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⭐ What is HTML?

HTML (HyperText Markup Language) is the standard markup language for creating web pages. It describes the structure and content of web documents using elements and tags.

🏗 Basic Structure

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Page Title</title>
</head>
<body>
  <!-- Content goes here -->
</body>
</html>
```

🔍 Key Components:

- `<!DOCTYPE html>` - Declares HTML5 document type
- `<html>` - Root element of the page
- `<head>` - Contains metadata (not visible on page)
- `<body>` - Contains visible content



HTML Elements and Tags

🕒 Basic Syntax

- **Opening tag:** `<tagname>`

- **Closing tag:** `</tagname>`
- **Self-closing tag:** `<tagname />`
- **Element with content:** `<tagname>content</tagname>`

⌚ Attributes

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

```

📖 Text Elements

abc Headings

```
<h1>Main Heading</h1>    <!-- Largest -->
<h2>Sub Heading</h2>
<h3>Section Heading</h3>
<h4>Subsection</h4>
<h5>Minor Heading</h5>
<h6>Smallest Heading</h6> <!-- Smallest -->
```

📄 Text Formatting

```
<p>Paragraph text</p>
<br>           <!-- Line break -->
<hr>           <!-- Horizontal rule -->

<!-- Text styling -->
<strong>Bold text</strong>
<b>Bold text (visual only)</b>
<em>Emphasized text</em>
<i>Italic text</i>
<u>Underlined text</u>
<mark>Highlighted text</mark>
<del>Deleted text</del>
<ins>Inserted text</ins>
<sub>Subscript</sub>
```

```
<sup>Superscript</sup>
<small>Small text</small>
<code>Code snippet</code>
<kbd>Keyboard input</kbd>
<var>Variable</var>
<samp>Sample output</samp>
```

Preformatted Text

```
<pre>
    Preformatted text
    preserves spaces
    and line breaks
</pre>

<blockquote cite="source">
    This is a quote from another source
</blockquote>
```

Links and Navigation

Anchor Links

```
<!-- External link --
<a href="https://www.example.com">Visit Example</a>

<!-- Internal link --
<a href="page.html">Go to Page</a>

<!-- Email link --
<a href="mailto:someone@example.com">Send Email</a>

<!-- Phone link --
<a href="tel:+1234567890">Call Us</a>

<!-- Link to section --
<a href="#section-id">Go to Section</a>
```

```
<!-- Download link -->  
<a href="file.pdf" download>Download PDF</a>  
  
<!-- Open in new tab -->  
<a href="https://example.com" target="_blank">Open in New Tab</a>
```

Images and Media

Images

```
  
  
<!-- Responsive image -->  
  
  
<!-- Image with different sources -->  
<picture>  
  <source media="(min-width: 800px)" srcset="large.jpg">  
  <source media="(min-width: 400px)" srcset="medium.jpg">  
    
</picture>
```

Audio and Video

```
<!-- Audio -->  
<audio controls>  
  <source src="audio.mp3" type="audio/mpeg">  
  <source src="audio.ogg" type="audio/ogg">  
  Your browser does not support audio.  
</audio>  
  
<!-- Video -->  
<video controls width="400">  
  <source src="video.mp4" type="video/mp4">  
  <source src="video.webm" type="video/webm">
```

Your browser does not support video.
</video>

Lists

Unordered Lists

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

Ordered Lists

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


<ol type="A"> <!-- A, B, C -->
<ol type="a"> <!-- a, b, c -->
<ol type="I"> <!-- I, II, III -->
<ol type="i"> <!-- i, ii, iii -->
<ol start="5"> <!-- Start from 5 -->
```

Definition Lists

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

Tables

Basic Table Structure

```
<table>
  <thead>
    <tr>
      <th>Header 1</th>
      <th>Header 2</th>
      <th>Header 3</th>
    </tr>
  </thead>
  <tbody>
    <tr>
      <td>Data 1</td>
      <td>Data 2</td>
      <td>Data 3</td>
    </tr>
    <tr>
      <td>Data 4</td>
      <td>Data 5</td>
      <td>Data 6</td>
    </tr>
  </tbody>
  <tfoot>
    <tr>
      <td>Footer 1</td>
      <td>Footer 2</td>
      <td>Footer 3</td>
    </tr>
  </tfoot>
</table>
```

Table Attributes

```
<!-- Spanning cells -->
<td colspan="2">Spans 2 columns</td>
<td rowspan="3">Spans 3 rows</td>
```

```
<!-- Table caption -->
<table>
  <caption>Table Title</caption>
  <!-- table content -->
</table>
```



Forms



Form Structure

```
<form action="/submit" method="POST">
  <fieldset>
    <legend>Personal Information</legend>

    <!-- Text input -->
    <label for="name">Name:</label>
    <input type="text" id="name" name="name" required>

    <!-- Email input -->
    <label for="email">Email:</label>
    <input type="email" id="email" name="email" required>

    <!-- Password input -->
    <label for="password">Password:</label>
    <input type="password" id="password" name="password" required>

    <!-- Number input -->
    <label for="age">Age:</label>
    <input type="number" id="age" name="age" min="1" max="120">

    <!-- Date input -->
    <label for="birthdate">Birthdate:</label>
    <input type="date" id="birthdate" name="birthdate">

    <!-- Radio buttons -->
    <fieldset>
      <legend>Gender:</legend>
```

```

<input type="radio" id="male" name="gender" value="male">
<label for="male">Male</label>

<input type="radio" id="female" name="gender" value="female">
<label for="female">Female</label>
</fieldset>

<!-- Checkboxes -->
<input type="checkbox" id="newsletter" name="newsletter" value="yes">
<label for="newsletter">Subscribe to newsletter</label>

<!-- Dropdown select -->
<label for="country">Country:</label>
<select id="country" name="country">
  <option value="">Select a country</option>
  <option value="us">United States</option>
  <option value="uk">United Kingdom</option>
  <option value="ca">Canada</option>
</select>

<!-- Textarea -->
<label for="comments">Comments:</label>
<textarea id="comments" name="comments" rows="4" cols="50"></t
extarea>

<!-- File upload -->
<label for="file">Upload file:</label>
<input type="file" id="file" name="file" accept=".pdf,.doc,.docx">

<!-- Submit button -->
<input type="submit" value="Submit">
<button type="submit">Submit Form</button>
<button type="reset">Reset Form</button>
</fieldset>
</form>

```

Input Types

```
<input type="text">      <!-- Text input -->
<input type="email">     <!-- Email validation -->
<input type="password">   <!-- Hidden text -->
<input type="number">    <!-- Numeric input -->
<input type="tel">       <!-- Telephone -->
<input type="url">       <!-- URL validation -->
<input type="search">    <!-- Search box -->
<input type="date">      <!-- Date picker -->
<input type="time">      <!-- Time picker -->
<input type="datetime-local"> <!-- Date and time -->
<input type="month">     <!-- Month picker -->
<input type="week">      <!-- Week picker -->
<input type="color">     <!-- Color picker -->
<input type="range">     <!-- Slider -->
<input type="file">      <!-- File upload -->
<input type="hidden">    <!-- Hidden field -->
<input type="checkbox">  <!-- Checkbox -->
<input type="radio">     <!-- Radio button -->
<input type="submit">    <!-- Submit button -->
<input type="reset">    <!-- Reset button -->
<input type="button">   <!-- Generic button -->
```

🌐 Semantic HTML5 Elements

🏗 Layout Elements

```
<header>
  <nav>
    <ul>
      <li><a href="#home">Home</a></li>
      <li><a href="#about">About</a></li>
      <li><a href="#contact">Contact</a></li>
    </ul>
  </nav>
</header>

<main>
```

```
<article>
  <header>
    <h1>Article Title</h1>
    <time datetime="2024-01-01">January 1, 2024</time>
  </header>

  <section>
    <h2>Section Heading</h2>
    <p>Section content...</p>
  </section>

  <aside>
    <h3>Related Links</h3>
    <ul>
      <li><a href="#">Link 1</a></li>
      <li><a href="#">Link 2</a></li>
    </ul>
  </aside>
</article>
</main>

<footer>
  <p>© 2024 Your Website. All rights reserved.</p>
</footer>
```

Content Elements

```
<figure>
  
  <figcaption>Image caption</figcaption>
</figure>

<details>
  <summary>Click to expand</summary>
  <p>Hidden content that can be toggled</p>
</details>

<progress value="70" max="100">70%</progress>
```

```
<meter value="6" min="0" max="10">6 out of 10</meter>

<address>
  Contact: <a href="mailto:email@example.com">email@example.com</a>
</address>
```

Meta Tags and Head Elements

Essential Meta Tags

```
<head>
  <!-- Character encoding -->
  <meta charset="UTF-8">

  <!-- Viewport for responsive design -->
  <meta name="viewport" content="width=device-width, initial-scale=1.0">

  <!-- Page description -->
  <meta name="description" content="Page description for search engines">

  <!-- Keywords -->
  <meta name="keywords" content="html, web development, tutorial">

  <!-- Author -->
  <meta name="author" content="Your Name">

  <!-- Refresh page -->
  <meta http-equiv="refresh" content="30">

  <!-- CSS link -->
  <link rel="stylesheet" href="styles.css">

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

```
<!-- External fonts -->
<link rel="preconnect" href="https://fonts.googleapis.com">

<!-- JavaScript -->
<script src="script.js"></script>
</head>
```

🎯 HTML Entities

abc Common Entities

<	<!-- < (less than) -->
>	<!-- > (greater than) -->
&	<!-- & (ampersand) -->
"	<!-- " (quotation mark) -->
'	<!-- ' (apostrophe) -->
 	<!-- Non-breaking space -->
©	<!-- © (copyright) -->
®	<!-- ® (registered) -->
™	<!-- ™ (trademark) -->
€	<!-- € (euro) -->
£	<!-- £ (pound) -->
¥	<!-- ¥ (yen) -->
§	<!-- § (section) -->
¶	<!-- ¶ (paragraph) -->

🔧 Best Practices

✓ Do's

- Always use proper DOCTYPE declaration
- Use semantic HTML5 elements
- Include alt attributes for images
- Use proper heading hierarchy (h1 → h2 → h3)
- Validate your HTML code

- Use lowercase for element names and attributes
- Quote attribute values
- Close all tags properly
- Use meaningful class and ID names
- Optimize for accessibility

✖ Don'ts

- Don't use deprecated elements (`` , `<center>` , etc.)
- Don't skip heading levels
- Don't use tables for layout
- Don't use inline styles (use CSS instead)
- Don't forget to escape special characters
- Don't use non-semantic elements when semantic ones exist
- Don't ignore validation errors

🌐 HTML5 APIs and Features

💡 New Input Attributes

```
<input type="text" placeholder="Enter your name" required>
<input type="email" pattern="[a-z0-9._%+-]+@[a-z0-9.-]+\.[a-z]{2,}+$>
<input type="number" min="1" max="100" step="5">
<input type="text" autocomplete="name">
<input type="text" autofocus>
<input type="text" readonly>
<input type="text" disabled>
```

⌚ Data Attributes

```
<div data-user-id="123" data-role="admin">User Info</div>
<button data-action="delete" data-confirm="Are you sure?">Delete</button>
```

```
<template id="my-template">
  <style>
    /* Scoped styles */
  </style>
  <div>Template content</div>
</template>
```

Microdata

```
<div itemscope itemtype="http://schema.org/Person">
  <h1 itemprop="name">John Doe</h1>
  <p itemprop="jobTitle">Software Developer</p>
  <a itemprop="url" href="https://johndoe.com">Website</a>
</div>
```

Quick Reference

• Essential Tags Checklist

- <!DOCTYPE html>
- <html lang="en">
- <head> with meta tags
- <title>
- <body>
- Semantic elements (<header> , <main> , <footer>)
- Proper heading structure
- Alt text for images
- Form labels and validation
- Valid and accessible markup

Useful Resources

- **W3C HTML Validator:** <https://validator.w3.org/>

- **MDN HTML Reference:** <https://developer.mozilla.org/en-US/docs/Web/HTML>
 - **HTML5 Specification:** <https://html.spec.whatwg.org/>
 - **Accessibility Guidelines:** <https://www.w3.org/WAI/WCAG21/quickref/>
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Happy coding! 🎉 Remember to always write semantic, accessible, and valid HTML!