📚HTML Notes

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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

```html
<!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>
<img src="image.jpg" alt="Description" width="300">
```

📖 Text Elements

🔤 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>
```

```html
<!-- 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

```html
<img src="image.jpg" alt="Description" width="300" height="200">

<!-- Responsive image -->
<img src="image.jpg" alt="Description" style="max-width: 100%; height: auto;">

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

Audio and Video

```html
<!-- 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>

<!-- Different numbering styles →
<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

```html
<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

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

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

📝 Forms

📖 Form Structure

```html
<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>
```

```html
        <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"></textarea>

    <!-- 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

```html
<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

```html
<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>
```

```html
    <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>&copy; 2024 Your Website. All rights reserved.</p>
  </footer>
```

📑 Content Elements

```html
<figure>
  <img src="image.jpg" alt="Description">
  <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 engine
s">

  <!-- 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">
```

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

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

🎯 HTML Entities

🔤 Common Entities

```html
&lt;     <!-- < (less than) →
&gt;     <!-- > (greater than) →
&amp;    <!-- & (ampersand) →
&quot;   <!-- " (quotation mark) →
&apos;   <!-- ' (apostrophe) →
    <!-- Non-breaking space →
&copy;   <!-- © (copyright) →
&reg;    <!-- ® (registered) →
&trade;  <!-- ™ (trademark) →
&euro;   <!-- € (euro) →
&pound;  <!-- £ (pound) →
&yen;    <!-- ¥ (yen) →
&sect;   <!-- § (section) →
&para;   <!-- ¶ (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 (`<font>` , `<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

```html
<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

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

🔍 Accessibility Features

♿ ARIA Attributes

```html
<button aria-label="Close dialog">×</button>
<div role="button" tabindex="0">Custom button</div>
<img src="chart.png" alt="Sales increased 25% this quarter" aria-describedby="chart-desc">
<p id="chart-desc">Detailed description of the chart...</p>

<!-- Skip link for screen readers →
<a href="#main-content" class="skip-link">Skip to main content</a>
```

🏷️ Form Accessibility

```html
<label for="username">Username:</label>
<input type="text" id="username" name="username" aria-required="true" aria-describedby="username-help">
<div id="username-help">Must be 3-20 characters long</div>

<fieldset>
  <legend>Preferred contact method</legend>
  <input type="radio" id="email-contact" name="contact" value="email">
  <label for="email-contact">Email</label>
  <input type="radio" id="phone-contact" name="contact" value="phone">
  <label for="phone-contact">Phone</label>
</fieldset>
```

🚀 Advanced HTML Concepts

🔧 Custom Elements

```html
<!-- Custom elements (requires JavaScript) →
<my-custom-element attribute="value">Content</my-custom-element>
```

📦 Web Components

```
<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/

Happy coding! 🎉 Remember to always write semantic, accessible, and valid HTML!