ReactJS

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About the Tutorial

React is a front-end library developed by Facebook. It is used for handling the view layer for web and mobile apps. ReactJS allows us to create reusable UI components. It is currently one of the most popular JavaScript libraries and has a strong foundation and large community behind it.

Audience

This tutorial will help JavaScript developers who look ahead to deal with ReactJS for the first time. We will try to introduce every concept by showing simple code examples that can be easily understood. After finishing all the chapters, you will feel confident working with ReactJS. As a bonus we will introduce additional elements that work well with ReactJS to help you learn the best practices and follow the modern JavaScript trends.

Prerequisites

If you want to work with ReactJS, you need to have solid knowledge of **JavaScript**, **HTML5**, and **CSS**. Even though ReactJS doesn't use HTML, the JSX is similar so your HTML knowledge will be very helpful. We will explain this more in one of the next chapters. We will also use **EcmaScript 2015** syntax so any knowledge in this area can be helpful.

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1. ReactJS – Overview

ReactJS is JavaScript library used for building reusable UI components. According to React official documentation, following is the definition –

React is a library for building composable user interfaces. It encourages the creation of reusable UI components, which present data that changes over time. Lots of people use React as the V in MVC. React abstracts away the DOM from you, offering a simpler programming model and better performance. React can also render on the server using Node, and it can power native apps using React Native. React implements one-way reactive data flow, which reduces the boilerplate and is easier to reason about than traditional data binding.

React – Features

- **JSX** – JSX is JavaScript syntax extension. It isn't necessary to use JSX in React development, but it is recommended.
- **Components** – React is all about components. You need to think of everything as a component. This will help you maintain the code when working on larger scale projects.
- **Unidirectional data flow and Flux** – React implements one-way data flow which makes it easy to reason about your app. Flux is a pattern that helps keeping your data unidirectional.
- **License** – React is licensed under the Facebook Inc. Documentation is licensed under CC BY 4.0.

React – Advantages

- Uses virtual DOM which is a JavaScript object. This will improve apps performance, since JavaScript virtual DOM is faster than the regular DOM.
- Can be used on client and server side as well as with other frameworks.
- Component and data patterns improve readability, which helps to maintain larger apps.

React – Limitations

- Covers only the view layer of the app, hence you still need to choose other technologies to get a complete tooling set for development.
- Uses inline templating and JSX, which might seem awkward to some developers.

2. ReactJS – Environment Setup

In this chapter, we will show you how to set up an environment for successful React development. Notice that there are many steps involved but this will help speed up the development process later. We will need **NodeJS**, so if you don't have it installed, check the link from the following table.

Sr. No.	Software	Description
1	NodeJS and NPM	NodeJS is the platform needed for the Cordova development. Checkout our **NodeJS Environment Setup**.

Step 1 - Install Global Packages

We will need to install several packages for this setup. We will need some of the **babel** plugins, so let's first install **babel** by running the following code in the **command prompt** window.

```
C:\Users\username>npm install -g babel

C:\Users\username>npm install -g babel-cli
```

Step 2 - Create the Root Folder

The root folder will be named **reactApp** and we will place it on **Desktop**. After the folder is created, we need to open it and create empty **package.json** file inside by running **npm init** from the **command prompt** and follow the instructions.

```
C:\Users\username\Desktop>mkdir reactApp

C:\Users\username\Desktop\reactApp>npm init
```

Step 3 - Add Dependencies and Plugins

We will use **webpack** bundler in these tutorial. Let's install **webpack** and **webpack-dev-server**.

```
C:\Users\username>npm install webpack --save

C:\Users\username>npm install webpack-dev-server --save
```

Since we want to use React, we need to install it first. The **--save** command will add these packages to **package.json** file.

```
C:\Users\username\Desktop\reactApp>npm install react --save
```

```
C:\Users\username\Desktop\reactApp>npm install react-dom --save
```

As already mentioned, we will need some **babel** plugins, so let's install it too.

```
C:\Users\username\Desktop\reactApp>npm install babel-core

C:\Users\username\Desktop\reactApp>npm install babel-loader

C:\Users\username\Desktop\reactApp>npm install babel-preset-react

C:\Users\username\Desktop\reactApp>npm install babel-preset-es2015
```

Step 4 - Create the Files

Let's create several files that we need. It can be added manually or using the **command prompt**.

```
C:\Users\username\Desktop\reactApp>touch index.html

C:\Users\username\Desktop\reactApp>touch App.jsx

C:\Users\username\Desktop\reactApp>touch main.js

C:\Users\username\Desktop\reactApp>touch webpack.config.js
```

Step 5 - Set Compiler, Server and Loaders

Open **webpack-config.js** file and add the following code. We are setting webpack entry point to be **main.js**. Output path is the place where bundled app will be served. We are also setting the development server to **8080** port. You can choose any port you want.

And lastly, we are setting babel loaders to search for **js** files, and use **es2015** and **react** presets that we installed before.

webpack.config.js

```
var config = {
   entry: './main.js',

   output: {
      path:'./',
      filename: 'index.js',
   },
   devServer: {
      inline: true,
      port: 8080
   },
   module: {
      loaders: [
         {
            test: /\.jsx?$/,
            exclude: /node_modules/,
            loader: 'babel',

            query: {
               presets: ['es2015', 'react']
            }
         }
      ]
   }
}
module.exports = config;
```

Open the **package.json** and delete **"test" "echo \"Error: no test specified\" && exit 1"** inside **"scripts"** object. We are deleting this line since we will not do any testing in this tutorial. Let's add the **start** command instead.

```
"start": "webpack-dev-server --hot"
```

Now, we can use **npm start** command to start the server. **--hot** command will add live reload after something is changed inside our files so we don't need to refresh the browser every time we change our code.

Step 6 - index.html

This is just regular HTML. We are setting **div id = "app"** as a root element for our app and adding **index.js** script, which is our bundled app file.

```
<!DOCTYPE html>
<html lang = "en">
   <head>
      <meta charset = "UTF-8">
      <title>React App</title>
   </head>
   <body>
      <div id = "app"></div>
      <script src = "index.js"></script>
   </body>
```

```
</html>
```

Step 7 - App.jsx and main.js

This is the first React component. We will explain React components in depth in a subsequent chapter. This component will render **Hello World!!!**.

App.jsx

```
import React from 'react';


class App extends React.Component {
   render() {
      return (
         <div>
            Hello World!!!
         </div>
      );
   }
}
export default App;
```

We need to import this component and render it to our root **App** element, so we can see it in the browser.

main.js

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


ReactDOM.render(<App />, document.getElementById('app'));
```

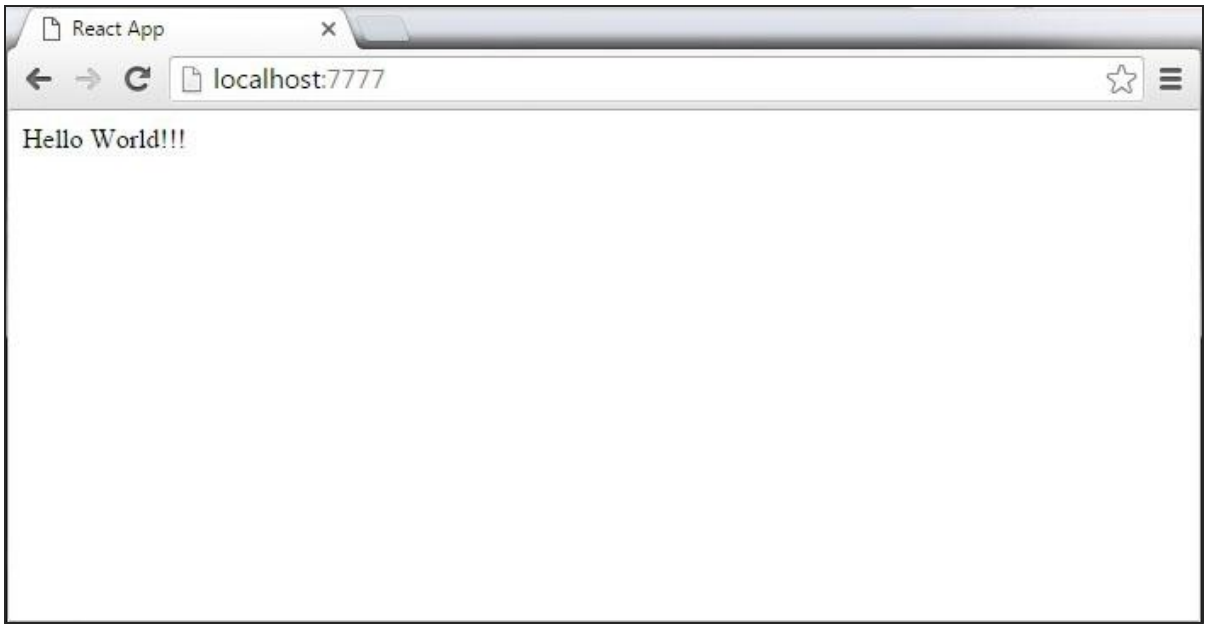
Note: Whenever you want to use something, you need to **import** it first. If you want to make the component usable in other parts of the app, you need to **export** it after creation and **import** it in the file where you want to use it.

Step 8 - Running the Server

The setup is complete and we can start the server by running the following command.

```
C:\Users\username\Desktop\reactApp>npm start
```

It will show the port we need to open in the browser. In our case, it is **http://localhost:8080/**. After we open it, we will see the following output.



Hello World!!!