

Unit 3

HTML 5 and Features

- Introduction
- Difference between HTML and HTML
- HTML 5 New Semantics Elements (HEADER, FOOTER, SECTION)
- HTML 5 New Elements
 - Tables, Images, Colors, Canvas, Forms
 - Interactive Elements
 - Graphics
 - Multimedia

HTML 5

- HTML5 is a markup language used for structuring and presenting content on the World Wide Web.
- It is the fifth and last major HTML version that is a World Wide Web Consortium (W3C) recommendation.
- HTML5 was first released on 22 January 2008.
- Its goals were to improve the language with support for the latest multimedia and other new features; to keep the language both easily readable by humans and consistently understood by computers and devices such as web browsers, parsers.
- To indicate that our HTML content uses HTML5, use: `<!DOCTYPE html>`

New Features

HTML5 introduces several new elements and attributes that can help in building modern websites. Here is a set of some of the most prominent features introduced in HTML5.

- **New Semantic Elements** – These are like `<header>`, `<footer>`, and `<section>`.
- **Forms 2.0** – Improvements to HTML web forms where new attributes have been introduced for `<input>` tag.
- **Persistent Local Storage** – To achieve without resorting to third-party plugins.
- **WebSocket** – A next-generation bidirectional communication technology for web applications.
- **Server-Sent Events** – HTML5 introduces events which flow from a web server to the web browsers and they are called Server-Sent Events (SSE). Canvas – This supports a two-dimensional drawing surface that you can program with JavaScript.
- **Audio & Video** – You can embed audio or video on your webpages without resorting to third-party plugins.
- **Geolocation** – Now visitors can choose to share their physical location with your web application.

- **Microdata** – This lets you create your vocabularies beyond HTML5 and extend your web pages with custom semantics.
- **Drag and drop** – Drag and drop the items from one location to another location on the same webpage.

HTML vs HTML 5

HTML	HTML5
Limited set of semantic elements	Expanded set of semantic elements
Limited multimedia support	Enhanced multimedia support (audio, video)
Basic form input types (text, checkbox)	Additional form input types (date, email, etc.)
It was less secure	It is more secure
Performance was slower	Performance was improved
Drag and drop was not provided	Drag and drop was provided

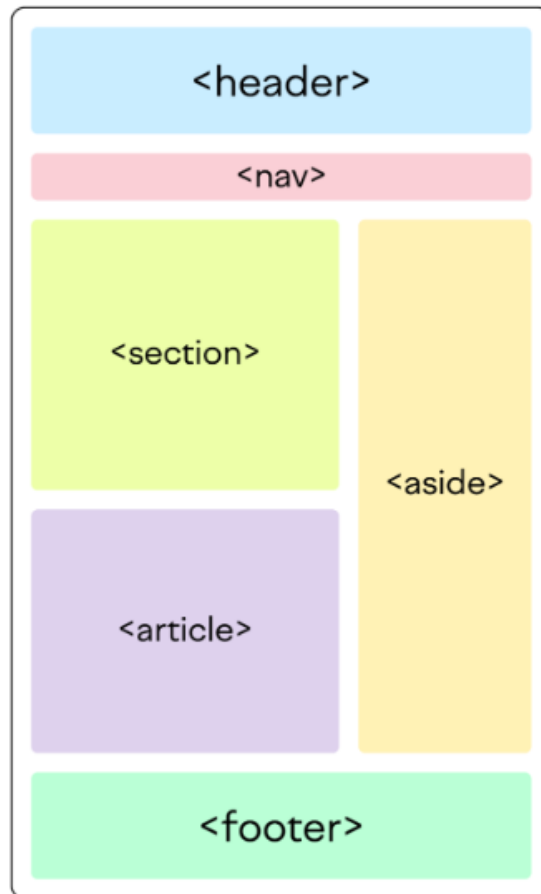
HTML 5 New semantic elements

HTML5 introduced a set of semantic elements that provide a clearer and more meaningful structure to web documents. These semantic elements are designed to describe the content they wrap, making it easier for search engines, screen readers, and other web technologies to understand and process the information.

Here are some commonly used HTML5 semantic elements:

1. **<header>**: Represents the introductory content or a container for a group of introductory content. It typically contains a site logo, navigation, or a heading.
2. **<nav>**: Defines a section of navigation links, such as a menu or a list of links to different parts of a website.
3. **<main>**: Represents the main content of a document. There should be only one **<main>** element per page, and it should contain the primary content.
4. **<article>**: Represents a self-contained composition within a document, such as a blog post, a news article, or a forum post. It should make sense on its own and be potentially distributable.
5. **<section>**: Defines a thematic grouping of content within a document. It can represent a chapter, a tabbed content area, or any other logically organized content.
6. **<aside>**: Represents content that is tangentially related to the surrounding content. It is typically used for sidebars, pull quotes, or advertising.

7. **<footer>**: Represents the footer or the closing section of a document or a section. It can contain information like copyright notices, contact information, or related links.
8. **<figure>** and **<figcaption>**: **<figure>** is used to encapsulate a single piece of content, such as an image, a video, or an illustration. The **<figcaption>** element is used to provide a caption or description for the content within the **<figure>**.



HTML 5 new elements

- **Tables:**
 - HTML5 tables now support nested tables, which allows to create more complex and visually appealing tables.
 - They also support new attributes, such as **rowspan** and **colspan**.
 - HTML5 introduced new attributes and elements for tables, such as `<thead>`, `<tfoot>`, `<th>` with the `scope` attribute, and `<caption>`.

- These additions enhance the structure and accessibility of tables.

- Images:
 - HTML5 images now support the srcset attribute, which allows to specify a set of different images for different screen sizes.
 - This can help to improve the performance of your website by loading the appropriate image size for the user's device.
 - HTML5 introduced the <picture> element, which allows developers to specify multiple sources for an image based on factors like device resolution or media queries.
 - It helps provide responsive images without the need for complex JavaScript or server-side solutions.

- Colors:
 - HTML5 introduces a number of new color attributes, such as color, background-color, and border-color.
 - These attributes allow to specify colors using a variety of different formats, including hexadecimal, RGB, and HSL.
 - HTML5 expanded the range of color options by introducing new color input types, including color pickers and support for specifying colors using the RGBa format (RGB with alpha channel for transparency).

- Canvas:
 - HTML5 canvas is a powerful tool that allows us to draw graphics on the fly.
 - In HTML5, canvas supports a number of new features, such as stroke smoothing, anti-aliasing, and gradients.
 - The <canvas> element in HTML5 provides a drawing surface that allows for dynamic rendering of 2D graphics using JavaScript.
 - It enables developers to create charts, animations, and games directly within the browser without relying on external plugins like Flash.

Example:

```
<canvas id="myCanvas" width="250" height="150" style="border:1px solid #c3c3c3;">
  Your browser does not support the HTML5 canvas tag.
</canvas>

<script>
```

```
var c = document.getElementById("myCanvas");
var ctx = c.getContext("2d");
ctx.fillStyle = "#FF0000";
ctx.fillRect(0, 0, 150, 75);
</script>
```

- Forms:

- HTML5 forms have been significantly improved in HTML5. They now support a number of new input types, such as email, number, and date.
- They also support new attributes, such as required and pattern, which can be used to validate user input.
- It also includes input types like email, url, tel, date, range, color, and more. Additionally, attributes like required, pattern, and autocomplete were introduced to enhance form validation and usability.

- Interactive elements:

- HTML5 introduces a number of new interactive elements, such as datalist, dialog, and menu.
- These elements can be used to create more engaging and interactive user experiences.
- HTML5 also introduced new interactive elements such as <details> and <summary> for creating expandable sections, <progress> for showing progress bars, <meter> for displaying meters and gauges, and <output> for displaying the result of a calculation or script.

- Graphics:

- HTML5 introduces a number of new graphics features, such as the svg element and the canvas element.
- These elements can be used to create complex and visually appealing graphics.
- It introduced the SVG (Scalable Vector Graphics) specification as a native part of the language.
- SVG allows for the creation of scalable, resolution-independent vector graphics directly in HTML.

- SVG

- SVG stands for Scalable Vector Graphics.
- SVG is a file format for describing two-dimensional vector graphics.

- This means that SVG images are made up of lines, curves, and shapes, rather than pixels.
- SVG images are resolution independent. This means that they can be scaled to any size without losing quality.
- SVG images are open and extensible. This means that they can be created and edited with any text editor, and they can be extended with custom elements and attributes.
- SVG images are supported by most modern browsers. This means that you can use SVG images on your website or in your web applications.
- SVG images are often used for logos, icons, charts, and other graphics that need to be scalable and resolution independent.

Example:

```
<svg width="100" height="100">
  <rect x="0" y="0" width="100" height="100" fill="red" />
</svg>
```

This code will create a red rectangle.

• SVG vs Canvas

Feature	SVG	Canvas
Data format	XML	JavaScript
Graphics type	Vector	Raster
Scalability	Infinite	Limited
Performance	Good for small objects or large surfaces.	Good for large objects or small surfaces.
Accessibility	Accessible by screen readers	Not accessible by screen readers

• Multimedia:

- HTML5 introduced the <video> and <audio> elements, providing native support for embedding and playing video and audio content without the need for external plugins like Flash.
- These elements support various formats and provide programmable control over playback using JavaScript.