GENERAL ASSEMBLY

JAVASCRIPT DEVELOPMENT

Sasha Vodnik, Instructor

INTRODUCTION TO REACT

LEARNING OBJECTIVES

At the end of this class, you will be able to

- Understand the roles of model, view, and controller
- Describe the difference between frameworks and libraries
- Recognize the primary uses of React
- Build a React component function
- Create a React component class
- Implement composition & reuse in a React app
- Install & use common React developer tools

AGENDA

- Model View Controller (MVC)
- Frameworks and libraries
- React overview
- Creating React components

WEEKLY OVERVIEW

WEEK 9	Deploying your app / React
WEEK 10	Final project lab / Graduation!

PRESENTATIONS

PRESENTATION STRUCTURE

- Describe the problem you set out to solve
- Demo your app!
- Share
  - A technical hurdle you encountered and how you worked with it
  - Something new you learned
- Answer questions

ACTIVITY

KEY OBJECTIVE

- Check in on final project

TYPE OF EXERCISE

- Groups of 2-3

TIMING

6 min

1. Take turns checking in about where you are with your final project. If you have a working prototype, display your app in your browser, demonstrate its functionality, and explain what you plan to add to your app.
2. Share a challenge you've run into with your project. If you've overcome it, describe how. If not, brainstorm resources and next steps with your group members.

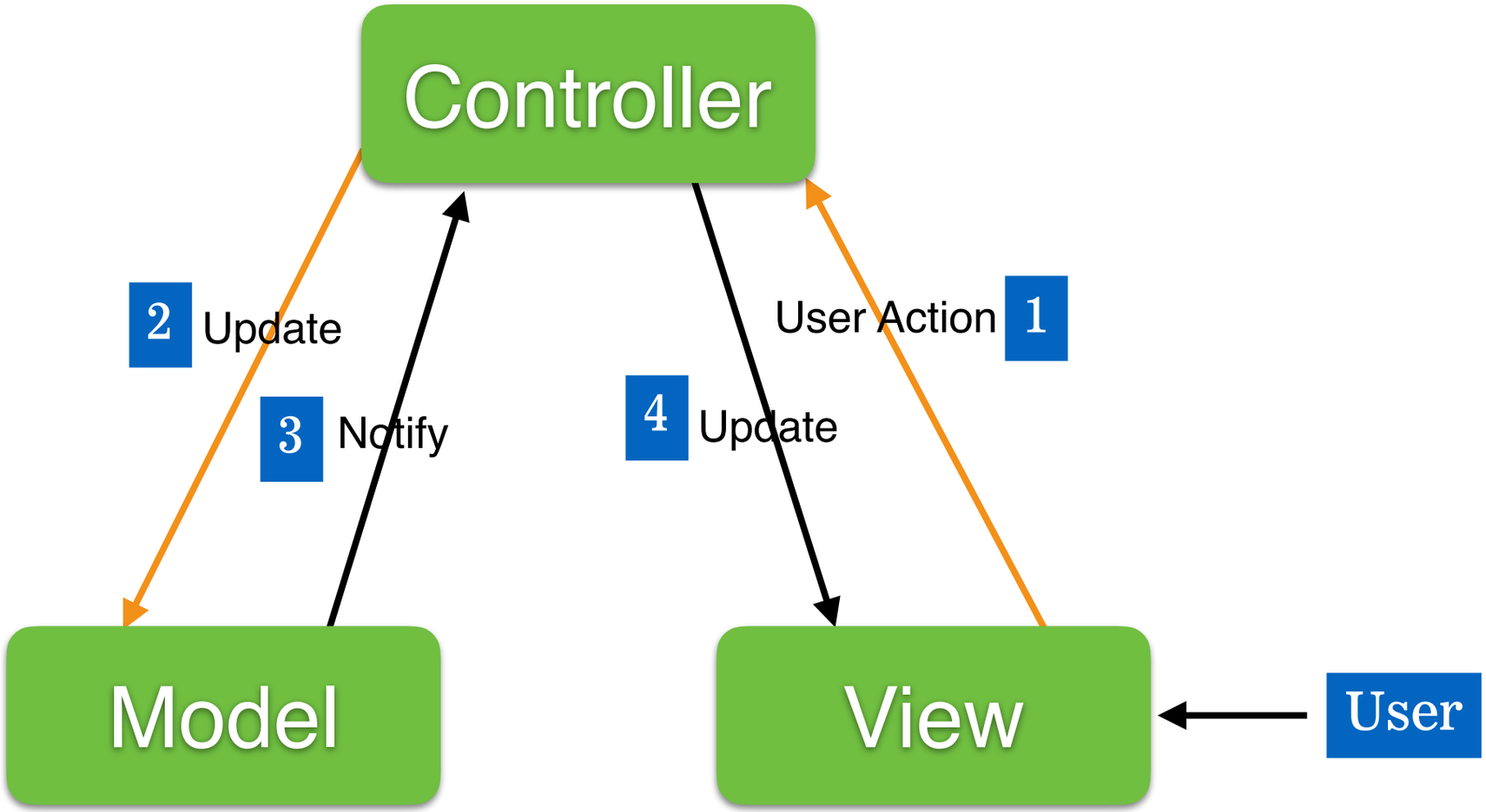
What methods & properties have we used to change the DOM?

REACT BASICS

MODEL-VIEW-CONTROLLER (MVC)

- **Model**: data
- **View**: user interface
- **Controller**: coordinates between model and view

MODEL-VIEW-CONTROLLER (MVC)



LIBRARIES VS FRAMEWORKS

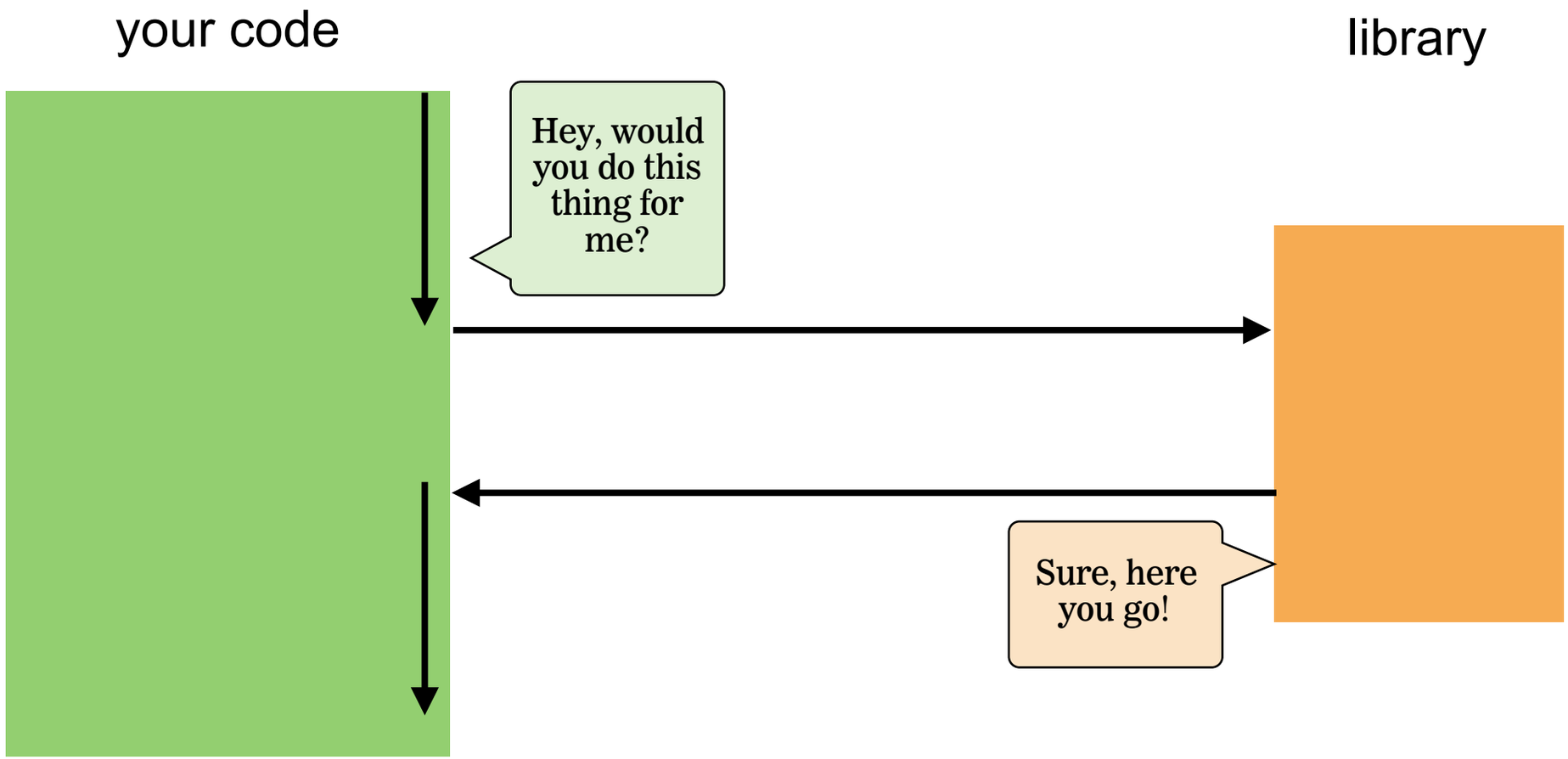
Libraries

LIBRARIES VS FRAMEWORKS

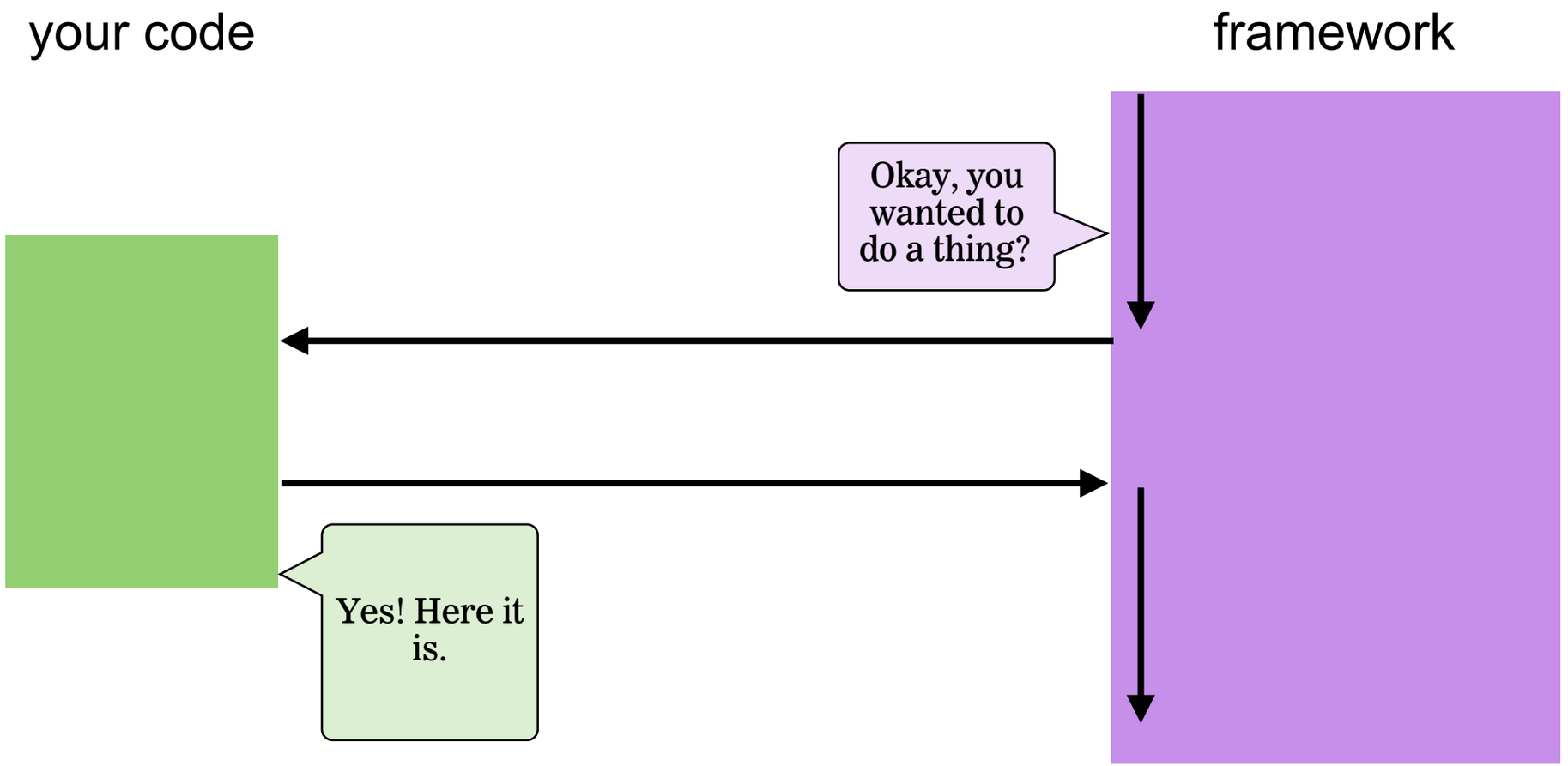
Libraries

Frameworks

YOUR CODE CALLS A LIBRARY

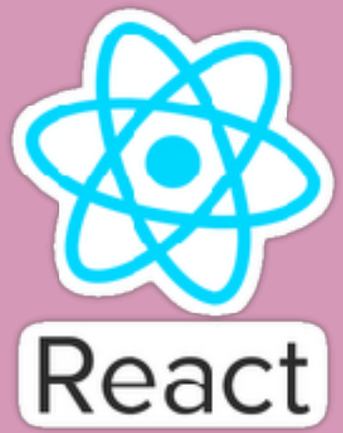


A FRAMEWORK CALLS YOUR CODE



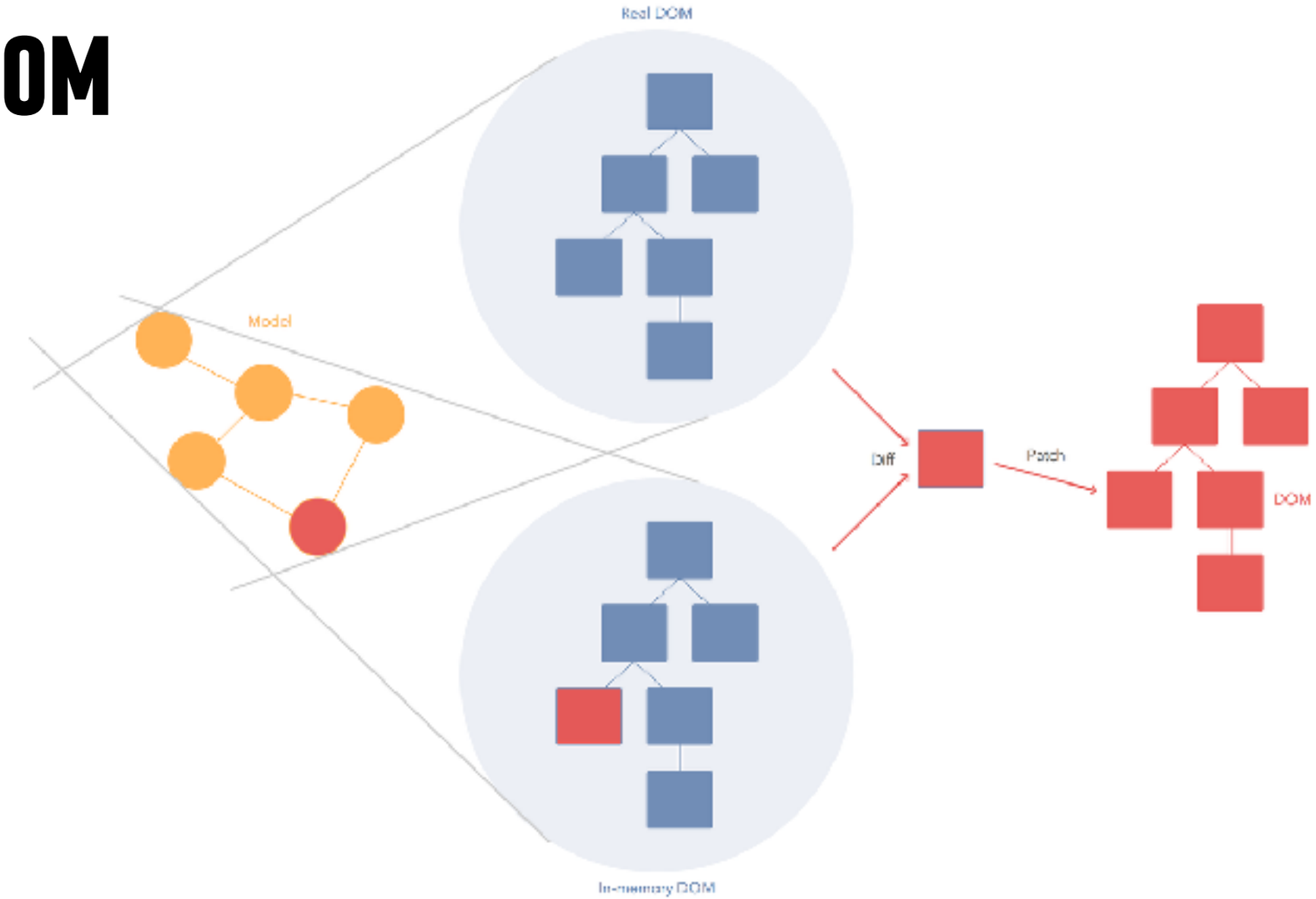
LIBRARIES VS FRAMEWORKS

Libraries



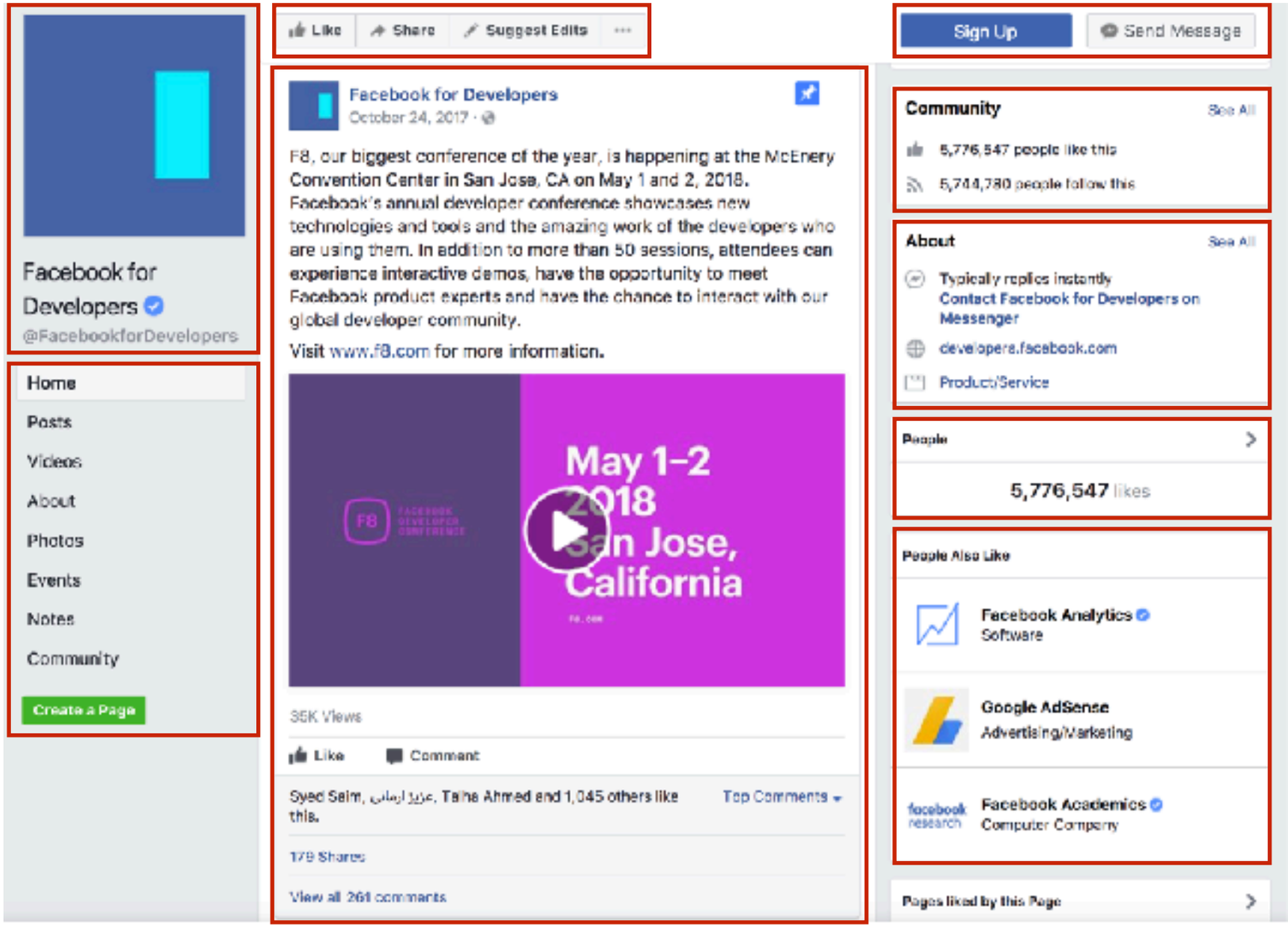
Frameworks

VIRTUAL DOM

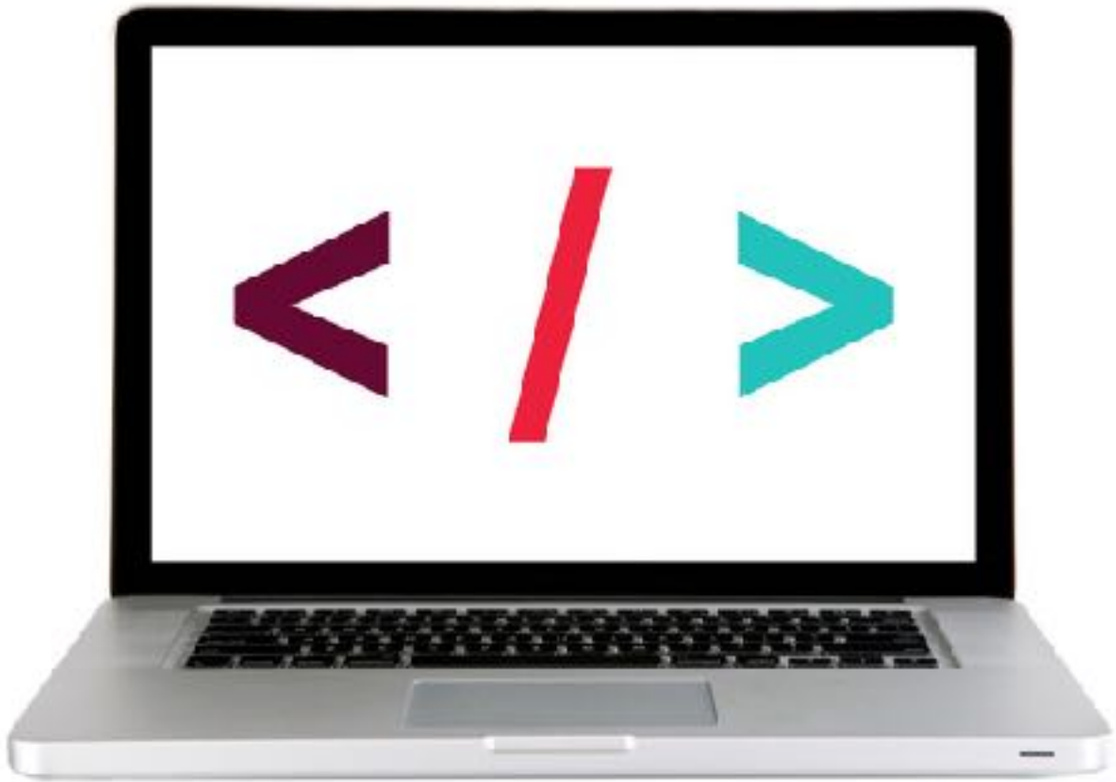


from https://stackoverflow.com/questions/21109361/why-is-reacts-concept-of-virtual-dom-said-to-be-more-performant-than-dirty-mode#23995928

COMPONENTS


Like
Share
Suggest Edits
Sign Up
Send Message
Facebook for Developers
@FacebookforDevelopers
Facebook for Developers
October 24, 2017
F8, our biggest conference of the year, is happening at the McEnery Convention Center in San Jose, CA on May 1 and 2, 2018. Facebook's annual developer conference showcases new technologies and tools and the amazing work of the developers who are using them. In addition to more than 50 sessions, attendees can experience interactive demos, have the opportunity to meet Facebook product experts and have the chance to interact with our global developer community.
Visit www.f8.com for more information.
May 1–2
2018
San Jose,
California
Home
Posts
Videos
About
Photos
Events
Notes
Community
Create a Page
35K Views
Like
Comment
Top Comments
179 Shares
View all 261 comments
Community
See All
5,776,547 people like this
5,744,780 people follow this
About
See All
Typically replies instantly
Contact Facebook for Developers on Messenger
developers.facebook.com
Product/Service
People
5,776,547 likes
People Also Like
Facebook Analytics
Software
Google AdSense
Advertising/Marketing
Facebook Academics
Computer Company
Pages liked by this Page

LET'S TAKE A CLOSER LOOK

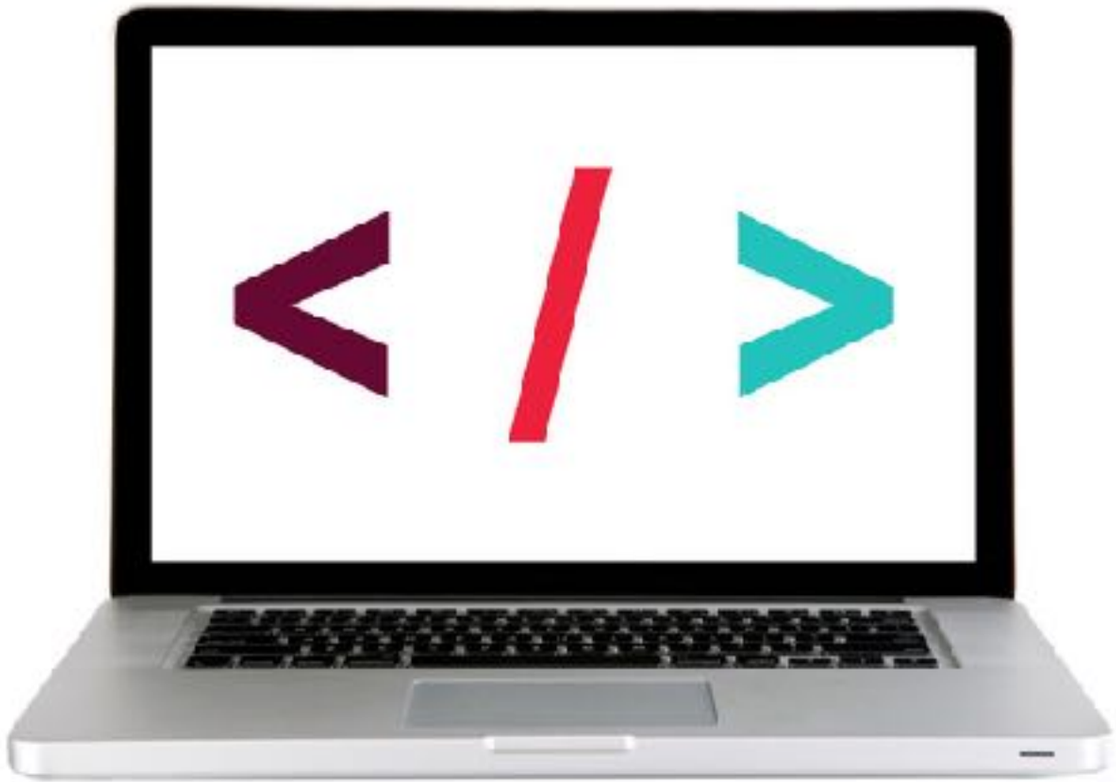


REACT DEVELOPER TOOLS

React Developer Tools

Offered by: Facebook

LET'S TAKE A CLOSER LOOK



CREATING REACT COMPONENTS

FUNCTIONAL COMPONENTS

FUNCTIONAL COMPONENTS

function name has an initial cap

```
function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}
```

FUNCTIONAL COMPONENTS

standard parameter name is `props`

```
function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}
```

FUNCTIONAL COMPONENTS

```
function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}
```

function always includes a `return` statement

FUNCTIONAL COMPONENTS

```
function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}
```

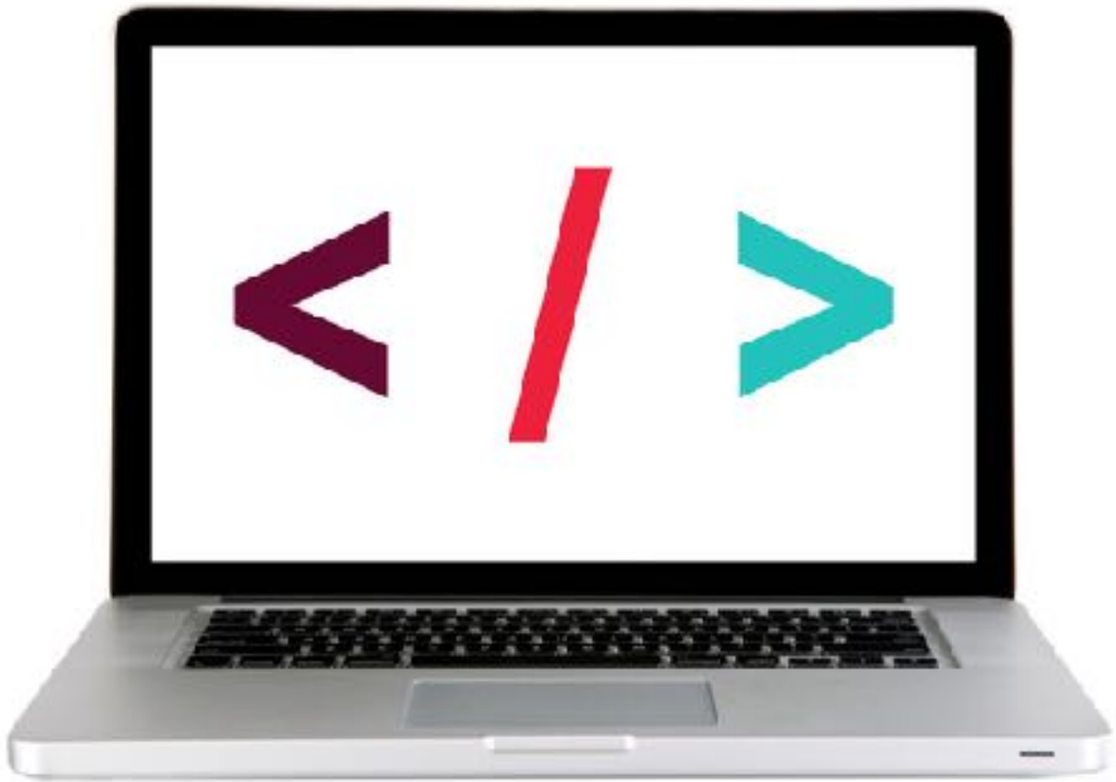
content of the `return` statement is JSX

FUNCTIONAL COMPONENTS

```
function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}
```

JSX can include JavaScript expressions wrapped in {}

LET'S TAKE A CLOSER LOOK



JSX

```
function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}
```

could be rendered by React using

```
`<h1>Hello, ${props.name}</h1>`;
```

JSX

```
function Welcome(props) {
  return <h1>Hello, {props.name}</h1>;
}
```

could also be rendered by React using

```
createElement('h1').textContent =
  'Hello, ' + props.name;
```

LOOPING IN REACT COMPONENTS

```
const listItems = numbers.map((number) =>
  <li>{number}</li>
);

return (
  <ul>{listItems}</ul>
);
```

LOOPING IN REACT COMPONENTS

```
[
  'carrot',
  'tomato',
  'cucumber'
]
```

maps to

```
[
  '<li>carrot</li>',
  '<li>tomato</li>',
  '<li>cucumber</li>'
]
```

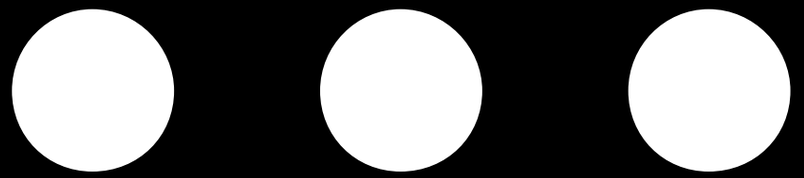
LOOPING IN REACT COMPONENTS

```
[
  '<li>carrot</li>',
  '<li>tomato</li>',
  '<li>cucumber</li>'
]
```

rendered as

```
<li>carrot</li>
<li>tomato</li>
<li>cucumber</li>
```

ES6 SPREAD OPERATOR



ES6 SPREAD OPERATOR

```
{
  firstName: 'Ben',
  lastName: 'Hector'
}

return <Greeting {...props} />;
```

is parsed as

```
return <Greeting firstName="Ben" lastName="Hector" />;
```

EXERCISE — CREATE FUNCTIONAL COMPONENTS

KEY OBJECTIVE

- Build a React functional component

LOCATION

- `starter-code > 1-functional-component-exercise`

TIMING

10 min

1. The start file contains the components we've already been working with, along with additional data in the state variable.
2. Create variables storing references to the two new elements in the DOM.
3. Create components to render the contents of the new state properties.
4. Call the render method for each of your two new components.
5. BONUS: Create and call a component function to render an image.

CLASS COMPONENTS

CLASS COMPONENTS

class name has an initial cap

```
class Welcome extends React.Component {
  render() {
    return (
      <p>Hello, {this.props.name}</p>
    );
  }
}
```

CLASS COMPONENTS

component class is always based on `React.Component`

```
class Welcome extends React.Component {
  render() {
    return (
      <p>Hello, {this.props.name}</p>
    );
  }
}
```

CLASS COMPONENTS

class definition always calls the `render()` function

```
class Welcome extends React.Component {
   render() {
      return (
         <p>Hello, {this.props.name}</p>
      );
   }
}
```

CLASS COMPONENTS

`render` function call always includes a `return` statement

```
class Welcome extends React.Component {
  render() {
    return (
      <p>Hello, {this.props.name}</p>
    );
  }
}
```

CLASS COMPONENTS

content of the `return` statement is JSX

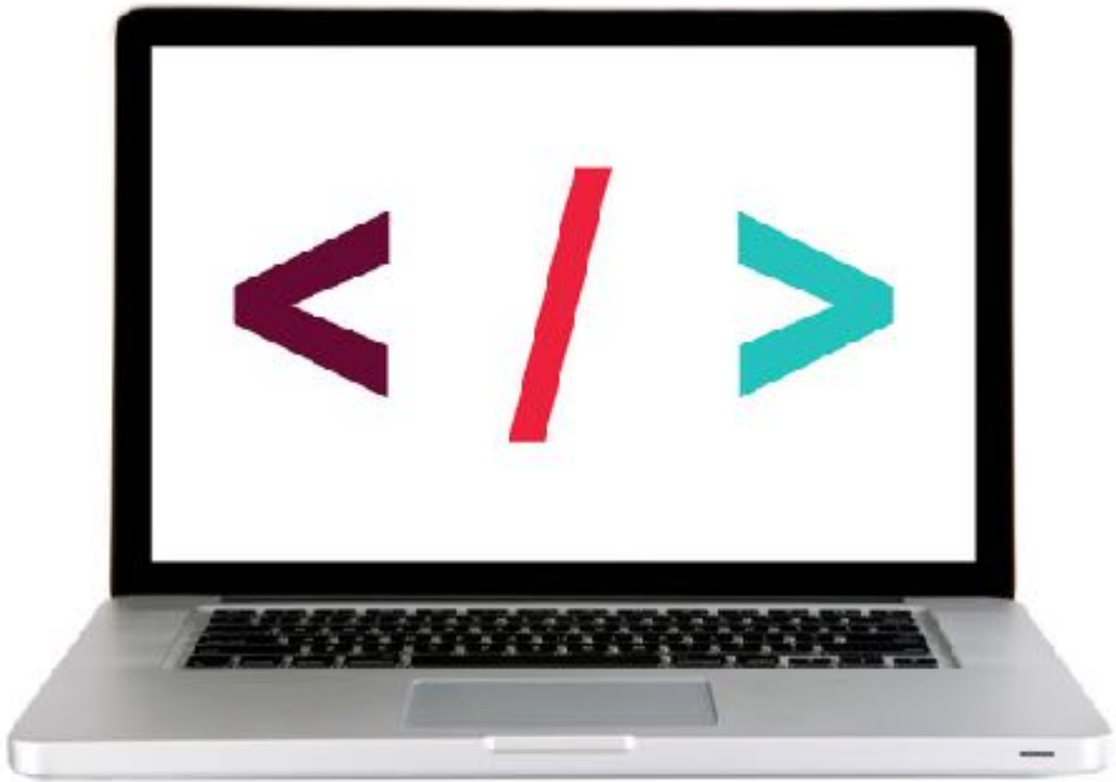
```
class Welcome extends React.Component {
  render() {
    return (
      <p>Hello, {this.props.name}</p>
    );
  }
}
```

CLASS COMPONENTS

JSX can include JavaScript expressions wrapped in {}

```
class Welcome extends React.Component {
  render() {
    return (
      <p>Hello, {this.props.name}</p>
    );
  }
}
```

LET'S TAKE A CLOSER LOOK



EXERCISE — CREATE CLASS COMPONENTS

KEY OBJECTIVE

- Build a React class component

TYPE OF EXERCISE

- Solo or in pairs

LOCATION

- `starter-code > 3-class-component-exercise`

TIMING

10 min

1. The start file contains the components we've already been working with, along with additional data in the state variable.
2. Create variables storing references to the two new elements in the DOM.
3. Create components to render the contents of the new data properties.
4. Call the render method for each of your two new components.

COMPOSITION

COMPOSITION

- In parent class, call each child with JSX using element syntax
- Pass necessary props as attributes, referencing `this.props`
- For child classes, move data manipulation outside of `render()` method, and reference the result instead
- Call `ReactDOM.render()` only on parent class

COMPOSITION

```
class Menu extends React.Component {
  render() {
    return (
      <nav>
        <ul>
          {this.props.menu.map(function(item, index) {
            return <li key={index}>{item}</li>;
          })}
        </ul>
      </nav>
    );
  }
}
```

COMPOSITION

```
class Menu extends React.Component {
  items = this.props.menu.map(function(item, index) {
    return <li key={index}>{item}</li>;
  });
  render() {
    return (
      <nav>
        <ul>
         {this.items}
        </ul>
      </nav>
    );
  }
}
```

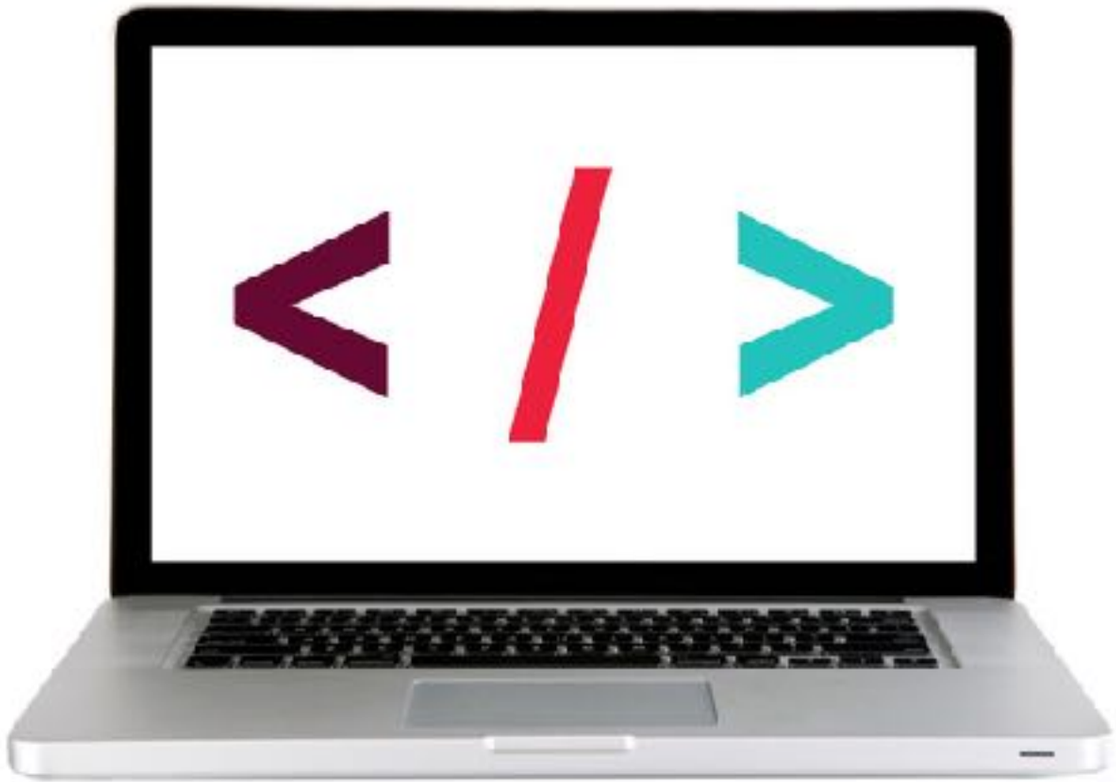
COMPOSITION

```
class Menu extends React.Component {
  items = this.props.menu.map(function(item, index) {
    return <li key={index}>{item}</li>;
  });
  render() {
    return (
      <nav>
        <ul>
          {this.items}
        </ul>
      </nav>
    );
  }
}
```

COMPOSITION

```
class App extends React.Component {
  render() {
    return (
      <div className="container">
        <Menu menu={this.props.menu} />
        <Heading title={this.props.title} />
        <Articles articles={this.props.articles} />
        <Footer footer={this.props.footer} />
      </div>
    );
  }
}
```

LET'S TAKE A CLOSER LOOK



EXERCISE — REUSE COMPONENTS WITH COMPOSITION

KEY OBJECTIVE

- Implement composition in a React app

TYPE OF EXERCISE

- Solo or in pairs

LOCATION

- `starter-code > 5-composition-exercise`

TIMING

20 min

1. Open `CawCaw comp.png` and examine the view you'll be creating.
2. Follow the instructions in script.js to build the `User`, `Content`, `Date`, and `App` components.

REUSE

REUSE

```
class Favorites extends React.Component {
  items = this.props.favorites.map(function(item, index) {
    return <img key={index} src={item.src} />;
  });
  render() {
    return (
      <nav>
        {this.items}
      </nav>
    );
  }
}
```

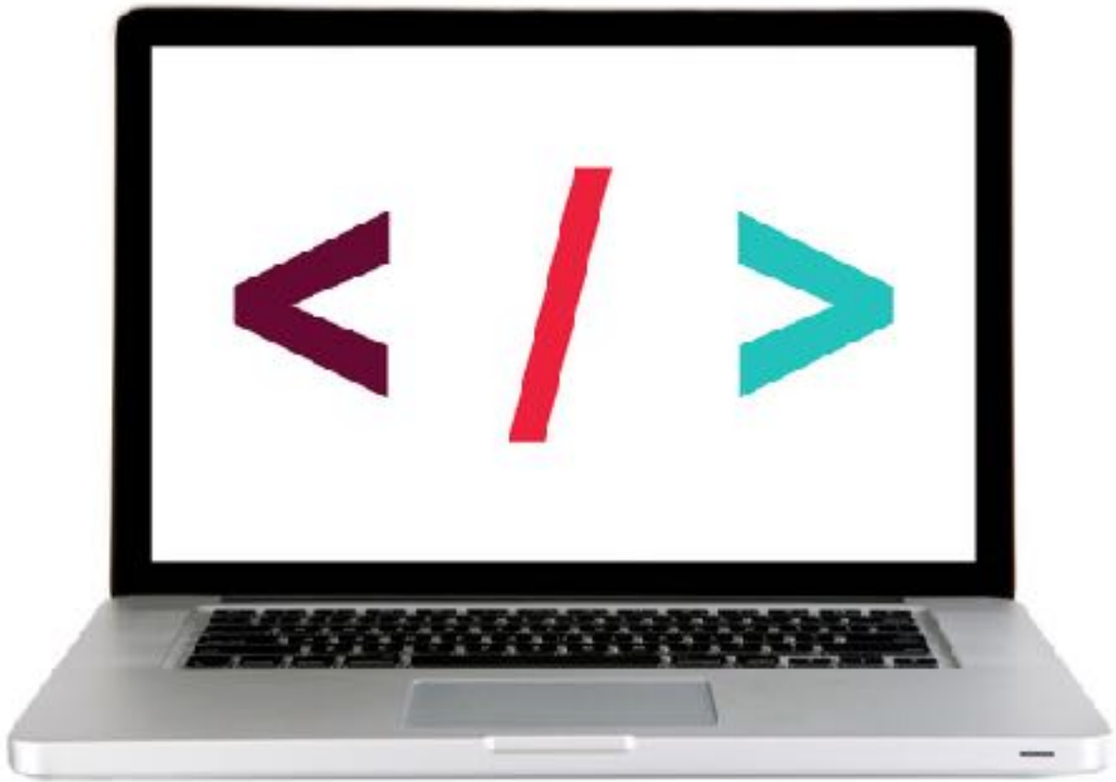
REUSE

```
class Suggestions extends React.Component {
  items = this.props.suggestions.map(function(item, index) {
    return <img key={index} src={item.src} />;
  });
  render() {
    return (
      <nav>
        {this.items}
      </nav>
    );
  }
}
```

REUSE

```
class Gallery extends React.Component {
  items = this.props.image.map(function(item, index) {
    return <img key={index} src={item.src} />;
  });
  render() {
    return (
      <nav>
        {this.items}
      </nav>
    );
  }
}
```

LET'S TAKE A CLOSER LOOK



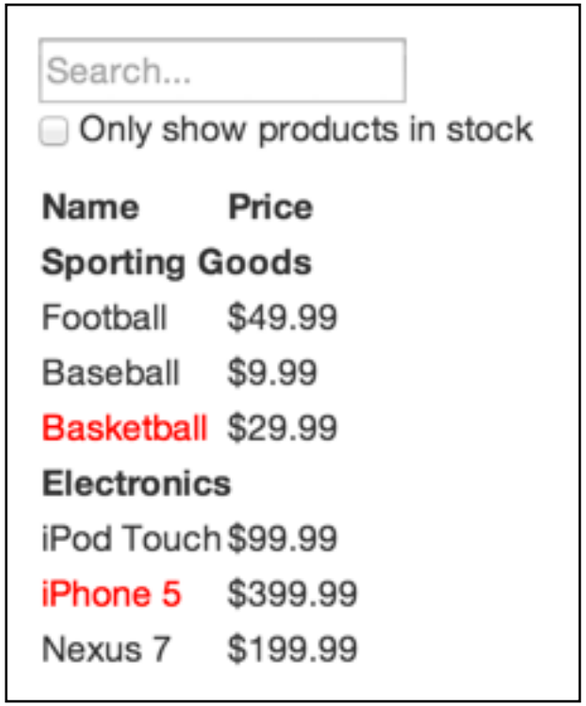
THINKING IN REACT

THINKING IN REACT

Data returned from a JSON API

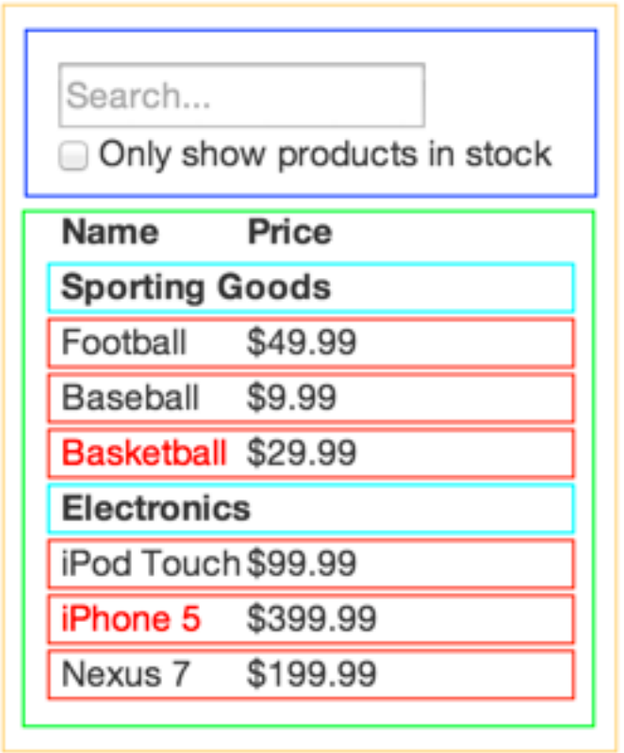
```
[
  {category: "Sporting Goods", price: "$49.99", stocked: true, name: "Football"},
  {category: "Sporting Goods", price: "$9.99", stocked: true, name: "Baseball"},
  {category: "Sporting Goods", price: "$29.99", stocked: false, name: "Basketball"},
  {category: "Electronics", price: "$99.99", stocked: true, name: "iPod Touch"},
  {category: "Electronics", price: "$399.99", stocked: false, name: "iPhone 5"},
  {category: "Electronics", price: "$199.99", stocked: true, name: "Nexus 7"}
];
```

Mock from designer



THINKING IN REACT

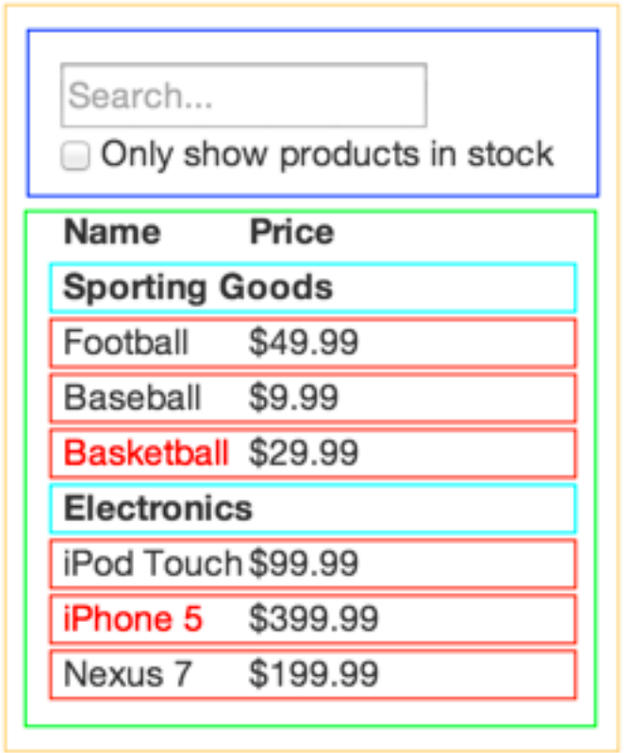
DRAW SOME BOXES



THINKING IN REACT

NAME THE BOXES (SEMANTICALLY!)

- FilterableProductTable
- SearchBar
- ProductTable
- ProductCategoryRow
- ProductRow

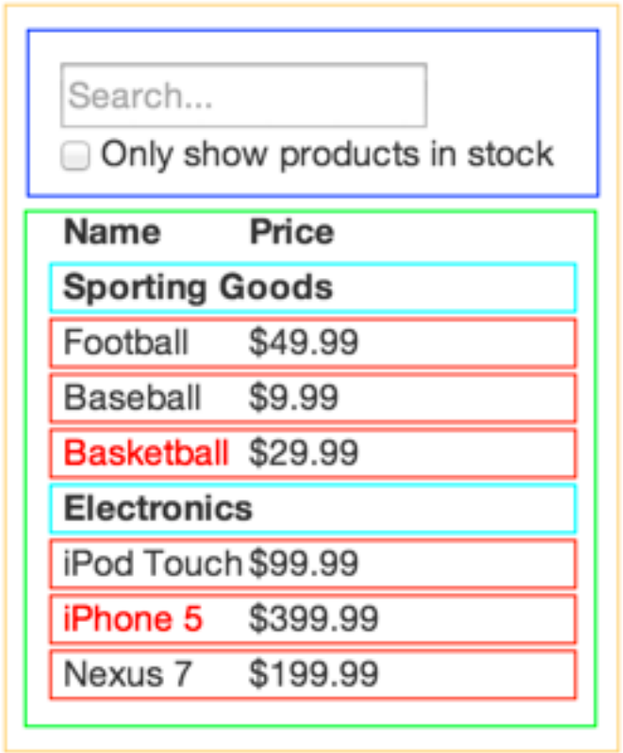


THINKING IN REACT

MAKE A HIERARCHY

components!

- FilterableProductTable
  - SearchBar
  - ProductTable
    - » ProductCategoryRow
    - » ProductRow



EXERCISE

KEY OBJECTIVE

- Create a component hierarchy

TYPE OF EXERCISE

- Individual/pair

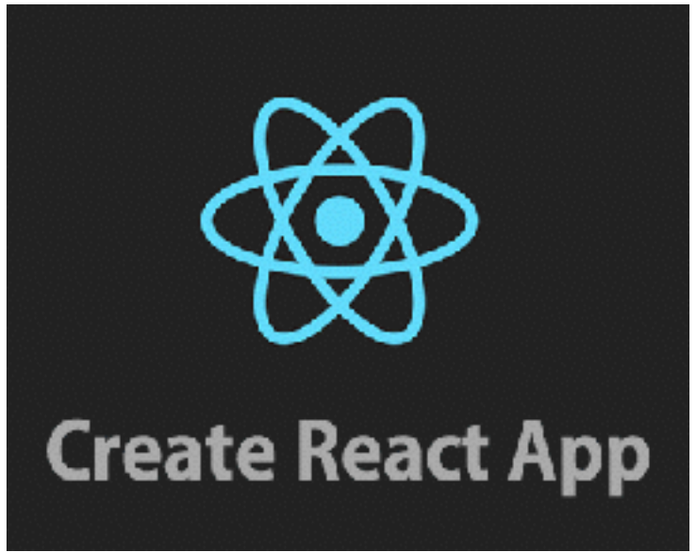
TIMING

10 min

1. Choose a section of your favorite website
2. Write down the component hierarchy (remember the steps: 1. Mock, 2. Boxes, 3. Name, 4. Hierarchy)
3. Don’t forget to use semantic names!

CREATE-REACT-APP

- npm package
- generates files & folder structure



Exit Tickets!

(Class #18)

LEARNING OBJECTIVES - REVIEW

- Understand the roles of model, view, and controller
- Describe the difference between frameworks and libraries
- Recognize the primary uses of React
- Build a React component function
- Create a React component class
- Implement composition & reuse in a React app
- Install & use common React developer tools

Q&A