Day 4 - HTML

What is HTML?

HTML (HyperText Markup Language) is the standard language used to create and structure content on the web. It uses a series of elements (or tags) to define and label content such as headings, paragraphs, links, images, and more, telling the browser how to display that content on a webpage.

Simple HTML Document:

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

Explanation:

- The **<!DOCTYPE>** declaration represents the document type, and helps browsers to display web pages correctly. It defines that this document is an HTML5 document.
- The **<html>** element is the root element of an HTML page
- The **<head>** element contains meta information about the HTML page
- The **<title>** element specifies a title for the HTML page (which is shown in the browser's title bar or in the page's tab)
- The **<body>** element defines the document's body, and is a container for all the visible contents, such as headings, paragraphs, images, hyperlinks, tables, lists, etc.

What is an HTML Element?

An HTML element is defined by a start tag, some content, and an end tag:

```
<tagname> Content goes here... </tagname>
```

The HTML element is everything from the start tag to the end tag:

```
<h1>My First Heading</h1>
```

Web Browsers:

The purpose of a web browser (Chrome, Edge, Firefox, Safari) is to read HTML documents and display them correctly.

A browser does not display the HTML tags, but uses them to determine how to display the document.

HTML Attributes:

HTML attributes provide additional information about HTML elements.

i) The href Attribute:

The <a> tag defines a hyperlink. The href attribute specifies the URL of the page the link goes to.

```
<a href="https://www.w3schools.com">Visit W3Schools</a>
```

ii) The src Attribute:

The <img> tag is used to embed an image in an HTML page. The src attribute specifies the path to the image to be displayed:

```
<img src="img_girl.jpg">
```

There are two ways to specify the URL in the src attribute:

a. Absolute URL - Links to an external image that is hosted on another website. Example: src="https://www.w3schools.com/images/img_girl.jpg".

b. Relative URL - Links to an image that is hosted within the website. Here, the URL does not include the domain name. If the URL begins without a slash, it will be relative to the current page. Example: src="img_girl.jpg".

iii) The width and height Attributes:

The <img> tag should also contain the width and height attributes, which specify the width and height of the image (in pixels):

```
<img src="img_girl.jpg" width="500" height="600">
```

iv) The alt Attribute:

The alt attribute for the <img> tag specifies an alternate text for an image, if the image for some reason cannot be displayed.

```
<img src="img_girl.jpg" alt="Girl with a jacket">
```

v) The style Attribute:

The style attribute is used to add styles to an element, such as color, font, size, and more.

```
<p style="color:red;">This is a red paragraph.</p>
```

vi) The lang Attribute:

You should always include the lang attribute inside the <html> tag, to declare the language of the Web page. This is meant to assist search engines and browsers.

```
<!DOCTYPE html>
<html lang="en">
<body>
```

Country codes can also be added to the language code in the lang attribute.

```
<!DOCTYPE html>
<html lang="en-US">
<body>
```

vii) The title Attribute:

The title attribute defines some extra information about an element.

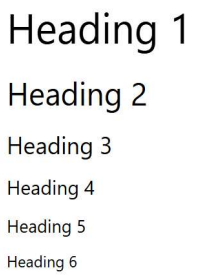
```
<p title="I'm a tooltip">This is a paragraph.</p>
```

Headings:

HTML headings are titles or subtitles that you want to display on a webpage.

HTML headings are defined with the <h1> to <h6> tags.

```
<h1>Heading 1</h1>
<h2>Heading 2</h2>
<h3>Heading 3</h3>
<h4>Heading 4</h4>
<h5>Heading 5</h5>
<h6>Heading 6</h6>
```



Paragraphs:

A paragraph always starts on a new line, and is usually a block of text and browsers automatically add some white space (a margin) before and after a paragraph.

```
<p>This is a paragraph.</p>
<p>This is another paragraph.</p>
```

Horizontal Rules:

The <hr> tag defines a thematic break in an HTML page, and is most often displayed as a horizontal rule.

The <hr> element is used to separate content in an HTML page.

```
<p>This is some text.</p>
<hr>
<h2>This is heading 2</h2>
```

Line Breaks:

The HTML
 element defines a line break. Use
 if you want a line break (a new line) without starting a new paragraph.

```
<p>This is<br>a paragraph<br>with line breaks.</p>
```

<pre> Element:

The HTML <pre> element defines preformatted text. The text inside a <pre> element is displayed in a fixed-width font (usually Courier), and it preserves both spaces and line breaks.

```
<pre>
  My Bonnie lies over the ocean.

  My Bonnie lies over the sea.

  My Bonnie lies over the ocean.

  Oh, bring back my Bonnie to me.
</pre>
```

HTML Styles:

The HTML style attribute is used to add styles to an element, such as color, font, size, and more.

```
<tagname style="property:value;">
```

The property is a CSS property. The value is a CSS value.

Text Formatting:

HTML contains several elements for defining text with a special meaning.

Formatting elements were designed to display special types of text:

```
<b> - Bold text
<strong> - Important text
<i> - Italic text
<em> - Emphasized text
<mark> - Marked text
<small> - Smaller text
<del> - Deleted text
<ins> - Inserted text
<sub> - Subscript text
<sup> - Superscript text
```

i) <b> and Elements:

The HTML <b> element defines bold text, without any extra importance.

The HTML element defines text with strong importance.

```
<b>This text is bold</b>
<strong>This text is important!</strong>
```

ii) <i> and Elements:

The HTML <i> element defines a part of text in an alternate voice or mood. The content inside is typically displayed in italic.

The HTML element defines emphasized text. The content inside is typically displayed in italic.

```
<i>This text is italic</i>
<em>This text is emphasized.</em>
```

iii) <small> Element:

The HTML <small> element defines smaller text:

```
<small>This is some smaller text.</small>
```

iv) <mark> Element:

The HTML <mark> element defines text that should be marked or highlighted.

```
<p>Do not forget to buy <mark>milk</mark> today.</p>
```

v) <del> Element:

The HTML <del> element defines text that has been deleted from a document. Browsers will usually strike a line through deleted text.

```
<p>My favorite color is <del>blue</del> red.</p>
```

vi) <ins> Element:

The HTML <ins> element defines a text that has been inserted into a document. Browsers will usually underline inserted text.

```
<p>My favorite color is <del>blue</del> <ins>red</ins>.</p>
```

vii) <sub> Element:

The HTML <sub> element defines subscript text. Subscript text appears half a character below the normal line, and is sometimes rendered in a smaller font.

```
<p>This is <sub>subscripted</sub> text.</p>
```

viii) <sup> Element:

The HTML <sup> element defines superscript text. Superscript text appears half a character above the normal line, and is sometimes rendered in a smaller font.

```
<p>This is <sup>superscripted</sup> text.</p>
```

HTML Semantic Elements:

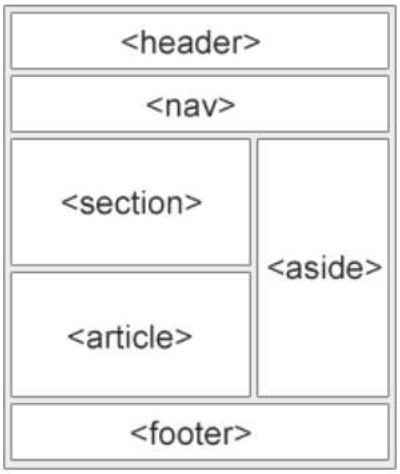
What are Semantic Elements?

A semantic element clearly describes its meaning to both the browser and the developer.

Examples of non-semantic elements: and - Tells nothing about its content.

Examples of semantic elements: <img>, <table>, and <article> - Clearly defines its content.

- <article>
- <aside>
- <details>
- <figcaption>
- <figure>
- <footer>
- <header>
- <main>
- <mark>
- <nav>
- <section>
- <summary>
- <time>



i) <section> Element: The <section> element defines a section in a document.

ii) <article> Element: The <article> element specifies independent, self-contained content.

iii) <header> Element: The <header> element represents a container for introductory content or a set of navigational links.

iv) <footer> Element: The <footer> element defines a footer for a document or section.

v) <nav> Element: The <nav> element defines a set of navigation links.

vi) <aside> Element: The <aside> element defines some content aside from the content it is placed in (like a sidebar).

vii) <figure> and <figcaption> Elements:

- The <figure> tag specifies self-contained content, like illustrations, diagrams, photos,

code listings, etc.

- The <figcaption> tag defines a caption for a <figure> element. The <figcaption> element can be placed as the first or as the last child of a <figure> element.
- The <img> element defines the actual image/illustration.

```
<figure>
  <img src="pic_trulli.jpg" alt="Trulli">
  <figcaption>Fig1. - Trulli, Puglia, Italy.</figcaption>
</figure>
```

Quotation and Citation Elements:

i) <blockquote> for Quotations:

The HTML <blockquote> element defines a section that is quoted from another source.

```
<p>Here is a quote from WWF's website:</p>
<blockquote cite="http://www.worldwildlife.org/who/index.html">
For 60 years, WWF has worked to help people and nature thrive. As the world's leading
conservation organization, WWF works in nearly 100 countries. At every level, we
collaborate with people around the world to develop and deliver innovative solutions that
protect communities, wildlife, and the places in which they live.
</blockquote>
```

ii) <q> for Short Quotations:

The HTML <q> tag defines a short quotation.

```
<p>WWF's goal is to: <q>Build a future where people live in harmony with nature.</q></p>
```

iii) <abbr> for Abbreviations:

The HTML <abbr> tag defines an abbreviation or an acronym, like "HTML", "CSS","ATM".

Marking abbreviations can give useful information to browsers, translation systems and search-engines.

```
<p>The <abbr title="World Health Organization">WHO</abbr> was founded in 1948.</p>
```

iv) <address> for Contact Information:

The HTML <address> tag defines the contact information for the author/owner of a document or an article.

```
<address>
Written by John Doe.<br>
Visit us at:<br>
Example.com<br>
Box 564, Disneyland<br>
USA
</address>
```

v) <cite> for Work Title:

The HTML <cite> tag defines the title of a creative work (e.g. a book, a poem, a song, a movie, a painting, a sculpture, etc.). **Note**: A person's name is not the title of a work.

```
<p><cite>The Scream</cite> by Edvard Munch. Painted in 1893.</p>
```

vi) <bdo> for Bi-Directional Override:

The HTML <bdo> tag is used to override the current text direction.

```
<bdo dir="rtl">This text will be written from right to left</bdo>
```

Comments:

HTML comments are not displayed in the browser, but they can help document your HTML source code.

```
<!-- Write your comments here -->
```

Links - Hyperlinks:

HTML links are hyperlinks. They are used to connect one page to another, or to an external website.

The HTML <a> tag defines a hyperlink.

```
<a href="url">link text</a>
```

By default, links will appear as follows in all browsers:

- An unvisited link is underlined and blue
- A visited link is underlined and purple
- An active link is underlined and red

Links - The target Attribute:

The target attribute specifies where to open the linked document.

The target attribute can have one of the following values:

- _self - Default. Opens the document in the same window/tab as it was clicked
- _blank - Opens the document in a new window or tab
- _parent - Opens the document in the parent frame
- _top - Opens the document in the full body of the window

```
<a href="https://www.w3schools.com/" target="_blank">Visit W3Schools!</a>
```

Link to an Email Address:

Use mailto: inside the href attribute to create a link that opens the user's email program (to let them send a new email):

```
<a href="mailto:someone@example.com">Send email</a>
```

Button as a Link:

To use an HTML button as a link, you have to add some JavaScript code.

JavaScript allows you to specify what happens at certain events, such as a click of a button.

```
<button onclick="document.location='default.asp'">HTML Tutorial</button>
```

Link Titles:

The title attribute specifies extra information about an element. The information is most often shown as a tooltip text when the mouse moves over the element.

```
<a href="https://www.w3schools.com/html/" title="Go to W3Schools HTML section">Visit our
HTML Tutorial</a>
```

Images:

The HTML <img> tag is used to embed an image in a web page. Images can improve the design and the appearance of a web page.

Syntax:

```
<img src="url" alt="alternatetext">
```

- src - Specifies the path to the image

- alt - Specifies an alternate text for the image

Example:

```
<img src="pic_trulli.jpg" alt="Italian Trulli">
```

Favicon:

A favicon is a small image displayed next to the page title in the browser tab.

```
<link rel="icon" type="image/x-icon" href="/images/favicon.ico">
```

Tables:

HTML tables allow web developers to arrange data into rows and columns.

A simple HTML table:

```
<table>
  <tr>
    <th>Company</th>
    <th>Contact</th>
    <th>Country</th>
  </tr>
  <tr>
    <td>Alfreds Futterkiste</td>
    <td>Maria Anders</td>
    <td>Germany</td>
  </tr>
  <tr>
    <td>Centro comercial Moctezuma</td>
    <td>Francisco Chang</td>
    <td>Mexico</td>
  </tr>
</table>
```

Table Cells:

Each table cell is defined by a <td> and a </td> tag.

Note: td stands for table data.

Table Rows:

Each table row starts with a <tr> and ends with a </tr> tag.

Note: tr stands for table row.

Table Headers:

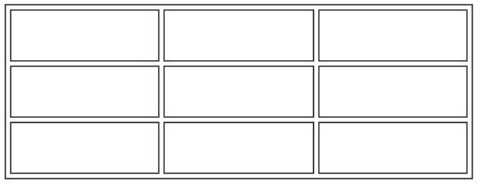
Sometimes you want your cells to be table header cells. In those cases use the <th> tag instead of the <td> tag.

Note: th stands for table header.

How To Add a Border:

To add a border, use the CSS border property on table, th, and td elements:

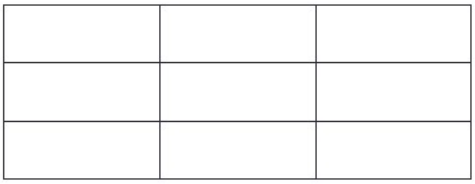
```
table, th, td {
  border: 1px solid black;
}
```



Collapsed Table Borders:

To avoid having double borders like in the example above, set the CSS border-collapse property to collapse. This will make the borders collapse into a single border:

```
table, th, td {
  border: 1px solid black;
  border-collapse: collapse;
}
```



Round Table Borders:

With the border-radius property, the borders get rounded corners:

```
table, th, td {
  border: 1px solid black;
  border-radius: 10px;
}
```

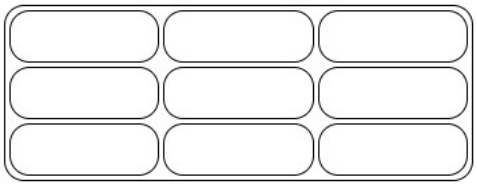


Table Colspan & Rowspan:

Colspan: To make a cell span over multiple columns, use the colspan attribute.

Rowspan: To make a cell span over multiple rows, use the rowspan attribute.

Example 1:

```
<table style="width:100%">
  <tr>
    <th colspan="2">Name</th>
    <th>Age</th>
  </tr>
  <tr>
    <td>Jill</td>
    <td>Smith</td>
    <td>43</td>
  </tr>
  <tr>
    <td>Eve</td>
    <td>Jackson</td>
    <td>57</td>
  </tr>
</table>
```

Name		Age
Jill	Smith	43
Eve	Jackson	57

Example 2:

```
<table style="width:100%">
  <tr>
    <th>Name</th>
    <td>Jill</td>
  </tr>
  <tr>
    <th rowspan="2">Phone</th>
    <td>555-1234</td>
  </tr>
  <tr>
    <td>555-8745</td>
  </tr>
</table>
```

Name	Jill
Phone	555-1234
	555-8745

Lists:

HTML lists allow web developers to group a set of related items in lists.

i) Unordered HTML List:

An unordered list starts with the <ul> tag. Each list item starts with the <li> tag.

```
<ul>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ul>
```

- Coffee
- Tea
- Milk

ii) Ordered HTML List:

An ordered list starts with the <ol> tag. Each list item starts with the <li> tag.

```
<ol>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ol>
```

1. Coffee
2. Tea
3. Milk

iii) HTML Description Lists:

A description list is a list of terms, with a description of each term.

The <dl> tag defines the description list, the <dt> tag defines the description term (name), and the <dd> tag describes each term:

```
<dl>
  <dt>Coffee</dt>
  <dd>- black hot drink</dd>
  <dt>Milk</dt>
  <dd>- white cold drink</dd>
</dl>
```

Coffee
- black hot drink

Milk
- white cold drink

HTML Block and Inline Elements:

Every HTML element has a default display value, depending on what type of element it is.

The two most common display values are block and inline.

i) Block-level Elements:

A block-level element always starts on a new line, and the browsers automatically add some space (a margin) before and after the element.

A block-level element always takes up the full width available (stretches out to the left and right as far as it can).

Two commonly used block elements are: <p> and .

Here are the block-level elements in HTML:

<address>	<article>	<aside>	<blockquote>	<canvas>	<dd>
	<dl>	<dt>	<fieldset>	<figcaption>	<figure>
<footer>	<form>	<h1>-<h6>	<header>	<hr>	
<main>	<nav>	<noscript>		<p>	<pre>
<section>	<table>	<tfoot>		<video>	

ii) Inline Elements:

An inline element does not start on a new line.

An inline element only takes up as much width as necessary.

Here are the inline elements in HTML:

<a>	<abbr>	<acronym>	<b>	<bdo>	<big>
 	<button>	<cite>	<code>	<dfn>	
<i>	<img>	<input>	<kbd>	<label>	<map>
<object>	<output>	<q>	<samp>	<script>	<select>
<small>			<sub>	<sup>	<textarea>
<time>	<tt>	<var>			

Inline-block:

If you change the element's display property from block to inline-block, the elements will no longer add a line break before and after, and will be displayed side by side instead of on top of each other.

How to use display: inline-block to align div elements side by side:

```
<style>
div {
  width: 30%;
  display: inline-block;
}
</style>
```

The Element:

The element is by default a block element, meaning that it takes all available width, and comes with line breaks before and after.

The element is often used as a container for other HTML elements.

Example:

```
<div style="background-color:black;color:white;padding:20px;">
  <h2>London</h2>
  <p>London is the capital city of England. It is the most populous city in the United
Kingdom, with a metropolitan area of over 13 million inhabitants.</p>
</div>
```

The Element:

The element is an inline container used to mark up a part of a text, or a part of a document.

The element has no required attributes, but style, class and id are common.

Example:

```
<p>My mother has <span style="color:blue;font-weight:bold;">blue</span> eyes and my father has <span style="color:darkolivegreen;font-weight:bold;">dark green</span> eyes.</p>
```

HTML class Attribute:

The HTML class attribute is used to specify a class for an HTML element.

It can also be used by a JavaScript to access and manipulate elements with the specific class name.

Example:

```
<div class="city">
  <h2>Paris</h2>
  <p>Paris is the capital of France.</p>
</div>
```

```
<style>
.city {
  background-color: tomato;
  color: white;
  padding: 10px;
}
</style>
```

HTML id Attribute:

The HTML id attribute is used to specify a unique id for an HTML element.

It is also used by JavaScript to access and manipulate the element with the specific id.

```
<h1 id="myHeader">My Header</h1>
```

```
#myHeader {
  background-color: lightblue;
  color: black;
  padding: 40px;
  text-align: center;
}
```

HTML Iframes:

An HTML iframe is used to display a web page within a web page.

HTML Iframe Syntax:

The HTML <iframe> tag specifies an inline frame.

An inline frame is used to embed another document within the current HTML document

```
<iframe src="url" title="description"></iframe>
```

Iframe - Set Height and Width:

Use the height and width attributes to specify the size of the iframe.

The height and width are specified in pixels by default:

```
<iframe src="demo_iframe.htm" height="200" width="300" title="Iframe Example"></iframe>
```

Iframe - Remove the Border:

By default, an iframe has a border around it.

To remove the border, add the style attribute and use the CSS border property:

```
<iframe src="demo_iframe.htm" style="border:none;" title="Iframe Example"></iframe>
```

Iframe - Target for a Link:

An iframe can be used as the target frame for a link.

The target attribute of the link must refer to the name attribute of the iframe:

```
<iframe src="demo_iframe.htm" name="iframe_a" title="Iframe Example"></iframe>

<p><a href="https://www.w3schools.com" target="iframe_a">W3Schools.com</a></p>
```

HTML JavaScript:

JavaScript makes HTML pages more dynamic and interactive.

i) HTML <script> Tag:

The HTML <script> tag is used to define a client-side script (JavaScript).

The <script> element either contains script statements, or it points to an external script file through the src attribute.

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

ii) HTML <noscript> Tag:

The HTML <noscript> tag defines an alternate content to be displayed to users that have

disabled scripts in their browser or have a browser that doesn't support scripts.

```
<script>
document.getElementById("demo").innerHTML = "Hello JavaScript!";
</script>
<noscript>Sorry, your browser does not support JavaScript!</noscript>
```

HTML File Paths:

A file path describes the location of a file in a web site's folder structure.

Example:

Path	Description
<img src="picture.jpg">	The "picture.jpg" file is located in the same folder as the current page
<img src="images/picture.jpg">	The "picture.jpg" file is located in the images folder in the current folder
<img src="/images/picture.jpg">	The "picture.jpg" file is located in the images folder at the root of the current web
<img src="../picture.jpg">	The "picture.jpg" file is located in the folder one level up from the current folder

HTML - The Head Element:

The HTML <head> element is a container for the following elements: <title>, <style>, <meta>, <link>, <script>, and <base>.

i) The HTML <title> Element:

The <title> element defines the title of the document. The title must be text-only, and it is shown in the browser's title bar or in the page's tab.

```
<head>
  <title>A Meaningful Page Title</title>
</head>
```

ii) The HTML <style> Element:

The <style> element is used to define style information for a single HTML page:

```
<style>
  body {background-color: powderblue;}
  h1 {color: red;}
  p {color: blue;}
</style>
```

iii) The HTML <link> Element:

The <link> element defines the relationship between the current document and an external resource. It is most often used to link to external style sheets.

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

iv) The HTML <meta> Element:

The <meta> element is typically used to specify the character set, page description, keywords, author of the document, and viewport settings.

The metadata will not be displayed on the page, but is used by browsers (how to display content or reload page), by search engines (keywords), and other web services.

Examples:

Define the character set used:

```
<meta charset="UTF-8">
```

Define keywords for search engines:

```
<meta name="keywords" content="HTML, CSS, JavaScript">
```

Define a description of your web page:

```
<meta name="description" content="Free Web tutorials">
```

Define the author of a page:

```
<meta name="author" content="John Doe">
```

Refresh document every 30 seconds:

```
<meta http-equiv="refresh" content="30">
```

Setting the viewport to make your website look good on all devices:

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

v) The HTML <script> Element:

The <script> element is used to define client-side JavaScripts.

```
<script>
function myFunction() {
  document.getElementById("demo").innerHTML = "Hello JavaScript!";
}
</script>
```

vi) The HTML <base> Element:

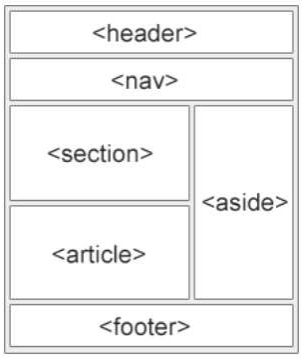
- The <base> element specifies the base URL and/or target for all relative URLs in a page.
- The <base> tag must have either an href or a target attribute present, or both.
- There can only be one single <base> element in a document!

```
<head>
<base href="https://www.w3schools.com/" target="_blank">
</head>
```

HTML Layout Elements and Techniques:

Websites often display content in multiple columns (like a magazine or a newspaper).

i) HTML Layout Elements:



- `<header>` - Defines a header for a document or a section
- `<nav>` - Defines a set of navigation links
- `<section>` - Defines a section in a document
- `<article>` - Defines independent, self-contained content
- `<aside>` - Defines content aside from the content (like a sidebar)
- `<footer>` - Defines a footer for a document or a section
- `<details>` - Defines additional details that the user can open and close on demand
- `<summary>` - Defines a heading for the `<details>` element

You can read more about semantic elements in our HTML Semantics chapter.

ii) HTML Layout Techniques:

There are four different techniques to create multicolumn layouts:

- CSS framework
- CSS float property
- CSS flexbox
- CSS grid

HTML Responsive Web Design:

What is Responsive Web Design?

Responsive Web Design is about using HTML and CSS to automatically resize, hide, shrink, or enlarge, a website, to make it look good on all devices (desktops, tablets, and phones):

i) Setting The Viewport:

To create a responsive website, add the following <meta> tag to all your web pages:

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

ii) Responsive Images:

Responsive images are images that scale nicely to fit any browser size.

a. Using the width Property:

If the CSS width property is set to 100%, the image will be responsive and scale up and down:

```
<img src="img_girl.jpg" style="width:100%;">
```

b. Using the max-width Property:

If the max-width property is set to 100%, the image will scale down if it has to, but never scale up to be larger than its original size:

```
<img src="img_girl.jpg" style="max-width:100%;height:auto;">
```

c. Show Different Images Depending on Browser Width:

The HTML <picture> element allows you to define different images for different browser window sizes.

Resize the browser window to see how the image below changes depending on the width:

```
<picture>
  <source srcset="img_smallflower.jpg" media="(max-width: 600px)">
  <source srcset="img_flowers.jpg" media="(max-width: 1500px)">
  <source srcset="flowers.jpg">
  <img src="img_smallflower.jpg" alt="Flowers">
</picture>
```

iii) Responsive Text Size:

The text size can be set with a "vw" unit, which means the "viewport width".

Note: Viewport is the browser window size. 1vw = 1% of viewport width. If the viewport is 50cm wide, 1vw is 0.5cm.

```
<h1 style="font-size:10vw">Hello World</h1>
```

iv) Media Queries:

With media queries you can define completely different styles for different browser sizes.

Example: resize the browser window to see that the three div elements below will display horizontally on large screens and stack vertically on small screens:

```
/* Use a media query to add a breakpoint at 800px: */
@media screen and (max-width: 800px) {
  .left, .main, .right {
    width: 100%; /* The width is 100%, when the viewport is 800px or smaller */
  }
}
```

HTML Forms:

An HTML form is used to collect user input. The user input is most often sent to a server for processing.

i) The <form> Element:

The <form> element is a container for different types of input elements, such as: text fields, checkboxes, radio buttons, submit buttons, etc.

```
<form>
.
form elements
.
</form>
```

ii) The <input> Element:

An <input> element can be displayed in many ways, depending on the type attribute.

Type	Description
<input type="text">	Displays a single-line text input field
<input type="radio">	Displays a radio button (for selecting one of many choices)
<input type="checkbox">	Displays a checkbox (for selecting zero or more of many choices)
<input type="submit">	Displays a submit button (for submitting the form)
<input type="button">	Displays a clickable button

iii) Text Fields:

The <input type="text"> defines a single-line input field for text input.

```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname">
</form>
```

First name:

Last name:

iv) The <label> Element:

The <label> tag defines a label for many form elements.

The for attribute of the <label> tag should be equal to the id attribute of the <input> element to bind them together.

v) Radio Buttons:

The <input type="radio"> defines a radio button.

Radio buttons let a user select ONE of a limited number of choices.

```
<p>Choose your favorite Web language:</p>

<form>
  <input type="radio" id="html" name="fav_language" value="HTML">
  <label for="html">HTML</label><br>
  <input type="radio" id="css" name="fav_language" value="CSS">
  <label for="css">CSS</label><br>
  <input type="radio" id="javascript" name="fav_language" value="JavaScript">
  <label for="javascript">JavaScript</label>
</form>
```

Choose your favorite Web language:

- ○ HTML
- ○ CSS
- ○ JavaScript

vi) Checkboxes:

The <input type="checkbox"> defines a checkbox.

Checkboxes let a user select ZERO or MORE options of a limited number of choices.

```
<form>
  <input type="checkbox" id="vehicle1" name="vehicle1" value="Bike">
  <label for="vehicle1"> I have a bike</label><br>
  <input type="checkbox" id="vehicle2" name="vehicle2" value="Car">
  <label for="vehicle2"> I have a car</label><br>
  <input type="checkbox" id="vehicle3" name="vehicle3" value="Boat">
  <label for="vehicle3"> I have a boat</label>
</form>
```

- ☐ I have a bike
- ☐ I have a car
- ☐ I have a boat

vii) The Submit Button:

The <input type="submit"> defines a button for submitting the form data to a form-handler.

The form-handler is typically a file on the server with a script for processing input data.

The form-handler is specified in the form's action attribute.

```
<form action="/action_page.php">
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="John"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Doe"><br><br>
  <input type="submit" value="Submit">
</form>
```

First name:
John
Last name:
Doe
Submit

viii) The Name Attribute for <input>:

Notice that each input field must have a name attribute to be submitted.

If the name attribute is omitted, the value of the input field will not be sent at all.

```
<form action="/action_page.php">
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" value="John"><br><br>
  <input type="submit" value="Submit">
</form>
```

HTML Form Attributes:

i) The Action Attribute:

The action attribute defines the action to be performed when the form is submitted.

Usually, the form data is sent to a file on the server when the user clicks on the submit button.

```
<form action="/action_page.php">
```

ii) The Target Attribute:

The target attribute specifies where to display the response that is received after submitting the form.

Value	Description
_blank	The response is displayed in a new window or tab
_self	The response is displayed in the current window
_parent	The response is displayed in the parent frame
_top	The response is displayed in the full body of the window
framename	The response is displayed in a named iframe

```
<form action="/action_page.php" target="_blank">
```

iii) The Method Attribute:

The method attribute specifies the HTTP method to be used when submitting the form data.

The form-data can be sent as URL variables (with method="get") or as HTTP post transaction (with method="post").

The default HTTP method when submitting form data is GET.

Method 1: This example uses the GET method when submitting the form data:

```
<form action="/action_page.php" method="get">
```

Method 2: This example uses the POST method when submitting the form data:

```
<form action="/action_page.php" method="post">
```

iv) The Autocomplete Attribute:

The autocomplete attribute specifies whether a form should have autocomplete on or off.

When autocomplete is on, the browser automatically complete values based on values that the user has entered before.

```
<form action="/action_page.php" autocomplete="on">
```

v) The Novalidate Attribute:

The novalidate attribute is a boolean attribute.

When present, it specifies that the form-data (input) should not be validated when submitted.

```
<form action="/action_page.php" novalidate>
```

HTML Form Elements:

i) The <input> Element:

The <input> element can be displayed in several ways, depending on the type attribute.

```
<label for="fname">First name:</label>
<input type="text" id="fname" name="fname">
```

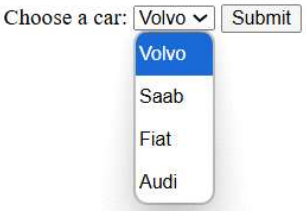
ii) The <label> Element:

The <label> element defines a label for several form elements.

iii) The <select> Element:

The <select> element defines a drop-down list:

```
<label for="cars">Choose a car:</label>
<select id="cars" name="cars">
  <option value="volvo">Volvo</option>
  <option value="saab">Saab</option>
  <option value="fiat">Fiat</option>
  <option value="audi">Audi</option>
</select>
```



iv) <option> Element:

The <option> element defines an option that can be selected.

By default, the first item in the drop-down list is selected.

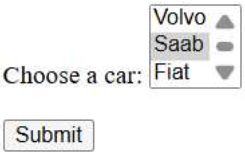
To define a pre-selected option, add the selected attribute to the option:

```
<form action="/action_page.php">
  <label for="cars">Choose a car:</label>
  <select id="cars" name="cars">
    <option value="volvo">Volvo</option>
    <option value="saab">Saab</option>
    <option value="fiat" selected>Fiat</option>
    <option value="audi">Audi</option>
  </select>
  <input type="submit">
</form>
```

v) Visible Values:

Use the size attribute to specify the number of visible values:

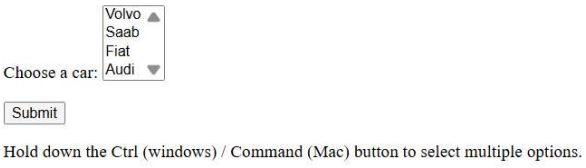
```
<label for="cars">Choose a car:</label>
<select id="cars" name="cars" size="3">
  <option value="volvo">Volvo</option>
  <option value="saab">Saab</option>
  <option value="fiat">Fiat</option>
  <option value="audi">Audi</option>
</select><br><br>
<input type="submit">
```



vi) Allow Multiple Selections:

Use the multiple attribute to allow the user to select more than one value:

```
<label for="cars">Choose a car:</label>
<select id="cars" name="cars" size="4" multiple>
  <option value="volvo">Volvo</option>
  <option value="saab">Saab</option>
  <option value="fiat">Fiat</option>
  <option value="audi">Audi</option>
</select>
```



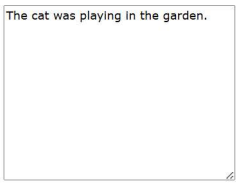
vii) The <textarea> Element:

The <textarea> element defines a multi-line input field (a text area).

The rows attribute specifies the visible number of lines in a text area.

The cols attribute specifies the visible width of a text area.

```
<textarea name="message" rows="10" cols="30">
The cat was playing in the garden.
</textarea>
```



viii) The <button> Element:

The <button> element defines a clickable button:

```
<button type="button" onclick="alert('Hello World!')">Click Me!</button>
```

ix) The <fieldset> and <legend> Elements:

The <fieldset> element is used to group related data in a form.

The <legend> element defines a caption for the <fieldset> element.

```
<form action="/action_page.php">
  <fieldset>
    <legend>Personalia:</legend>
    <label for="fname">First name:</label><br>
    <input type="text" id="fname" name="fname" value="John"><br>
    <label for="lname">Last name:</label><br>
    <input type="text" id="lname" name="lname" value="Doe"><br><br>
    <input type="submit" value="Submit">
  </fieldset>
</form>
```

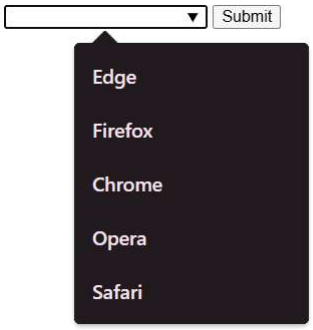
x) The <datalist> Element:

The <datalist> element specifies a list of pre-defined options for an <input> element.

Users will see a drop-down list of the pre-defined options as they input data.

The list attribute of the <input> element, must refer to the id attribute of the <datalist> element.

```
<form action="/action_page.php">
  <input list="browsers" name="browser">
  <datalist id="browsers">
    <option value="Edge">
    <option value="Firefox">
    <option value="Chrome">
    <option value="Opera">
    <option value="Safari">
  </datalist>
  <input type="submit">
</form>
```



HTML Input Types

i) Input Type Text: <input type="text"> defines a single-line text input field:

```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname">
</form>
```

First name:

Last name:

ii) Input Type Password: <input type="password"> defines a password field:

```
<form>
  <label for="username">Username:</label><br>
  <input type="text" id="username" name="username"><br>
  <label for="pwd">Password:</label><br>
  <input type="password" id="pwd" name="pwd">
</form>
```

Username:

Password:

iii) Input Type Submit: <input type="submit"> defines a button for submitting form data to a form-handler.

The form-handler is typically a server page with a script for processing input data.

The form-handler is specified in the form's action attribute:

```
<form action="/action_page.php">
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="John"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Doe"><br><br>
  <input type="submit" value="Submit">
</form>
```

First name:
John
Last name:
Doe
Submit

iv) Input Type Reset: <input type="reset"> defines a reset button that will reset all form values to their default values.

```
<form action="/action_page.php">
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="John"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Doe"><br><br>
  <input type="submit" value="Submit">
  <input type="reset" value="Reset">
</form>
```

First name:
John
Last name:
Doe
Submit Reset

v) Input Type Radio: <input type="radio"> defines a radio button.

Radio buttons let a user select ONLY ONE of a limited number of choices:

```
<form>
  <input type="radio" id="html" name="fav_language" value="HTML">
  <label for="html">HTML</label><br>
  <input type="radio" id="css" name="fav_language" value="CSS">
  <label for="css">CSS</label><br>
  <input type="radio" id="javascript" name="fav_language" value="JavaScript">
  <label for="javascript">JavaScript</label>
</form>
```

HTML
CSS
JavaScript

vi) Input Type Checkbox: <input type="checkbox"> defines a checkbox.

Checkboxes let a user select ZERO or MORE options of a limited number of choices.

```
<form>
  <input type="checkbox" id="vehicle1" name="vehicle1" value="Bike">
  <label for="vehicle1"> I have a bike</label><br>
  <input type="checkbox" id="vehicle2" name="vehicle2" value="Car">
  <label for="vehicle2"> I have a car</label><br>
  <input type="checkbox" id="vehicle3" name="vehicle3" value="Boat">
  <label for="vehicle3"> I have a boat</label>
</form>
```

I have a bike
I have a car
I have a boat

vii) Input Type Button: <input type="button"> defines a button:

```
<input type="button" onclick="alert('Hello World!')" value="Click Me!">
```

Click Me!

viii) Input Type Color: The <input type="color"> is used for input fields that should contain a color.

```
<form>
  <label for="favcolor">Select your favorite color:</label>
  <input type="color" id="favcolor" name="favcolor">
</form>
```

Select your favorite color: Submit

ix) Input Type Date: The <input type="date"> is used for input fields that should contain a date.

```
<form>
  <label for="birthday">Birthday:</label>
  <input type="date" id="birthday" name="birthday">
</form>
```

Birthday: dd-mm-yyyy Submit

You can also use the min and max attributes to add restrictions to dates:

```
<form>
  <label for="datemax">Enter a date before 1980-01-01:</label>
  <input type="date" id="datemax" name="datemax" max="1979-12-31"><br><br>
  <label for="datemin">Enter a date after 2000-01-01:</label>
  <input type="date" id="datemin" name="datemin" min="2000-01-02">
</form>
```

x) Input Type Datetime-local: The <input type="datetime-local"> specifies a date and time input field, with no time zone.

```
<form>
  <label for="birthdaytime">Birthday (date and time):</label>
  <input type="datetime-local" id="birthdaytime" name="birthdaytime">
</form>
```

Birthday (date and time): dd-mm-yyyy --:-- -- Submit

xi) Input Type Email: The <input type="email"> is used for input fields that should contain an e-mail address.

```
<form>
  <label for="email">Enter your email:</label>
  <input type="email" id="email" name="email">
</form>
```

Enter your email: Submit

xii) Input Type Image: The <input type="image"> defines an image as a submit button.

```
<form>
<input type="image" src="img_submit.gif" alt="Submit" width="48" height="48">
</form>
```

xiii) Input Type File: The <input type="file"> defines a file-select field and a "Browse" button for file uploads.

```
<form>
  <label for="myfile">Select a file:</label>
  <input type="file" id="myfile" name="myfile">
</form>
```

Select a file: Choose File No file chosen

Submit

xiv) Input Type Hidden: The <input type="hidden"> defines a hidden input field (not visible to a user).

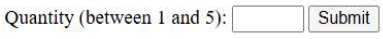
```
<form>
  <label for="fname">First name:</label>
  <input type="text" id="fname" name="fname"><br><br>
  <input type="hidden" id="custId" name="custId" value="3487">
  <input type="submit" value="Submit">
</form>
```

xv) Input Type Month: The <input type="month"> allows the user to select a month and year.

```
<form>
  <label for="bdaymonth">Birthday (month and year):</label>
  <input type="month" id="bdaymonth" name="bdaymonth">
</form>
```

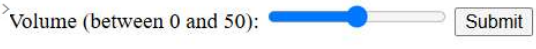
xvi) Input Type Number: The <input type="number"> defines a numeric input field.

```
<form>
  <label for="quantity">Quantity (between 1 and 5):</label>
  <input type="number" id="quantity" name="quantity" min="1" max="5">
</form>
```



xvii) Input Type Range: The <input type="range"> defines a control for entering a number whose exact value is not important (like a slider control). Default range is 0 to 100.

```
<form>
  <label for="vol">Volume (between 0 and 50):</label>
  <input type="range" id="vol" name="vol" min="0" max="50">
</form>
```

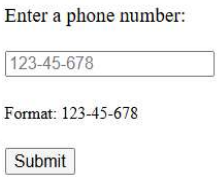


xviii) Input Type Search: The <input type="search"> is used for search fields (a search field behaves like a regular text field).

```
<form>
  <label for="gsearch">Search Google:</label>
  <input type="search" id="gsearch" name="gsearch">
</form>
```

xix) Input Type Tel: The <input type="tel"> is used for input fields that should contain a telephone number.

```
<form>
  <label for="phone">Enter your phone number:</label>
  <input type="tel" id="phone" name="phone" pattern="[0-9]{3}-[0-9]{2}-[0-9]{3}">
</form>
```



xx) Input Type Time: The <input type="time"> allows the user to select a time (no time zone).

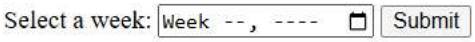
```
<form>
  <label for="appt">Select a time:</label>
  <input type="time" id="appt" name="appt">
</form>
```

xxi) Input Type Url: The <input type="url"> is used for input fields that should contain a URL address.

```
<form>
  <label for="homepage">Add your homepage:</label>
  <input type="url" id="homepage" name="homepage">
</form>
```

xxii) Input Type Week: The <input type="week"> allows the user to select a week and year.

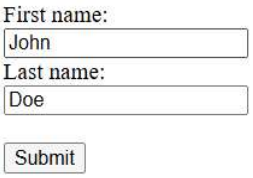
```
<form>
  <label for="week">Select a week:</label>
  <input type="week" id="week" name="week">
</form>
```



HTML Input Attributes

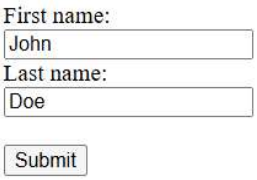
i) The value Attribute: The input value attribute specifies an initial value for an input field:

```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="John"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Doe">
</form>
```



ii) The readonly Attribute: The input readonly attribute specifies that an input field is read-only.

```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="John" readonly><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Doe">
</form>
```



iii) The disabled Attribute: The input disabled attribute specifies that an input field should be disabled.

```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="John" disabled><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Doe">
</form>
```

iv) The size Attribute: The input size attribute specifies the visible width, in characters, of an input field.

Note: The size attribute works with the following input types: text, search, tel, url, email, and password.

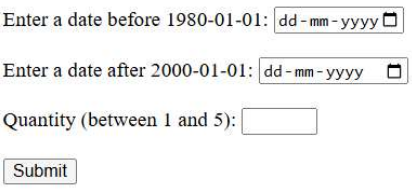
```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" size="50"><br>
  <label for="pin">PIN:</label><br>
  <input type="text" id="pin" name="pin" size="4">
</form>
```

v) The maxlength Attribute: The input maxlength attribute specifies the maximum number of characters allowed in an input field.

```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" size="50"><br>
  <label for="pin">PIN:</label><br>
  <input type="text" id="pin" name="pin" maxlength="4" size="4">
</form>
```

vi) The min and max Attributes: The input min and max attributes specify the minimum and maximum values for an input field.

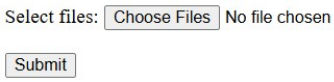
```
<form>
  <label for="datemax">Enter a date before 1980-01-01:</label>
  <input type="date" id="datemax" name="datemax" max="1979-12-31"><br><br>

  <label for="datemin">Enter a date after 2000-01-01:</label>
  <input type="date" id="datemin" name="datemin" min="2000-01-02"><br><br>

  <label for="quantity">Quantity (between 1 and 5):</label>
  <input type="number" id="quantity" name="quantity" min="1" max="5">
</form>
```



vii) The multiple Attribute: The input multiple attribute specifies that the user is allowed to enter more than one value in an input field.

The multiple attribute works with the following input types: email, and file.

```
<form>
  <label for="files">Select files:</label>
  <input type="file" id="files" name="files" multiple>
</form>
```



viii) The pattern Attribute: The input pattern attribute specifies a regular expression that the input field's value is checked against, when the form is submitted.

The pattern attribute works with the following input types: text, date, search, url, tel, email, and password.

```
<form>
  <label for="country_code">Country code:</label>
  <input type="text" id="country_code" name="country_code"
  pattern="[A-Za-z]{3}" title="Three letter country code">
</form>
```

Country code: Submit

ix) The placeholder Attribute: The input placeholder attribute specifies a short hint that describes the expected value of an input field (a sample value or a short description of the expected format).

```
<form>
  <label for="phone">Enter a phone number:</label>
  <input type="tel" id="phone" name="phone"
  placeholder="123-45-678"
  pattern="[0-9]{3}-[0-9]{2}-[0-9]{3}">
</form>
```

Enter a phone number: 123-45-678 Submit

x) The required Attribute: The input required attribute specifies that an input field must be filled out before submitting the form.

```
<form>
  <label for="username">Username:</label>
  <input type="text" id="username" name="username" required>
</form>
```

Username: Submit

xi) The step Attribute:

The input step attribute specifies the legal number intervals for an input field.

Example: if step="3", legal numbers could be -3, 0, 3, 6, etc.

```
<form>
  <label for="points">Points:</label>
  <input type="number" id="points" name="points" step="3">
</form>
```

Points: 3 Submit

xii) The autofocus Attribute: The input autofocus attribute specifies that an input field should automatically get focus when the page loads.

```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" autofocus><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname">
</form>
```

First name:
Last name:
Submit

xiii) The height and width Attributes: The input height and width attributes specify the height and width of an <input type="image"> element.

```
<form>
  <label for="fname">First name:</label>
  <input type="text" id="fname" name="fname"><br><br>
  <label for="lname">Last name:</label>
  <input type="text" id="lname" name="lname"><br><br>
  <input type="image" src="img_submit.gif" alt="Submit" width="48" height="48">
</form>
```

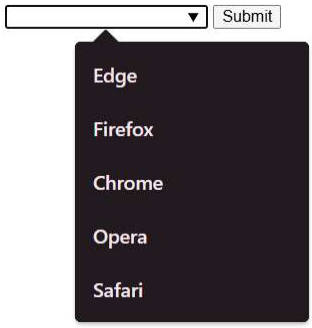
First name:

Last name:

Note: The input type="image" sends the X and Y coordinates of the click that activated the image button.

xiv) The list Attribute: The input list attribute refers to a <datalist> element that contains pre-defined options for an <input> element.

```
<form>
  <input list="browsers">
  <datalist id="browsers">
    <option value="Edge">
    <option value="Firefox">
    <option value="Chrome">
    <option value="Opera">
    <option value="Safari">
  </datalist>
</form>
```



xv) The autocomplete Attribute: Autocomplete allows the browser to predict the value. When a user starts to type in a field, the browser should display options to fill in the field, based on earlier typed values.

```
<form action="/action_page.php" autocomplete="on">
  <label for="fname">First name:</label>
  <input type="text" id="fname" name="fname"><br><br>
  <label for="lname">Last name:</label>
  <input type="text" id="lname" name="lname"><br><br>
  <label for="email">Email:</label>
  <input type="email" id="email" name="email" autocomplete="off"><br><br>
  <input type="submit" value="Submit">
</form>
```

First name:

Last name:

Email:

Submit

HTML Multimedia:

What is Multimedia?

Multimedia comes in many different formats. It can be almost anything you can hear or see, like images, music, sound, videos, records, films, animations, and more.

Web pages often contain multimedia elements of different types and formats.

Multimedia Formats:

Multimedia elements (like audio or video) are stored in media files.

Multimedia files have formats and different extensions like: .wav, .mp3, .mp4, .mpg, .wmv, and .avi.

Common Video Formats:

There are many video formats out there.

The MP4, WebM, and Ogg formats are supported by HTML.

The MP4 format is recommended by YouTube.

Common Audio Formats:

MP3 is the best format for compressed recorded music. The term MP3 has become synonymous with digital music.

If your website is about recorded music, MP3 is the choice.

HTML Video:

The HTML <video> element is used to show a video on a web page.

```
<video width="320" height="240" controls>
  <source src="movie.mp4" type="video/mp4">
  <source src="movie.ogg" type="video/ogg">
Your browser does not support the video tag.
</video>
```

HTML Video Tags:

Tag	Description
<video>	Defines a video or movie
<source>	Defines multiple media resources for media elements, such as <video> and <audio>
<track>	Defines text tracks in media players

HTML <video> Autoplay:

To start a video automatically, use the autoplay attribute:

```
<video width="320" height="240" autoplay>
  <source src="movie.mp4" type="video/mp4">
  <source src="movie.ogg" type="video/ogg">
Your browser does not support the video tag.
</video>
```

Add muted after autoplay to let your video start playing automatically (but muted):

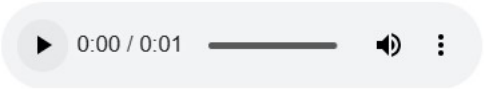
```
<video width="320" height="240" autoplay muted>
  <source src="movie.mp4" type="video/mp4">
  <source src="movie.ogg" type="video/ogg">
Your browser does not support the video tag.
</video>
```

HTML Audio:

The HTML <audio> element is used to play an audio file on a web page.

The HTML <audio> Element: To play an audio file in HTML, use the <audio> element:

```
<audio controls>
  <source src="horse.ogg" type="audio/ogg">
  <source src="horse.mp3" type="audio/mpeg">
Your browser does not support the audio element.
</audio>
```



HTML Audio Tags:

Tag	Description
<audio>	Defines sound content
<source>	Defines multiple media resources for media elements, such as <video> and <audio>

HTML <audio> Autoplay: To start an audio file automatically, use the autoplay attribute:

```
<audio controls autoplay>
  <source src="horse.ogg" type="audio/ogg">
  <source src="horse.mp3" type="audio/mpeg">
Your browser does not support the audio element.
</audio>
```

Add muted after autoplay to let your audio file start playing automatically (but muted):

```
<audio controls autoplay muted>
  <source src="horse.ogg" type="audio/ogg">
  <source src="horse.mp3" type="audio/mpeg">
Your browser does not support the audio element.
</audio>
```

HTML YouTube Videos:

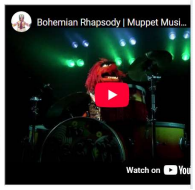
The easiest way to play videos in HTML, is to use YouTube.

Playing a YouTube Video in HTML:

To play your video on a web page, do the following:

- Upload the video to YouTube
- Take a note of the video id
- Define an <iframe> element in your web page
- Let the src attribute point to the video URL
- Use the width and height attributes to specify the dimension of the player
- Add any other parameters to the URL (see below)

```
<iframe width="420" height="315"
src="https://www.youtube.com/embed/tgbNymZ7vqY">
</iframe>
```



YouTube Autoplay + Mute:

You can let your video start playing automatically when a user visits the page, by adding autoplay=1 to the YouTube URL. However, automatically starting a video is annoying for your visitors!

Add mute=1 after autoplay=1 to let your video start playing automatically (but muted).

```
<iframe width="420" height="315"
src="https://www.youtube.com/embed/tgbNymZ7vqY?autoplay=1&mute=1">
</iframe>
```