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Introduction to React.js

What is React, JSX, Overview and Syntax

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React Overview

History and Philosophy

What is React.js?

- **React** is a JavaScript library for building **user interfaces** (UI)
- Focused on creating **reusable components**
- Developed by **Facebook**

```
const HelloMessage = (props) => (
  <div>Hello {props.name}</div>
);
ReactDOM.render(
  <HelloMessage name="Maria" />,
  document.getElementById('root')
);
```

Features

- Open-source
- Declarative
  - Design **simple** views for each **state** in your app
  - Easier to **debug**
- Component-Based
  - Encapsulated **components** that manage their **own** state
  - Keep **state** out of the **DOM**

Features

- ✓ Isomorphic
  - ✓ JavaScript that runs on **both** client & server
  - ✓ Better user experience
- ✓ Native support
  - ✓ Compose rich **mobile** UI in **Android, iOS**

Advantages

- Easy to learn
- Fast **performance**
- Use all **ES6** features
  - **Promises**, **Classes** and **Modules**
- Compatible with other **libraries**
- Great **error reporting**

React Installation

Packages, Setup, Structure

Create React App

- ✓ Less to learn - **instant reloads** help you focus on development
- ✓ Only one dependency - no complicated version mismatches
- ✓ No Lock-In - under the hood **Webpack**, **Babel**, **ESLint**
- ✓ Install the React app creator (one-time global install)

Install and Run the React App Creator

- Run the React app creator

```
npx create-react-app my-app
```

- Starts your React app from the command line

```
cd my-app
```

```
npm start
```

- Browse your app from http://localhost:3000

Finding Information

- ✓ Visit the **official website**

  https://reactjs.org/

- ✓ Documentation

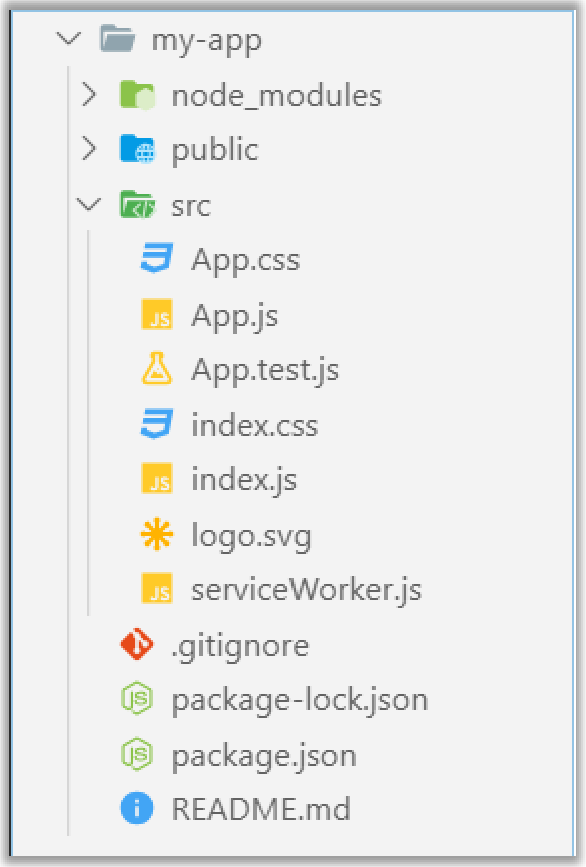
  https://reactjs.org/docs/installation.html

- ✓ Online sandbox

  https://codesandbox.io/

React App Structure

- **`package.json`** - project configuration
  - Module name, dependencies, build actions
- **`index.html`**
  - App main HTML file
- **`index.js`**
  - App main JS file (startup script)
- **`App.js`**, **`App.css`**, **`App.test.js`**
  - React component "**App**"



```
my-app
  node_modules
  public
  src
    App.css
    App.js
    App.test.js
    index.css
    index.js
    logo.svg
    serviceWorker.js
  .gitignore
  package-lock.json
  package.json
  README.md
```

Live Demo

JSX Syntax

Overview, Syntax, Advantages

JSX Overview

- **JSX** is React's JavaScript **superset language**
    - Has all of JavaScript's **features** and more
- Unique approach to **mixing HTML and JS**
- Compiles to **plain JavaScript**

```
<div className="red">Children Text</div>
```

```
React.createElement("div",
  { className: "red" },
  "Children Text"
);
```

JSX Syntax

```
<div className="red">Children Text</div>
```

```
<MyCounter count={3 + 5} />
```

Expression

```
let gameScores = {
  player1: 2,
  player2: 5
};
<DashboardUnit index="2" onClick={() => {}}>
  <h1>Scores</h1>
  <Scoreboard className="results" scores={gameScores} />
</DashboardUnit>
```

Custom component

Pass variable as prop

JSX Rules and Principles

- Standard elements use lowercase names
  - **`div`**, **`span`**, **`form`**, **`input`**, …
- Custom components **always** use Pascal case
  - **`MyCustomComponent`**, **`Greeting`**, **`ScoreBoard`**, …
- Component name cannot be an expression
  - Use a **variable** instead
- There must be a **root element**
- More info at: https://reactjs.org/docs/jsx-in-depth.html

Compilation

- JSX **compiles** to function calls

```
<div className="red">Children Text</div>
```

Element type (HTML tag name)

Properties object

List of children

```
React.createElement("div",
                    { className: "red" },
                    "Children Text" [, …]);
```

Live Demo

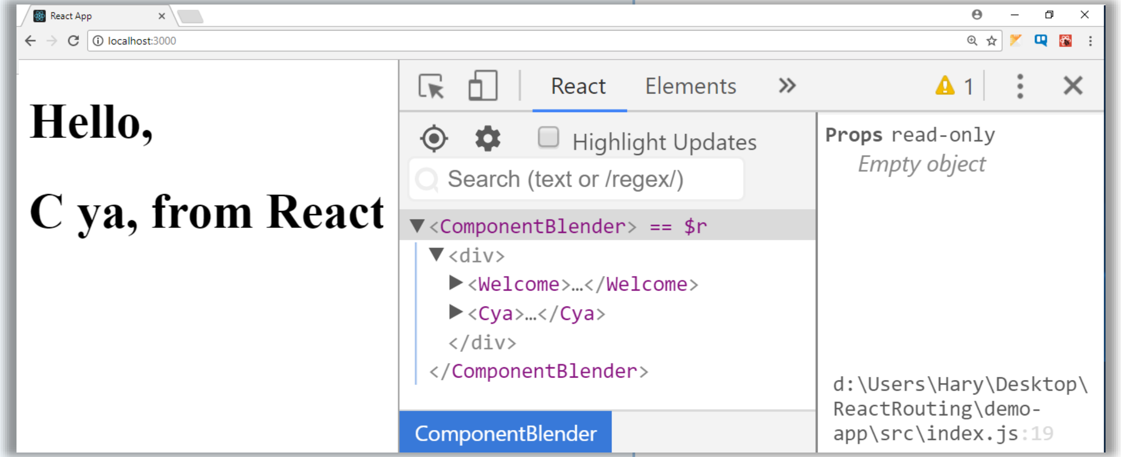
Composition

Definition and Advantages

Composition

- React components can be **nested**, like DOM elements

```
function Welcome() {
  return <h1>Hello, from React</h1>;
}
function Cya() {
  return <h1>C ya, from React</h1>;
}
function ComponentBlender() {
  return (
    <div>
      <Welcome />
      <Cya />
    </div>
  );
}
```



Hello,

C ya, from React

```
▼<ComponentBlender> == $r
  ▼<div>
    ▶<Welcome>…</Welcome>
    ▶<Cya>…</Cya>
   </div>
 </ComponentBlender>
```

Props read-only
Empty object

d:\Users\Hary\Desktop\ReactRouting\demo-app\src\index.js:19

```
ReactDOM.render(<ComponentBlender />,
    document.getElementById('root'));
```

Component Syntax

- Names always start with **uppercase**
- Tags must be **closed**
  - If there are no children - use **self-closing tags**
- **Information** is passed via **props**

```
<Dropdown> A dropdown list <UserHead name='homeHeader' />
  <Menu>
    <MenuItem>Do Something</MenuItem>
    <MenuItem>Do Something Fun!</MenuItem>
    <MenuItem>Do Something Else</MenuItem>
  </Menu>
</Dropdown>
```

Advantages

- Encapsulate logic
- **Separate** your code
  - Easier to **maintain** and **debug**
  - Allows **reusability**
- Components are neat

Live Demo

Summary

- **React** is a JavaScript library for building user interfaces
- **React** uses all **ES6** features
- **JSX** is React's JavaScript **superset**
- React **components** can be nested (composition)

Questions?

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