

HTML

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History

- HTML was first created by Tim Berners-Lee, Robert Cailliau, and others starting in 1989.
 - The concept of hypertext goes back even further than that.
- Since then, the language has been in constant development.
- Web development has changed immensely:
 - A web page is no longer just a document; it is likely to be a full-scale web application.
 - Even when it is “just a document,” we want search engines and other tools to understand the content of the website. We aren’t just creating pages for human readers anymore, but for artificially-intelligent systems that collect and manipulate information.
- HTML5 is the latest specification of the HTML language.
 - It represented a major break with previous markup practices.

Basics

- HTML is used to create the structure of web pages.
 - It contains Tags and Attributes.
 - We can link multiple pages using Hyperlinks.
-
- HTML pages are created by tagging textual information with HTML markup.
 - Tags appear inside angled brackets < and >. For example,
 - causes text to appear in bold.
 - <I> marks up the text to appear in italics.
 - HTML is about building, rather than designing.

Web browsers

- A web browser retrieves information from other parts of the web and displays it on your desktop or mobile device.
 - The information is transferred using the Hypertext Transfer Protocol.
 - A rendering engine is used to translate that data which is written in Hypertext Markup Language (HTML) into text and images.
- Additionally,
 - It provides navigation facilities for users.
 - It caches most frequently accessed data to increase browsing speed.
 - It handles security.
 - It stores browsing history and bookmarks, .
 - ...
 - and a lot more with browser extensions.

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HTML Documents

- All HTML documents must start with a document type declaration:
`<!DOCTYPE html>`.
- The HTML document itself begins with `<html>` and ends with `</html>`.
- `<head>` is used to define the head portion of the HTML document that contains information related to the document.
- The visible part of the HTML document is between `<body>` and `</body>`.

HTML Page Structure

```
<!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>
```

Concept and syntax

- An HTML document is a plaintext document structured with elements.
 - An element is a part of a webpage. It may contain a data item or a chunk of text or an image, or perhaps nothing.
 - Elements are surrounded by matching opening and closing tags.
- HTML tags can be extended with attributes, which provide additional information affecting how the browser interprets the element:

Anatomy of an HTML element



Concept and syntax

- **Void elements:** Not all elements follow the pattern of an opening tag, content, and a closing tag. Some elements consist of a single tag, which is typically used to insert/embed something in the document.
 - For example, the `` element embeds an image file onto a page.

```

```


Nesting elements

- Elements can be placed within other elements.

```
<ul>  
  <li>Example 1</li>  
  <li>Example 2</li>  
</ul>
```

- The tags have to open and close in a way that they are inside or outside one another.
 - The entire element(s) (the child(ren)), including its markup, must be within the start and end tags of the containing element (the parent).

Element categories

- A block-level element forms a visible block on a page.
 - It appears on a new line following the content that precedes it.
 - Any content that follows a block-level element also appears on a new line.
 - For example, Each `<p>` element appears on a new line, with space above and below.
- An inline element is contained within block-level elements, and surrounds only small parts of the document's content.
 - It does not cause a new line to appear in the document.
 - It is typically used with text, for example an `<a>` element creates a hyperlink, and elements such as `` or `` create emphasis.

Element categories

```
<em>first</em><em>second</em><em>third</em>
```

```
<p>fourth</p>
```

```
<p>fifth</p>
```

```
<p>sixth</p>
```

*first**second**third*

fourth

fifth

sixth

HTML Attributes

- HTML elements can have attributes.
- Attributes provide additional information about the element.
- Attributes come in name/value pairs like `charset="utf-8"`.
- Let's look at ``, `` and `` as an example:

```
<ol >  
  <li>Item 1</li>  
  <li>Item 2</li>  
  <li>Item 3</li>  
</ol>
```

HTML Attributes

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- Let's look at ``, `` and `` as an example:

```
<ol value="2" type="a">  
  <li>Item 1</li>  
  <li value="4">Item 2</li>  
  <li>Item 3</li>  
</ol>
```

HTML Attributes

- An attribute should have:
 - A space between it and the element name. (For an element with more than one attribute, the attributes should be separated by spaces too.)
 - The attribute name, followed by an equal sign.
 - An attribute value, wrapped with opening and closing (single or double) quote marks.
- Another example of an element is `<a>` (stands for anchor)
 - An anchor can make the text it encloses into a hyperlink. Anchors can take a number of attributes, such as `href`, `title` and `target`.
 - Let's give it a try.

HTML Attributes

- **Boolean attributes** can only have one value, which is generally the same as the attribute name.
 - For example, for form `<input>` elements, the `disabled` attribute disables the element and introduces a grayed-out appearance.
 - Let's give it a try.

```
<input type="text" disabled="disabled" />
```

```
<input type="text" disabled />
```

```
<input type="text" />
```

Basic HTML elements

- **Headings:** HTML headings are defined with `<h1>` to `<h6>` tags. `<h1>` defines the most important heading. `<h6>` defines the least important heading
- **Paragraphs:** HTML paragraphs are defined with `<p>` tags.
- **Links:** HTML links are defined with `<a>` tags.
- **Images:** HTML images are defined with `` tags. The source file (`src`), alternative text (`alt`), `width`, and `height` are provided as attributes.
- **Buttons:** HTML buttons are defined with `<button>` tags.
- **Tables:** An HTML table is defined with a `<table>` tag. Table rows are defined with `<tr>` tags. Table headers are defined with `<th>` tags. Table cells (data) are defined with `<td>` tags.

Basic HTML elements

```
<h1>This is heading 1</h1>
<h2>This is heading 2</h2>
<h3>This is heading 3</h3>

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

<a href="https://www.google.com">This is
a link</a>



<button>Click me</button>
```

```
<table>
  <tr>
    <th>Firstname</th>
    <th>Lastname</th>
    <th>Age</th>
  </tr>
  <tr>
    <td>Jill</td>
    <td>Smith</td>
    <td>50</td>
  </tr>
  <tr>
    <td>Eve</td>
    <td>Jackson</td>
    <td>94</td>
  </tr>
</table>
```

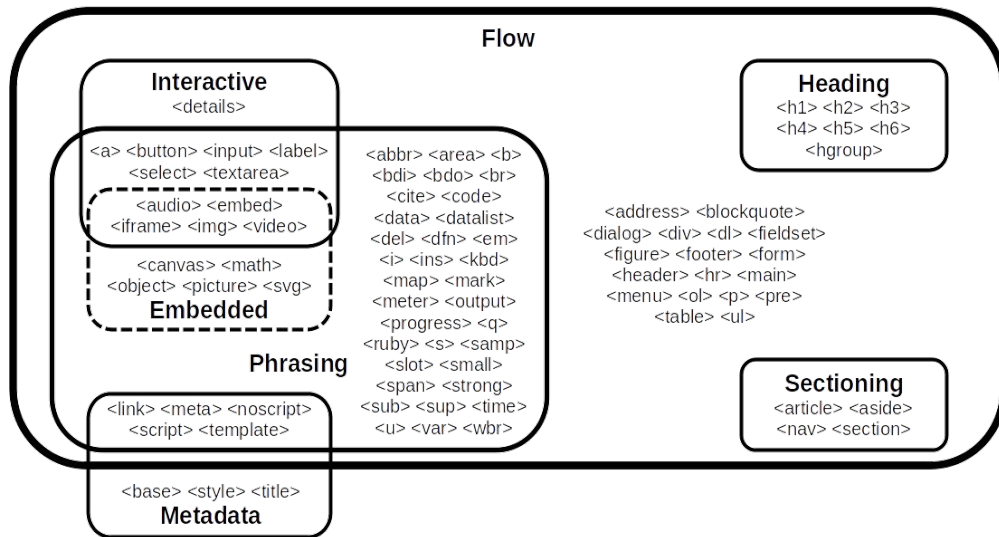
Element categories

- With HTML5, element categories are redefined in a much more detailed and less ambiguous way.
 - There are 16 of them: Metadata Content, Flow Content, Sectioning Content, Heading Content, Phrasing Content, Embedded Content, Interactive Content, Sectioning Roots, Form-Associated Elements, Listed Elements, Submittable Elements, Resettable Elements, Autocapitalize-Inheriting Elements, Labelable Elements, Palpable Content, Script-Supporting Elements

¹<https://html.spec.whatwg.org/multipage/indices.html#element-content-categories>

Element categories

HTML element content categories



`<body>` `<caption>` `<col>` `<colgroup>` `<dd>` `<dt>` `<figcaption>` `<head>`
`<html>` `<legend>` `` `<optgroup>` `<option>` `<rp>` `<rt>` `<source>`
`<summary>` `<tbody>` `<td>` `<tfoot>` `<th>` `<thead>` `<tr>` `<track>`

¹https://en.wikipedia.org/wiki/HTML_element

Element categories

- Another way to categorize the elements is as **semantic** and **non-semantic**.
 - semantic: relating to meaning in language or logic.
- Semantic HTML elements are those that clearly describe their meaning in a human- and machine-readable way.
 - Examples of non-semantic elements: `<div>` and `` - Tells nothing about its content.
 - Examples of semantic elements: `<form>`, `<table>`, and `<article>` - Clearly defines its content.
- As HTML5 is still relatively new, this use of non-semantic elements is still very common on websites today.
 - Many web sites contain HTML code like: `<div id="nav">` `<div class="header">` `<div id="footer">` to indicate navigation, header, and footer.

Element categories

This first block of code uses semantic elements.

- It is much **easier to read**.
- It has **greater accessibility**.

```
<header></header>
<section>
  <article>
    <figure>
      <img>
      <figcaption></figcaption>
    </figure>
  </article>
</section>

<footer></footer>
```

This second block of code uses non-semantic elements.

- It leads to **less consistent** code, since there are many ways to create a header element, and they all depend on the personal preference of the programmer.

```
<div id="header"></div>
<div class="section">
  <div class="article">
    <div class="figure">
      <img>
      <div class="figcaption"></div>
    </div>
  </div>
</div>

<div id="footer"></div>
```

(Some) Semantic Elements in HTML

Tag	Description
<article>	Defines independent, self-contained content
<aside>	Defines content aside from the page content
<details>	Defines additional details that the user can view or hide
<figcaption>	Defines a caption for a <figure> element
<figure>	Specifies self-contained content, like illustrations, diagrams, photos, code listings, etc.
<footer>	Defines a footer for a document or section
<header>	Specifies a header for a document or section
<main>	Specifies the main content of a document
<mark>	Defines marked/highlighted text
<nav>	Defines navigation links
<section>	Defines a section in a document
<summary>	Defines a visible heading for a <details> element
<time>	Defines a date/time

¹https://www.w3schools.com/html/html5_semantic_elements.asp

<section> and <article>

- Both these elements are used for sectioning a content, and they can be used interchangeably.
 - An article is intended to be independently distributable or reusable.
 - Forum posts, blog posts, user comments, product cards, newspaper articles
 - A section is a thematic grouping of content, typically with a heading.
 - Chapters, introduction, news items, contact information, etc.
- <https://html.spec.whatwg.org/multipage/sections.html#the-section-element>
- <https://html.spec.whatwg.org/multipage/sections.html#the-article-element>

<header> and <hgroup>

- The <header> element is generally found at the top of a document, a section, or an article and usually contains the main heading and some navigation and search tools.
- The <hgroup> element should be used where you want a main heading with one or more subheadings.
 - The <header> element can contain any content, but the <hgroup> element can only contain other headers, that is <h1> to <h6> and including <hgroup>.
 - You can have several <header> elements in one HTML document. However, <header> cannot be placed within a <footer>, <address> or another <header> element.
- <https://html.spec.whatwg.org/multipage/sections.html#the-header-element>
- <https://html.spec.whatwg.org/multipage/sections.html#the-hgroup-element>

<aside> and <nav>

- The <aside> element is intended for content that is not part of the flow of the text in which it appears, however still related in some way.
- The <nav> element defines a set of navigation links. Before HTML5, menus were created with 's and 's. Now, we can separate our menu items with a <nav>, for navigation between pages.
 - We can have any number of <nav> elements on a page. For example, its common to have global navigation across the top (in the <header>) and local navigation in a sidebar (in an <aside> element).
- <https://html.spec.whatwg.org/multipage/sections.html#the-aside-element>
- <https://html.spec.whatwg.org/multipage/sections.html#the-nav-element>

<footer>

- A <footer> is generally found at the bottom of a document, a section, or an article.
- Just like the <header> the content is generally meta-information, such as author details, legal information, sitemap and/or links to related information.
- You can have several <footer> elements in one document.
- <https://html.spec.whatwg.org/multipage/sections.html#the-footer-element>

<figure> and <figcaption>

- <figure> is for wrapping your image content around it.
- <figcaption> is to caption your image.
- The element defines the actual image/illustration.

```
<figure>
  
  <figcaption>Logo of HTML5</figcaption>

</figure>
```

- <https://html.spec.whatwg.org/multipage/grouping-content.html#the-figure-element>
- <https://html.spec.whatwg.org/multipage/grouping-content.html#the-figcaption-element>

Last but not least

- **Readability**

- **Whitespace in HTML:** No matter how much whitespace you use inside HTML element content (which can include one or more space character, but also line breaks), the HTML parser reduces each sequence of whitespace to a single space when rendering the code.
- **HTML comments:** The purpose of comments is to allow you to include notes in the code to explain your logic or coding. To write an HTML comment, wrap it in the special markers `<!--` and `-->`.

```
<p>I'm not inside a comment</p>
```

```
<!-- <p>I am!</p> -->
```