GENERAL ASSEMBLY

JAVASCRIPT DEVELOPMENT

Sasha Vodnik, Instructor

HELLO!

1. Pull changes from the `svodnik/JS-SF-9-resources` repo to your computer
2. Open the `17-react > starter-code` folder in your editor

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
- Create a component hierarchy
- Build a React component

AGENDA

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

WEEKLY OVERVIEW

WEEK 10	React / Final project lab
WEEK 11	Final project presentations

EXIT TICKET QUESTIONS

1. Can you connect firebase to a domain name that you already own?

Final Project Checkin

ACTIVITY

KEY OBJECTIVE

- Check in on final project

TYPE OF EXERCISE

- Groups of 3

TIMING

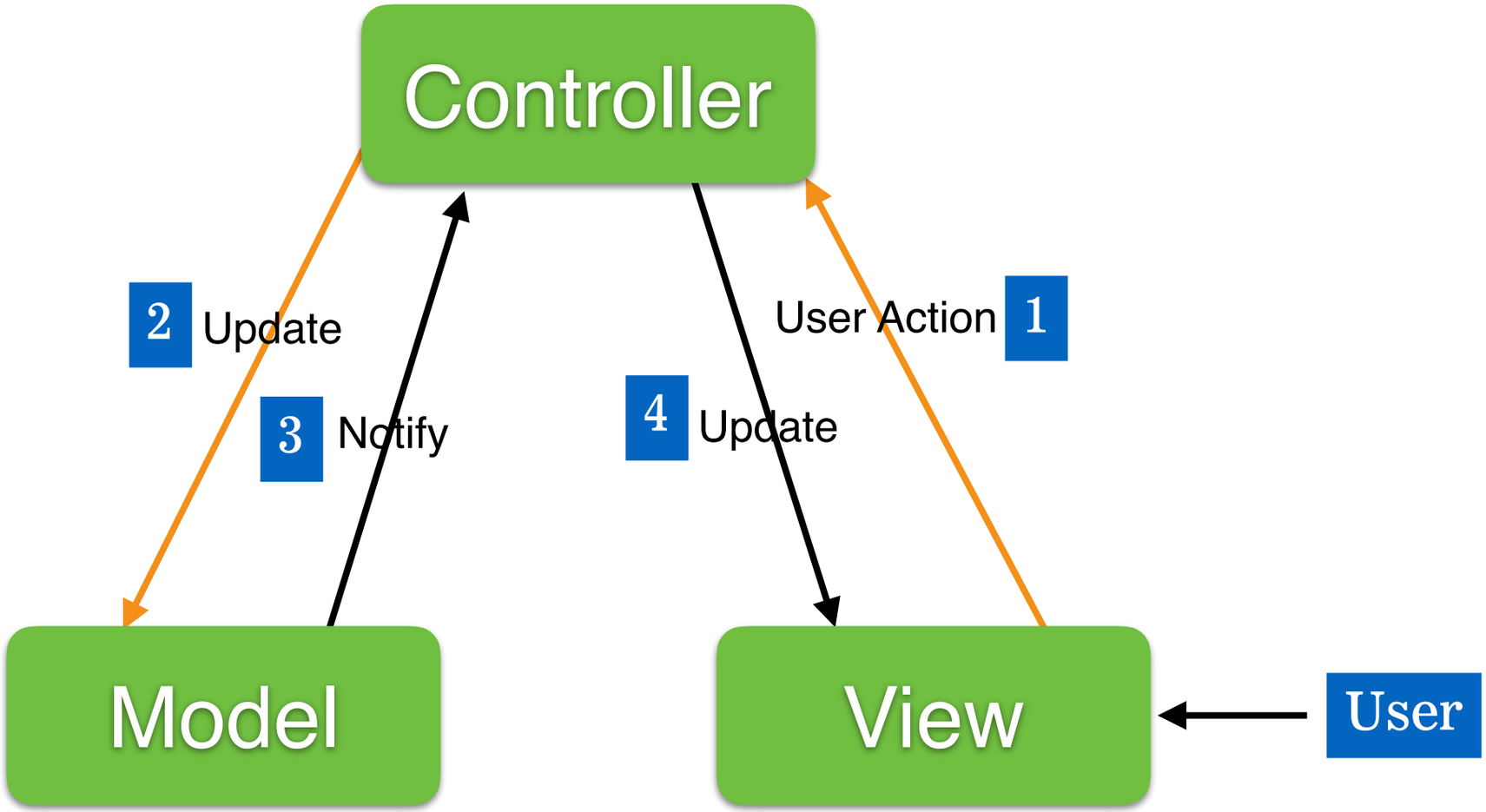
10 min

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.

MODEL-VIEW-CONTROLLER (MVC)

- **Model**: handles data and business logic
- **View**: presents data to user in any supported format and layout
- **Controller**: receives user inputs and calls appropriate resources to carry them out

MODEL-VIEW-CONTROLLER (MVC)

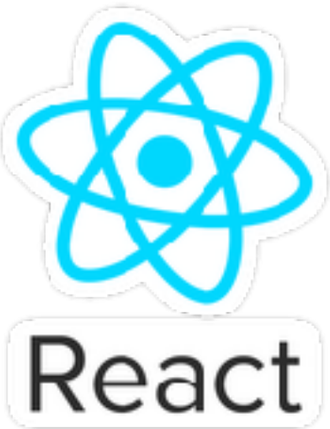


A Library

- Set of predefined functions that your code calls
- Each call performs work and returns a result (and control) to your code
- Specific, well-defined operations
- Example: jQuery

A Framework

- Opinionated architecture for building software
- Control-flow exists, you fill in with your code
- Calls your code; is always in control
- Examples: React, Angular, Vue, Ember



GraphQL

Describe your data

```
type Project {
  name: String
  tagline: String
  contributors: [User]
}
```

Ask for what you want

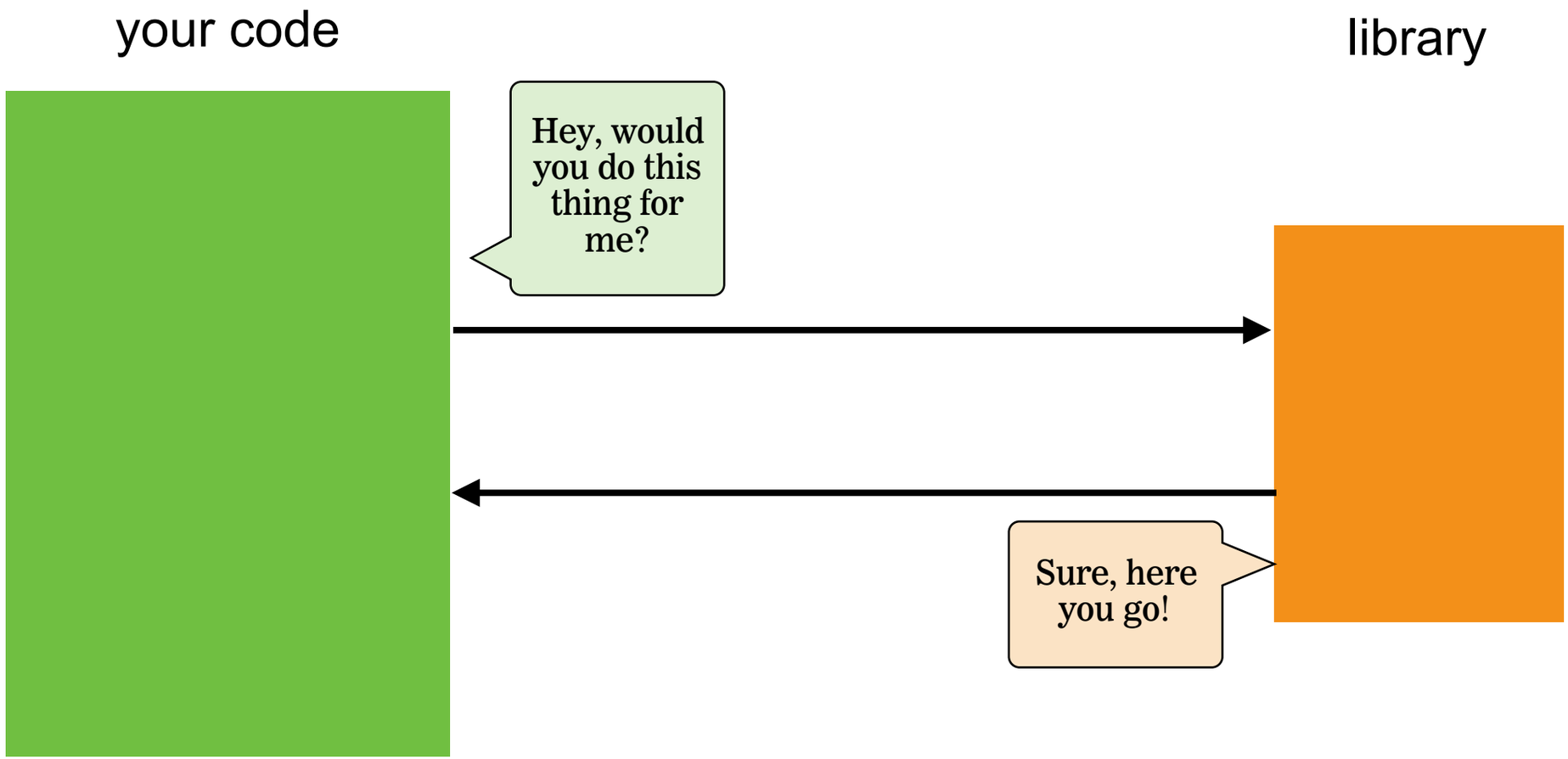
```
{
  project(name: "GraphQL") {
    tagline
  }
}
```

Get predictable results

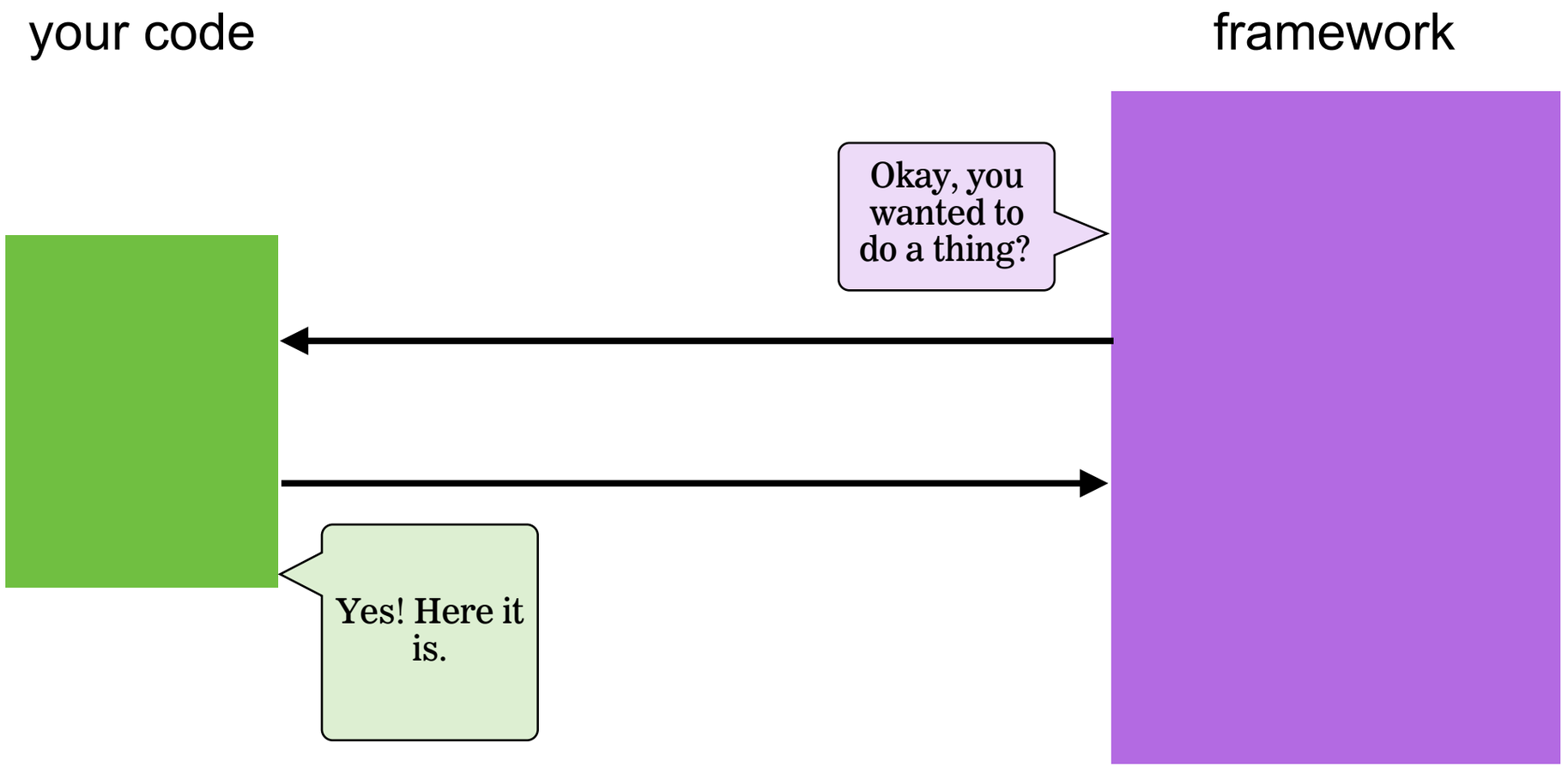
```
{
  "project": {
    "tagline": "A query language for APIs"
  }
}
```


```
function init()
{
    // Initialize
    var gl = initWebGL("example");
    if (!gl) {
        return;
    }

    g.program = simpleSetup(
            gl, "vshader", "fshader",
            [ "vNormal", "vColor", "vPosition"], [ 0, 0, 0, 1 ], 10000);

    // Set some uniform variables for the shaders
    gl.uniform3f(gl.getUniformLocation(g.program, "lightDir"), 0, 0, 1);
    gl.uniform1i(gl.getUniformLocation(g.program, "sampler2d"), 0);

    // Create a box. with the BufferObjects containing the arrays
    // for vertices, normals, texture coords, and indices.
    g.box = makeBox(gl);
```

YOUR CODE CALLS A LIBRARY



A FRAMEWORK CALLS YOUR CODE



WHY USE FRAMEWORKS?

- Standard / well known
  - Dictates a method that cannot be (easily) ignored
- Common problems already solved
  - Cross Browser
  - Accessibility
  - Complexity of state

LIBRARIES

- Target a single problem
- Are usable in any project
- Often consist of a set of independent functions
- Are lightweight

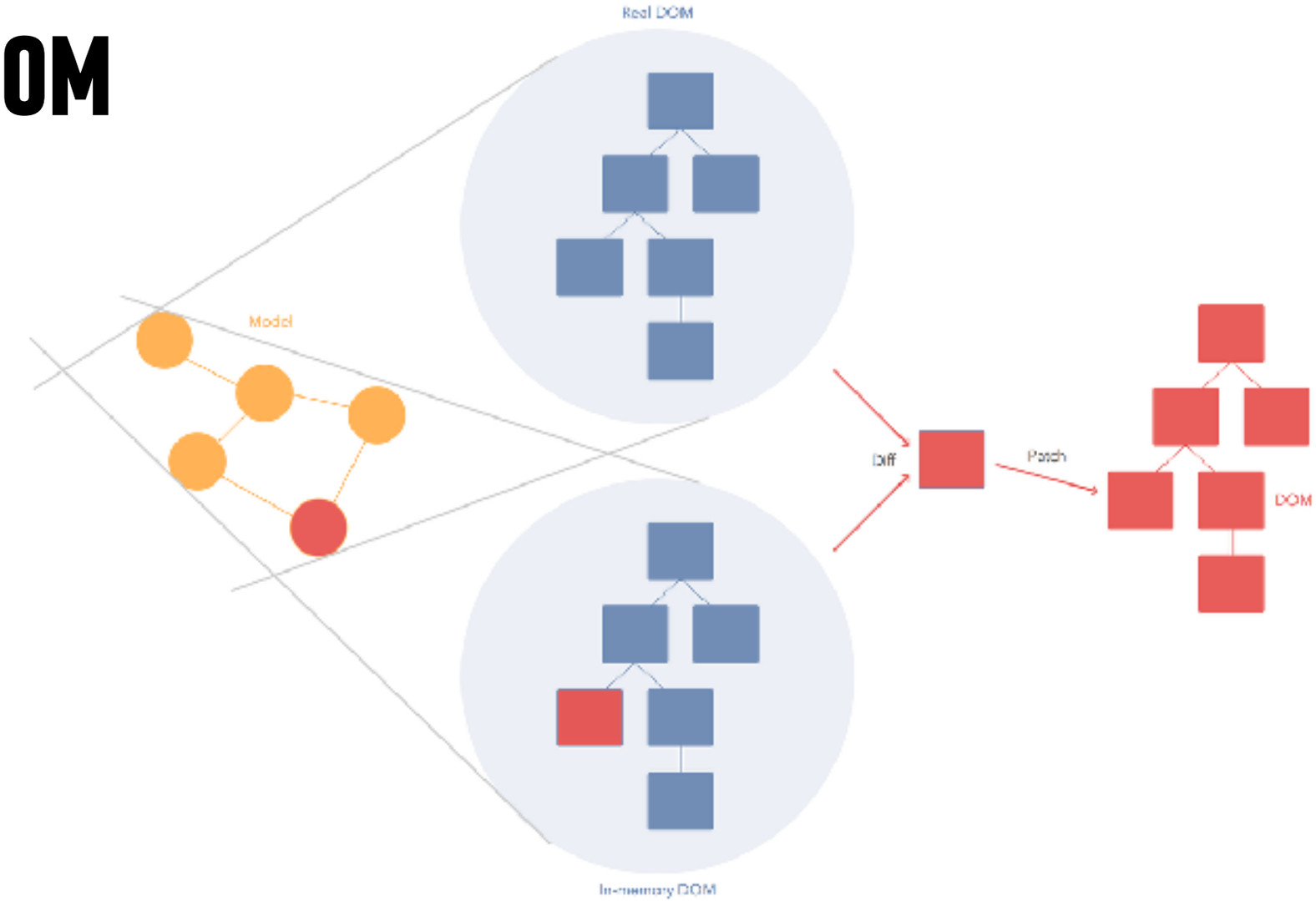
REACT

- somewhere between a framework and a library
  - “a framework that feels like a library”
- It only cares about your views (V from MVC)
- BUT you must do your views the React way

VIRTUAL DOM

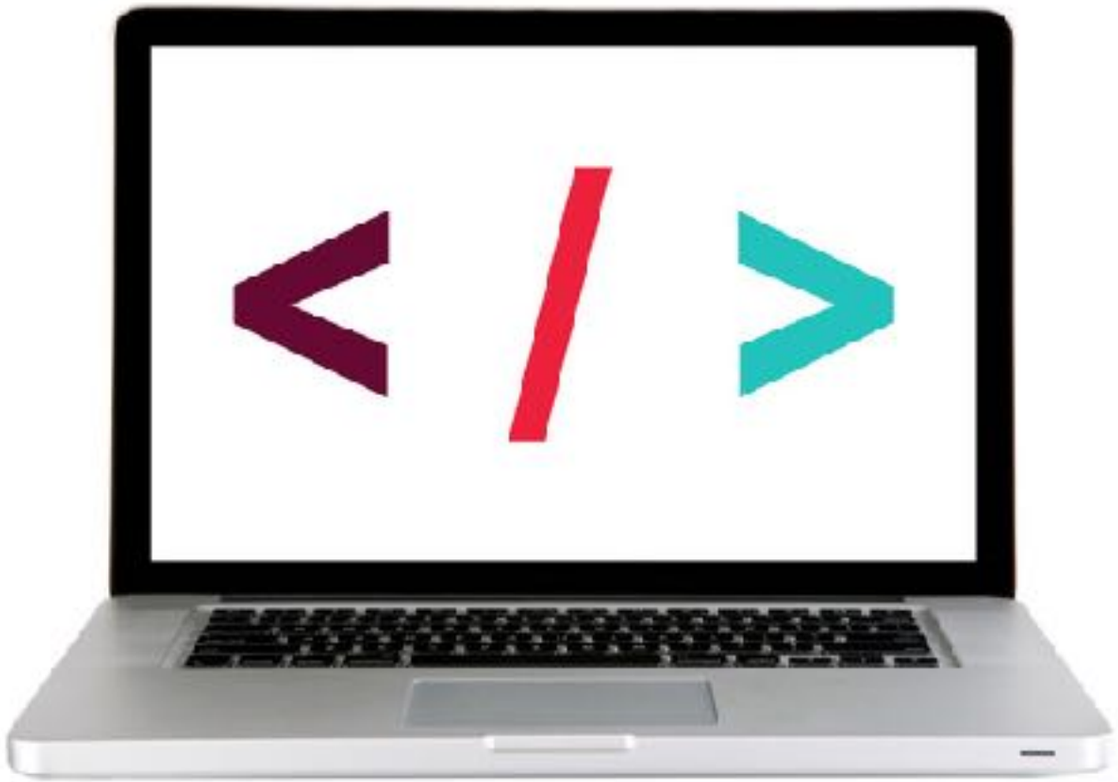
- Tracks changes to DOM without making them immediately
- React changes DOM to match only when necessary
- This is quicker than doing direct DOM manipulation

VIRTUAL DOM

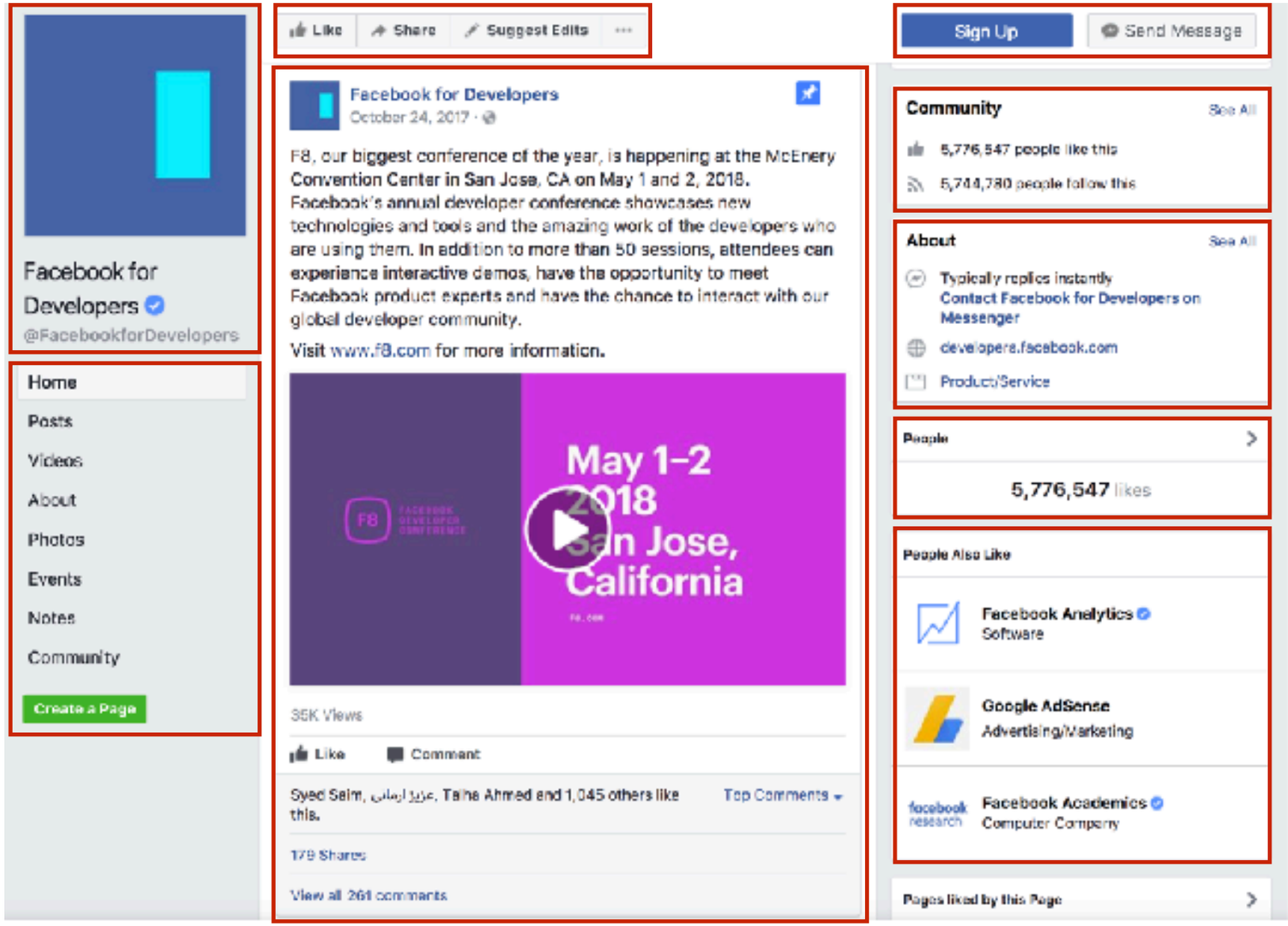


from https://stackoverflow.com/questions/21109361/why-is-reacts-concept-of-virtual-dom-said-to-be-more-performant-than-dirty-mode#23995928

LET'S TAKE A CLOSER LOOK



COMPONENTS


Like
Share
Suggest Edits
Sign Up
Send Message
Facebook for Developers
@FacebookforDevelopers
Home
Posts
Videos
About
Photos
Events
Notes
Community
Create a Page
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
35K Views
Like
Comment
Syed Salm, عزیز ارمان, Talha Ahmed and 1,045 others like this.
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

CREATING REACT COMPONENTS

- Create a component function
  - initial cap in function name
  - `props` is parameter name
- Add a `return` statement to the component function
  - Contents should be JSX
  - Can include JavaScript expressions wrapped in { }

CREATING REACT COMPONENTS

function name has an initial cap

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

CREATING REACT COMPONENTS

standard parameter name is `props`

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

CREATING REACT COMPONENTS

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

function always includes a `return` statement

CREATING REACT COMPONENTS

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

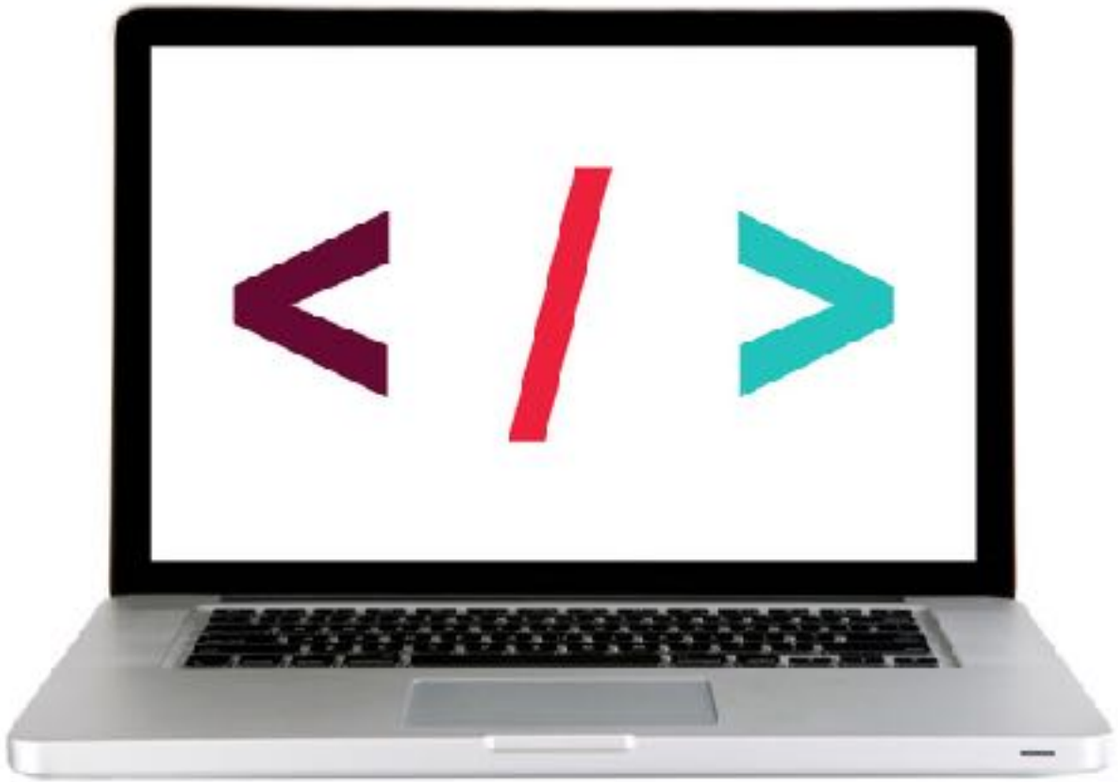
content of the `return` statement is JSX

CREATING REACT COMPONENTS

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

JSX can include JavaScript expressions wrapped in {}

LET'S TAKE A CLOSER LOOK



JSX

- Extension to JavaScript
- Lets you write JavaScript code that looks like HTML (actually XML)
- Compiles to a JavaScript object
- Supports JavaScript expressions in curly braces

ES6 SPREAD OPERATOR

- . . . characters
- lets you specify an object as the parameter of a function, but transforms that argument into key-value pairs at runtime
- essentially setting key-value pairs as HTML attributes in the React code
- only evaluated at runtime, so it's based on the current value of the state at runtime

ES6 SPREAD OPERATOR

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

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

is parsed as

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

LOOPING IN REACT COMPONENTS

- Commonly used for an array of values
- `array.map()` function built into JavaScript
  - accepts a function as an argument
  - loops through the array, executing the specified function with each element as the argument
  - can return a JSX expression to build out an HTML structure based on a set of values

EXERCISE — CREATE REACT COMPONENTS

KEY OBJECTIVE

- Build a React component

TYPE OF EXERCISE

- Solo or in pairs

LOCATION

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

TIMING

10 min

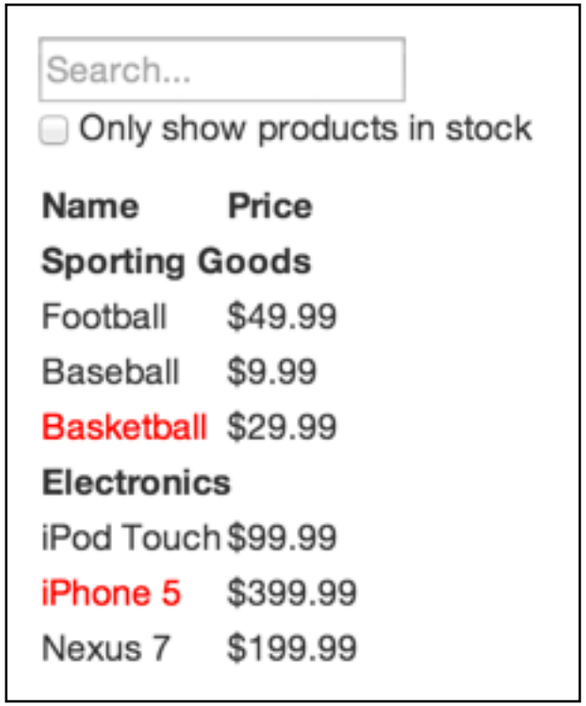
1. The start file contains the components we've already been working with, along with additional data in the state variable.
2. Create variables storing references to the two new elements in the DOM.
3. Create components to render the contents of the new state properties.
4. Call the render method for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

THINKING IN REACT

Data returned from a JSON API

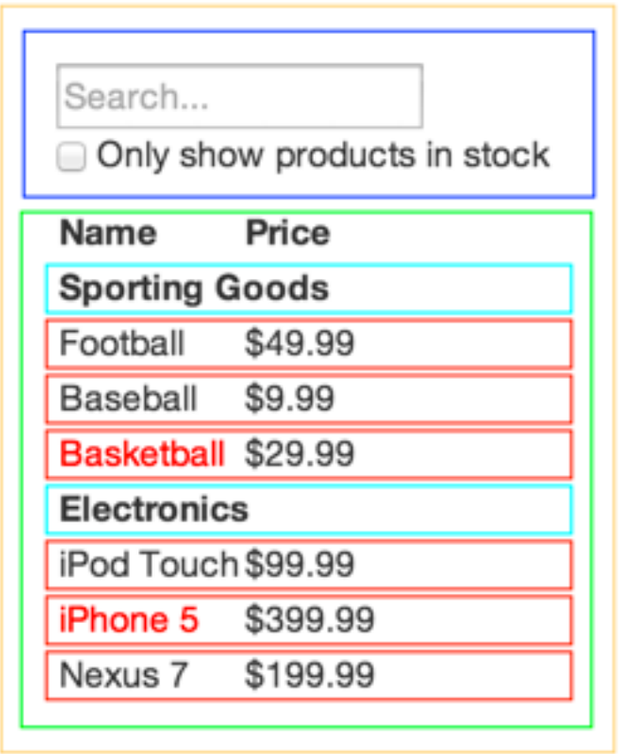
```
[
  {category: "Sporting Goods", price: "$49.99", stocked: true, name: "Football"},
  {category: "Sporting Goods", price: "$9.99", stocked: true, name: "Baseball"},
  {category: "Sporting Goods", price: "$29.99", stocked: false, name: "Basketball"},
  {category: "Electronics", price: "$99.99", stocked: 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

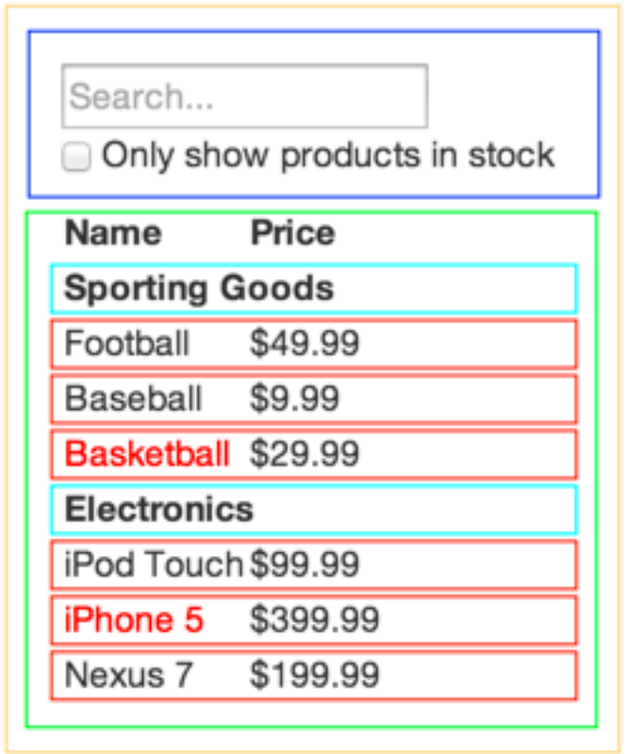
DRAW SOME BOXES



THINKING IN REACT

NAME THE BOXES (SEMANTICALLY!)

- FilterableProductTable
- SearchBar
- ProductTable
- ProductCategoryRow
- ProductRow

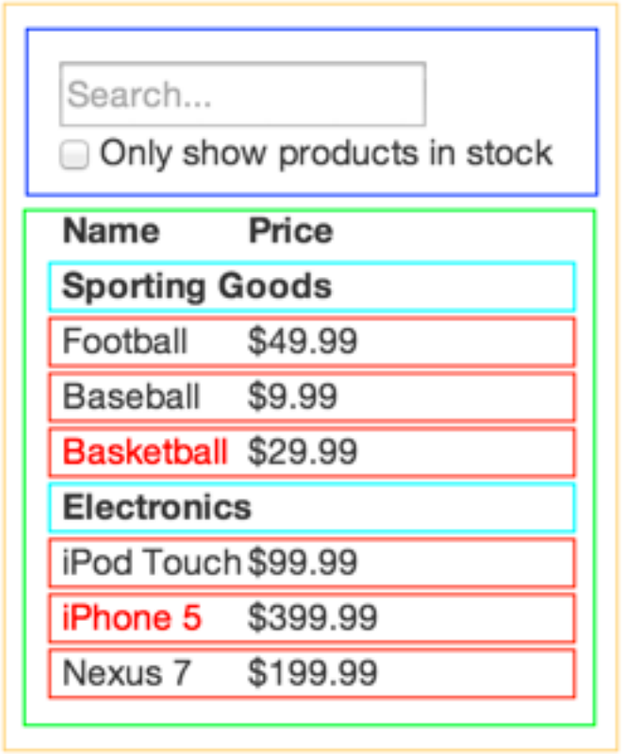


THINKING IN REACT

MAKE A HIERARCHY

components!

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



EXERCISE

KEY OBJECTIVE

- Create a component hierarchy

TYPE OF EXERCISE

- Individual/pair

TIMING

7 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!

BUILDING A PROJECT WITH NODE/NPM

package.json

```
{
  "name": "2-react-workshop",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "start": "http-server lib"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "devDependencies": {
    "http-server": "^0.11.1"
  }
}
```

BUILDING A PROJECT WITH NODE/NPM

`lib` folder

REACT LAB

- Created by Jess Telford, a GA JSD instructor in Australia

https://github.com/svodnik/react-workshop

Exit Tickets!

(Class #17)

LEARNING OBJECTIVES - REVIEW

- Understand the roles of model, view, and controller
- Describe the difference between frameworks and libraries
- Recognize the primary uses of React
- Create a component hierarchy
- Build a React component

NEXT CLASS PREVIEW

Final project lab

- All of next class will be lab time for you to work on your final project.
- Larissa and I will be available during class if you want to think through challenges together. (Your classmates will, too!)

Q&A