**React**

**Introduction:**

* React is an open-source JavaScript library for building user interfaces.
* React is used to build **single page applications**.
* **Single page application** is such application which is loaded once and rest of the work is done by JavaScript without reloading the page.
* Instead of manipulating the browser’s DOM directly, react creates a virtual DOM in memory, where it does all the necessary changes, before making the changes in the browser DOM.
* React is based on components based where we build a website by breaking into chunks and we can use these components again.
* React is very popular because it follows **write once use everywhere** principle.

**History:**

* React is created by **Facebook**.
* React.JS was first used in 2011 for Facebook’s Newsfeed feature.
* Facebook Software Engineer, **Jordan Walke** created it.
* The first version of react (V0.3.0) was released in **2013**.
* The latest version of react is (V18.2.0).

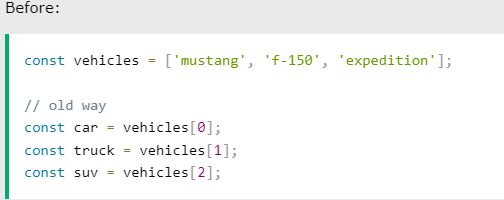
**React ES6:**

* ECMAScript6 is the 6th version of JavaScript created to standardize JavaScript in 2015 and is also known as ECMAScript 2015.
* React uses ES6 as it introduced the following features:

1. ***classes*** *concept.*
2. ***arrow******functions****.*
3. ***let*** *and* ***const*** *variable declaration.*
4. *array methods like .****map****().*
5. ***destructuring.***
6. ***spread operator****.*
7. ***modules****.*
8. *ternary operator. {if else = ? :}*

**Destructuring:**

Destructuring makes it easy to extract exactly what we need from an array or an object.

****

**A computer code with text

Description automatically generated with medium confidence**

**Spread Operator:**

The JS operator (. . .) allows us to quickly copy all or part of an existing array or object into another array or object.

**A screenshot of a computer

Description automatically generated**

**A screenshot of a computer

Description automatically generated**

**Modules:**

* ES6 modules allow us to break up our code into separate files.
* ES6 modules rely on **import** and **export** statements.
* We can export a function or a variable from any file.
* There are two types of exports **Named** and **Default**.

**Named exports:**

A screenshot of a computer program

Description automatically generated

**Default exports:**

**A screenshot of a computer code

Description automatically generated**

**Imports**

**A screenshot of a computer

Description automatically generated**

**JSX:**

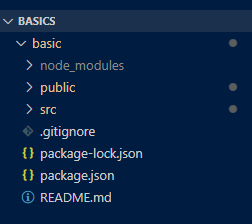
* **JSX** stands for **JavaScript XML**, **JSX** is a syntax extension for JS that lets us write HTML-Like markup inside a JS file.
* **JSX** is stricter and has a few more rules than HTML like ***Rendering a single root element, close all the tags, camelCase naming conventions.***
* Using **JSX** we can combine HTML and JS code.
* **Babel** compiles JSX to **React.createElement() calls**.
* When we want to render multiple elements in JSX, we should use **JSX fragment tag <> </>.**
* ***Example****: Return* ***(<>****<h1>Hello</h1><div><h2>Hii</h2></div>* ***</>)***

**React Environment Setup:**

* Before we start with **React.js** we need to have **Node.js** installed in our system as **React.js** is a JavaScript library and **Node.js** is the **runtime environment** that allows us to run JavaScript on the server side.
* Download latest version of Node.js here: [Link](https://nodejs.org/en/download)
* After successfully installing verify the installation by entering the following **command** in command prompt: **node -v**
* If Node.js is installed correctly then you will be able to see a version of Node.js or else, you will get an error.
* We also require a **code editor** to work with our code and one of the most used **code editors** is **VS Code.**
* Download latest version of VS Code here: [Link](https://code.visualstudio.com/download)

**Getting Started with React App:**

* Now create a react app package by using the following command inside your directory: **npx create-react-app app\_name**
* **npx(node package execute)** is a package executer, and it is used to execute JavaScript packages directly, without installing them.
* **npm(node package manager)** is a package manager used to install, delete, and update JavaScript packages on your machine.
* This will create a react app and we can start working on **React.js.**
* A basic react app structure looks like this:

****

**node\_modules (Folder):** *Contains all the dependencies that are needed for an initial working react app.*

**.gitignore (file):** *This file specifies intentionally untracked files that Git should ignore.*

**package-lock.json (file):** It ensures that your package is consistent across various machines by storing the versions of which dependencies are installed with your package

**package.json (file):** *It specifies the dependencies being used in the project which helps npm setup same environment on different machine for our project.*

**README.md (file):** *This file can be used to define usage, build instructions, summary of project, etc. It uses markdown markup language to create content.*

***public (Folder):***

* *The "public" folder in a React project contains static assets that are directly served to the client without processing by Webpack or any other build tool.*
* *It usually includes the* ***HTML file(s), images, fonts, and other assets*** *that don't need to be processed by the JavaScript bundler.*
* *The main* ***HTML file (index.html)*** *typically resides here. This file is where your React application is injected and rendered into the DOM.*
* *Assets placed in the public folder are often referenced directly from the HTML or JSX files without the need for imports.*

***src (Folder):***

* *The "src" folder contains the source code of your React application.*
* *This is where you write your* ***React components, JavaScript files, CSS or Sass files,******and any other code*** *related to your application's logic and presentation.*
* *Typically, the main* ***JavaScript file (index.js or App.js)*** *that initializes your React application is located here.*
* *React components and other modules are organized within the "src" folder, often in subdirectories based on their functionality or feature.*
* *Code in the "src" folder is processed by build tools like Webpack and Babel to transform it into a format that can be understood by the browser.*

**Props:**

* Props is short form of properties and “props” are like arguments in a function.
* In React.JS, props are used to pass data from one component to another component.
* Props are **Read-Only**, we can set typed of props by using **propTypes,** we can also provide default values for **props using defaultProps, and we can also make props to be mandatory by using isRequired.**

**Example:**

**components/Navbar.js**

**A screen shot of a computer program

Description automatically generated**

**App.js**

**A screen shot of a computer program

Description automatically generated**