

Front-End-Engeneering

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1 Introduction

Document containing all my progress learning frontEnd development and engineering

2 Codecademy FrontEnd Career path

2.1 Web Foundations

2.1.1 links and bibliography

Codecademy Docs - <https://www.codecademy.com/resources/docs>

MDN Web Docs - <https://developer.mozilla.org/>

CSS-Tricks - <https://css-tricks.com/>

React Documentation - <https://reactjs.org/>

Redux Documentation - <https://redux.js.org/>

DEV Community - <https://dev.to/>

Stack Overflow - <https://stackoverflow.com/>

Codecademy Workspaces - <https://www.codecademy.com/workspaces/new>

Books:

HTML and CSS: Design and Build Websites, Jon Duckett

Cracking the Coding Interview (6th Edition), Gayle Laakmann McDowell

2.1.2 client-server Model in FrontEnd

The browser initiates requests to the server and renders website files

The server stores website files and sends them to the web browser upon request

HTTP The server and the client transfer data to each other using HTTP

When the server responds to a client it includes a HTTP code as a part of the response indicating if the request was successful

Important codes are:

200 (OK) : the request has succeeded

301 (moved Permanently) : The resource has been moved and the client is being redirected

404 (not found) : the request resource was not found

500 (Internal server error) : The server encountered an unexpected error.

When a user enters a URL, the server processes the request, sending back the HTML file containing the webpage's content and links to additional assets. Simultaneously, the browser initiates parallel HTTP requests for various resources:

CSS Stylesheets: Define the visual style and layout of the webpage.

Images and Videos: Essential visual elements are sent from the server to the

browser, with potential delays for large files.

JavaScript Files: Enable interactivity, functioning as the "behavior" of the web-page.

In modern browsers, these requests occur concurrently, enhancing efficiency. The browser displays the HTML content promptly, allowing user interaction while other assets continue to load. This entire process unfolds rapidly, typically within a second, influenced by factors such as connection speed, website size, and the distance between the browser and server.

2.2 Languages for web development

2.2.1 HTML

HTML is the skeleton of all web pages. It provides structure to the content on a website, including text, images, buttons, videos, and more

HTML Markup The ML in HTML stands for markup language ,HTML separates content and annotation by using HTML tags

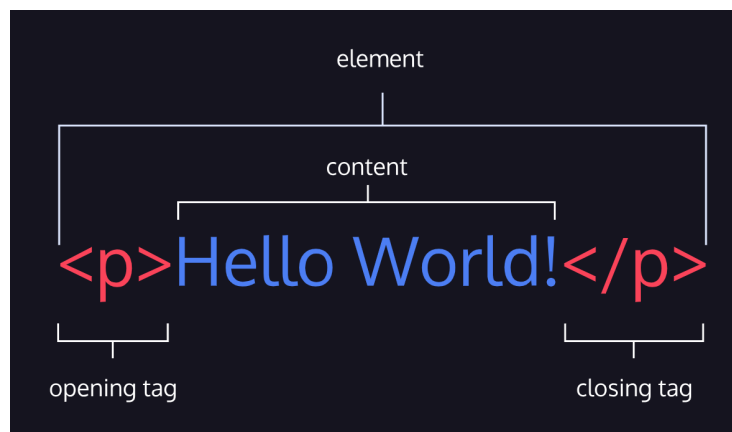


Figure 1: HTML structure

HTML Hypertext The H and T in HTML stands for hypertext. Hypertext is text that is linked to other text.

Adding Hyperlinks An attribute in HTML provides additional information about an HTML element. It comes in a name and value pair with the structure name="value"

Links are created in HTML with something called the href attribute, which stands for hyperlink reference.

EXAMPLE:

```
<a href="www.codecademy.com">Learn to code!</a>
```

With this code, we're assigning the value `www.codecademy.com` to the `href` attribute. When a user clicks on the text of this link (Learn to code!), they will be directed to `www.codecademy.com`.

2.2.2 CSS

CSS is the language that provides style to the content of an HTML page. This includes colors, fonts, positioning, layout, and more!

An HTML link tag is often used to create a connection between an HTML file and the CSS file and tells the browser to apply the CSS styles to the HTML. To place the link tag put it in the head element of the HTML file.

EXAMPLE:

```
<link rel="stylesheet" href="style.css">
```

The `rel` attribute explains the relationship between the current document and the linked resource. In this case, it indicates that the linked resource is a stylesheet.

CSS basic Rule structure

```
//h1 is the selector
//color and background are the properties
//red and yellow are the values
h1 {color: red; background: yellow;}
```

2.2.3 Javascript

Any website that provides more than just static information probably utilizes JavaScript in some way.

One of the defining features of JavaScript is its ability to respond to browser events.

Events allow JavaScript to respond to user behaviors, like the user hovering their mouse over an HTML element or resizing their window.

Events and functions combine to give JavaScript the ability to create interactive experiences. When an event is fired, a function is executed.

The JavaScript code is between the script tags. This tag alerts the browser that the page contains JavaScript and separates the JavaScript code from the HTML.

HTML attributes can set events, where the name of the attribute is the event and the value of the attribute is the JavaScript function that we want to execute.

```
<button onclick="changeColor()">Repaint!</button>
```

In this case when the user clicks the Repaint button the background color changes.

```
<script>
  function getRandomColor(){
    let letters = '0123456789ABCDEF';
    let color = '#';
    for (let i = 0; i < 6; i++) {
      color += letters[Math.floor(Math.random() * 16)];
    }
    return color;
  }
  function changeColor(){
    let newColor = getRandomColor();
    document.body.style.backgroundColor = newColor;
  }
</script>
```

2.2.4 SQL

SQL stores information in tables, which is simply a collection of information organized into rows and columns.

Web developers and software engineers also use SQL to build apps that can save, modify, and access data.

2.2.5 Resume of this chapter

HTML — structures website content

CSS — applies styling to websites

JavaScript — adds interactivity to websites

SQL — allows your web application to store and retrieve data

3 Fundamentals of HTML

IMPORTANT LINK: <https://www.codecademy.com/learn/learn-html/modules/learn-html-elements/cheatsheet>

HTML stands for HyperText Markup Language:

A markup language is a computer language that defines the structure and presentation of raw text.

In HTML, the computer can interpret raw text that is wrapped in HTML elements.

HyperText is text displayed on a computer or device that provides access to other text through links, also known as hyperlinks.

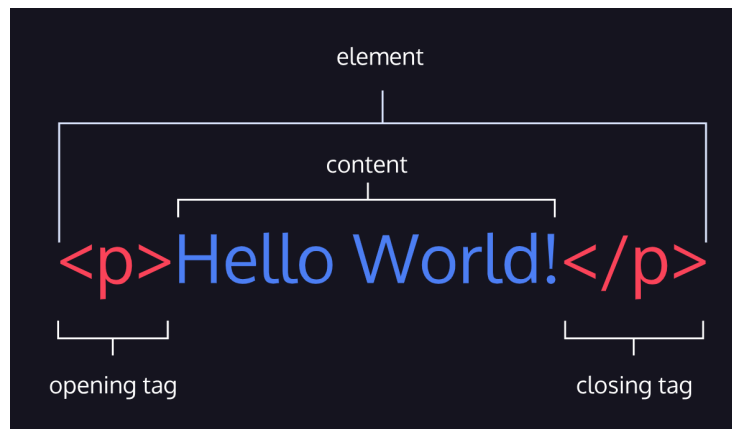


Figure 2: HTML structure

3.1 The Body

Only content inside the opening and closing body tags can be displayed to the screen.

```
<body>
  <p>
    Random text that you want to put here
  </p>
</body>
```

3.2 HTML Structure

HTML is organized as a collection of family tree relationships.

When an element is inside another element its a child of that element. The child element is said to be nested inside of the parent element.

This analogy can be extended to grandchildren, great-grandchildren, and beyond. The relationship between elements and their ancestor and descendent elements is known as hierarchy.

```
<body>
  <div>
    <h1>Sibling to p, but also grandchild of body</h1>
    <p>Sibling to h1, but also grandchild of body</p>
  </div>
</body>
```

In this example, the body element is the parent of the div element. Both the h1 and p elements are children of the div element and are at the same level so h1 and p are siblings and are grandchildren of the body element. Understanding HTML hierarchy is important because child elements can inherit behavior and styling from their parent element.

3.3 Headings

HTML follows a similar pattern. In HTML, there are six different headings, or heading elements.

```
<h1> <h2> <h3> <h4> <h5> <h6>
```

h1 used for main headings. All other smaller headings are used for subheadings.

3.4 Divs

One of the most popular elements in HTML is the div element. div is short for “division” or a container that divides the page into sections. divs allow us to group HTML elements to apply the same styles for all HTML elements inside. Add two spaces of indentation when you nest elements inside of divs for better readability

3.5 Attributes

HTML attributes are data that can be added to the opening tag of an HTML element. These attributes modify the default behavior of the element or provide additional information about it.

Attributes consist of a name and are usually set equal to a value. Values are enclosed in double or single quotation marks

3.5.1 Syntax

```
<tagname attribute="value"></tagname>
```


3.5.2 List of some attributes

class An HTML attribute used to select one or more elements for the application of styling or logic.

dir Sets the direction of the text of an HTML element.

id Used to specify a unique id for an HTML element, which cannot be shared across multiple elements within the same HTML document.

src Specifies the location of a digital source.

style Specifies how an element will be rendered in a web browser.

title Contains and can display the specified information about the element it belongs to.

3.5.3 Image attributes

Using an `img` element, which is commonly used to display images, uses several attributes, such as `src`, `width`, and `height`

```

```

3.6 Displaying Text

3.6.1 Paragraphs

(`p` element) contain a block of plain text.

3.6.2 `span`

`span` element is used to separate small pieces of content that are on the same line as other content.

EXAMPLE

```
<p><span>Self-driving cars</span>  
are anticipated to replace up to 2 million  
jobs over the next two decades.</p>
```

3.7 Styling Text

The `em` tag will generally render as italic emphasis.

The `strong` will generally render as bold emphasis.

```
<em> \\\puts the text in italic  
<strong> \\\puts the text in bold
```

3.8 Line Breaks

br element use this if you want to send the following text to the next line
EXAMPLE:

```
<p>The Nile River is the longest river <br> in the world,  
measuring over 6,850 <br> kilometers long  
(approximately 4,260 <br> miles).</p>
```

The text will be displayed in this way:

The Nile River is the longest river in the world, measuring over 6,850 kilometers long (approximately 4,260 miles).

3.9 Lists

3.9.1 Unordered Lists

In HTML, you can use an unordered list tag **ul** to create a list of items in no particular order. An unordered list outlines individual list items **li** with a bullet point.

```
<ul> -> unordered list tag  
<li> -> list item
```

```
<ul>  
  <li>Limes</li>  
  <li>Tortillas</li>  
  <li>Chicken</li>  
</ul>
```

3.9.2 Ordered Lists

Is just like the unordered lists except the list is numbered it uses the tag **ol**

```
<ol> -> ordered list tag  
<li> -> list item tag
```

```
<ol>  
  <li>Preheat the oven to 350 degrees.</li>  
  <li>Mix whole wheat flour, baking soda, and salt.</li>  
  <li>Cream the butter, sugar in separate bowl.</li>  
  <li>Add eggs and vanilla extract to bowl.</li>  
</ol>
```

3.10 Images

The **img** tag allows you to add an image to a web page ,this tag is a self-closing tag that means that it doesnt need the final tag.

EXAMPLE:

```

```

In the attribute src you have to put the URL of the image its required for this element.

A URL is the web address or local address where a file is stored.

3.10.1 Image Alts

To make your site accessible to users of all backgrounds including users using assistive technologies such as screen readers you will need image tags.

The alt attribute, which means alternative text, brings meaning to the images on our sites , and it should be a description of the image.

The alt attribute in HTML serves three key purposes:

providing a description for users if an image fails to load.

Enabling screen reading software to vocalize the description for visually impaired users.

And contributing to better SEO by offering search engines information about website images for improved ranking.

If the image on the web page doesn't contain any meaningful information the alt attribute should be left empty.

Example:

```

```

3.11 Videos

In addition to images, HTML also supports displaying videos. Like the **img** element, the **video** element requires a src attribute with a link to the video source.

The video is not an self closing tag.

Example:

```
<video src="myVideo.mp4" width="320" height="240" controls>  
  Video not supported  
</video>
```

After the src attribute, the width and height attributes are used to set the size of the video displayed in the browser. The controls attribute instructs the browser to include basic video controls such as pausing and playing.

The text, Video not supported, between the opening and closing video tags **will only be displayed if the browser is unable to load the video.**

3.12 Review of this chapter

HTML stands for HyperText Markup Language and is used to create the structure and content of a webpage.

Most HTML elements contain opening and closing tags with raw text or other HTML tags between them.

HTML elements can be nested inside other elements.

The enclosed element is the child of the enclosing parent element.

Any visible content should be placed within the opening and closing body tags.

Headings and sub-headings, h1 to h6 tags, are used to provide titles for sections of content.

p, span and div tags specify text or blocks.

The em and strong tags are used to emphasize text.

Line breaks are created with the br tag.

Ordered lists (ol) are numbered and unordered lists (ul) are bulleted.

Images (img) and videos (video) can be added by linking to an existing source.