React Foundation

Module 2: Component-Based Architecture

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Composable Components

The concept of components is the foundation of React.js philosophy. They allow you to reuse code and logic. They are like templates only better.

Types of React.js Components

React.js component types:

- Regular HTML elements such as h1, p, div, etc.
- Custom or composable components

Difference Between Regular and Custom Components

If it's a regular HTML tag name, then React.js will create such element. Otherwise, it will look for the custom component definition.

Note: React.js uses lower-case vs. upper case to distinguish between HTML tags and components.

Defining a Component

Composable components are created with `class/extends` and must have `render` method that returns regular component (`div`, `h1`, etc.):

```
const React = require('react')

class HelloWorld extends React.Component {
  render() {
    return <h1>Hello world!</h1>
  }
}
```

Sidenote `createClass()`

Old style (ES5):

```
var React = require('react')

var HelloWorld = React.createClass({
  render: function() {
    return (
      <h1>Hello world!!!</h1>
    )
  }
})
```

Refactoring with a HelloWorld Component

The `hello-world-component/jsx/hello-world.jsx` file has a custom component:

```
const React = require('react')
const ReactDOM = require('react-dom')

const HelloWorld = require('./hello-world.jsx')

ReactDOM.render(
  <HelloWorld/>,
  document.getElementById('content')
)
```

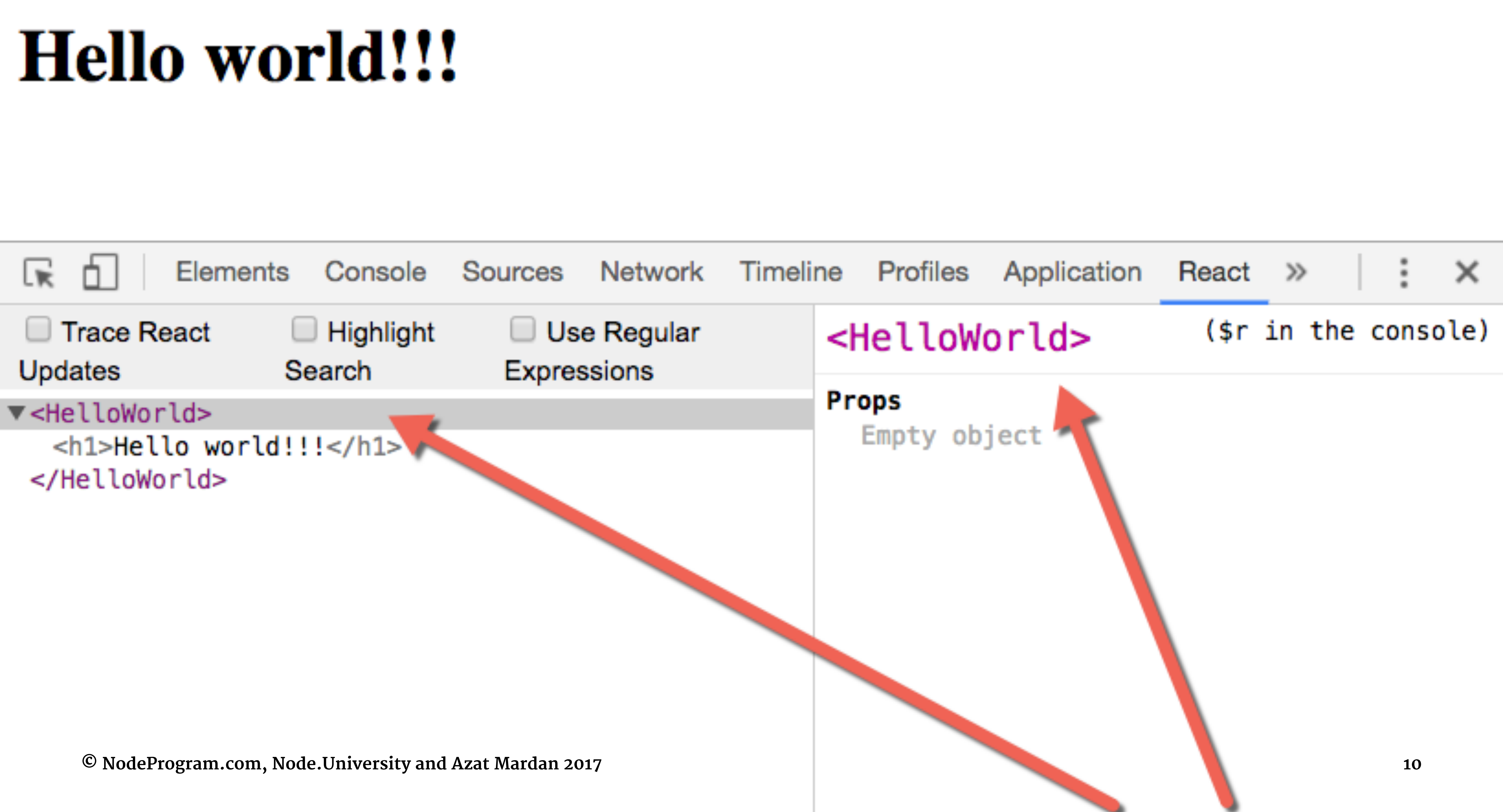
HTML Skeleton

Point your `index.html` to use `js/bundle.js`:

```html
<!DOCTYPE html>
<html>
  <head>
  </head>
  <body>
    <div id="content"></div>
    <script src="js/bundle.js"></script>
  </body>
</html>
```

Running the Code

Open `index.html` and check if you see Hello world! (Use `static`)



Hello world!!!

```
▼<HelloWorld>
   <h1>Hello world!!!</h1>
 </HelloWorld>
```

```
<HelloWorld>        ($r in the console)
Props
  Empty object
```

Variables

Use `{}` to render variable inside of JSX:

```
{a}
{' '}
{b}
```

Even use JavaScript in the curly braces!

```
{Math.random()}
```

```
{365/7}
```

Variable Example

```
class Content extends React.Component {
  render() {
    let a = 1
    return (
      <div>
        <h1>
          {a}. Core React.js
        </h1>
        <p>This text is very useful for learning React.js.</p>
      </div>
    )
  }
}
```

Props

Props or properties are immutable meaning they don't change. They are passed by parent components to their children.

Using Props

```
class ClickCounterButton extends React.Component {
  render() {
    return <button onClick={this.props.handler}>Don't click me {this.props.counter} times! </button>
  }
}
```

Supplying Props

Provide props to the ClickCounterButton component:

```
class Content extends React.Component {
  constructor(props) {
    super(props)
    this.state = {counter: 0}
    this.click = this.click.bind(this)
  }
  click(event) {
    this.setState({counter: ++this.state.counter})
  }
  render() {
    return (
      <div>
        <ClickCounterButton counter={this.state.counter} handler={this.click}/>
      </div>
    )
  }
}
```

http://plnkr.co/edit/3HqvdG?p=preview

States

States are mutable properties of components meaning they can change. When state changes the corresponding view changes, but everything else in DOM remains intact.

Initial State

```
class Content extends React.Component {
  constructor(props) {
    super(props)
    this.state = {a: 0}
  }
  render() {
    // ...
  }
}
```

Sidenote: ES5

The initial state is set by the `getInitialState` method which is called once when the element is created.

Let's use this method to return `a`:

```
var Content = React.createClass({
  getInitialState: function(){
    return {a: 0}
  },
  render: function() {
    // ...
  }
})
```

Updating State

State is updated with `this.setState()`, so this code will update the value with a random number every 300 milliseconds:

```
class Content extends React.Component {
  constructor(props){
    super(props)
    this.state = {a: 0}
    setInterval(()=>{
      this.setState({a: Math.random()})
    }, 300)
  }
  render() {
    // ...
  }
}
```

Outputting The State

To output the state property `a`, we use `{this.state.a}`:

```
  render() {
    return (
      <div>
        <h1>Changing the State</h1>
        <p>This value is random: {this.state.a}</p>
      </div>
    )
  }
}
```

Lists

What are Lists

Lists are often use on webpages. They consist of many similar items wrapped in a parent element. Examples include:

- Menus
- Ordered and unordered lists
- Grids

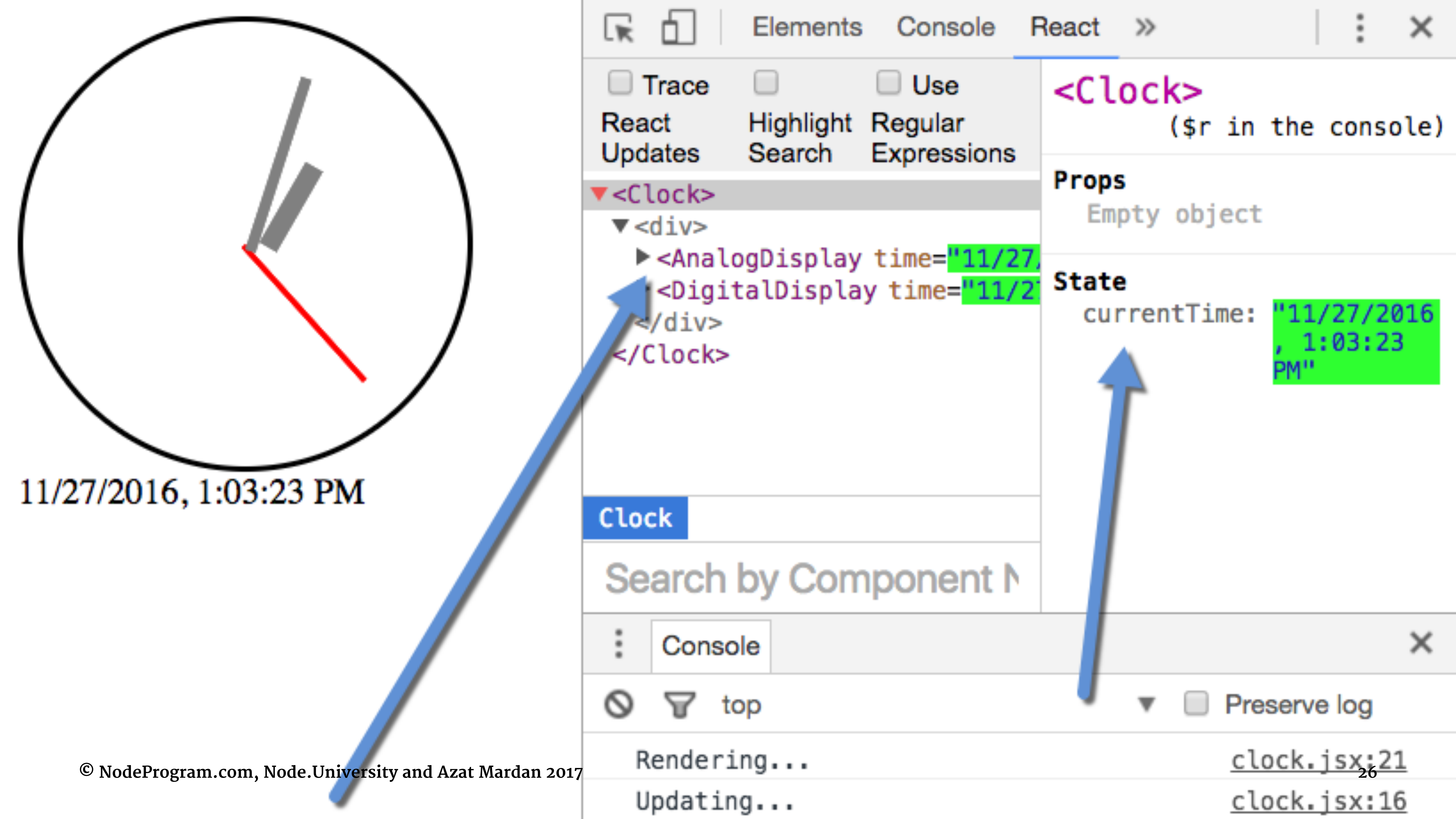
List Implementation

The easiest way to implement a list in React.js is to use array and map(), e.g.,

```
render() {
  return (
    <ul>
      {this.props.items.map((value, index) =>{
        return <li>{value}</li>
      })}
    </ul>
  )
}
```

Clock Project

Source: `code/clock`


11/27/2016, 1:03:23 PM

```
▼<Clock>
  ▼<div>
    ▶<AnalogDisplay time="11/27/
     <DigitalDisplay time="11/2
   </div>
</Clock>
```

```
<Clock>
      ($r in the console)
Props
  Empty object
State
  currentTime: "11/27/2016, 1:03:23 PM"
```

```
Rendering...                                   clock.jsx:21
Updating...                                    clock.jsx:16
```

Demo 💻