

Understanding HTML and XHTML Connections

Introduction

- HTML (HyperText Markup Language) is the standard markup language for creating web pages.
- Hypertext is the text which contains links to other texts.
- It is a markup language which consists of a set of markup tags.
- HTML uses markup tags to describe web pages.
- HTML markup tags are usually called HTML tags.
- HTML tags are keywords surrounded by angle brackets like <html>.
- HTML tags come in pairs like and .
- The first tag in a pair is the start tag, the second tag is the end tag.
- It forms the backbone of web pages and applications by providing the basic structure that other technologies like CSS (Cascading Style Sheets) and JavaScript enhance with styling and interactivity.

Features of HTML

- *Markup Language*: HTML uses tags to define elements of a webpage, such as headings, paragraphs, links, images and forms.
- *Hypertext*: HTML allows the inclusion of hyperlinks, enabling navigation between different pages or resources on the internet.
- *Structure*: It organizes content hierarchically using tags like <header>, <footer>, <main>, and <section>.

Basic Structure of HTML Page

```
<!DOCTYPE html>

<html>

    <head>

        <title>My First HTML Page</title>

    </head>

    <body>

        <p>Zero to Infinity</p>

    </body>

</html>
```

- `<!DOCTYPE html>`: Declares the document type as HTML5.
- `<html>`: Root element of the document.
- `<head>`: contains meta information about the HTML page
- `<title>`: Specifies the title of the document, which is displayed in the browser's title bar or tab.
- `<body>`: Contains the visible content of the web page. The body of a document provides content of the document.

Creating an HTML File

- You can use any text editor, from the basic Editors such as Notepad (Windows) or Advanced Editors like Visual Studio Code, Sublime Text, Notepad++, or Atom.
- Open your text editor and create a new file. Save the file with the .html extension. For example, index.html. Make sure the "Save As

"type" is set to All Files (if using Notepad).

- Locate the saved file in your computer. Double-click the file, or right-click and choose Open With > your preferred browser (e.g., Chrome, Firefox, Edge).
- The file will open in the browser, displaying the HTML content.

The image shows a split-screen interface. The top half is a code editor with a dark theme. On the left is the Explorer sidebar, which shows a folder named "ZEROTOINFINITY" containing an "index.html" file. The main area displays the HTML code:

```
<!DOCTYPE html>
<html>
<head>
<title>My First HTML Page</title>
</head>
<body>
<p>Zero to Infinity</p>
</body>
</html>
```

The bottom half is a web browser window titled "My First HTML Page". The address bar shows the URL "127.0.0.1:5500/index.html". The page content is a single paragraph: "Zero to Infinity".

HTML Tags and Elements

In HTML (HyperText Markup Language), tags and elements are the fundamental building blocks of a webpage.

HTML Tags

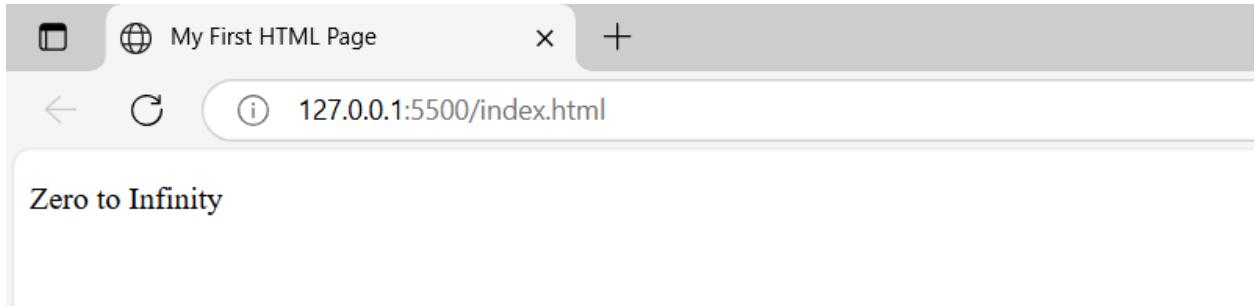
- Tags are the keywords enclosed in angle brackets (<>) that define the structure and content of an HTML document. Tags typically come in pairs:
 - Opening tag: <tagname> (e.g., <p>)
 - Closing tag: </tagname> (e.g., </p>)
- Some tags, like
 (line break) and , are self-closing and do not require a closing tag.

HTML Elements

- An HTML element consists of an opening tag, content, and a closing tag.
 - Eg: <h1>Welcome to My Website</h1>
- Block-level elements – Take up the full width of the container
 - Eg:<div>, <p>, <h1>–<h6>, <section>
- Inline elements – Take up only as much space as needed
 - Eg: , <a>, ,

1. Title

- Used to define the title of the webpage.
- The title is displayed on the browser tab
- Used by search engines as the title of the page in search results
 - Eg: <title>My First HTML Page</title>

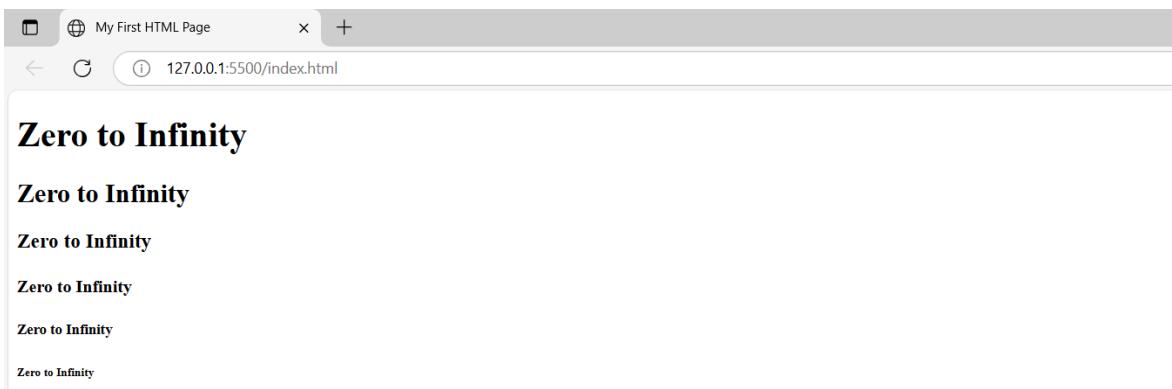


2. Headings

- Used to define the titles and subtitles on a webpage.
- There are six levels of headings, from `<h1>` to `<h6>`, with `<h1>` being the highest (or most important) level and `<h6>` the lowest.

Eg:

```
<h1>Zero to Infinity</h1>  
<h2>Zero to Infinity</h2>  
<h3>Zero to Infinity</h3>  
<h4>Zero to Infinity</h4>  
<h5>Zero to Infinity</h5>  
<h6>Zero to Infinity</h6>
```



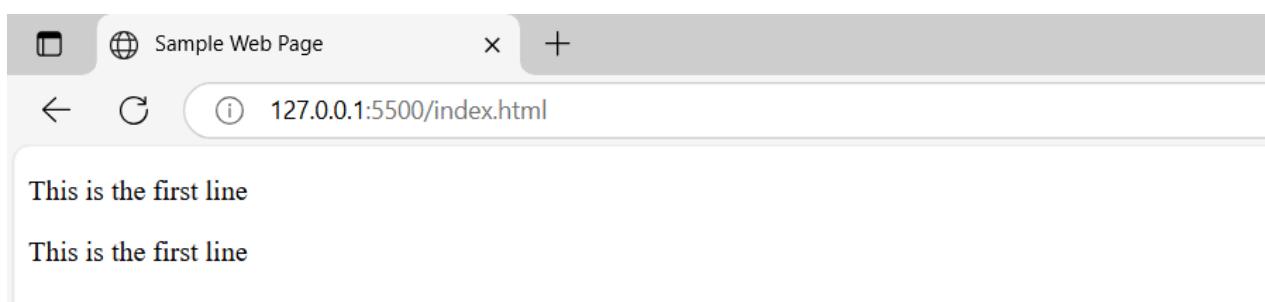
3. Paragraph

- The `<p>` tag in HTML is used to define a paragraph of text.
- It is a block-level element
- Browsers add some default margin above and below paragraphs for readability.
- Can include inline elements such as ``, ``, or `<a>` within a paragraph.

Eg: `<p>Zero to Infinity</p>`

```
<!DOCTYPE html>

<html>
  <head>
    <title>Sample Web Page</title>
  </head>
  <body>
    <p>This is the first paragraph. It introduces the concept of
    paragraphs in HTML.</p>
  </body>
</html>
```



4. Line Breaks

-
 tag is used to create line break
- This is the simplest way to insert a line break.
- It is a self-closing tag and does not require a closing tag.

```
<!DOCTYPE html>
```

```
<html>
```

```
  <head>
```

```
    <title>Sample Web Page</title>
```

```
  </head>
```

```
  <body>
```

```
    <p>This is the first line.<br>This is the second line.</p>
```

```
  </body>
```

```
</html>
```

5. Font Styles

- Font styles and sizes can be adjusted using various tags and CSS (Cascading Style Sheets).
- These styles can be nested to apply multiple styling rules to text within different elements.
- Font Style Tags:
 - : Makes text bold.
 - <i>: Makes text italic.
 - : Makes text italic.

- : Emphasizes text, typically in italics (semantic meaning in HTML).
- : Makes text bold with stronger emphasis (semantic meaning in HTML).

```
<!DOCTYPE html>

<html>

  <head>
    <title>Sample Web Page</title>
  </head>

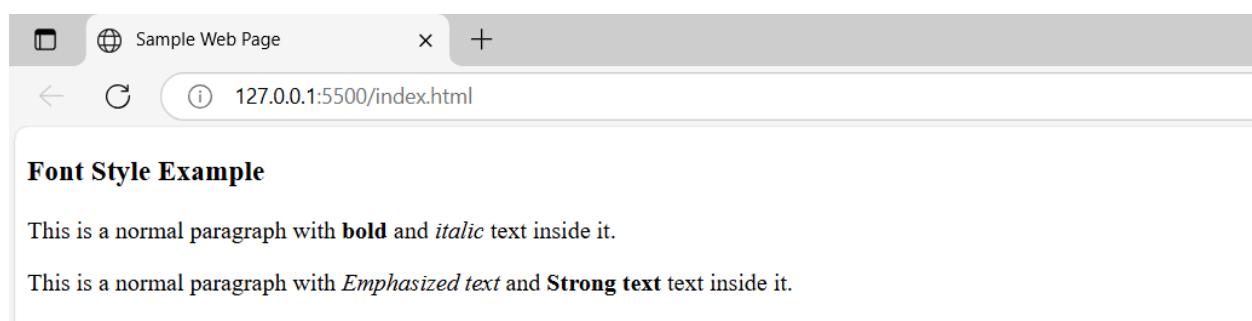
  <body>
    <h3>Font size Example</h3>

    <p>This is a normal paragraph with <b>bold</b> and
       <i>italic</i> text inside it.</p>

    <p>This is a normal paragraph with <em>Emphasized
       text</em> and <strong>Strong text</strong> text inside
       it.</p>

  </body>

</html>
```

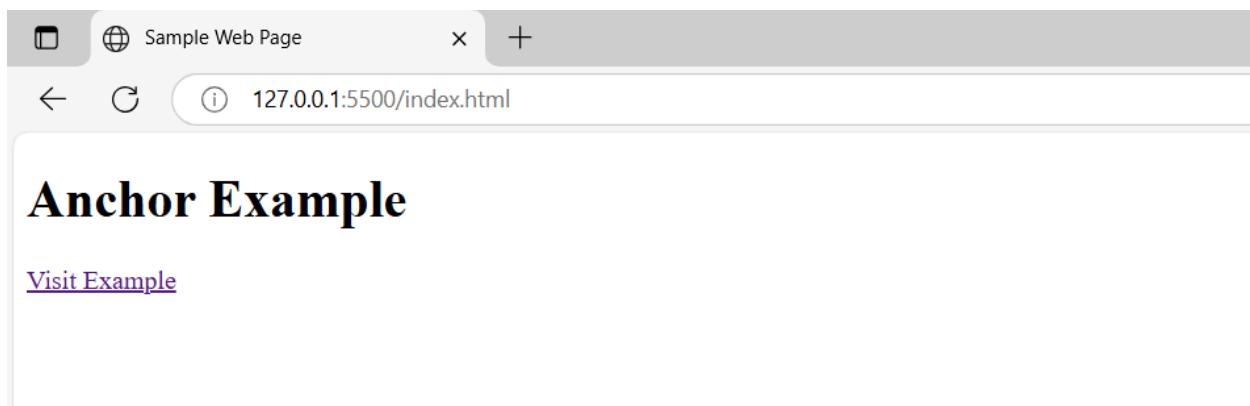


6. Anchor Tag

- The `<a>` tag in HTML is used to create hyperlinks
- enabling users to
- navigate between different pages,
- sections of the same page,
- other resources such as files, images, or external websites.

```
<!DOCTYPE html>

<html>
  <head>
    <title>Sample Web Page</title>
  </head>
  <body>
    <h1>Anchor Example</h1>
    <a href="https://example.com">Visit Example</a>
  </body>
</html>
```



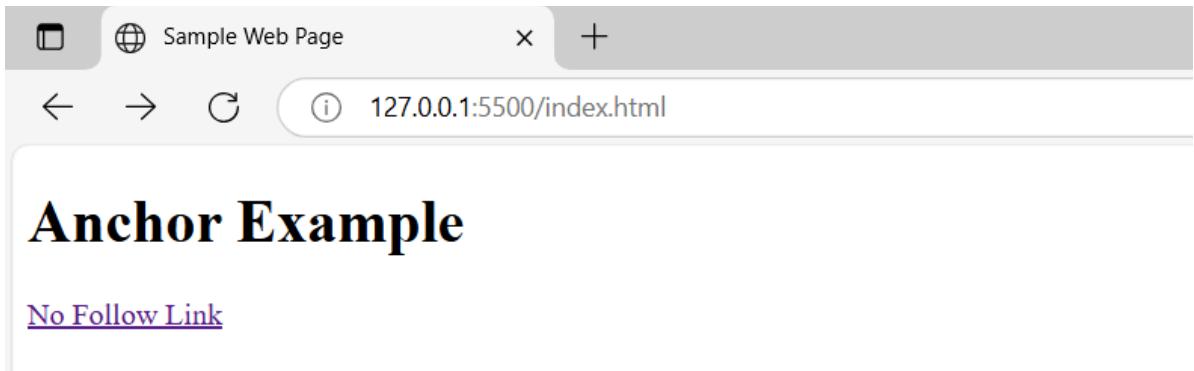
Various Attributes of <a>

- href (Hyperlink Reference):
 - Specifies where to open the linked document.
 - _self (default): Opens in the same tab/window.
 - _blank: Opens in a new tab/window.
- Open in New Tab
- title
 - Adds a tooltip that appears when the user hovers over the link.

```
<a href="https://example.com" title="Visit Example">Hover Over Me</a>
```

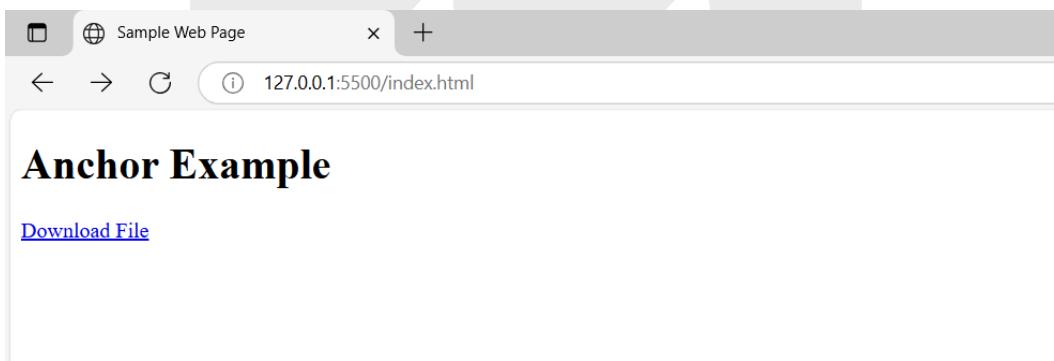


- rel
 - Specifies the relationship between the current document and the linked document (e.g.,nofollow, noopener).
- ```
No Follow Link
```
- the rel="nofollow" attribute tells search engines not to follow or pass any SEO ranking value to the linked page.



- download
  - Suggests that the target should be downloaded when clicked.

```
Download File
```



```
<!DOCTYPE html>

<html>
 <head>
 <title>Sample Web Page</title>
 </head>
 <body>
 <h1>Anchor Tag Examples</h1>
```

```

<p>Visit Example Website</p>

<p>Opens in a new tab</p>

<p>Jump to Footer</p>

<p>Download Document</p>

<h2 id="footer">Footer Section</h2>

</body>

</html>

```



## 7. Image

- The `<img>` tag in HTML is used to embed images into a webpage.
- It is an inline, self-closing element that does not require a closing tag.
- The image source and additional attributes define the image's

properties.

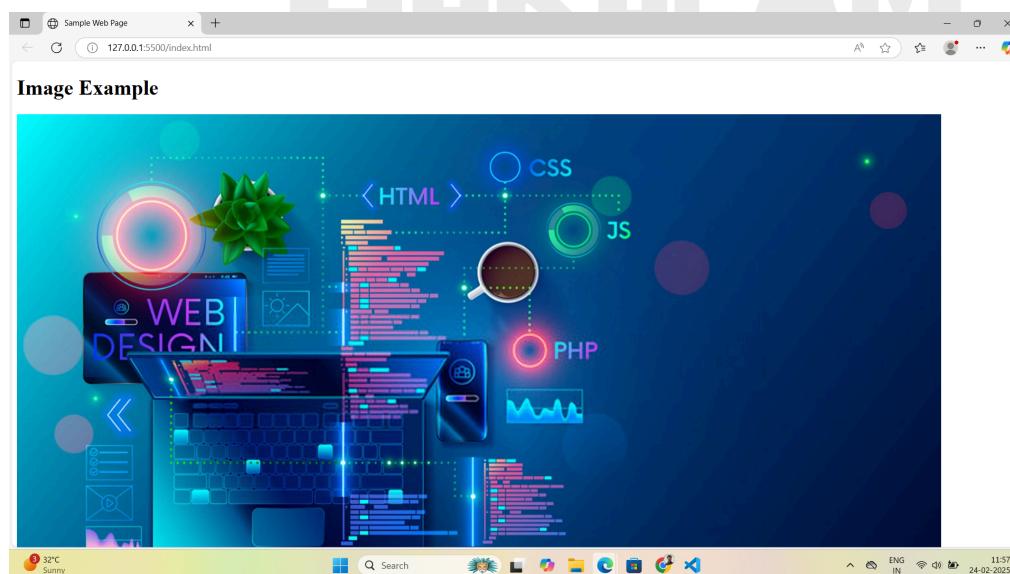
Eg: With Source attribute value

```
<!DOCTYPE html>

<html>

 <head>
 <title>Sample Web Page</title>
 </head>

 <body>
 <h1>Image Example</h1>
 <img src=
 "https://www.webhopers.com/wp-content/uploads/2022/04/
 Top-web-Design-Company-in-Patna.jpeg" alt="Description
 of image" >
 </body>
</html>
```



Eg: Without Source attribute value

```
<!DOCTYPE html>

<html>

 <head>

 <title>Sample Web Page</title>

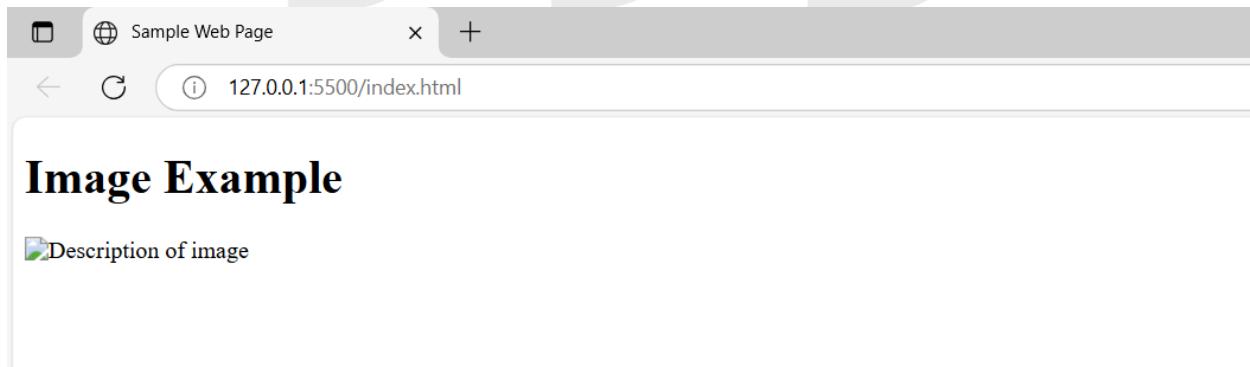
 </head>

 <body>

 <h1>Image Example</h1>

 </body>

</html>
```



### Common Image Attributes:

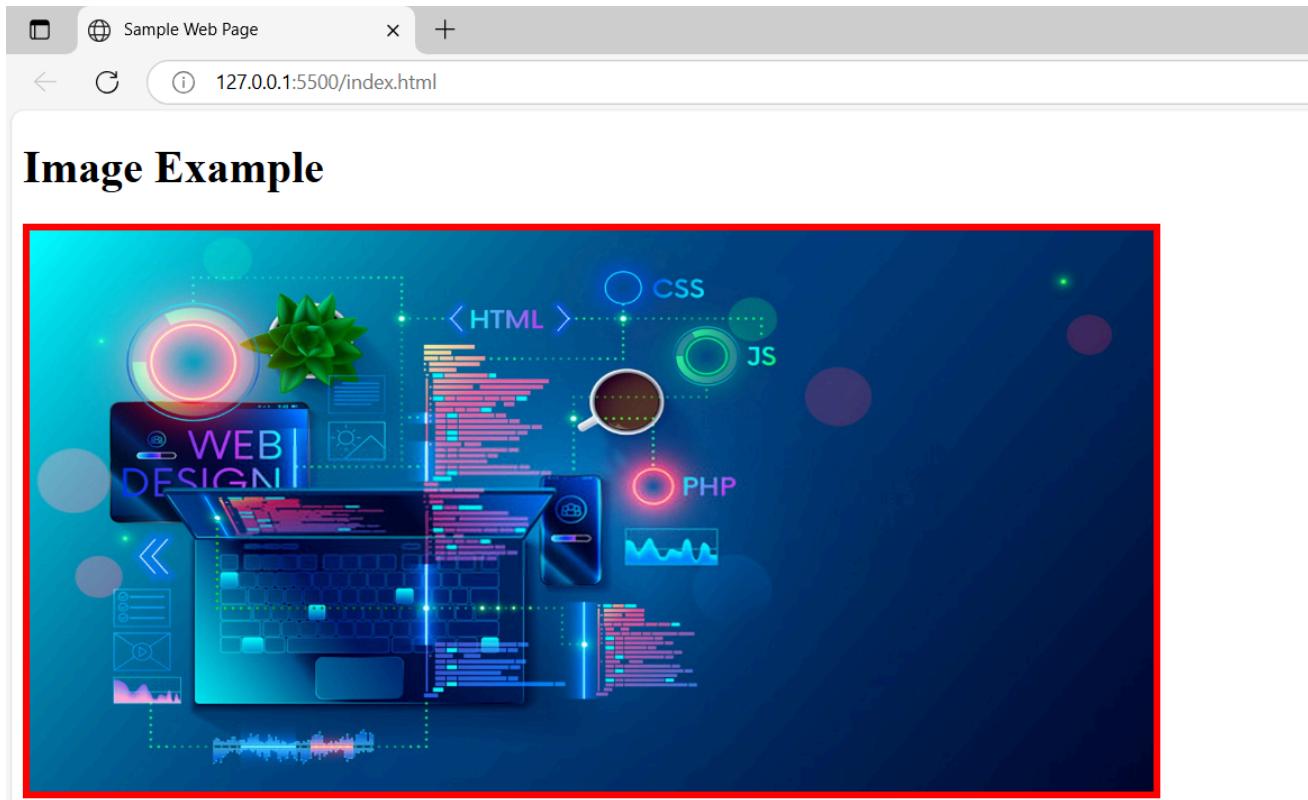
- src (Required): Specifies the source (URL or file path) of the image.
  - Example: ``
- alt (Optional but Recommended): Provides alternative text describing the image for accessibility and when the image

fails to load.

- Example: 
- width & height: Define the dimensions of the image in pixels.
  - Example: 
- style: Allows inline css.
  - Example: 

```
<!DOCTYPE html>

<html>
 <head>
 <title>Sample Web Page</title>
 </head>
 <body>
 <h1>Image Example</h1>
 <img src=
 "https://www.webhopers.com/wp-content/uploads/2022/04/
 Top-web-Design-Company-in-Patna.jpeg"
 alt="Description of image"
 width="800px" height="400px"
 style="border 5px solid red">
 </body>
</html>
```



## 8. List

- Lists are used to organize and display content in a structured manner.
- List items are denoted by 'li'
- HTML supports two main types of lists:
  - Ordered lists
  - Unordered lists
  - Definition lists.

### Ordered lists (ol)

- The items are displayed with numbers or letters.
- This type is used when the order of items does matter.

```
<!DOCTYPE html>

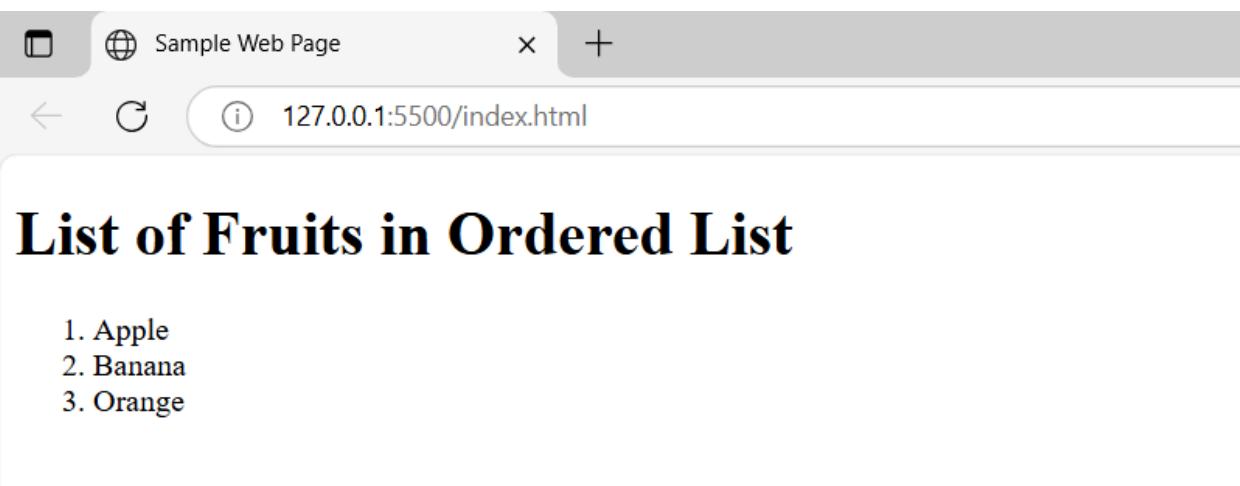
<html>

 <head>
 <title>Sample Web Page</title>
 </head>

 <body>
 <h1>List of Fruits in Ordered List</h1>

 Apple
 Banana
 Orange

 </body>
</html>
```



## Unordered lists (ul)

- The items are displayed with bullets by default.
- This type is used when the order of items doesn't matter.

```
<!DOCTYPE html>

<html>

 <head>
 <title>Sample Web Page</title>
 </head>

 <body>
 <h1>List of Fruits in Unordered List</h1>

 Apple
 Banana
 Orange

 </body>
</html>
```



## Definition lists (dl)

- These types of lists are used for terms and their definitions.
- This contains
  - <dt> (definition term) and
  - <dd> (definition description).

```
<body>
```

```
 <h1>Definition List Example</h1>
```

```

```

```
 <dt>HTML:</dt>
```

```
 <dd>HyperText Markup Language</dd>
```

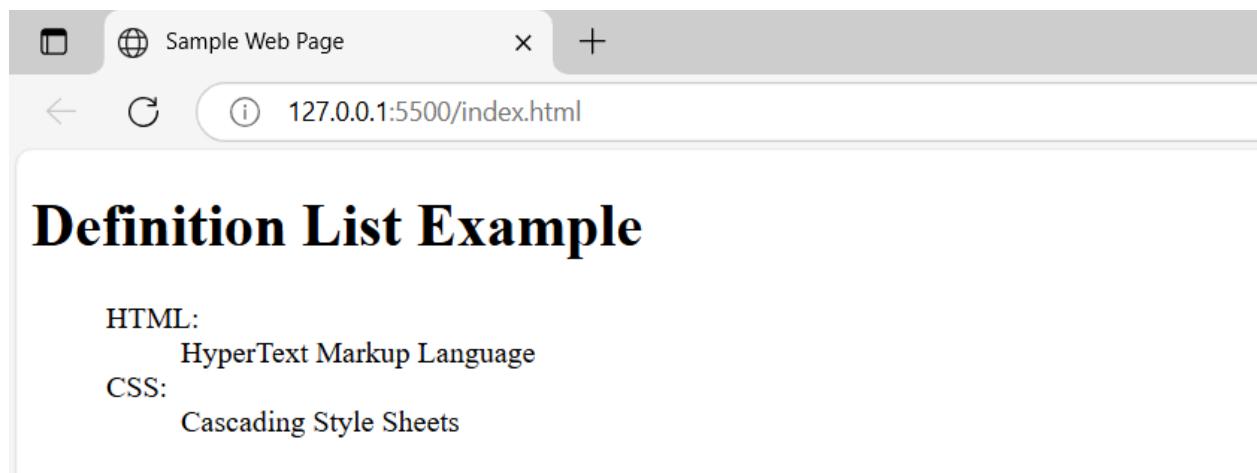
```
 <dt>CSS:</dt>
```

```
 <dd>Cascading Style Sheets</dd>
```

```

```

```
</body>
```



## Nested Lists

```
<body>
```

```
 <h1>Nested List Example</h1>
```

```

```

```
 Fruits
```

```

```

```
 Apple
```

```
 Orange
```

```

```

```

```

```

```

```
</body>
```

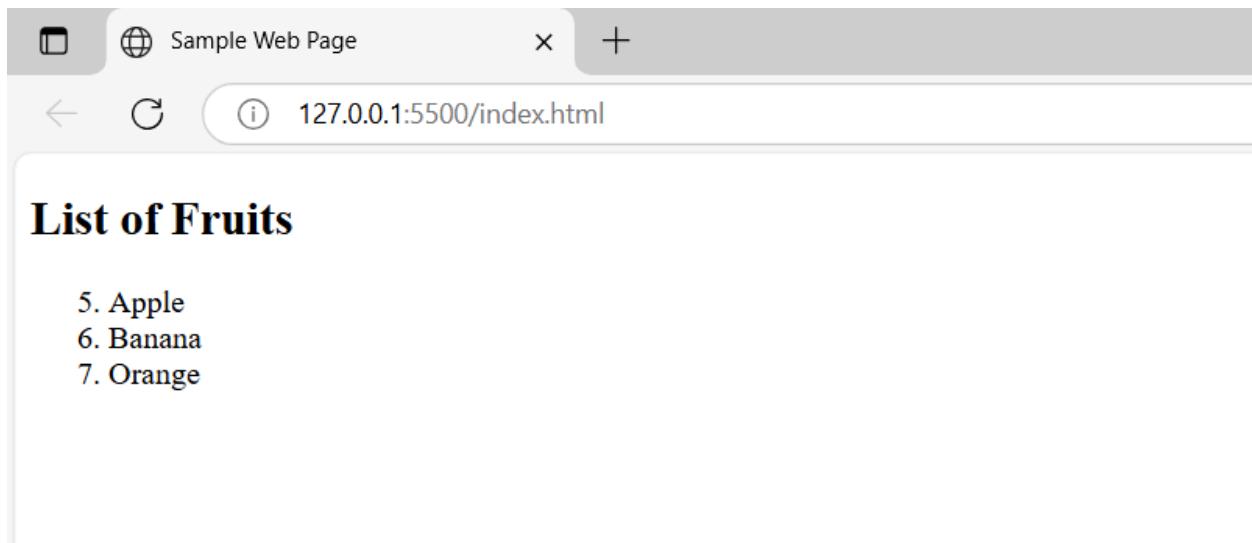


## List Attributes

- type Attribute (<ol> only)
  - Specifies the starting value.

```
<body>
 <h2>List of Fruits</h2>
 <ol type="A">
 Apple
 Banana
 Orange

</body>
```



- start Attribute (`<ol>` only)
  - Changes the numbering style.

```
<body>

 <h2>List of Fruits</h2>

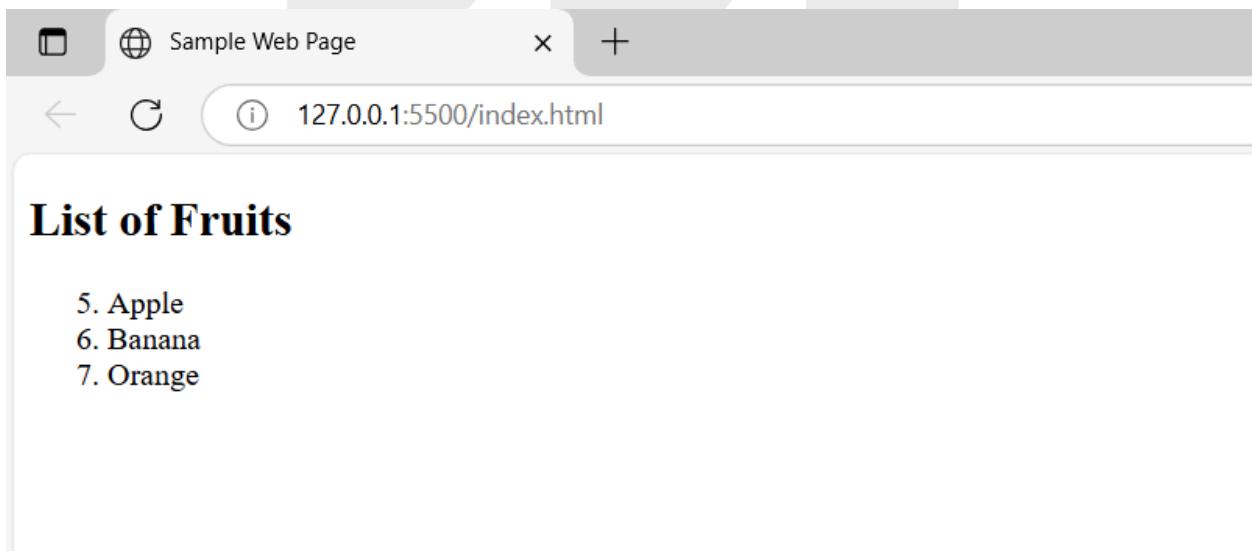
 <ol start="5">

 Apple

 Banana

 Orange

</body>
```



## 9. Forms

- An HTML form is used to collect user input.
- The user input is most often sent to a server for processing.
- The HTML `<form>` tag is used to create an HTML form for user input

- The <form> element is a container for different types of input elements, such as: text fields, checkboxes, radio buttons, submit buttons, etc.

## Key form Elements

- <form>: Defines the form.
- action: URL where form data is sent.
- method: HTTP method (GET or POST).
- <input>: Collects user input.
- <label>: Improves accessibility and usability.
- <select> and <option>: Create dropdowns.
- <textarea>: Multi-line text input.
- <button>: Used for submitting forms or other actions.

## Input Elements

- element is the most used form element.
- An <input> element can be displayed in many ways, depending on the type attribute.
  - text: Displays a single-line text input field
  - number: Displays a number input field
  - email: Displays a email input field
  - password: Displays a password input field
  - radio: Displays a radio button (for selecting one of many choices)
  - checkbox: Displays a checkbox (for selecting zero or more of many choices)
  - submit: Displays a submit button (for submitting the form)

- button: Displays a clickable button
- file: For uploading a file

```
6 <body>
7 <h1>HTML Form</h1>
8 <form action="submit.js" method="post">
9 <label for="name">Name:</label>
10 <input type="text" required />

11
12 <label for="email">Email:</label>
13 <input type="email" required />

14
15 <label for="name">Phone Number:</label>
16 <input type="number" required />

17
18 <label for="password">Password:</label>
19 <input type="password" required />

20
21 <label for="gender">Gender:</label>
22 <select id="gender" name="gender">
23 <option value="male">Male</option>
24 <option value="female">Female</option>
25 <option value="other">Other</option></select>
26 >

27
28 <label for="subscribe">
29 <input type="checkbox" value="yes" />
30 Subscribe to newsletter
31 </label>
32

33
34 <button type="submit">Submit</button>
35 </form>
36 </body>
```

Sample Web Page

127.0.0.1:5500/index.html

## HTML Form

Name:

Email:

Phone Number:

Password:

Gender:

Subscribe to newsletter

## 10. Table

- The <table> tag in HTML is used to create tables, which are structured grids of rows and columns for organizing and displaying data.
- Key Tags and Elements of table tag
  - <table>: Defines the table.
  - <tr> (Table Row): Defines a row in the table.
  - <th> (Table Header): Defines a header cell. Content is bold and centered by default.
  - <td> (Table Data): Defines a standard cell in the table.
  - <caption>: Adds a title or description to the table.

```
<body>

<h1>HTML Table Example</h1>

<table>

 <caption>Student Information</caption>

 <tr>

 <th>Name</th>

 <th>Age</th>

 <th>Grade</th>

 </tr>

 <tr>

 <td>Jovan</td>

 <td>7</td>

 <td>A</td>

 </tr>

 <tr>

 <td>Anika</td>

 <td>17</td>

 <td>B+</td>

 </tr>

 <tr>

 <td>Arnav</td>

 </tr>

</table>
```

```
<td>12</td>
<td>A</td>
</tr>

<tr>
 <td>Shivanika</td>
 <td>8</td>
 <td>A+</td>
</tr>
</table>
</body>
```



The screenshot shows a web browser window with the title "Sample Web Page". The address bar displays the URL "127.0.0.1:5500/index.html". The main content area of the browser shows the rendered HTML table with the following data:

Name	Age	Grade
Jovan	7	A
Anika	17	B+
Arnav	12	A
Shivanika	8	A+

**HTML Table Example**

Student Information

Name	Age	Grade
Jovan	7	A
Anika	17	B+
Arnav	12	A
Shivanika	8	A+

## Attributes of table tag

- border: Specifies the width of the table border (e.g., `<table border="1">`).
- cellpadding: Adds space inside cells (deprecated; use CSS).
- cellspacing: Adds space between cells (deprecated; use CSS).
- rowspan and colspan: Used with `<td>` (table data) and `<th>` (table header) elements to span a cell across multiple rows or columns in a table.

## 11. div Tag

- It is a block-level container used to group content or elements together.
- It has no inherent styling or semantic meaning, but it is widely used in HTML for layout and organizational purposes.
- It helps with structuring and styling web pages.
- Although it has no semantic meaning, its flexibility and compatibility make it essential for layout and design.

```
<!DOCTYPE html>

<html>

 <head>

 <title>Sample Web Page</title>

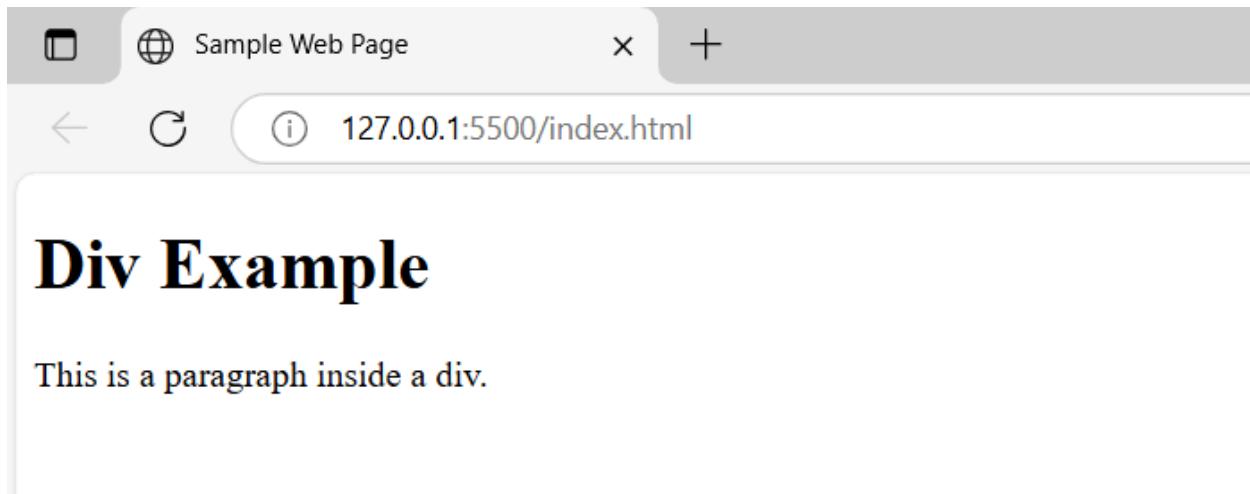
 </head>

 <body>

 <div>

 <h1>Div Example</h1>
```

```
<p>This is a paragraph inside a div.</p>
</div>
</body>
</html>
```



## Attributes of div

- id: Assigns a unique identifier to the <div> (useful for CSS and JavaScript).
  - Example: <div id="unique-div">Unique Div</div>
- class: Assigns one or more class names for styling.
  - Example: <div class="container">Div with Class</div>
- style: Adds inline CSS styling.
  - Example: <div style="background-color: yellow;">Inline Styled Div</div>

## Understanding HTML and XHTML Connections

- HTML (HyperText Markup Language)
  - Standard language for creating web pages.
  - Uses predefined tags to structure content (e.g., `<p>`, `<h1>`, `<div>`).
  - Not strict about syntax (e.g., missing closing tags might still work in browsers).
  - Does not enforce case sensitivity (e.g., `<Br>` and `<br>` are the same).

```
<html>
 <head>
 <title>My Page</title>
 </head>
 <body>
 <p>Hello, World!</p>
 </body>
</html>
```

- XML (eXtensible Markup Language)
  - Not a presentation language like HTML but a data storage and transport language.
  - Used to define custom markup languages.
  - Syntax is strict: well-formed and case-sensitive.
  - Self-descriptive (users define their own tags).

```
<person>

 <name>John Doe</name>

 <age>30</age>

</person>
```

- XHTML (eXtensible HyperText Markup Language)
  - A stricter and more structured version of HTML, based on XML.
  - Requires all tags to be properly closed, nested, and lowercase.
  - Attributes must be quoted and should not be minimized
    - (e.g., `<input type="text" />` instead of `<input>`).

```
<!DOCTYPE html
```

```
PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```

```
<html xmlns="http://www.w3.org/1999/xhtml">
```

```
 <head>
```

```
 <title>My XHTML Page</title>
```

```
 </head>
```

```
 <body>
```

```
 <p>Hello, World!</p>
```

```
 </body>
```

```
</html>
```

- HTML5
  - Latest version of HTML with new elements, APIs, and improved support for multimedia.
  - Introduces semantic elements (e.g., `<header>`, `<article>`, `<footer>`).
  - Reduces reliance on external plugins like Flash (e.g., `<video>` and `<audio>` elements).
  - Supports new form controls and APIs like Geolocation, Web Storage, and Canvas.

```
<!DOCTYPE html>

<html lang="en">
 <head>
 <meta charset="UTF-8">
 <title>My HTML5 Page</title>
 </head>
 <body>
 <header>
 <h1>Welcome!</h1>
 </header>
 <section>
 <p>This is an HTML5 page.</p>
 </section>
 </body>
```

</html>

## HTML and XHTML Connections

- XHTML (Extensible HyperText Markup Language) is a more structured and XML-compliant version of HTML.
- It is defined as an XML application and is supported by all major browsers.
- XHTML enforces stricter rules for writing markup to ensure better compatibility and extensibility with other data formats, such as XML.
- Unlike HTML, which allows browsers to overlook markup errors, XHTML enforces stricter error handling.

## Key Differences Between XHTML and HTML

- Mandatory <!DOCTYPE> Declaration: XHTML requires a <!DOCTYPE> declaration at the beginning of the document.
- Required xmlns Attribute in <html>: Specifies the XML namespace and is required in the <html> tag for XHTML.
- Mandatory <html>, <head>, <title>, and <body> Elements: XHTML requires these elements to structure the document correctly.
- Proper Nesting of Elements: XHTML elements must be properly nested, meaning no overlapping tags are allowed.
- All Elements Must Be Closed: Every element must have a closing tag or be self-closed.
- Lowercase for All Element and Attribute Names: Element and attribute names must always be in lowercase.
- Attribute Values Must Be Quoted: All attribute values must be

enclosed in quotes.

- No Attribute Minimization Allowed: In XHTML, attributes without values (e.g., checked instead of checked="checked") are not allowed.

