CSE 331
Software Design & Implementation

Spring 2021
Section 8 – HW8: JavaScript
Administtrivia

• HW7 due tonight!

• Thanksgiving break
  – No class (and OH) Wednesday, Thursday, and Friday

• HW8 due Thursday, 12/2
  – Will be introduced in class on Monday

• Any questions?
Agenda

• HTML + JS Practice

• HW7 Office Hours
What's difference between Java and JavaScript?

Jay Prakash
It is like "car and carpet".

Faisal
It's like "moon and honeymoon".
Reminder:

**Anatomy of a Tag**

```html
<p id="firstParagraph"> Some Text </p>
```

- **Element**
- **Tag Name**
- **Attribute Name**
- **Attribute Value**
- **Content**
- **Closing Tag**
Example 1:

Button Alerts

- `<script type="text/javascript">` tag: allows us to include Javascript inside an HTML file

- How do we write a function to alert the user?

- How do we call that function when a button is clicked?
<html>
  <head>
    <title>1. HTML5 Buttons</title>
  </head>
  <body>
    <script type="text/javascript">
      function drawSomething() {
        alert(“Hello, World!”);
      }
    </script>
    <button onclick="sayHello()">Click Me!</button>
  </body>
</html>
CANVAS
Example 2:
Drawing on a Canvas

- `<canvas>` tag: creates a blank drawing surface that you can “draw” on with JS
  - Create lines, shapes, draw images.
  - Has `width` and `height` attributes to determine the size of the drawing surface.
- We will be using `<canvas>` in HW8 and HW9 to draw lines/paths on top of images (like a map of campus!)
- Javascript is going to need some kind of Canvas object in order to call functions and draw pictures.
  - How do we get this object?
Modifying HTML with JS

• JS exists to allow webpages (meaning the HTML inside them) to change dynamically. So JS has to have a way to access/change the HTML tags.

• Implementation: Every HTML element has an associated JS object that the browser maintains.
  – Can get a reference in JS by using the “id” attribute.
  – Every tag can have an ID - value is a string that uniquely identifies an element.

HTML:

```html
<p id="thePar">Hello, World!</p>
```

JS:

```javascript
let parObj = document.getElementById("thePar");
parObj.innerHTML = "Hello, 331!";
```
Example 2 Code

```html
<html>
<head>
    <title>2. HTML5 Canvas</title>
</head>
<body>
    <script type="text/javascript">
        function drawSomething() {
            let canvas = document.getElementById("theCanvas");
            let context = canvas.getContext("2d");
            context.fillStyle = "teal";
            context.fillRect(50, 50, 150, 100);
        }
    </script>
    <button onclick="drawSomething()">Draw Something Cool</button>
    <br />
    <canvas id="theCanvas" width="500" height="500"></canvas>
</body>
</html>
```
Example 3: Factoring Out Javascript

• If we want to do a lot, that’s a lot of Javascript to have embedded in our HTML file!
  • Can we move it?

• Script tags can take a src attribute
Example 3 Code

3-html-draw-factored.html

```html
<html>
<head>
    <title>2. HTML5 Canvas</title>
</head>
<body>
    <button onclick="drawSomething()">Draw Something Cool</button>
    <canvas id="theCanvas" width="500" height="500"></canvas>
</body>
</html>
```

3-js-draw-factored.js

```javascript
function drawSomething() {
    let canvas = document.getElementById("theCanvas");
    let context = canvas.getContext("2d");
    context.fillStyle = "teal";
    context.fillRect(50, 50, 150, 100);
}
```
Office Hours

• Rest of class is reserved for office hours
  – Any questions?
    • Dijkstra’s, generics, etc.