

React Fundamentals

AGENDA

Component Oriented

Templates: JSX

State & Props

Simple React App Demo

Component Oriented

HTML Element vs Component

Similarities

- Both have a tree hierarchy
- Both affect the layout of the resulting DOM
-

Differences

- React Components are like “super” elements
- React Components have functional behaviour
- React Components automatically re-render as their state changes



In React, Everything is a Component

- React applications are made up of nested React Components
- Each time a Component is `rendered`, whatever children of that Component are `rendered`

```
function Form(props) {  
  return (<form>  
    <TextInput name="username" />  
    <PasswordInput name="password" />  
  </form>);  
}
```

```
function TextInput(props) {  
  return (<input name={props.name} />);  
}
```

JSX - React Templating

React is a Frontend Framework

- React allows us to **build dynamic frontends** for our websites by composing Components
- Data is still managed by a backend system (for example: express, RoR, flask, etc)
- AJAX (*axios* or *jQuery* or *fetch api*) is used to fetch data for frontend
- Unlike jQuery, **React has a built in templating engine: JSX**
- Unlike anything we've seen before, **React chooses when to render**

JSX is a template language

- JSX is a lot like EJS
 - Instead of being stored in a separate “template” file
 - Every component returns JSX
 - Thus, JSX is by made up of nested partials
 - The JSX return will be re-evaluated whenever a component needs to be rendered

jsx

```
function Form(props) {  
  return (<form>  
    <TextInput name="username" />  
    <PasswordInput name="password" />  
  </form>);  
}
```

jsx

```
function TextInput(props) {  
  return (<input name={props.name} />);  
}
```


State & Props

Component-Local State

- React Components are dynamic – they change in response to data-changes!
- A Component can store data in 2 ways: State and Properties (i.e. Props)
 - a. **State is data owned by this component**
 - b. **Props is data owned by a parent component**
- Anytime either State or Props change, those related Components will `render`

Props passed from parent to child

- We've seen props already
- In React, we pass props just as we would set an attribute on an HTML Element
- This is often referred to as **prop-threading**
- Our parent component `Form` passes the “*name*” prop into the `TextInput` sub-component
- In this case, because the `Form` component passes a bare-string, **name** is static

```
function Form() {  
  return (<form>  
    <TextInput name="username" />  
    <PasswordInput name="password" />  
  </form>);  
}
```

```
function TextInput(props) {  
  return (<input name={props.name} />);  
}
```

Props are Immutable from the Child

- Although any state may be changed by the component that owns them
- From the perspective of the child component: Props are immutable
- You **may use** a prop to
 - Render it's value
 - Conditionally change how something else is rendered
 - Invoke a function in the parent component (if a function is passed)
- You **may never**
 - Update the value of a prop

State in React is local to a Comp

- **useState** hooks allow us to **create state** in a component

```
function TextInput(props) {  
  const [inputValue, setInputValue] = useState("");  
  return (<input name={props.name} />);  
}
```

getter

setter

State is mutable through setter fx

- **useState** returns an accessor and a mutator (a getter and a setter)
- Using this setter, we can change the state.

```
function TextInput(props) {  
  const [inputValue, setInputValue] = useState("");  
  function mutateState(e) {  
    setInputValue("potato");  
  }  
  return (<input name={props.name} onChange={mutateState}/>);  
}
```

Questions?