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Peckham DAZ

Week 3 - Accessible Web Development

Date 15/07/24

Hello!

Dan Hearn (he/him)

@dhearn97

- Studying MSc Creative Computing here at the CCI
- Background in UX/UI Design and Front-end Web Development
- Interested in signal processing for audio and visuals, and the intersection between the physical and digital.

Week 3 Agenda

Lecture (1hr)

- Recap front-end web languages *(30 mins)*
- Inclusive web design & accessible websites *(15 mins)*
- Coding accessible websites *(15 mins)*

Break (20 mins)

Labs in groups

- Coding practice and challenges
- Making a webpage more accessible
- Optional exercises

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Recap

HTML, CSS, JavaScript

Front-end web languages

Front-end Web Languages

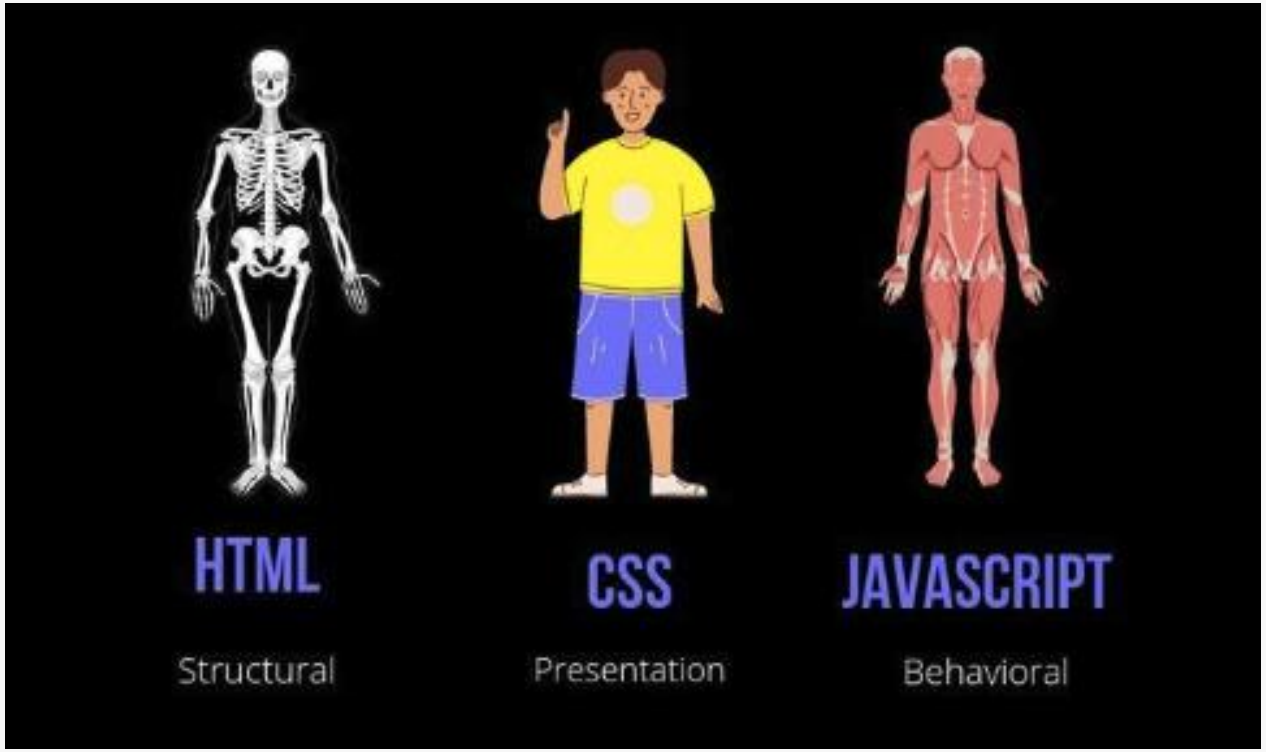
Front-end refers to the visible user interface that a user interacts with.

It’s made up of 3 languages:

HTML: The structure and layout of a page

CSS: The styling and look of a page

JAVASCRIPT: The functionality of a page

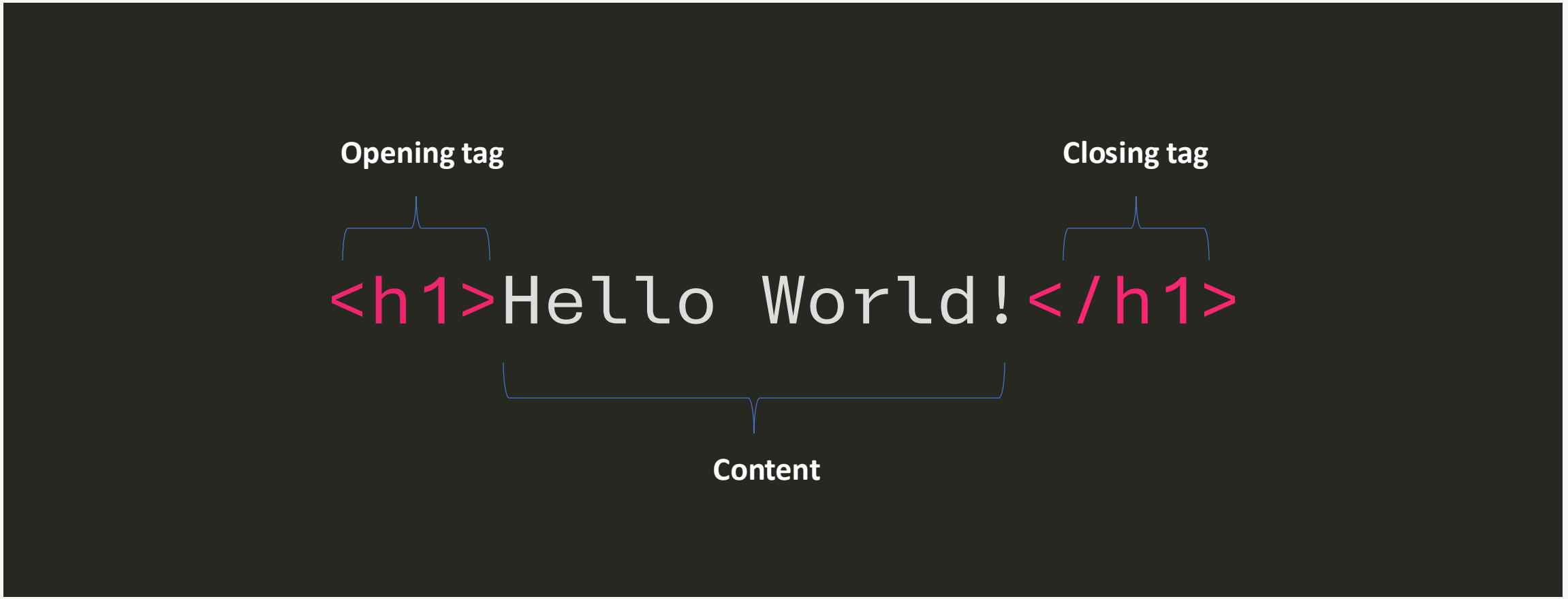


Hyper Text Markup Language (HTML)

- Describes the structure and meaning of a webpage
- Made up of tags (also called elements)
- Denotes text and images/video
- Can be manipulated by CSS and JavaScript
- It forms the foundation of the DOM (Document Object Model)

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-
scale=1.0">
  <title> This is the tab title in your browser </title>
</head>
<body>
  Everything inside here gets rendered in your browser!
</body>
</html>
```

Tags/Elements



Tags...

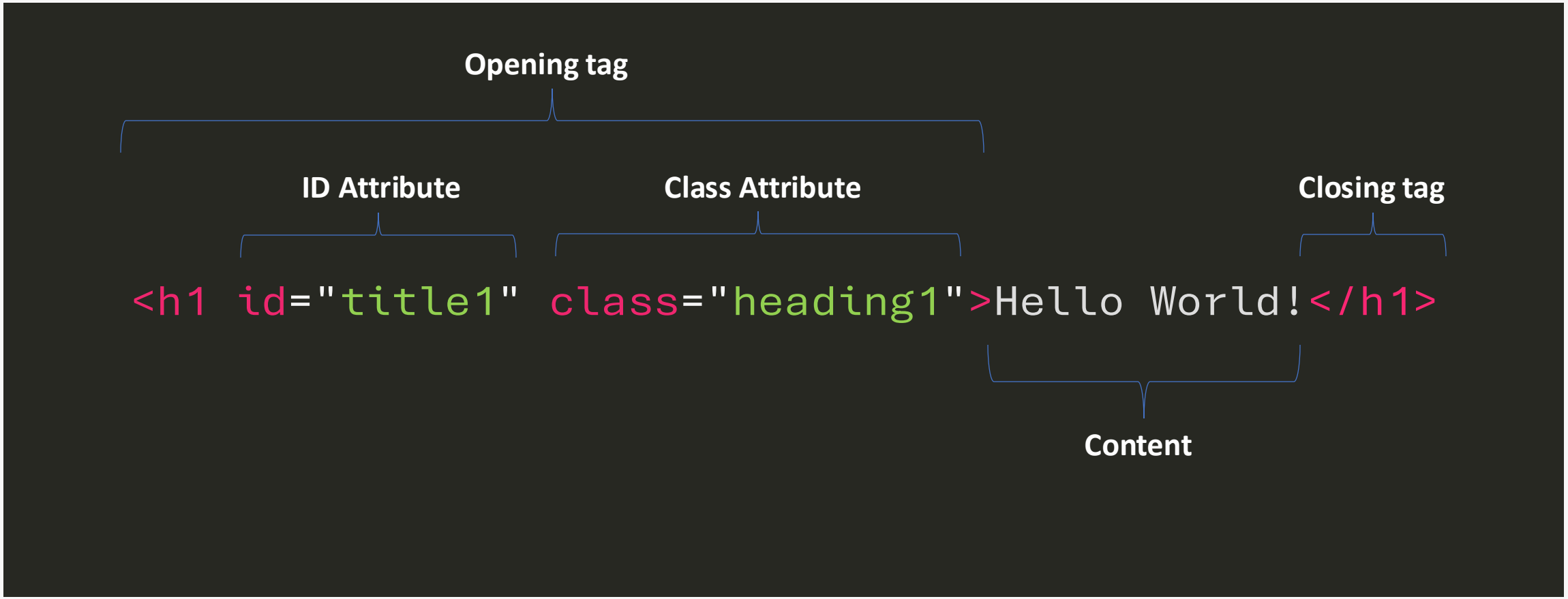
There are loads! We'll mainly be using these...

- Heading `<h1></h1>…<h6></h6>`
- Paragraph `<p></p>`
- Div `<div></div>`
- Button `<button></button>`
- Form `<form></form>`
- Inputs `<input></input>`
- Input label `<label></label>`
- Anchors (page links) `<a></a>`
- Image `<img>`
- Script `<script></script>`
- Option `<option></option>`
- Select `<select></select>`
- Textarea `<textarea></textarea>`
- Link (Stylesheet) `<link>`
- Unordered List `<ul></ul>`
- List Items `<li></li>`

HTML Tag Cheatsheet!

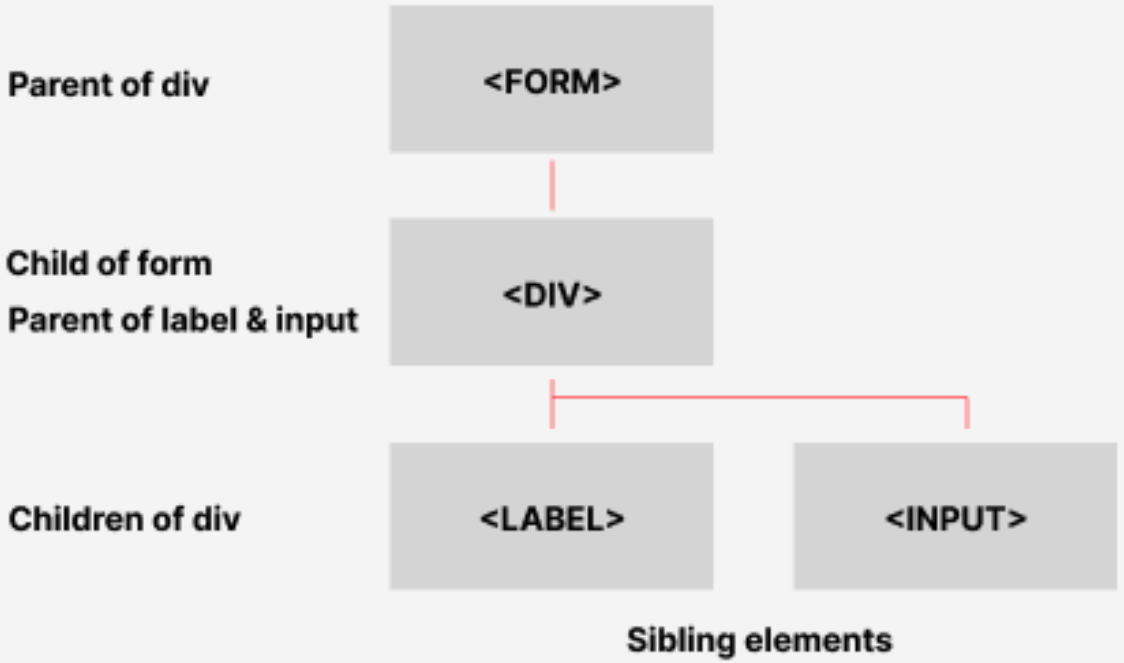
HTML Attributes

List of Attributes



Parent/child Relationship...

…Forms the DOM Family Tree

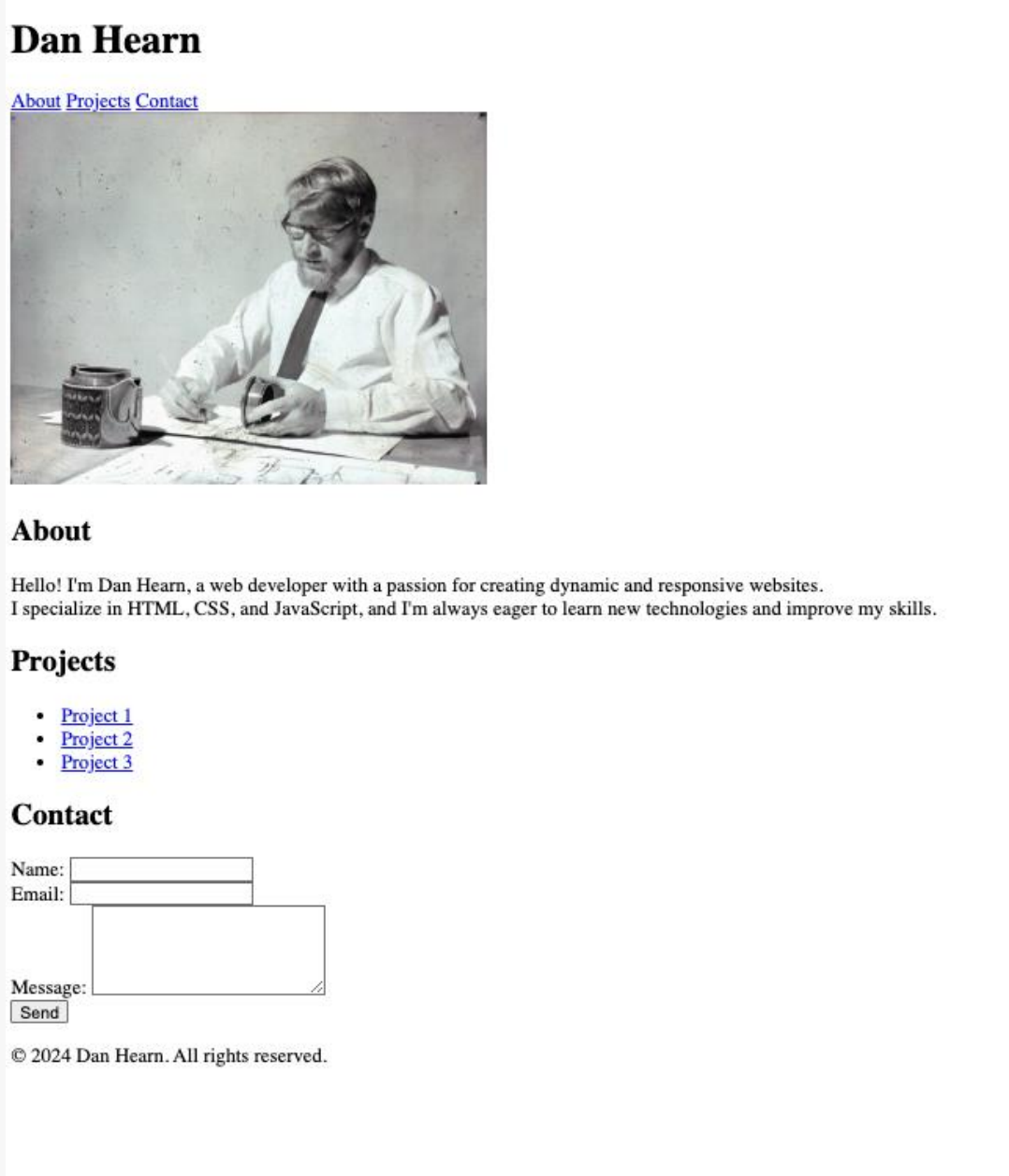


Back to the 90's...

This is a raw HTML website. No CSS or Javascript has been used.

- Notice how the browser applies some default styles to certain elements.
- **What HTML Tags do you think make up this page?**

[My 90's style portfolio]



Cascading Stylesheets (CSS)

- A stylesheet language used to style HTML elements
- Can add some basic functionality to a webpage
- Used to create the 'branding style' of your webpage
- Can be used to improve accessibility and user experience.

```
button {
  background-color: #4CAF50;
  border: none;
  color: white;
}
```

CSS Selectors

Selectors allow you to target specific HTML tags to style them.

Core selectors:

- All selector: * {}
- Tag selectors: button {}
- ID selectors: #id-name {}
- Class selectors: .class-name {}

List of other selectors

```css
/* All Selector */
* {
  font-family: 'Courier New', Courier, monospace;
}
/* HTML Tag selector */
button {
  background-color: #4CAF50;
  color: white;
}
/* ID selector */
#submit-btn {
  border: 1px solid #000;
  padding: 10px;
}
/* Class Selector */
.button {
  font-size: 16px;
  cursor: pointer;
}
```

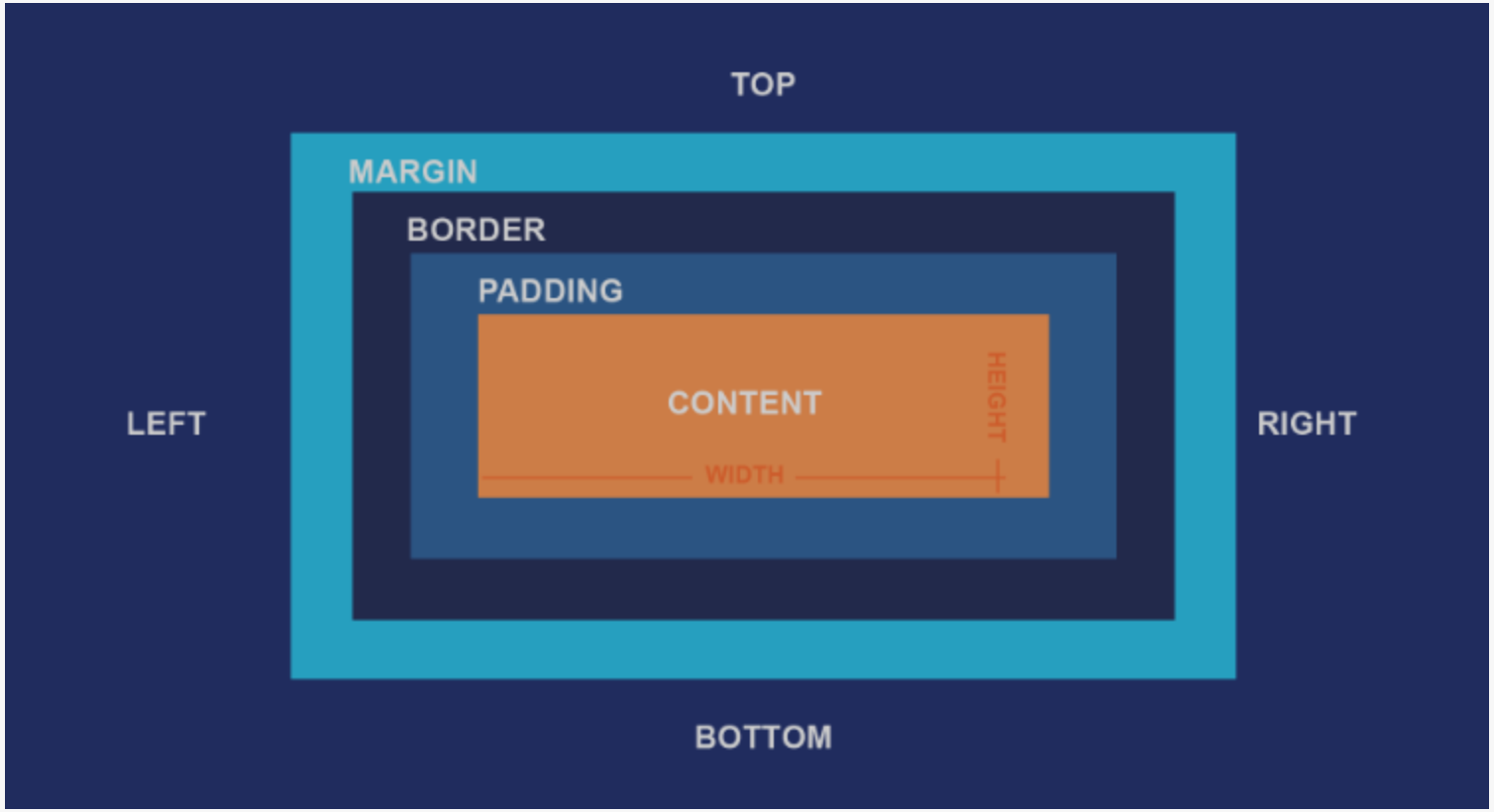
CSS Properties

- CSS properties specify how HTML elements should be displayed
- manage the positioning and spacing of elements on a webpage
- They allow for customisation of colors, fonts, and backgrounds
- Properties can change styles dynamically, improving user experience and accessibility

There are hundreds of CSS properties

```
button {
  background-color: #4CAF50;
  border: none;
  color: white;
  padding: 15px 32px;
  text-align: center;
  text-decoration: none;
  display: inline-block;
  font-size: 16px;
  margin: 4px 2px;
  cursor: pointer;
  border-radius: 8px;
  transition-duration: 0.4s;
}
```

Properties - Box Model



Use inspector tools to help understand this

Cascade, Specificity, and Inheritance

- **Cascade** refers to how a CSS file is read from top to bottom. If there are two identical selectors with different properties, the second selector will override the properties of the first.
- Some selectors are more **specific** than others - meaning that some can override others.
- Some properties are **inherited** from parent elements

Specificity Values

`h1` = 1

`.heading-1` = 10

`#title` = 100

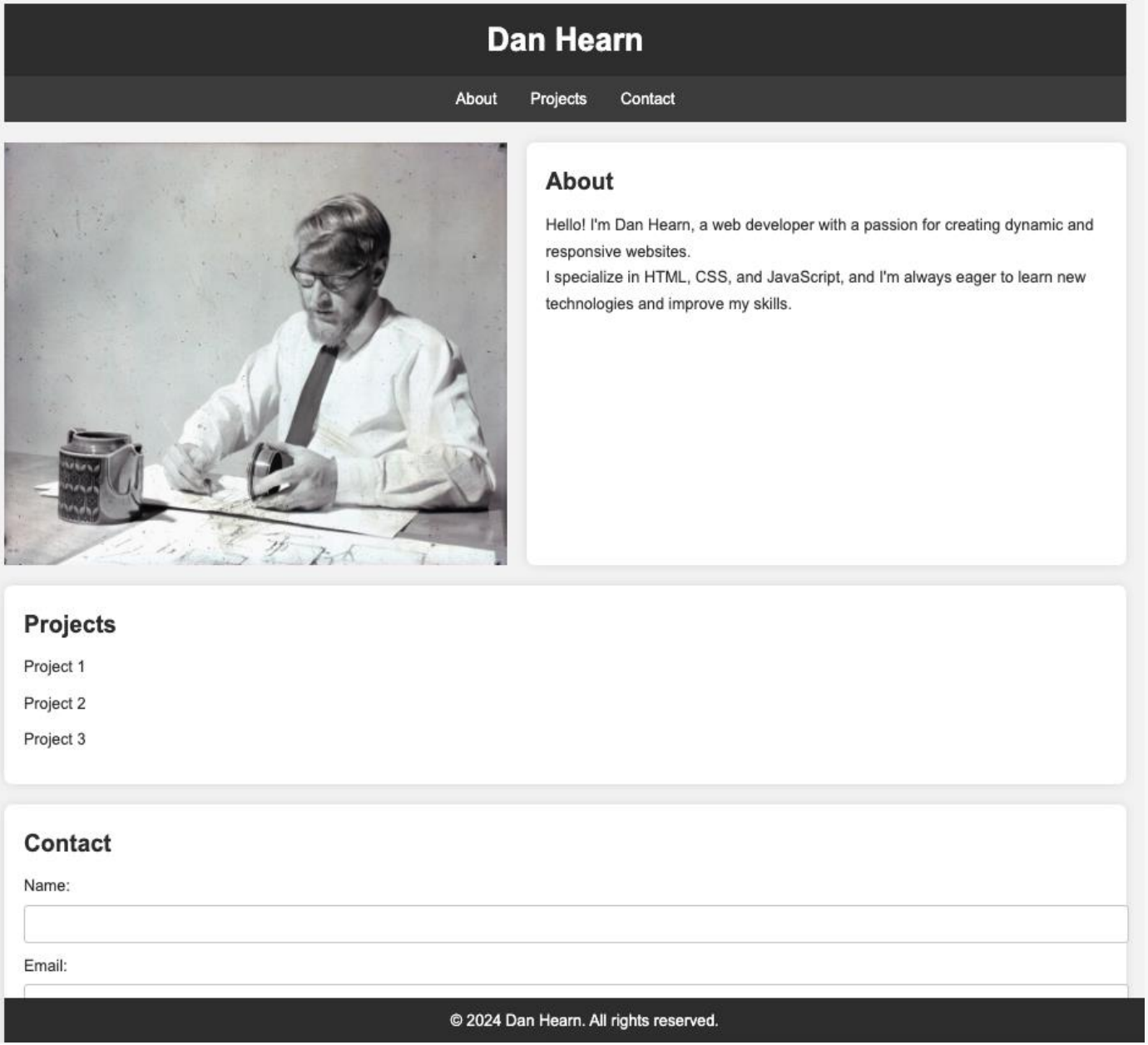
```
/* What's the specificity value? */
 button.btn-class#button1 {

 }
```

HTML & CSS

- CSS can target HTML elements with selectors
- CSS applies styling and functionality to HTML elements through properties

[My portfolio with CSS]



JavaScript (JS)

- A scripting language that adds functionality to a webpage
- Can be used to manipulate the DOM, HTML, and CSS
- Allows us to create a dynamic webpage which improves accessibility and user experience

```
const button = document.getElementById('button1');

function handleClick() {
  console.log('Hello, world!');
}

button.addEventListener('click', handleClick);
```

Variables

- Variables are containers for pieces of data - numbers, strings etc
- Must start with a letter, underscore (_) , or dollar sign ($)
- Declared using **var**, **let**, and **const.**
- **Const** cannot be edited once declared, but **var** and **let** can change throughout your program.

```
let name = "John"; // let keyword
const age = 30; // const keyword (constant value)
var isMarried = false; // var keyword
(global/function scope)
```

Scope

- **Global scope:** vairables that can be accessed from anywhere in the program
- **Function scope**: variables that can be used within a function
- **Block variables:** variables that can be used within a code block

```
// Global Scope
var globalVar = "I am global";

function testScope() {
  // Function Scope
  var functionVar = "I am inside a function";

  if (true) {
    // Block Scope
    let blockVar = "I am inside a block";
    console.log(blockVar); // Accessible here
  }
// console.log(blockVar); // Error: blockVar is not defined
}

testScope();

// console.log(functionVar); // Error: functionVar is not defined
console.log(globalVar); // Accessible here
```

Core Datatypes

- **Boolean**
- **String**
- **Number (Integers & floating points)**
- **Array**
- **Object**
- Undefined
- Null

```
let stringVar = "This is a string"; // String
let numberVar = 42; // Number
let booleanVar = true; // Boolean
let nullVar = null; // Null
let undefinedVar; // Undefined
let objectVar = { key: "value" }; // Object
let arrayVar = [1, 2, 3, 4, 5]; // Array
```

Operators

Arithmetic

Addition(+), Subraction(-), Multiplication(*), Division(/)

Comparison

Equal to (==), Not equal to(!=), Strict equal to(===), Greater than(>), Less than (<)

Logical

AND(&&), OR(||), NOT (!)

```
let a = 10;
let b = 5;
let add = a + b; // Addition
let subtract = a - b; // Subtraction
let multiply = a * b; // Multiplication
let divide = a / b; // Division
let remainder = a % b; // Remainder
let exponent = a ** b; // Exponentiation
let isEqual = a == b; // Equality
let isStrictEqual = a === b; // Strict Equality
let isNotEqual = a != b; // Inequality
let isStrictNotEqual = a !== b; // Strict Inequality
let greaterThan = a > b; // Greater than
let lessThan = a < b; // Less than
```

Expressions

Expressions are code snippets that **evaluate to a value**, such as a combination of variables, operators, and function calls, which can be used to **perform calculations, assign values, or produce outputs**.

```
let sum = 5 + 3; // Addition
let product = 4 * 2; // Multiplication
let greeting = "Hello, " + name + "!"; // String concatenation
```

Conditional Statements

Allows your program to make decisions and perform actions based on wether a given condition is **true** or **false.**

```
if (a > b) {
  console.log("a is greater than b");
} else if (a < b) {
  console.log("a is less than b");
} else {
  console.log("a is equal to b");
}
```

Functions

Functions are **resuable blocks of code** that perform a specific task. Like a machine that takes an input, does something, and produces an output.

```
// Function to add two numbers
function addNumbers(a, b) {
  return a + b;
}
// Calling the addNumbers function
addNumbers(5, 10);
```

Arrays & Loops

- Arrays are data structures that allow you to store **multiple pieces of data** within a single variable.
- Array items are **indexed starting from 0** and are separated by a comma.
- Loops are constructs that allow you to **execute a block of code repeatedly** until a specific condition is met.
- For loops have a **counter variable** with an intial value, **a condition**, and **a counter** incrementer/decrementer.

```
// Array
let fruits = ["apple", "banana", "cherry"];
console.log(fruits[0]); // Accessing 0 array element

// For loop
for (let i = 0; i < 3; i++) {
  console.log(fruits[i]);
}
```

DOM Manipulation

We can use JavaScript's built-in document methods to:

- **Select HTML elements** based on element name, id, class, or using CSS selectors
- **Append (add) or remove HTML elements**
- **Listen for document events** such as click, hover, scroll, keyboard events

Let's use JavaScript DOM manipulation on my protfolio

```
const button = document.getElementById('button1');

function handleClick() {
  console.log('Hello, world!');
}

button.addEventListener('click', handleClick);
```

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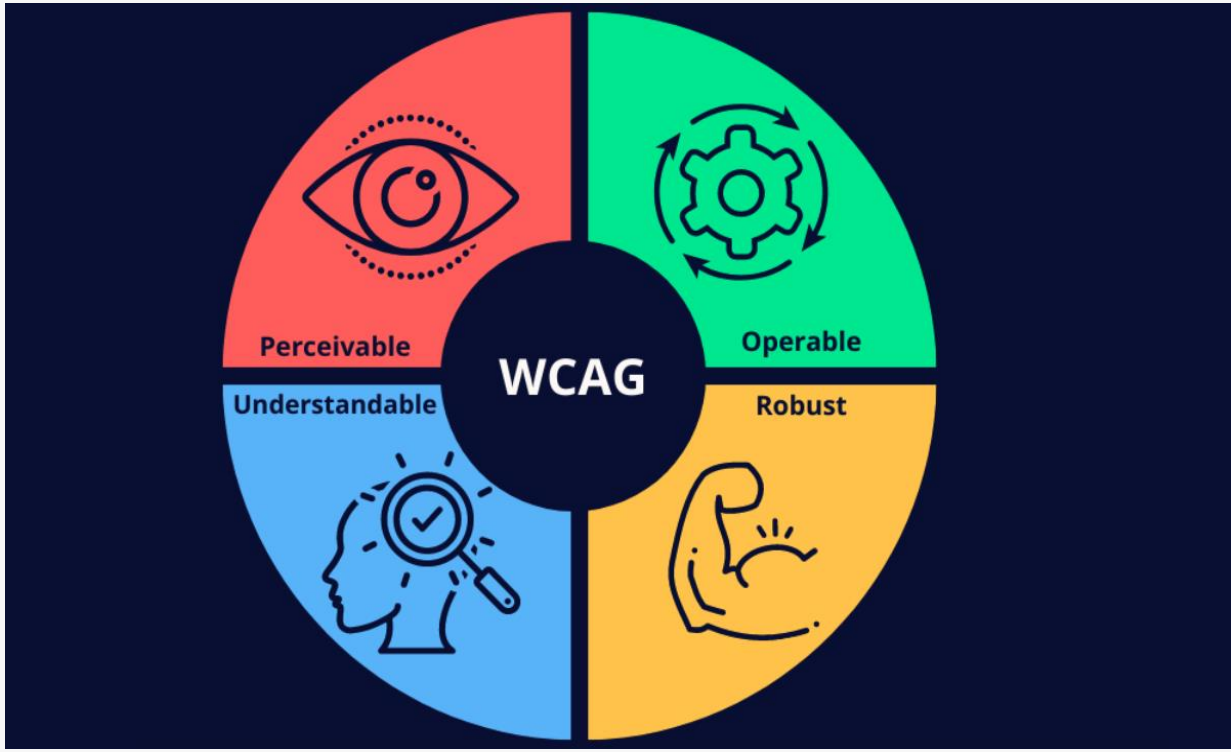
Inclusive Web Design

- Participatory Design Methods
- Accessibility Tools
- Responsive Web Design

WCAG Guidelines

Web content accessibility guidelines

- An accessibiliy guideline maintained by W3C
- Public websites must meet this standard
- There are 3 ratings **A (fail), AA (required), AAA (best)**
- Tools such as **Axe, Wave, Tenon, SiteImprove** can help you test
- **User testing** with **real people** is extrememly important!



Perceivable

- Provide alternative text for non-text content
- Provide captions for video
- Create content that can be presented in different ways *e.g text, video, audio*

Operable

- Allow keyboard-only navigation
- Create space around text
- Use labels and headings
- Make navigation as simple as possible
- Test with screen readers, screen magnifiers, voice commands

Understandable

- Make text as clear as possible
- Be clear about how things work
- Make content predictable
- Find ways to help users who are lost

Robust

- Works on different devices and browsers
- Don’t use exclusive technology *e.g plugins*
- Do not use exploitative technology

Participatory Design

Directly involve users into the design process to ensure their needs inform the design and development of software.

Applying PD to Accessibility

Inclusive Approach: Treat users with disability as experts of their own experience

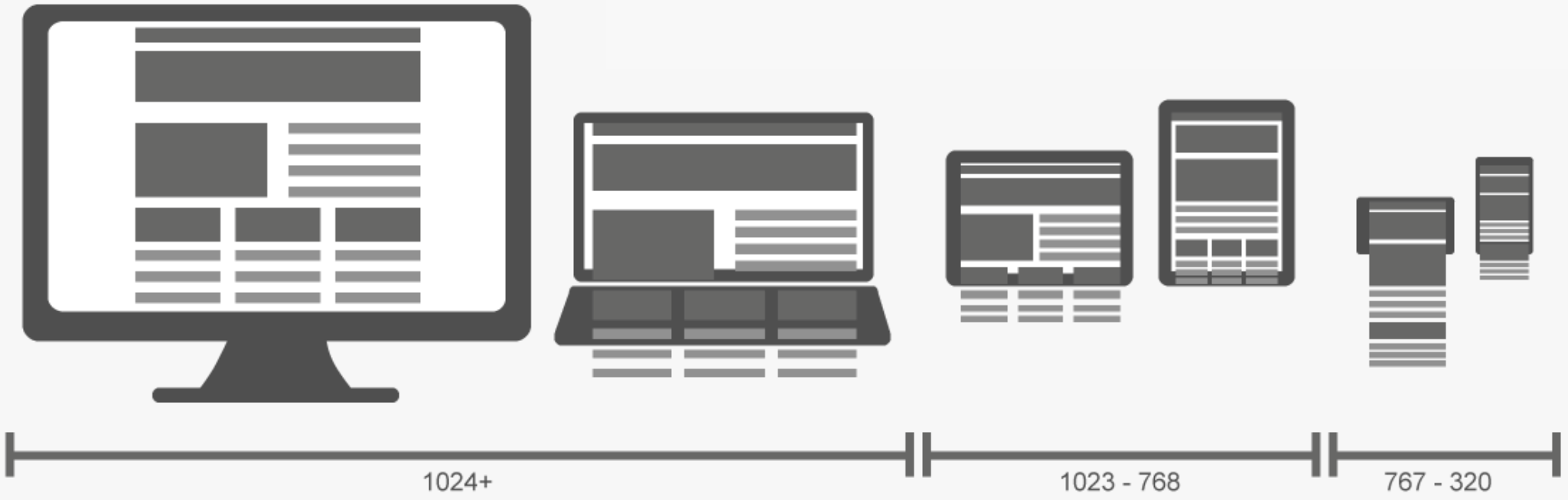
Early Involvement: Ensure accessibility needs are addressed from the onset of design

Methodologies: Conduct continuous user research and accessibility walkthroughs to refine designs iteratively

Iterative Design Article

When to use which user research methods

Responsive Web Design



Coding Accessible Websites

Resources for accessible web coding best practices:

Accessibility guide from MDN web docs

FreeCodeCamp article

Additional Learning resources:

Extracirricular codealong course from freecodecamp - It's great!

Learn the Web accessibility series - also great!

Accessible HTML

- Use semantic HTML tags
- Provide alternative text for images using 'alt' attribute
- Use labels with form elements
- Create accessible links
- Use heading tags appropriately
- Include captions for multimedia

[Accessible HTML cheatsheet]

```
<body>
  <header>
      <img src="logo.png" alt="Company Logo">
      <nav>
          <ul>
              <li><a href="#main-content">Skip to main content</a></li>
              <li><a href="about.html">About Us</a></li>
              <li><a href="services.html">Services</a></li>
              <li><a href="contact.html">Contact</a></li>
          </ul>
      </nav>
  </header>

  <main id="main-content">
      <h1>Welcome to Our Company</h1>
      <section>
          <h2>Our Mission</h2>
          <p>Our mission is to provide high-quality products and services to our customers.</p>
      </section>
      <section>
          <h2>Contact Us</h2>
          <form action="/submit" method="post">
              <div>
                  <label for="username">Username:</label>
                  <input type="text" id="username" name="username">
              </div>
              <div>
                  <label for="email">Email:</label>
                  <input type="email" id="email" name="email">
              </div>
              <div>
                  <button type="submit">Submit</button>
              </div>
          </form>
      </section>
  </main>

  <footer>
      <p>&copy; 2024 Our Company</p>
  </footer>

  <button aria-expanded="false" aria-controls="menu">Menu</button>
  <video controls>
      <source src="video.mp4" type="video/mp4">
      <track kind="captions" src="captions.vtt" srclang="en" label="English">
  </video>
</body>
```

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Accessible CSS

- Use focus and hover states
- Ensure good colour contrast
- Use responsive layouts with media queries
- Create flexible and adaptive layouts
- Use readable font sizes
- Ensure a consistent look and feel

```css
.btn-submit {
  padding: 10px 40px;
  color: white;
  font-weight: bold;
  background-color: green;
  border-radius: 5px;
  border: 2px solid green;
  cursor: pointer;
}
.btn-submit:hover {
  color: green;
  background-color: white;
}

@media screen and (max-width: 768px) {
  /* Styles for smaller screens */
}
```

Accessible JS

- Create dynamic styling to aid accessibility and user experience
- Handle keyboard events
- Create accessible form validation
- Provide controls for media playback
- Create a dynamic user interface

```
const button = document.getElementById('button1');

function handleClick() {
  console.log('Hello, world!');
}

button.addEventListener('click', handleClick);
```

Overview

1. Follow the WACG standards
2. Use accessibility tools & test with real people
3. Design with an accessibility mindset
4. Adapt an iterative design & development process
5. Remember accessible code is just as important as accessible design

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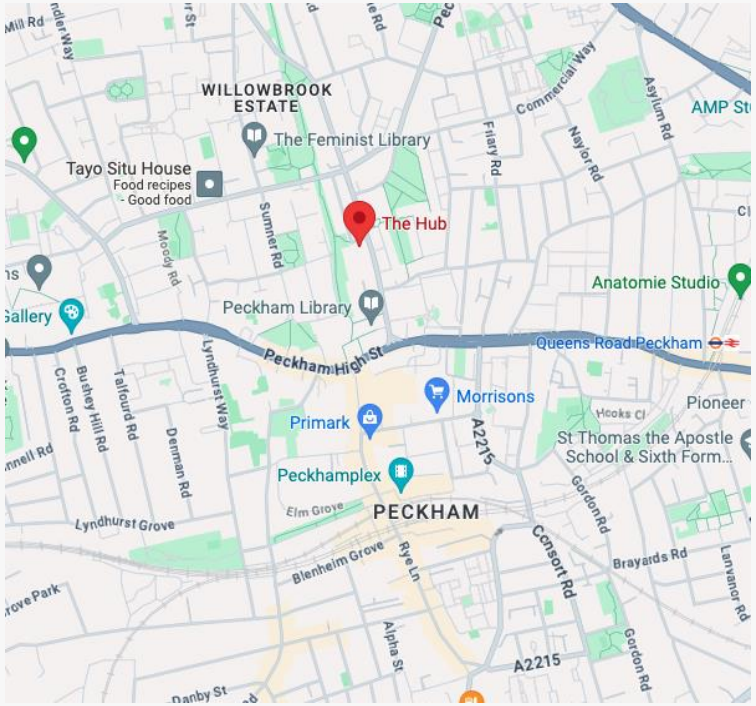

Friday 26th July we are in **The Hub, Bonar Road**!!

The DAZ Schedule can be found here