Attendance

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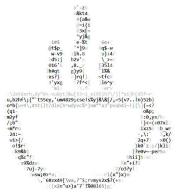

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Software Saturdays

Spring 2023 - Lesson 2

JavaScript

Review of the Beginner Track

- 5 Lessons
  - HTML/CSS
  - JavaScript
  - JSX and Intro to ReactJS
  - More ReactJS
  - APIs and ReactJS
- 2 Project Days

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Help Available

- Recordings
  - Every Sunday
- Weekly Office Hours
  - T/TH 4:30 - 5:30
- Slack Channels
  - Every Day

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Before We Begin

All attendees will be registered on Brightspace

Join the Software Saturdays Slack!
https://softwaresaturdays.slack.com

1. #announcements
2. #general-discussion
3. #spring-2022-reactjs

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Before We Begin

- Please have a text editor to open and edit code files
  - If you do not have one, Visual Studio Code is a good choice
  - https://code.visualstudio.com/download
- Demo files and examples are on GitHub
  - https://github.com/SoftwareSaturdays/2022-Spring-ReactJS

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Before We Begin

- We need to install NodeJS and NPM
  - https://nodejs.org/en/download/
- NodeJS is a very customizable JavaScript toolbox
- NPM is a JavaScript package installer

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Git/Github

- Code examples and templates on Git/Github
- Easiest way to handle this is to use Github Desktop
- Download from: https://desktop.github.com/
- Access all of the demos and checkpoints locally
- If you are having trouble setting up Git/Github Desktop, message us on Slack or come to Office Hours

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Part 1: JavaScript

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Pulling the demos

- From Github Desktop
  - Click Add Repository -> Clone Repository -> URL
  - Paste this link: https://github.com/SoftwareSaturdays/2023-Spring-ReactJS.git
  - Switch to the “lesson2-template” branch
  - Repository -> Open with Visual Studio Code
- From the command line:

```
git clone https://github.com/SoftwareSaturdays/2023-Spring-ReactJS.git
git checkout lesson2-template
```

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What is JavaScript?

- JavaScript is a high-level programming language to create dynamic web pages
- JavaScript can be used in an HTML page
- JavaScript has similarities to Python and C

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Basic JavaScript Syntax

- `var`
  - Defines a basic variable
- `let`
  - Defines a basic variable
- `function`
  - Defines the start of a function
- `document`
  - Refers to the HTML web page

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Basic JavaScript syntax

- `if`
  - Defines an if statement
- `else`
  - Defines an else statement
- `for`
  - Defines a for loop
- `while`
  - Defines a while loop

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JavaScript math operators

- `+` : Addition
- `-` : Subtraction
- `*` : Multiplication
- `/` : Division
- `%` : Modulus
- `**` : Exponents

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JavaScript Comparison operators

- `<` : Less than
- `<=` : Less than or equal to
- `>` : Greater than
- `>=` : Greater than or equal to
- `==` : Equal to
- `!=` : Not equal to
- `===` : Strict equal to
- `!==` : Strict not equal to

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Adding JavaScript to HTML

- To add a JavaScript file to an HTML file, use a `<script></script>` tag
  - `<script src="script.js"></script>`

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Demo Program #1

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Variables: let vs var

- Never use `var`!
- let has safety precautions and protections
- We will from now on always use `let`

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Types of Equality

- Using == allows JavaScript to convert the type before comparing
- Using === will not allow any conversions before comparing

https://dorey.github.io/JavaScript-Equality-Table/

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Types of Equality

- Some bad situations can occur if you are not careful
  - `'12' == 12` -> true
  - `'12' === 12` -> false
  - `1 == true` -> true
  - `1 === true` -> false

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JavaScript Functions

- Functions can have parameters and return values
- Parameters can change the result of a program
- Return values can return data from the function

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Demo Program #2

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Checkpoint #1

Try writing the FizzBuzz program in your editor

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Checkpoint #1 - FizzBuzz

- Write a function that prints the numbers from 1 to 100. But for multiples of three print “Fizz” instead of the number, and for the multiples of five print “Buzz”. For numbers which are multiples of both three and five print “FizzBuzz”.

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JavaScript Arrays

- Arrays in JavaScript are defined with square brackets
  - [1, 2, -5, 0.56, true]
- Arrays can hold any type and quantity of data
- Arrays are zero-indexed
- The first element is in index 0

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Demo Program #3

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JavaScript Objects

- One of the most popular data transfer formats on the web is JSON
- JSON is JavaScript Object Notation
  - We will use this later on!
- JavaScript objects are like fancy arrays or Python dictionaries

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JavaScript Objects

- JavaScript objects use a key:value pair
- Use the key to reference the stored data
- Values can be any data type
  - You can even use arrays or another object

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Demo Program #4

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Checkpoint #2

Create a ‘dealership’ using arrays and objects

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Part 2: Responsiveness

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Modifying HTML and CSS

- We can modify HTML and CSS from JavaScript using the document word we discussed earlier
- We will not spend a lot of time on this section as ReactJS does it for us

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Referring to HTML elements

- Remember class and id fields from last week?
- We can use them to reference an element or group of elements in JavaScript

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Methods to change HTML

- `document.getElementByID()`
  - Finds and returns the element with a certain ID
- `document.getElementsByClassName()`
  - Finds and returns an array with all elements with a certain class name

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Event Handlers

- Adding onclick to an HTML button will make the button run some JavaScript function when it is clicked

```
<button onclick="someFunction()">Text</button>
```

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Demo Program #5

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Other Resources: JavaScript

- We only went over the basics, but JavaScript is a powerful language
- Other things include lambdas, async functions, and GET requests
- Link below has more in depth reference

https://www.w3schools.com/js/

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Checkpoint #3

Modify the FizzBuzz program to add to the web page

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Thanks for coming!

Please give us some feedback!

https://purdue.ca1.qualtrics.com/jfe/form/SV_095OhPyXsSNWvLU

- Any Questions?
  - Open review hours on Wednesdays, 6pm to 7pm
  - Ask a mentor during the meeting or on Slack

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