Emanuel Estrada
Sebastian Cedeno
Georgina Gonzalez
Ricardo Espinoza

Lab HTML, CSS and JS

1. HTML

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Introduction

- **What is HTML?**
  HyperText Markup Language, is the standard markup language for Web Pages.
  https://www.w3schools.com/whatis/whatis_html.asp
- **What is a Tag?**
  Is the part of the html that gives structure to the document and serves for indexing.
  https://www.atinternet.com/es/glosario/tag-html/
- **What is a DOCTYPE? How do you create one for an HTML5 document?**
  Is an instruction that specifies the version of the html document. To create a HTML5 document the next instruction is used: <!DOCTYPE html>
  https://devcode.la/tutoriales/doctype-que-es-y-para-que-sirve/
- **How do you create an encoding for an HTML5 document?**
  This instruction inside the head:
  `<meta charset="utf-8"/>`
  https://www.w3.org/International/questions/qa-html-encoding-declarations
- **Explain the head and the body tags.**
  The head is the meta data that is not shown in the page, like titles, links, source code, encoding. The body is everything that can be seen on the page

Basic Tags

- **Show an example of the a tag.**
  <head></head>
  <body></body>
  <html></html>

- **Explain the div and the span tag. What is the difference between them?**

Div is a block element, and span an inline element. The div always starts on a new line, span maintains its content on the same line.

- **Explain the section, article, aside, header, footer tag?**
  These are semantic elements. These are elements that define themselves to both the browser and the developer.
  https://www.w3schools.com/html/html5_semantic_elements.asp
- **Create a basic html page using the previous tags.**
  <header><h1>Welcome!</h1></header>
  <section> I'm fine </section>
  <article> I'm just tired </article>
  <aside>I just need some...</aside>
  <footer><h1>REST</h1></footer>
- **Explain the purpose of the h1….h6 tags.**
  The "h" stands for heading. These are used for headings. The number stands for the importance of the heading, 1 being the most important un 6 the least.
- **What is a navigation bar. Create a navigation bar using the nav tag.**
  The navigation bar contains the set navigation links for a page.

```
<nav class="menu">
<ul>
 <li><a href="#">Inicio</a></li>
 <li><a href="#">Sobre nosotros</a></li>
 <li><a href="#">Contacto</a></li>
</ul>
</nav>
```

- **Explain the attributes of the img tag. Write an example.**
  - align: to align the element
  - alt: alternate text for image
  - border: border around an image
  - crossorigin: allows images from third party sites to be used with canvas
  - height: the height of an image
  - hspace: the whitespace on the left and right
  - ismap: an image as a server-side image map
  - longdesc: URL to a long description of an image
  - sizes: the size for the page layout
  - src: the URL of an image
  - srcset: URL of an image to use in different situations
  - usemap: an image as a client-side image-map
  - vsapce: the whitespace on the top and bottom
  - width: specifies the width of an image

  https://www.w3schools.com/tags/tag_img.asp

- **Create an unordered list. Create an ordered list.**
  #Unordered


```
 <li>Sleep</li>
 <li>Food</li>
 <li>Time</li>
</ul>
```

```
#Ordered
<ol type="1">
 <li>Time</li>
 <li>Sleep</li>
 <li>Food</li>
</ol>
```

- **Create a table using html.**

```
<table>
  <tr>
    <th>Nombre</th>
    <th>Matricula</th>
  </tr>
  <tr>
    <td>Sebas</td>
    <td>A0122222</td>
  </tr>
  <tr>
    <td>Gina</td>
    <td>A0122221</td>
  </tr>
  <tr>
    <td>Manny</td>
    <td>A0122220</td>
  </tr>
</table>
```

Other Tags

- **Explain the advantages and disadvantages of the iframe tag.**
    - Advantages
        - Safe
        - Content is loaded before advertisement
    - Disadvantages
        - Not good for search engine optimization
        - Cannot be seen on certain devices
        - Responsive webdesigns can only be possible when the iFrame width is dynamic
        - Advisor canvas is limited to the boundaries of the iFrame

https://smartassistant.zendesk.com/hc/en-us/articles/115000636245-Q-What-are-the-advantages-disadvantages-of-iFrame-integration-

- **Explain how you can create a form in html. Explain the input types. Show an example.**
  You create a form in html with the form tag. These forms contain 3 types of input
  1. text: a one-line text input hit
  2. radio: for selecting many choices
  3. submit: a submit button

  Example:
  ```
  <form>
        Nombre:<br>
         <input type="text" name="firstname"><br>
        Matricula:<br>
        <input type="text" name="lastname">
  </form>
  ```
- **What is microdata? Show 1 practical example.**
  Micro data is a simple mechanism to label data in a document, to be processed as an name-value pair. This helps search engines to classify the content of a webpage, and thus giving better results for a search.
  https://schema.org/docs/gs.html#microdata_why
- **Explain the video tag. Are there disadvantages using the video tag?**
  Equivalent to the img tag for video, specifies which kind of video is used. There are a lot of advantages to this tag, but there are also disadvantages. Is not good for older devices, cannot point to a particular point in the video, it does not have full screen support.
  https://webapps.stackexchange.com/questions/774/what-advantages-and-disadvantages-are-there-to-using-the-html5-beta-of-youtube

Use to validate all your html document: http://validator.w3.org

Create an html challenge

Create and solve the challenge

Create a simple page, with two headers, an image, a hyperlink, an email, and a paragraph and a background color.

Solution:

```
<html>

<head>
```

```
<title>Your Title Here</title>

</head>

<body bgcolor="FFFFFF">

<center><a
href="https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwic2J-c2qjkAhWyKH
0KHSRZCBAQjRx6BAgBEAQ&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FSmiley&psig=AOvVa
w1V1gTwPGgyRC4tNUNlOzq_&ust=1567189561741732"><img src="happy.jpg" align="bottom">
</a></center>

<hr>

<a href="http://unsitioquemeponga feliz.com">Uyx</a>

toy triston

<h1>Necesito un gansito</h1>

<h2>Bien frio</h2>

Contactame <a href="hol@amiwo.com">

hol@amiwo.com</a>.

<p> Un parrafo

<p> <b>Y otro</b>

<br> <b><i>Y otro</i></b>

<hr>

</body>

</html>
```

2. CSS

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Introduction

- **What is CSS?**
  CSS stands for Cascade Style Sheets and is a protocol to define styles that tell the browser how to render and display HTML content.

- **What is the purpose of CSS?**
  To define styles that can be used by different HTML elements

- **How do you apply a CSS to an HTML (explain the 3 options)**
  - Using style tags on each HTML element
  - Define style metadata on header
  - Import external stylesheet

- **What is a selector? What is a CSS rule?**
  - Selectors are patterns used to select the HTML elements we want to style
  - A CSS rule is a line that defines a style for a specific selection

Basic CSS

- **Explain a:**
  - **Tag Selector**
    Selects the generic tags of HTML (paragraphs, headers, etc)
    Syntax: p { }

  - **Class Selector**
    Selects specific tags of HTML marked with a class name
    Syntax: .className { }

  - **Tag and Class Selector**
    Selects a unique tag type marked with a class name
    Syntax: .pClassName p { }

  - **Id Selector**
    Selects a unique tag of HTML identified with a an ID
    Syntax: #idName { }

- **Explain a CSS Pseudo Selectors.**
  Pseudo classes are like subclasses is used to define a special state of an element. For example, a link can have a different style for its different states:
  - univisted,
  - Visited,
  - hovered.

- **Change the style of the a tag.**

```
h1 {
   color: blue;
   size: 24px;
}
```

- **What is a class? What is an id? How are they relate to CSS?**
  Classes and id's are identifiers that can be attached to HTML elements to do specific things with them, such as changing their specific style regardless their tag, when it comes to CSS. Id's are unique while classes can be used by several elements.

- **Explain the CSS Box Model? Show an example.**
  In CSS, the box model is used when talking about design and layout. The content is boxed within a padding box, which is boxed within a border box, which is boxed within a margin box.

- **How can you change the font using CSS?**
  If the font is already imported, use font-family argument, if not, import locally or from cloud such as Google Fonts.

Advanced CSS

- **Explain the static, relative, fixed and absolute position.**
  - Static: The default position of block elements on the page.
  - Relative: The placement of the element within the flow of the document.
  - Absolute: Removes the element from the flow of content and allows it to be positioned in relation to the HTML document.
  - Fixed: Removes elements from the flow of the HTML and allows them to be positioned anywhere relative to the window.

- **Explain the display and the visibility properties.**
  Used to show and hide items, chance opacity, etc.
  - Visibility: Hides or shows the element, but it still takes up space in the layout. Child element of a hidden box will be visible if their visibility is set to visible.
  - Display: Turns on or off the display and removes the element completely from the document id hidden. It does not take up any space, even though the HTML for it is still in the source code.

- **Explain gradients and shadows in CSS.**
    - Shapes can be filled with gradients (combination of various colours that fade into one another) and elements can have a shadow natively with CSS.
    - Tools like https://cssgradient.io/ can be used to generate gradients easily.

Create a css challenge

Create a landing page that welcomes the user. The text must be centered (absolute), font size 24 and color green.

Solution:

```
<html>
   <head>
       <title>Test</title>
       <style>
           body {
               text-align: center;
               padding: 25% 0;
           }
           h1 {
               color: blue;
               font-size: 24;
           }
       </style>
   </head>
   <body>
       <h1>Welcome!</h1>
       <p>Enjoy this site</p>
   </body>
</html>
```

References

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https://www.w3schools.com/cssref/css_selectors.asp
https://stackoverflow.com/questions/16946878/how-do-i-select-an-element-that-has-a-certain-class
https://www.w3schools.com/css/css_pseudo_classes.asp

https://www.w3schools.com/css/css_boxmodel.asp
http://nigelbuckner.com/downloads/handouts/web/pos-explained/index.html
https://www.tutorialrepublic.com/css-tutorial/css-visibility.php

3. Javascript

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Introduction

- **What is Javascript?**
  A programming language normally used as part of web pages to interact with the user and make dynamic pages.
- **How can you code JS in a HTML document. Show examples.**
  You can include JS in your HTML in two ways: write it directly in the HTML with the <script> tag, or include it as a link to an external file.
  In the HTML:
  ```
  <script type="text/javascript">
    alert("This alert box was called with the onload event");
  </script>
  ```
  Including a file:
  ```
  <script type="text/javascript" src="path-to-javascript-file.js"></script>
  ```
- **Declare a variable in JS.**
  ```
  var num = 1;
  var name = "Panchita";
  ```
- **Create a function in JS**
  ```
  function myFunction(p1, p2) {
    //code to be executed
    return p1 * p2;   // The function returns the product of p1 and p2
  }
  ```
- **Create an "object" in JS**
  ```
  var person = {firstName:"John", lastName:"Doe", age:50, eyeColor:"blue"};
  ```
- **Explain loops and conditionals in JS**
  Conditionals in javascript determine whether or not a piece of code can run by checking if a certain condition is met.
  ```
  if (condition) {
    //  block of code to be executed if the condition is true
  }
  ```
  Loops execute a piece of code repeatedly while a certain condition remains true.
  ```
  while (condition) {
        // code block to be executed
  }
  ```

Basic Javascript

- **What is the DOM?**
  The Document Object Model defines a standard for accessing documents. It “allows programs and scripts to dynamically access and update the content, structure, and style of a document”.HTML DOM methods are actions you can perform (on HTML Elements). HTML DOM properties are values (of HTML Elements) that you can set or change. A property is a value that you can get or set (like changing the content of an HTML element). A method is an action you can do (like adding or deleting an HTML element).
- **Explain setAttribute, getAttribute, getElementsByTagName and getElementById**
  The **setAttribute** method receives two parameters, the attribute you want to give a value to, and said value. It does exactly that, set the given value to the specified attribute:
  `element.setAttribute(attributename, attributevalue)`
  The **getAttribute** method returns the value saved in a given class attribute:
  `element.getAttribute(attributename)`
  The **getElementsByTagName** method returns all elements in the document with the specified tag:
  `document.getElementsByTagName(tagname)`
  The **getElementById** returns the element that has the given ID as attribute:
  `document.getElementById(elementID)`
- **Explain createTextNode, createElement, appendChild**
  The **createTextNode** is a method used to provide text to an element:
  `document.createTextNode(text)`
  The **createElement** is a method that create an Element node of the specified name (e.g. BUTTON):
  `document.createElement(nodename)`
  The **appendChild** is a method that appends a node as the last child of a node:
  `node.appendChild(node)`
- **Show 4 examples of how can you manipulate the DOM using JS**
  GetElementById is a method, and innerHTML is a property.

```
<html>
<body>

<h2>My First Page</h2>

<p id="demo"> </p>

<script>
document.getElementById("demo").innerHTML = "Hello World!";
</script>

</body>
</html>
```

Return the number of images in a document.

```
<html>
<body>

<h2>Finding HTML Elements Using document.images</h2>

<img src="pic_htmltree.gif" width="486" height="266">
<img src="pic_navigate.gif" width="362" height="255">

<p id="demo"></p>

<script>
document.getElementById("demo").innerHTML =
"Number of images: " + document.images.length;
</script>

</body>
</html>
```

Display the number of links in a document.

```
<html>
<body>

<h2>Finding HTML Elements Using document.links</h2>

<p>
<a href="/html/default.asp">HTML</a>
<br>
<a href="/css/default.asp">CSS</a>
</p>

<p id="demo"></p>

<script>
document.getElementById("demo").innerHTML =
"Number of links: " + document.links.length;
</script>

</body>
</html>
```

Display number of elements with the specified tag name.

```
<html>
<head>
<script>
function getElements() {
  var x = document.getElementsByTagName("input");
  document.getElementById("demo").innerHTML = x.length;
}
</script>
</head>
<body>
```

```
<input type="text" size="20"><br>
<input type="text" size="20"><br>
<input type="text" size="20"><br>

<p>
<input type="button" onclick="getElements()" value="How many input
elements?">
</p>

<p id="demo"></p>

</body>
</html>
```

- **Explain what is an event?**
  They are things that happen to HTML elements which JS reacts to. For example, finish loading or a button clicked.
- **Show 4 examples of using addEventListener. (with different events)**

```
document.addEventListener("click", function(){
  document.getElementById("demo").innerHTML = "Hello World";
});

document.addEventListener("mouseover", function(){
  document.body.style.backgroundColor = "red";
});

document.addEventListener("mousemove", function() {
  myFunction(p1, p2);
});

document.addEventListener("mouseout", someOtherFunction);
```

- **Explain what is AJAX. Show a very basic example.**
  AJAX (Asynchronous JavaScript And XML) allows web pages to be updated asynchronously by exchanging data with a web server behind the scenes. This means that it is possible to update parts of a web page, without reloading the whole page.
  Example: create a simple XMLHttpRequest, and retrieve data from a txt file.

```
<html>
<body>

<div id="demo">
<h2>The XMLHttpRequest Object</h2>
<button type="button" onclick="loadDoc()">Change Content</button>
</div>

<script>
function loadDoc() {
  var xhttp = new XMLHttpRequest();
  xhttp.onreadystatechange = function() {
    if (this.readyState == 4 && this.status == 200) {
      document.getElementById("demo").innerHTML =
      this.responseText;
```

```
    }
  };
  xhttp.open("GET", "ajax_info.txt", true);
  xhttp.send();
}
</script>

</body>
</html>
```

JS and other applications

- **Explain how you can manipulate a google maps using JS.**
  Using the Maps JavaScript API, you can customize maps with your own content and imagery for display on web pages and mobile devices.
  Example: The following web page displays a map centered on Sydney, New South Wales, Australia:

```
<!DOCTYPE html>

<html>

  <head>

    <title>Simple Map</title>

    <meta name="viewport" content="initial-scale=1.0">

    <meta charset="utf-8">

    <style>

      /* Always set the map height explicitly to define the size of the div

       * element that contains the map. */

      #map {

        height: 100%;

      }

      /* Optional: Makes the sample page fill the window. */

      html, body {

        height: 100%;
```

```
        margin: 0;
        padding: 0;
      }
    </style>
  </head>
  <body>
    <div id="map"></div>
    <script>
      var map;
      function initMap() {
        map = new google.maps.Map(document.getElementById('map'), {
          center: {lat: -34.397, lng: 150.644},
          zoom: 8
        });
      }
    </script>
    <script
src="https://maps.googleapis.com/maps/api/js?key=YOUR_API_KEY&callback=initMap"
    async defer></script>
  </body>
</html>
```

Create a JS challenge

Create and solve the challenge

Challenge: create an HTML DOM Animation that has a background with a square in the top left corner, and a button on top. When the button is clicked, the figure is moved accross the background:

```
<!DOCTYPE html>
<html>
<style>
#container {
  width: 400px;
  height: 400px;
  position: relative;
  background: pink;
}
#animate {
  width: 50px;
  height: 50px;
  position: absolute;
  background-color: purple;
}
</style>
<body>

<p><button onclick="MoveSquare()">Click To Move</button></p>

<div id ="container">
  <div id ="animate"></div>
</div>

<script>
function MoveSquare() {
  var elem = document.getElementById("animate");
  var pos = 0;
  var id = setInterval(frame, 5);
  function frame() {
    if (pos == 350) {
      clearInterval(id);
    } else {
      pos++;
      elem.style.top = pos + "px";
      elem.style.left = pos + "px";
    }
  }
}
</script>

</body>
</html>
```

References

https://www.w3schools.com/jsref/met_node_appendchild.asp
https://www.w3schools.com/jsref/met_document_createelement.asp
https://www.geeksforgeeks.org/html-dom-createtextnode-method/
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