

# HTML

## Reading Material



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## Understanding the concept of HTML

### HTML and its History

HTML, or Hypertext Markup Language, is the standard language used to create and design web pages. It provides the structure and layout of content on the World Wide Web. HTML was first introduced by Tim Berners-Lee in 1991 as a means to share documents on the Internet. Since then, it has undergone several revisions and updates to accommodate advancements in web technology.

### HTML Document Structure

HTML provides the structure for webpages, organizing content with a variety of elements and attributes. By using semantic HTML and structuring documents properly, you create webpages that are easier to read, maintain, and optimize for search engines and accessibility.

```

<!DOCTYPE html>           ← Tells version of HTML
<html>                  ← HTML Root Element

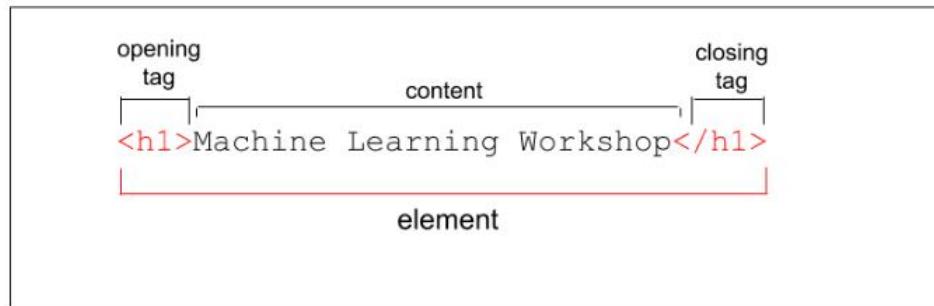
<head>                  ← Used to contain page HTML metadata
  <title>Page Title</title>   ← Title of HTML page
</head>

<body>                  ← Hold content of HTML
  <h2>Heading Content</h2>    ← HTML heading tag
  <p>Paragraph Content</p>    ← HTML paragraph tag
</body>

</html>

```

## Elements and Tag HTML



**Elements:** In HTML, elements are the building blocks of web pages. They consist of tags and content enclosed within those tags. Each element serves a specific purpose and contributes to the structure and layout of the page. For example, the `<p>` element represents a paragraph, `<h1>` to `<h6>` represents headings of different levels, `<img>` represents an image, and so on.

**Tags:** Tags are the fundamental components of HTML syntax. They define the beginning and end of an element and can also contain attributes that provide additional information about the element. Tags are enclosed in angle brackets (`<>`). For example, `<p>` is the opening tag for a paragraph element, and `</p>` is the closing tag.

**Semantic Tags:** Semantic tags are specific HTML elements that convey meaning about the content they enclose. They provide more context to web browsers and search engines, helping them better understand the structure of the page. Examples of semantic tags include `<header>`, `<nav>`, `<main>`, `<section>`, `<article>`, `<aside>`, `<footer>`, `<figure>`, and `<figcaption>`. These tags help organize content in a meaningful way and improve accessibility and SEO.

here's a list of some of the most commonly used HTML tags:

- <html>**: Defines the root of an HTML document.
- <head>**: Contains metadata about the HTML document, such as title, links to stylesheets, scripts, etc.
- <title>**: Sets the title of the HTML document, displayed in the browser's title bar or tab.
- <body>**: Contains the content of the HTML document, such as text, images, links, etc.
- <h1> to <h6>**: Defines headings of various levels, with `<h1>` being the highest level and `<h6>` being the lowest.
- <p>**: Defines a paragraph of text.
- <a>**: Creates hyperlinks to other web pages or resources.
- <img>**: Inserts an image into the document.
- <ul>**: Defines an unordered list.
- <ol>**: Defines an ordered list.
- <li>**: Defines a list item within an unordered or ordered list.
- <div>**: Defines a division or section within an HTML document, often used for layout purposes.
- <span>**: Defines a generic container that does not represent anything specific on its own.
- <table>**: Defines a table.
- <tr>**: Defines a row within a table.
- <td>**: Defines a cell within a table row.
- <form>**: Defines a form for user input.
- <input>**: Defines an input control within a form.
- <textarea>**: Defines a multi-line text input control within a form.
- <button>**: Defines a clickable button.

## List

**1. Ordered Lists (<ol>):** Ordered lists are numbered lists where each list item is prefixed with a number or letter. They are typically used when the order of items is important. The <ol> tag is used to create an ordered list, and each list item is defined using the <li> (list item) tag.

```
<ol>
  <li>First item</li>
  <li>Second item</li>
  <li>Third item</li>
</ol>
```

**2. Unordered Lists (<ul>):** Unordered lists are bulleted lists where each item is prefixed with a bullet point or another marker. They are used when the order of items is not significant. The <ul> tag is used to create an unordered list, and each list item is defined using the <li> tag.

```
<ul>
  <li>Apples</li>
  <li>Oranges</li>
<li>Bananas</li>
</ul>
```

**3. Definition Lists (<dl>):** Definition lists are used to display terms and their definitions. Each term is defined using the <dt> (definition term) tag, and each definition is provided using the <dd> (definition description) tag. Unlike ordered and unordered lists, definition lists do not have a specific marker for list items.

```
<dl>
  <dt>HTML</dt>
  <dd>Hypertext Markup Language</dd>
  <dt>CSS</dt>
  <dd>Cascading Style Sheets</dd>
</dl>
```

HTML lists provide a flexible way to structure and present information on a web page, allowing developers to choose the appropriate type of list based on the content and context.

## Media tags

Media tags in HTML are elements used to embed and display different types of media content, such as images, graphics, audio, video, and external web pages, within an HTML document. These tags provide a structured way to include multimedia elements and enhance the visual and auditory experience of a web page.

## Here's a brief overview of each media tag:

**Image (<img>):** The <img> tag is used to embed images into an HTML document. It specifies the URL of the image file using the src attribute and provides alternative text for accessibility and SEO with the alt attribute.

```

```

**Canvas (<canvas>):** The <canvas> tag provides a drawing surface for graphics and animations using JavaScript. Developers can dynamically draw shapes, text, images, and other visual elements on the canvas using JavaScript APIs.

```
<dl>  
  <dt>HTML</dt>  
  <dd>Hypertext Markup Language</dd>  
  <dt>CSS</dt>  
  <dd>Cascading Style Sheets</dd>  
</dl>
```

**Audio (<audio>):** The <audio> tag is used to embed audio files into an HTML document. It supports various audio formats like MP3, Ogg, and WAV. Attributes like controls, autoplay, and loop provide control over playback behavior.

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

**Video (<video>):** The <video> tag is used to embed video files into an HTML document. It supports various video formats like MP4, WebM, and Ogg. Similar to the <audio> tag, it has attributes like controls, autoplay, and loop for controlling playback.

```
<video controls width="400" height="300">  
  <source src="video.mp4" type="video/mp4">  
  Your browser does not support the video tag.  
</video>
```

**Inline Frame (<iframe>):** The <iframe> tag is used to embed another HTML document or external content within the current document. It provides a way to include external content like maps, videos, or other web pages by specifying the URL of the content to be embedded.

```
<dl>  
  <dt>HTML</dt>  
  <dd>Hypertext Markup Language</dd>  
  <dt>CSS</dt>  
  <dd>Cascading Style Sheets</dd>  
</dl>
```

## Table

A table in HTML is defined with the `<table>` element. A table is divided into rows using the `<tr>` (table row) element, and each row is divided into cells using `<td>` (table data) or `<th>` (table header) elements.

- **<table>**: The root element for creating a table.
- **<caption>**: Provides a title for the table.
- **<thead>**: Groups the header content in the table.
- **<tbody>**: Groups the body content in the table.
- **<tfoot>**: Groups the footer content in the table.
- **<tr>**: Defines a row in the table.
- **<th>**: Defines a header cell in the table. Header cells are usually bold and centered.
- **<td>**: Defines a standard data cell in the table.

## Attributes

- **border**: Adds a border to the table and its cells.
- **colspan**: Spans a cell across multiple columns.
- **rowspan**: Spans a cell across multiple rows.

## Example with Attributes

```
<table border="1">
  <tr>
    <th rowspan="2">Header 1</th>
    <th colspan="2">Header 2 and 3</th>
  </tr>
  <tr>
    <th>Header 2</th>
    <th>Header 3</th>
  </tr>
  <tr>
    <td>Data 1</td>
    <td>Data 2</td>
    <td>Data 3</td>
  </tr>
  <tr>
    <td>Data 4</td>
    <td colspan="2">Data 5 and 6</td>
  </tr>
</table>
```

## Browser output

Header 1	Header 2 and 3	
	Header 2	Header 3
Data 1	Data 2	Data 3
Data 4	Data 5 and 6	

## Form and input elements

**<form> Element:** The <form> element is used to create an HTML form for user input. It can contain various input elements like text fields, checkboxes, radio buttons, and more.

### Attributes of <form>:

- **action:** Specifies the URL to which the form data will be sent.
- **method:** Specifies the HTTP method to use when sending form data (e.g., GET or POST).
- **enctype:** Specifies the encoding type when submitting the form (e.g., multipart/form-data for file uploads).

**<input> Element:** The <input> element is used to create interactive controls in a web form that can accept data from the user. There are various types of input fields, each with different purposes.

### Common types of <input>:

- **text:** A single-line text field.
- **password:** A single-line text field that hides the input text.
- **email:** A single-line text field for entering email addresses.
- **number:** A field for entering a number.
- **checkbox:** A checkbox that can be toggled on or off.
- **radio:** A radio button for selecting one option from a group.
- **submit:** A button for submitting the form.
- **reset:** A button for resetting the form fields to their initial values.
- **file:** A field for uploading files.

### Attributes of <input>:

- **type:** Specifies the type of input (e.g., text, password, email).
- **name:** Specifies the name of the input element, which is used to identify the data when it is submitted.
- **value:** Specifies the initial value of the input element.
- **placeholder:** Provides a hint to the user of what can be entered in the field.
- **required:** Specifies that the input field must be filled out before submitting the form.
- **disabled:** Specifies that the input field is disabled and cannot be used.
- **readonly:** Specifies that the input field is read-only and cannot be edited.

### Example

```

<form action="/submit_form" method="POST">
    <label for="name">Name:</label>
    <input type="text" id="name" name="name"
placeholder="Enter your name" required><br><br>

    <label for="email">Email:</label>
    <input type="email" id="email" name="email"
placeholder="Enter your email" required><br><br>

    <input type="submit" value="Submit">
</form>

```

## Browser output

<b>Name:</b>	<input type="text" value="Enter your name"/>
<b>Email:</b>	<input type="text" value="Enter your email"/>
<b>Submit</b>	

## SEO and meta tag

### SEO (Search Engine Optimization):

SEO involves optimizing web pages to improve their visibility and ranking in search engine results. Key aspects include creating high-quality content, using relevant keywords, optimizing on-page elements like title tags and headings, building backlinks, ensuring technical SEO factors like site speed and mobile-friendliness, and providing a positive user experience.

### Meta Tags:

**Meta tags are HTML elements that provide information about a web page to search engines and users. Key meta tags include:**

- **Title Tag (`<title>`):** Specifies the title of the page displayed in search results.
- **Meta Description Tag (`<meta name="description" content="...">`):** Provides a brief summary of the page's content in search results.
- **Canonical Tag (`<link rel="canonical" href="...">`):** Indicates the preferred URL for indexing when there are duplicate content issues.
- **Robots Meta Tag (`<meta name="robots" content="...">`):** Controls how search engine crawlers interact with the page (e.g., indexing or following links).

Implementing SEO best practices and using relevant meta tags can help websites rank higher in search results and attract more organic traffic.

```

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="description" content="This is a concise and informative meta description of the web page. It provides a summary of the page's content for search engines and users.">
    <title>Example Page</title>
</head>
<body>
    <h1>Welcome to Example Page</h1>
    <p>This is the content of the example page.</p>
</body>
</html>

```

In this example, the `<meta name="description" content="...">` tag provides a brief summary of the web page's content. Search engines use this information to display relevant snippets in search results, helping users understand what the page is about before they click on it.

## Accessibility

Accessibility in HTML ensures that web content is usable by people with disabilities. It involves using semantic HTML, providing alternative text for images, organizing content with proper headings, making forms accessible, enabling keyboard navigation, maintaining color contrast, adding captions and transcripts for multimedia content, implementing responsive design, and testing for accessibility issues. By prioritizing accessibility, web developers can create inclusive experiences that cater to all users.

**Semantic HTML:** Elements like `<header>`, `<nav>`, `<main>` convey structure to assistive tech.

**Alternative Text:** `<img>` alt attribute provides descriptions for screen readers.

**Proper Heading Structure:** `<h1>` to `<h6>` help navigation and hierarchy understanding.

**Form Accessibility:** `<label>` tags make forms easier to use for screen reader users.

**Keyboard Accessibility:** Ensures all elements are navigable via keyboard.

**Color Contrast:** Maintains readability for users with low vision or color blindness.

**Audio and Video Accessibility:** Captions, transcripts, and descriptions for multimedia content.

**Responsive Design:** Adapts content to various devices for accessibility.

**Testing and Validation:** Regularly tests with accessibility tools and user feedback for improvements.