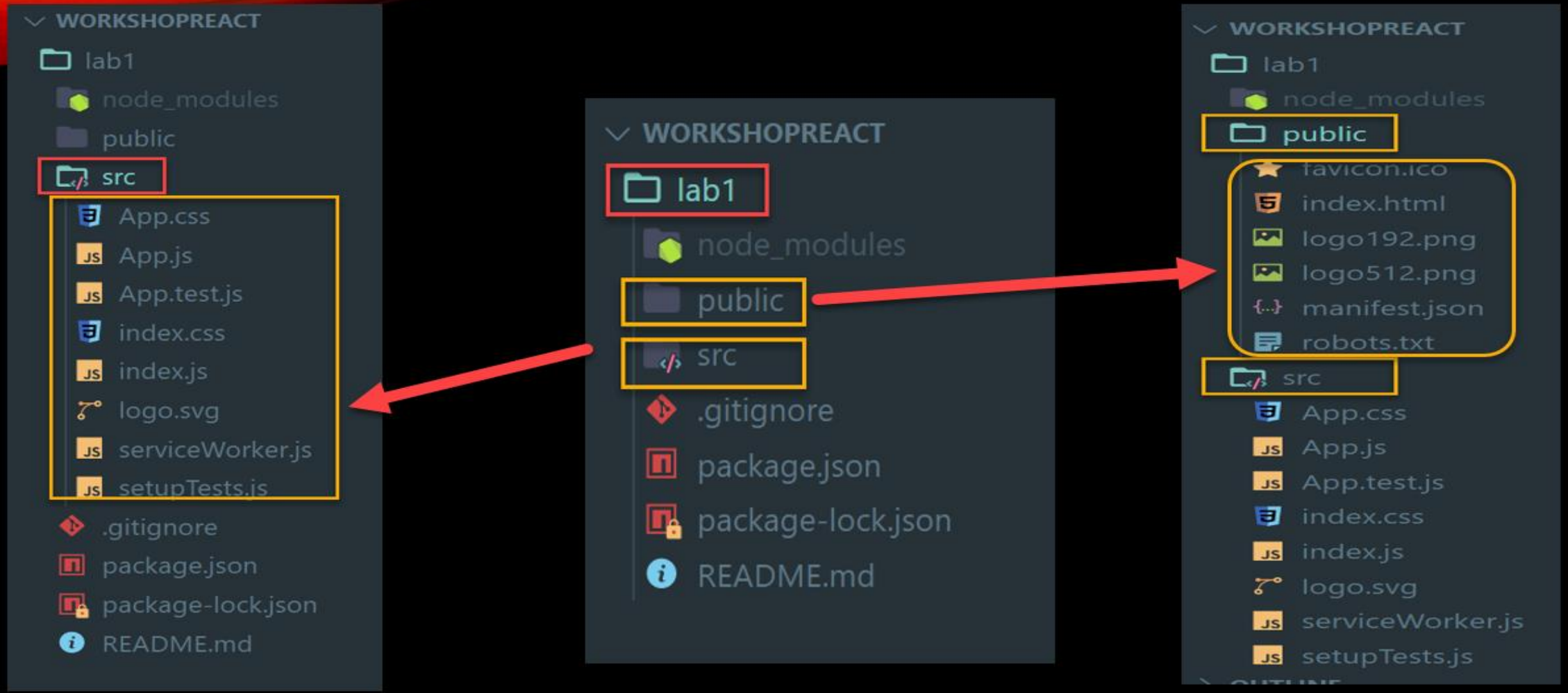
index.html | App.js | index.js | package.json

lab1 > public > index.html > html > head

You, a few seconds ago | 1 author (You)

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="utf-8" />
    <link rel="icon" href="%PUBLIC_URL%/favicon.ico" />
    <meta name="viewport" content="width=device-width, initial-scale=1" />
    <meta name="theme-color" content="#000000" />
    <meta name="description" content="Web site created using create-react-app" />
    <link rel="apple-touch-icon" href="%PUBLIC_URL%/logo192.png" />

    <link rel="manifest" href="%PUBLIC_URL%/manifest.json" />

    <title>React App</title>
</head>      You, a few seconds ago • Uncommitted changes

<body>
    <noscript>You need to enable JavaScript to run this app.</noscript>
    <div id="root"></div>
</body>

</html>
```

FILE REACT ORGANIZATION



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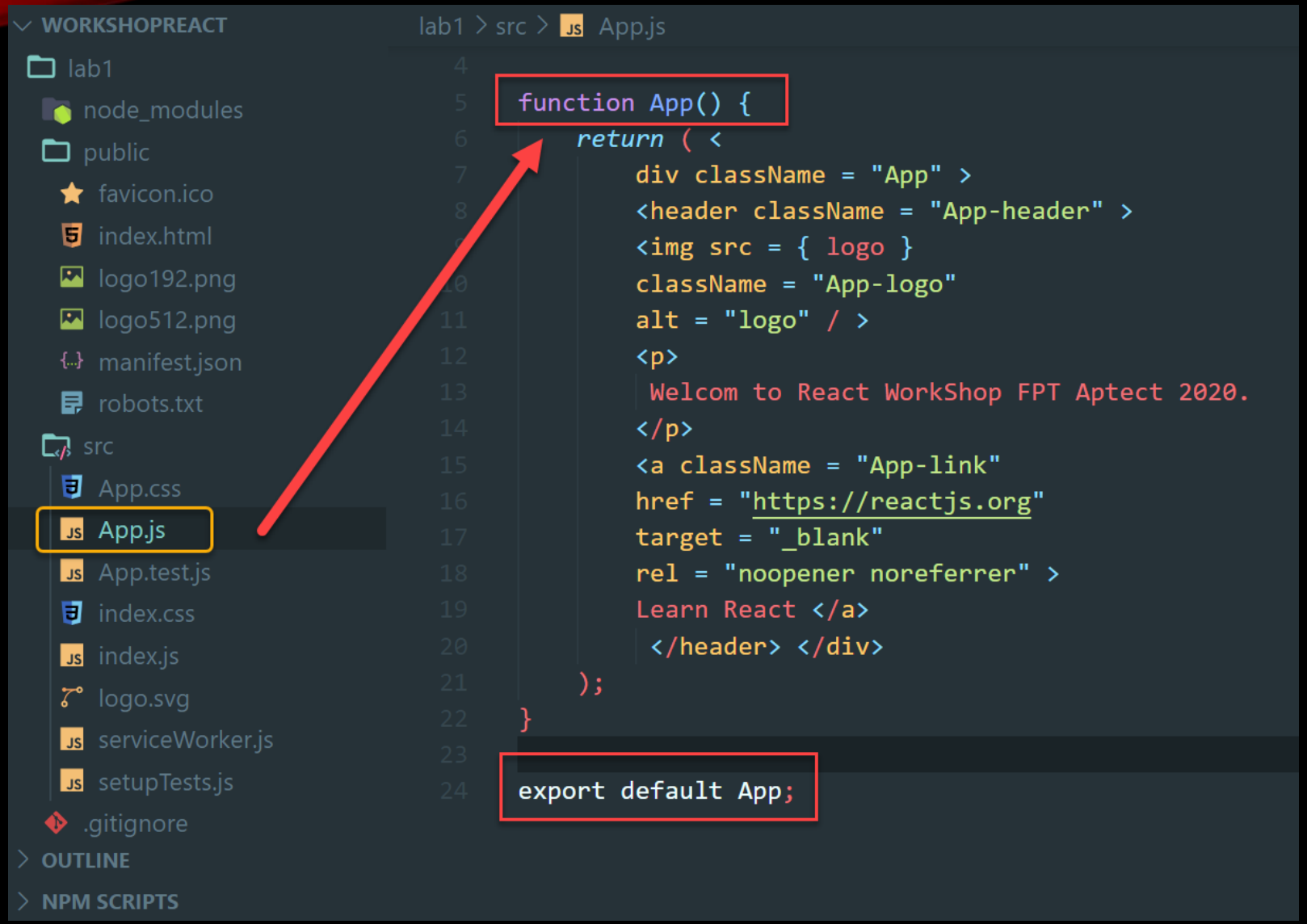

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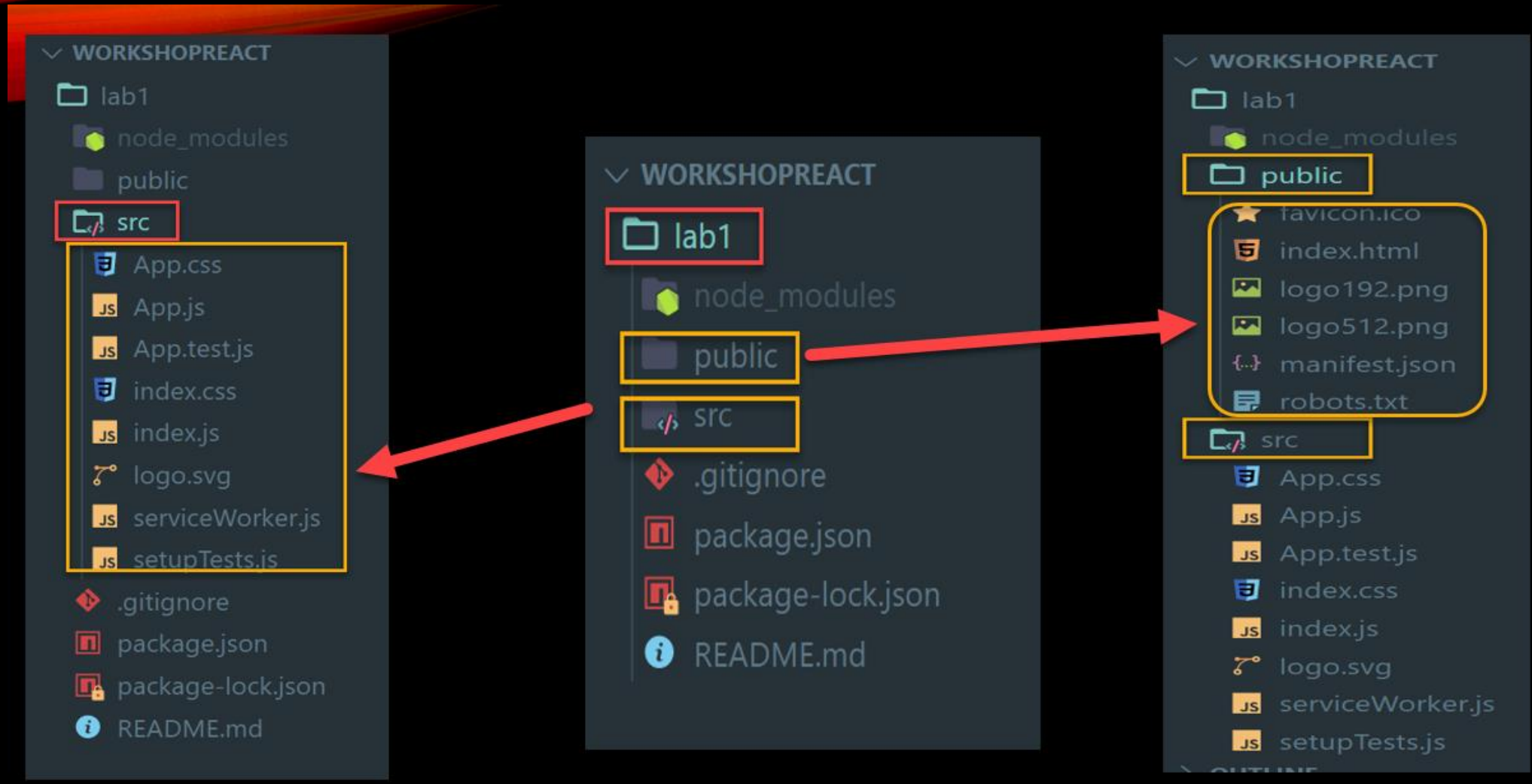

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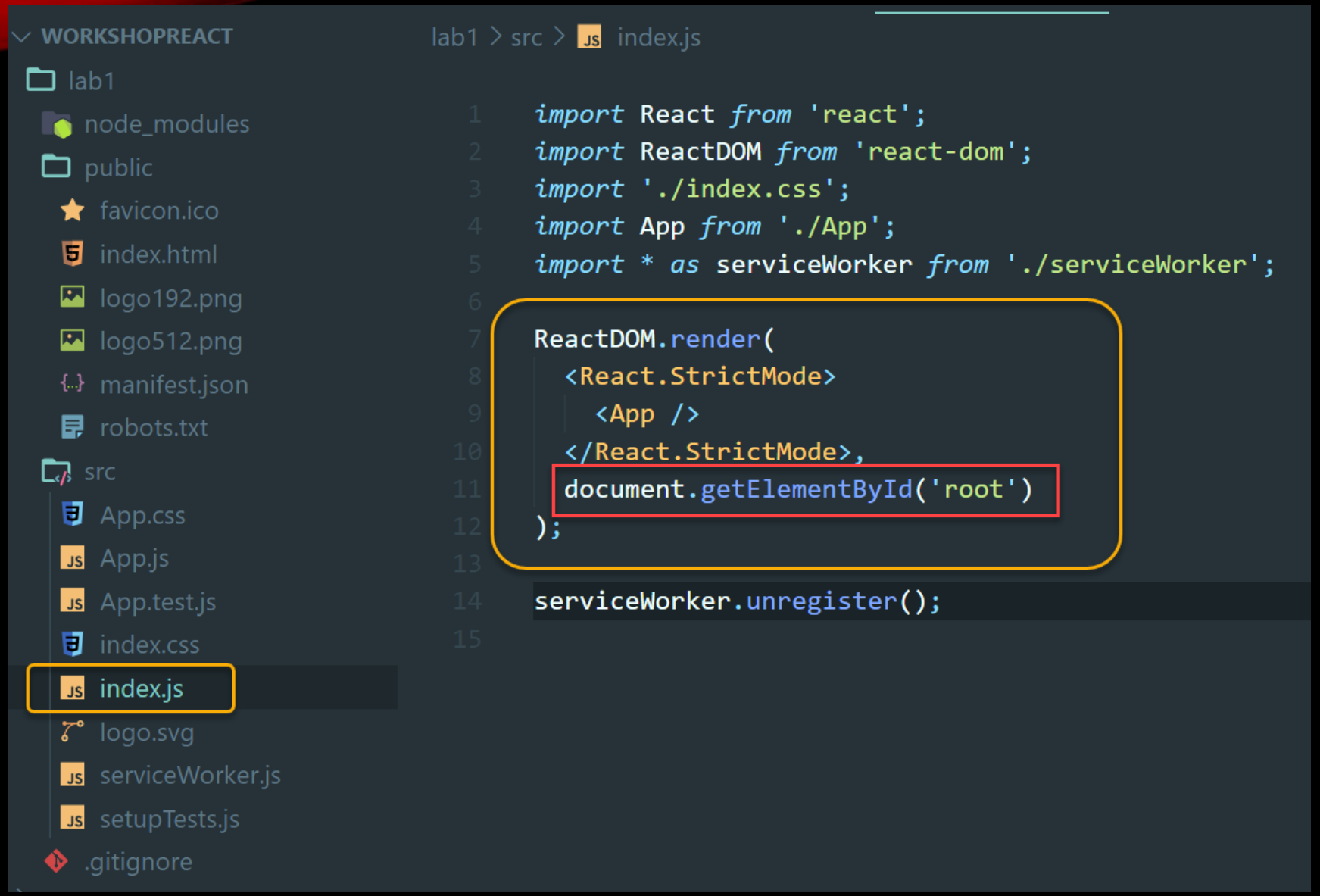

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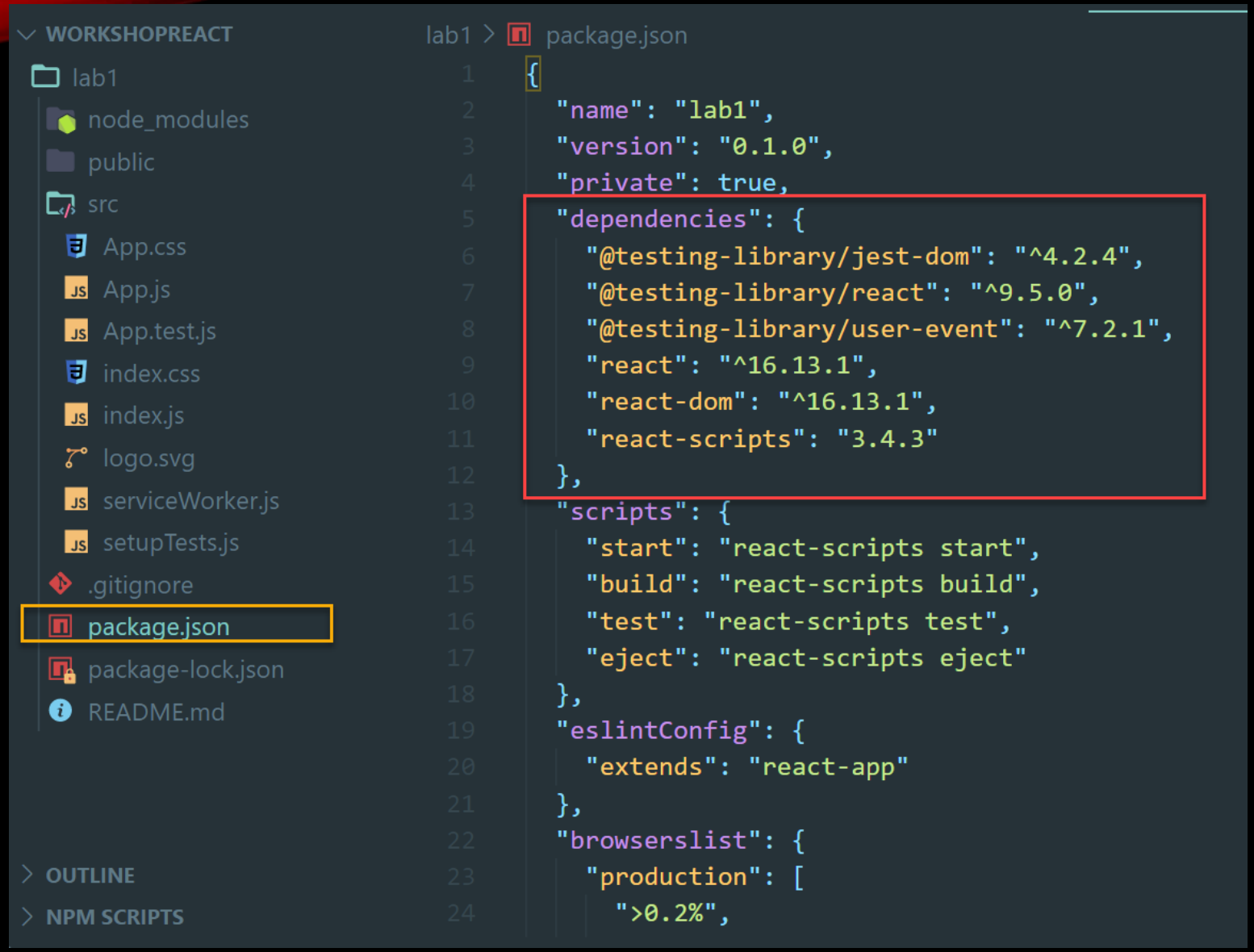

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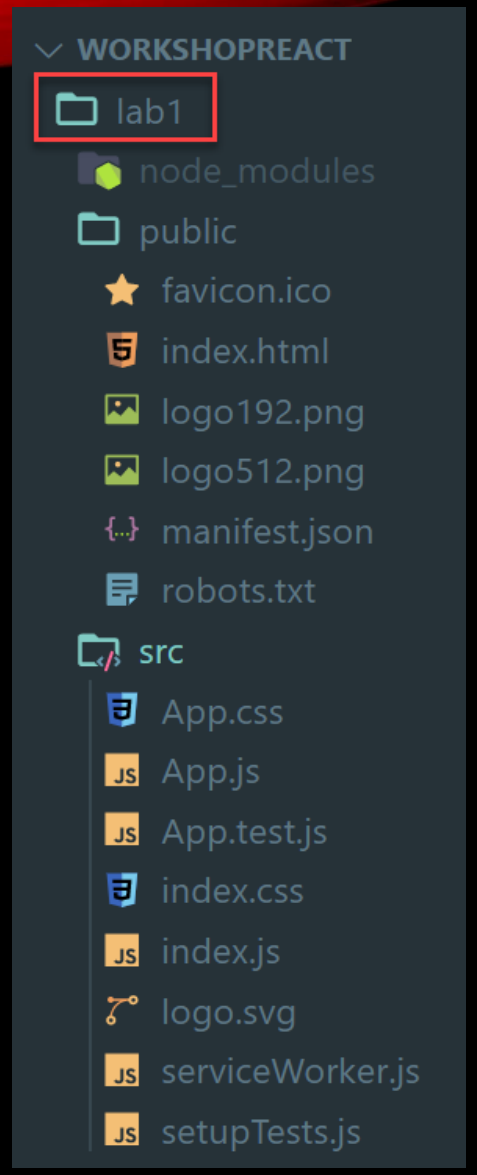

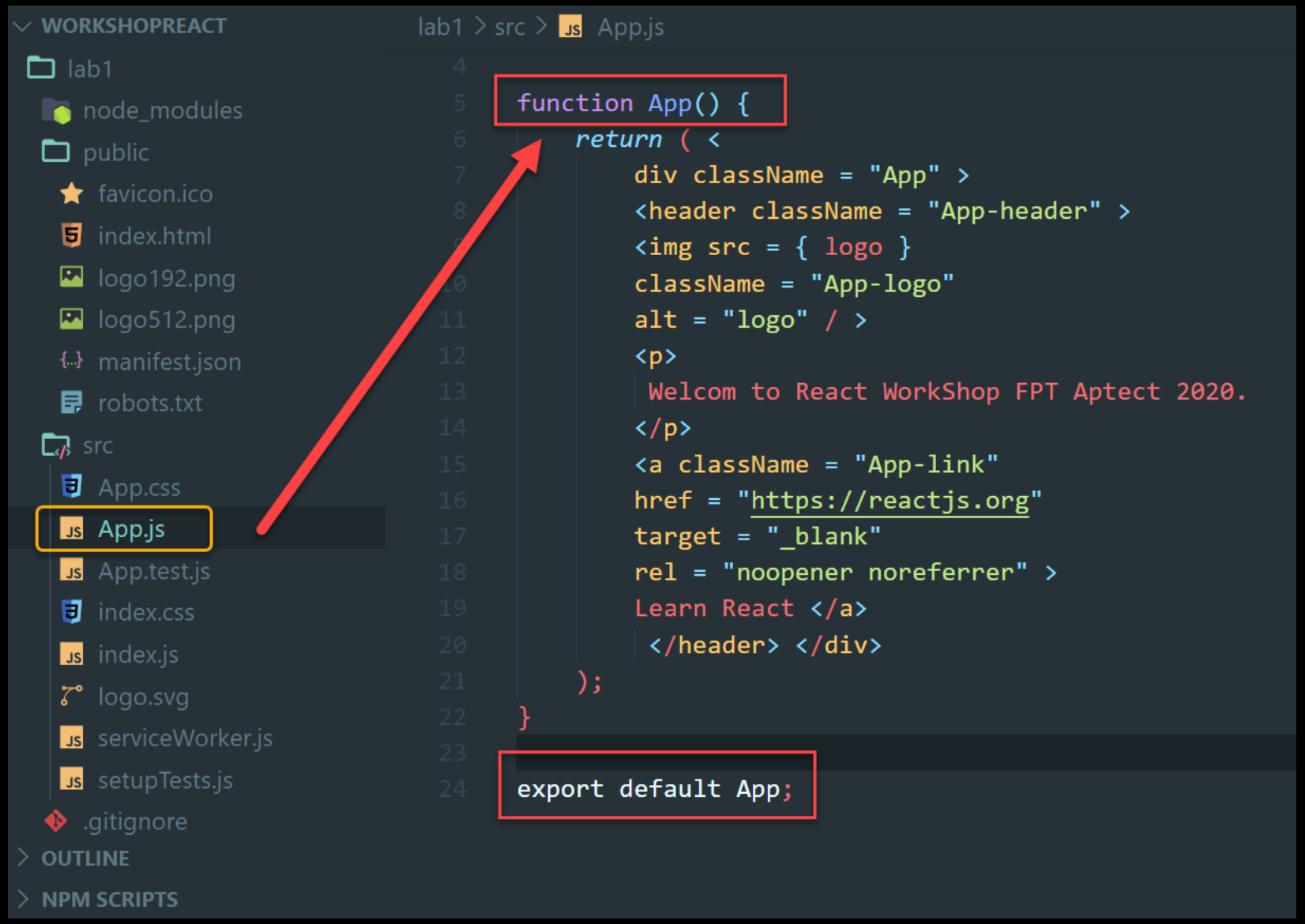

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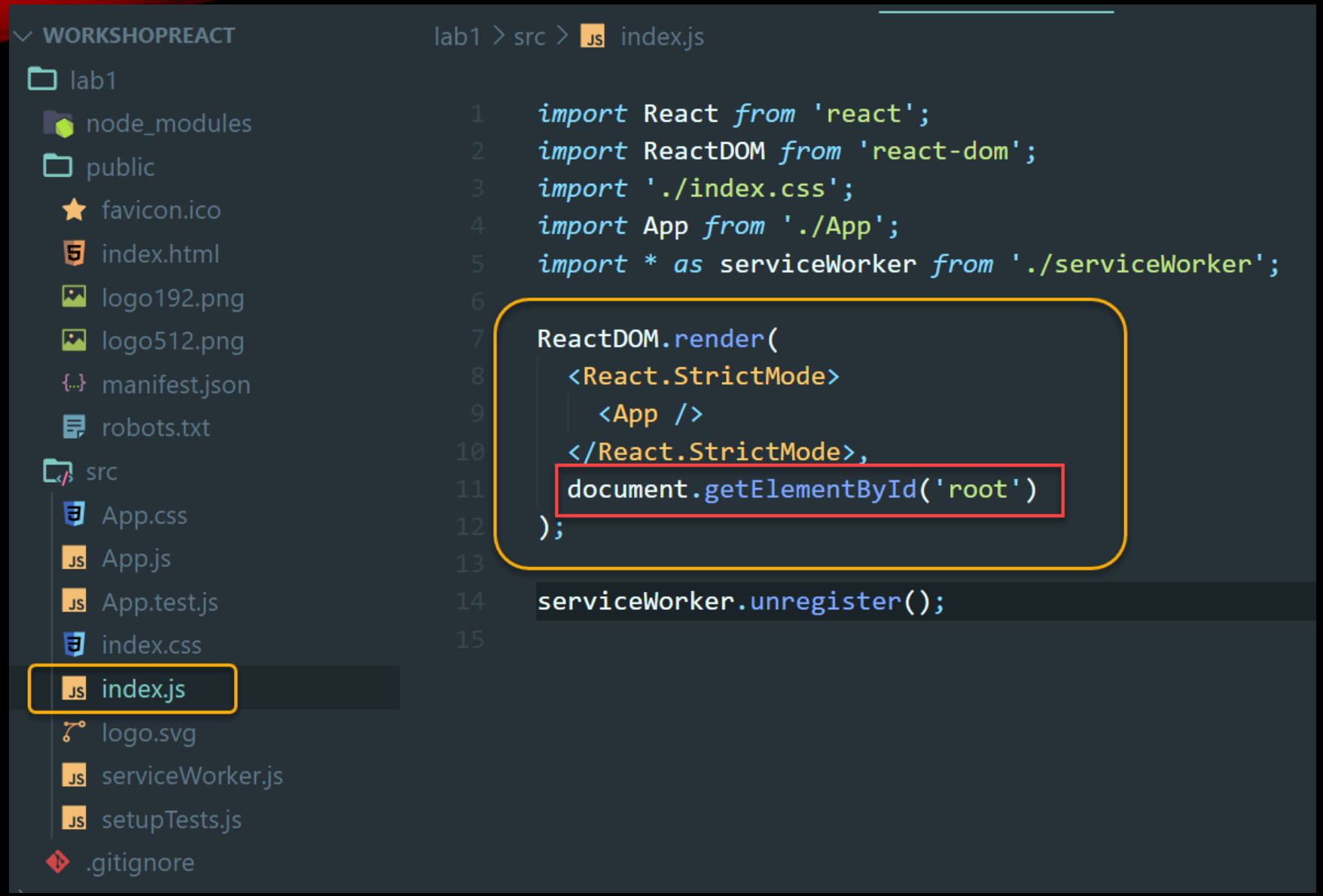

FILE REACT ORGANIZATION

THE END