

HTML



NOTES

BY

...Amit Kumar Prasad...

HTML Notes – Beginner to Advanced

Chapter 0: Introduction to HTML

What is HTML?

- **HTML** stands for **Hyper Text Markup Language**.
- It is the **foundation of every website** on the internet.
- Used to define the **structure** and **layout** of web pages.
- With proper understanding of HTML tags and their structure, you can build powerful and beautiful websites.

Why Do We Need CSS and JavaScript?

Layer	Purpose
HTML	Defines the structure of a webpage (skeleton)
CSS	Adds style and presentation (color, layout, design)
JavaScript	Adds logic and interactivity (buttons, sliders, etc.)

Beautiful Analogy:

- **HTML** = Car body (metal frame)
- **CSS** = Paint, seat covers, lights (design)
- **JavaScript** = Engine, gear system, sensors (functionality)

Installing VS Code:

- Recommended text editor: **VS Code** (Microsoft, free, lightweight).
- Install from <https://code.visualstudio.com/>
- **Note:** HTML can be written in **Notepad** too, but VS Code provides a richer experience.

Practice Questions On Chapter 0:

1. What is HTML and why is it called a markup language?
 2. Differentiate between HTML, CSS, and JavaScript with examples.
 3. Explain the car analogy used to describe HTML, CSS, and JavaScript.
 4. How does a text editor help in web development?
 5. Can we build a complete website using only HTML? Why or why not?
-

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Chapter 1: Your First Web Page

Starting a Website

- We begin by creating a file named 'index.html'
- index.html is the **default landing file** of any website

Basic HTML Document Structure:

```
<!DOCTYPE html>
<html>
  <head>
    <title>My Website</title>
  </head>
  <body>
    <h1>This is a heading tag</h1>
    <p>This is a paragraph tag</p>
  </body>
</html>
```

Notes:

- Tags usually have an **opening** and **closing** pair.
- Some tags are **empty/self-closing**, e.g.,
, <hr>.
- html tag is the **root**; head and body are its children.
- Use **.html** or **.htm** extensions.
- Use **Inspect Element (F12)** to see a webpage's structure.

HTML Comments:

```
<!-- This is a comment -->
```

Shortcut in VS Code: Ctrl + /

Case Sensitivity:

- HTML is **case-insensitive**, so <h1> = <H1>.

Practice Questions On Chapter 1:

1. What is the role of `<!DOCTYPE html>`?
 2. Explain the difference between `<head>` and `<body>`.
 3. Write a basic HTML skeleton with heading and paragraph.
 4. What are empty tags? Give examples.
 5. How can we comment a line in HTML?
-

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Chapter 2: Tags, Elements & Attributes

HTML Elements:

- Element = Opening tag + Content + Closing tag

```
<p>This is an element</p>
```

HTML Attributes:

- Provide **additional information** about elements.

```
<a href="https://example.com">Click Here</a>
```

Headings:

```
<h1>Most Important</h1>
```

```
<h6>Least Important</h6>
```

Tip: Do not use headings to make text bold — use CSS.

Paragraph:

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

Anchor:

```
<a href="https://...">Visit Site</a>
```

Image:

```

```

Text Formatting:

- **Bold:**

```
<b>Bold</b>
```

- **Italic:**

```
<i>Italic</i>
```

- **Underline:**

```
<u>Underline</u>
```

- **Big:**

```
<big>Big</big>
```

- **Small:**

`<small>Small</small>`

- **Subscript:**

`H₂O`

- **Superscript:**

`x²`

Line Break & Horizontal Rule:

- `
` `<!--this will give a line break-->`
- `<hr>` `<!--this will give a horizontal line in the html document-->`

PRE Tag:

- Preserves **spaces and new lines** as written:

```
<pre>
This is
pre-formatted
</pre>
```

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Practice Questions On Chapter 2:

1. Difference between an element and an attribute?
 2. Write an anchor tag that opens a link in a new tab.
 3. How do `<big>`, `<small>`, `<sup>`, and `<sub>` differ?
 4. What does the `<pre>` tag do?
 5. Which tag would you use to insert an image?
-

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Chapter 3: Semantic HTML Tags & Layout

Semantic Tags:

```
<header>
  <nav>
    <!-- Here some text comes. -->
  </nav>
</header>
<main>
  <!-- Here main body text comes -->
  <section> ... </section>
  <!--We can put <section> tag anywhere-->
  <!--<section> groups related content with a heading for better document
  structure and semantics.-->
  <article>
    <!--Standalone text (e.g., blog post, news article)-->
  </article>
  <aside>
    <!--Supplementary content (e.g., sidebars, pull quotes, ads)-->
  </aside>
</main>
<footer>
  <!-- Here footer link comes -->
</footer>
```

- **Semantic Tags** makes structure more **readable and SEO-friendly**.

Anchor Tags:

```
<a href="/page">Open Same Tab</a>
<a href="/page" target="_blank">New Tab</a>
<a href="/about"></a>
```

div VS span:

Tag	Type	Usage
div	Block-level	For grouping blocks
span	Inline	For inline text or portions

Practice Questions On Chapter 3:

1. What is the importance of semantic tags?
 2. Difference between `<div>` and ``?
 3. How can an anchor tag be used to link an image?
 4. What is the use of the target attribute?
 5. Why are semantic tags important for SEO?
-

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Chapter 4: Lists, Tables & Forms

Lists:

- Unordered List

```
<ul>
  <li>Item 1</li>
</ul>
```

- Ordered List

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

Tables:

```
<table>
  <caption>Student Info</caption>
  <thead>
    <tr><th>Name</th><th>Age</th></tr>
  </thead>
  <tbody>
    <tr><td>Amit</td><td>21</td></tr>
  </tbody>
</table>
```

Colspan:

```
<th colspan="2">Full Width</th>
```

Forms:

```
<form>
  <input type="text">
  <textarea rows="4" cols="30"></textarea>
  <select><option>Option</option></select>
</form>
```

Embedding Videos:

```
<video src="video.mp4" width="300" controls autoplay></video>
```

Practice Questions On Chapter 4:

1. What is the difference between `<u1>` and `<o1>`?
 2. Write a basic table with header and 2 rows.
 3. How can you create a form to collect a user's name?
 4. What is the purpose of `colspan` in tables?
 5. How do you embed a video in HTML?
-
-

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Chapter 5: HTML & SEO (Search Engine Optimization)

Types of SEO:

- **On-page SEO** → done via HTML and page content
- **Off-page SEO** → backlinks, social shares, etc.

On-page SEO using HTML:

```
<meta name="description" content="Best portfolio site">
<meta name="keywords" content="web, dev, html">
<meta name="author" content="Amit Kumar Prasad">
<title>My Portfolio</title>
<link rel="icon" href="favicon.ico">
```

- Optimize image size
 - Use alt text in images
 - Minimize unused code (CSS/JS)
-

Practice Questions On Chapter 5:

1. What is on-page SEO and how does HTML help?
 2. Write meta tags for description and author.
 3. How does the alt attribute help in SEO?
 4. What's the difference between meta keywords and description?
 5. Why is removing unused CSS/JS important?
-

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Chapter 6: HTML Advanced – Real-World Elements

1. HTML Tables with Styling and Structure

```
<table border="1">
  <tr>
    <th>Name</th>
    <th>Age</th>
    <th>City</th>
  </tr>
  <tr>
    <td>Amit</td>
    <td>20</td>
    <td>Hyderabad</td>
  </tr>
</table>
```

- **Note:** We should always use CSS for adding borders in table.

2. HTML Forms – Inputs, Labels, and Structure

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

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

  <button type="submit">Submit</button>
</form>
```

3. Semantic HTML Tags for Structure & SEO

```
<header>
  <h1>Student Hub</h1>
</header>
<nav>
  <a href="#">Home</a>
</nav>
<main>
  <section>
    <h2>Courses</h2>
  </section>
</main>
<footer>
  <p>© Amit's Learning Empire</p>
</footer>
```

4. Multimedia Embeds

```
<audio controls>
  <source src="music.mp3" type="audio/mpeg">
</audio>
```

```
<video controls>
  <source src="video.mp4" type="video/mp4">
</video>
```

```
<iframe src="https://www.youtube.com/embed/..." allowfullscreen></iframe>
```

5. Meta Tags for SEO

```
<meta charset="UTF-8">
<meta name="description" content="Learn HTML with Amit">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

6. Lists – Ordered, Unordered, Definition

```
<ul>
  <li>Apple</li>
  <li>Banana</li>
</ul>
```

```
<ol>
  <li>Step 1</li>
  <li>Step 2</li>
</ol>
```

```
<dl>
  <dt>HTML</dt>
  <dd>Structure of Web</dd>
</dl>
```

7. Advanced Table Attributes

```
<table border="1">
  <caption>Student Info</caption>
  <thead><tr><th>Name</th><th>Age</th></tr></thead>
  <tbody><tr><td>Amit</td><td>20</td></tr></tbody>
  <tfoot><tr><td colspan="2">End of Table</td></tr></tfoot>
</table>
```

8. Advanced Forms with Fieldsets, Validation

```
<form action="/submit" method="POST">
  <fieldset>
    <legend>Personal Info</legend>
    <label for="name">Name:</label>
    <input type="text" id="name" name="username" required>

    <label>Gender:</label>
    <input type="radio" name="gender" value="male"> Male
    <input type="radio" name="gender" value="female"> Female

    <label>Subjects:</label>
    <input type="checkbox" name="sub" value="math"> Math
    <input type="checkbox" name="sub" value="phy"> Physics

    <label for="bio">Bio:</label>
    <textarea id="bio" rows="4"></textarea>

    <button type="submit">Submit</button>
  </fieldset>
</form>
```

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Practice Questions (Advanced Real-World HTML):

1. Create a responsive table with header, footer, and a merged cell using colspan.
 2. Build a form that includes: **text input, radio, checkbox, dropdown, and textarea**. Add required validations.
 3. What is the use of **<legend>** and **<fieldset>** in forms?
 4. Design a webpage layout using only semantic tags.
 5. What's the role of **<meta viewport>** in mobile responsiveness?
 6. Explain how to embed a YouTube video and style it using CSS.
-
-

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

Chapter 7: Advanced HTML – Developer Mode (Optional)

1. HTML5 Semantic Revolution

- Shift from `<div id="header">` to `<header>`
- Boosts accessibility and SEO ranking
- Semantic tags: `<header>`, `<footer>`, `<nav>`, `<figure>`, `<figcaption>`

2. Accessibility with ARIA (Accessible Rich Internet Applications)

- HTML for all users, including screen readers
`<button aria-label="Close dialog">X</button>`
- Use role, aria-label, aria-hidden, aria-expanded

3. HTML5 APIs You Should Know

a) Geolocation API

```
navigator.geolocation.getCurrentPosition(showPosition);
```

b) Drag and Drop API

```
<div draggable="true">Drag me</div>
```

c) Web Storage API

```
localStorage.setItem("username", "Amit");
```

d) Web Workers (Run scripts in background threads)

```
const worker = new Worker("worker.js");
```

e) HTML Canvas API

- Used for drawing graphics
`<canvas id="myCanvas"></canvas>`

4. Advanced Form Validation with HTML5

- Input Types: email, url, number, range, date, color
`<input type="email" required>`
`<input type="number" min="1" max="10">`
- Constraint validation APIs: `checkValidity()`, `setCustomValidity()`

5. Performance & Clean Code Practices

- Use `defer` or `async` in `<script>` to avoid render-blocking.
- Lazy load images using `loading="lazy"`.
- Prefer semantic structure for crawlability.
- Avoid deeply nested tags (harder to maintain).

6. Security in HTML

- Escape special characters: &, <, >.
- Use rel="noopener noreferrer" in external links.
- Prevent XSS: never trust user input, sanitize using server logic.

7. Responsive & Adaptive Techniques

- Use <meta name="viewport"> for mobile devices.
- Integrate with CSS media queries and HTML-based structure.
- Leverage <picture> for adaptive images.

```
<picture>
  <source srcset="image.webp" type="image/webp">
  
</picture>
```

8. Web Components (The Future of HTML)

- Custom Elements + Shadow DOM = Encapsulation

```
<my-card></my-card>
<script>
  class MyCard extends HTMLElement {
    connectedCallback() {
      this.innerHTML = `<div class="card">Hi!</div>`;
    }
  }
  customElements.define('my-card', MyCard);
</script>
```

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

This work is licensed under Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

© Amit Kumar Prasad - Free for educational use only. Reproduction, resale or modification prohibited.

"© By Amit Kumar Prasad | Free for Education Only - Redistribution Prohibited"

- - *AMIT KUMAR PRASAD*