

# FRONT-END DEVELOPMENT PROGRAM

Lecture 01: HTML

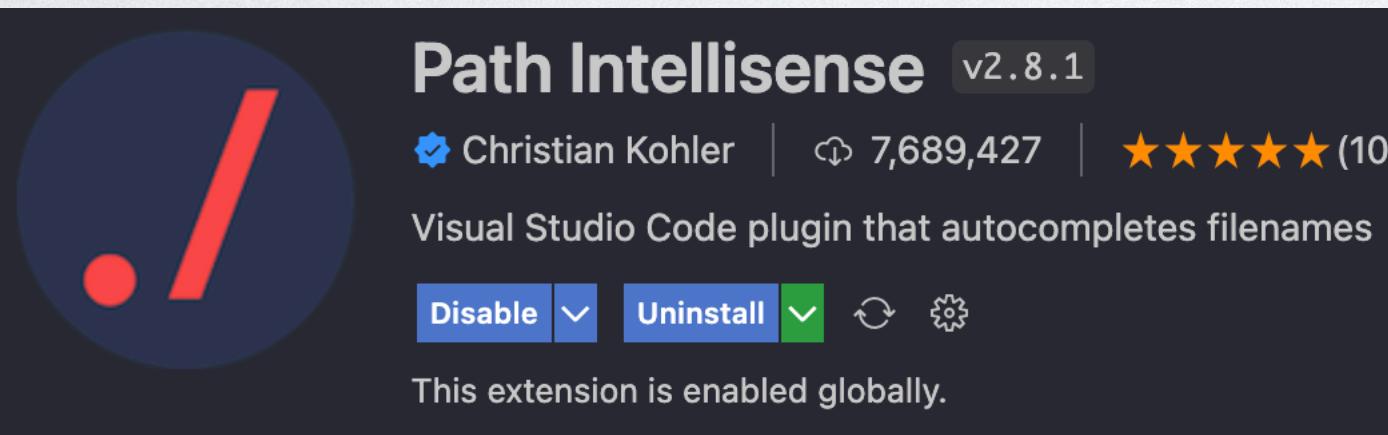
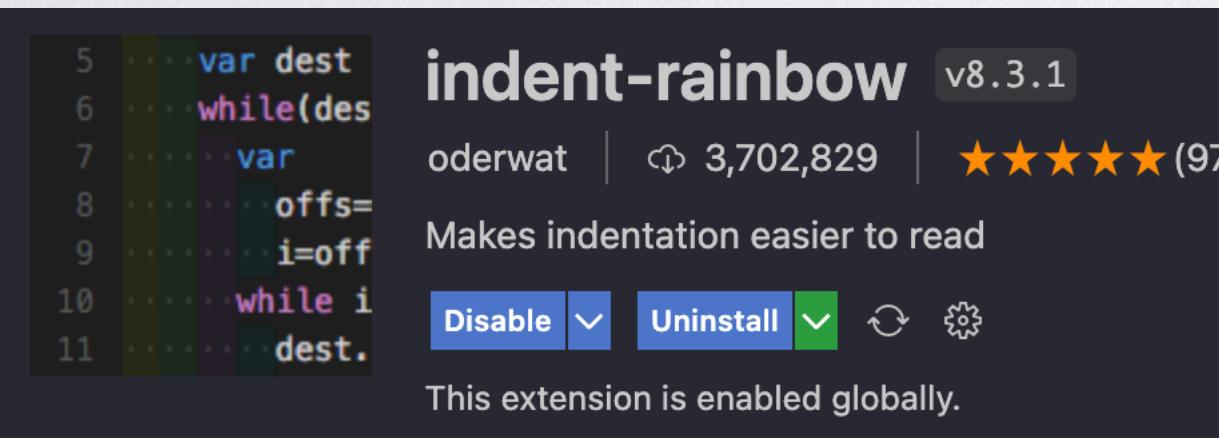
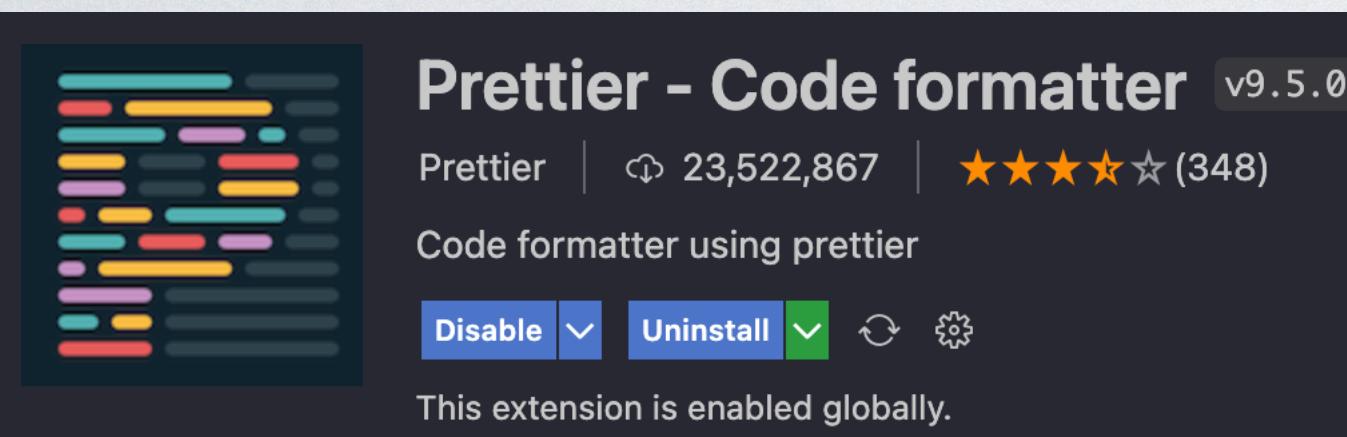
BeaconFire

# OUTLINE

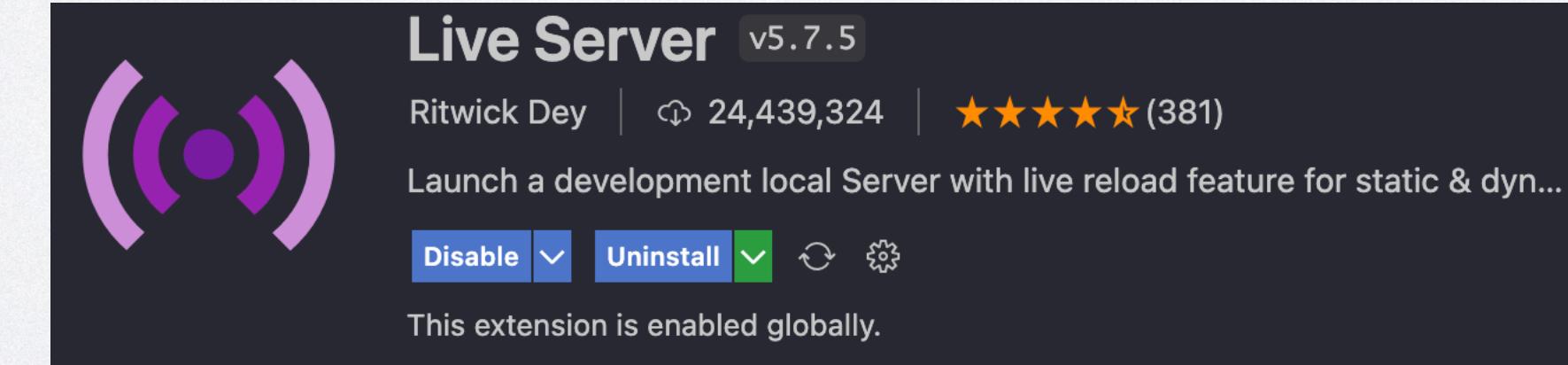
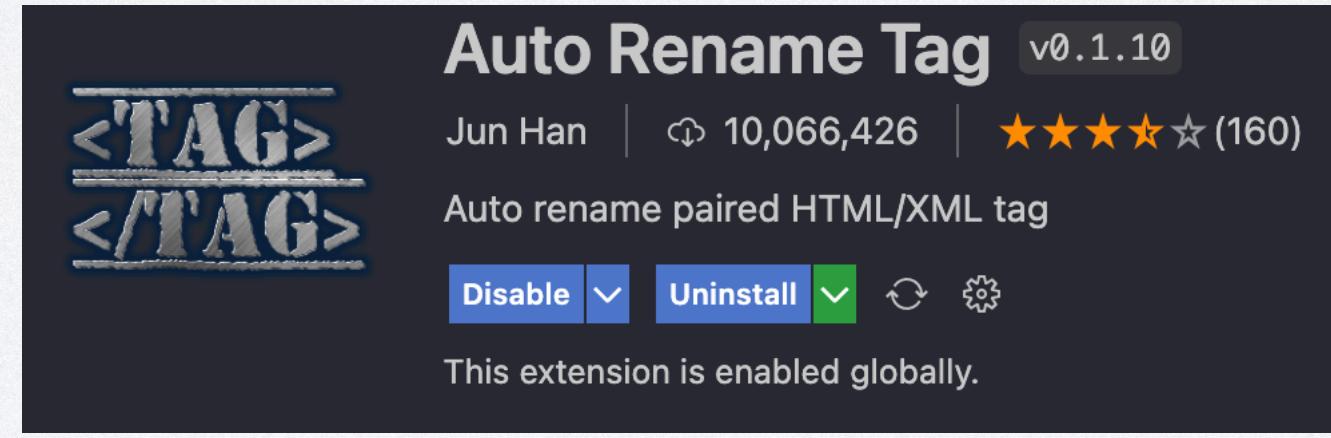
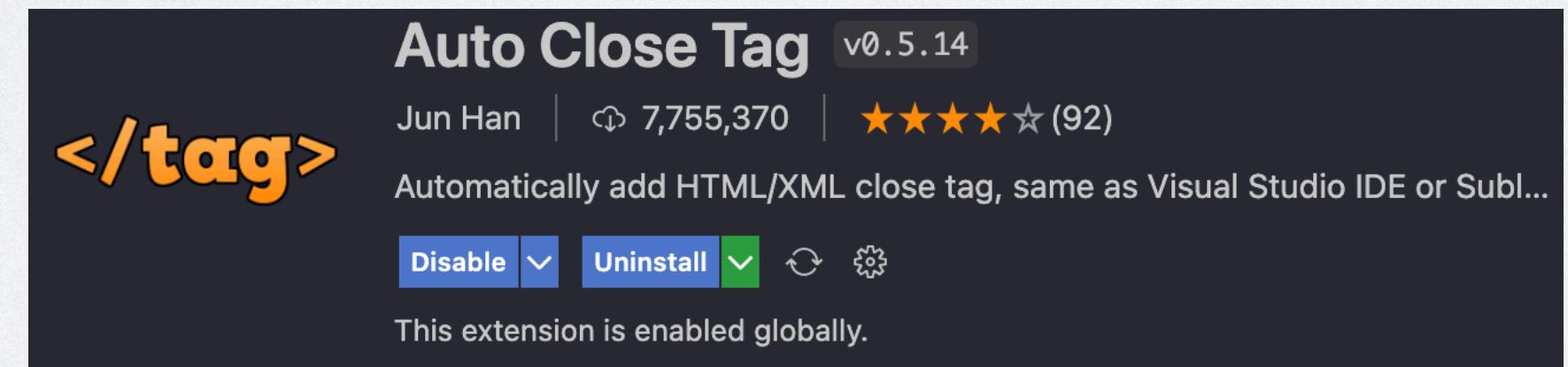
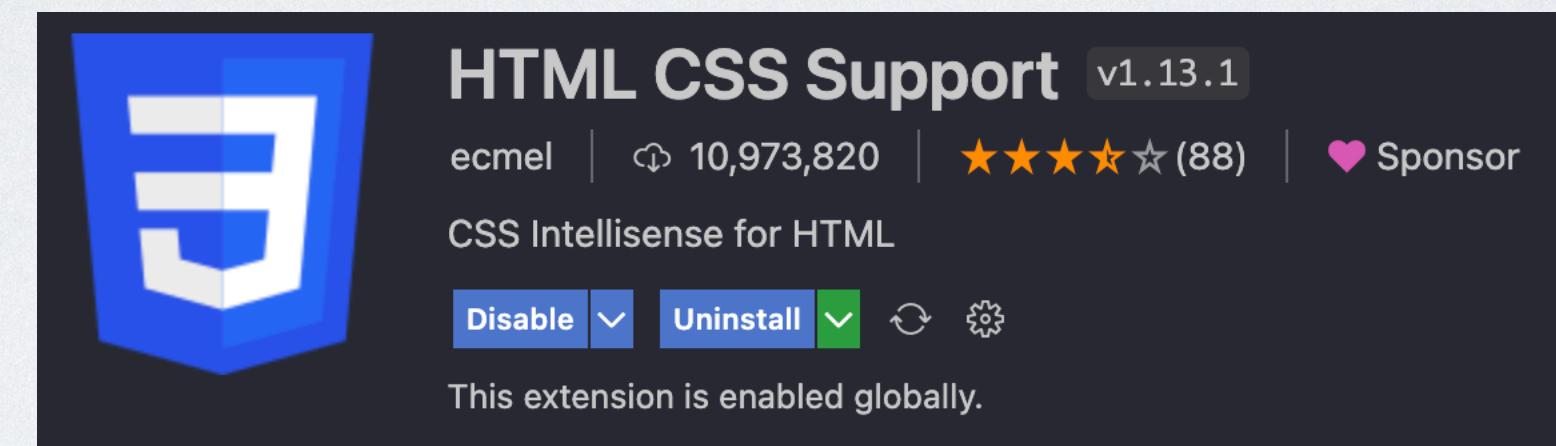
- VSCode
  - HTML & CSS extensions
- W3C
- HTML

# VSCODE EXTENSIONS

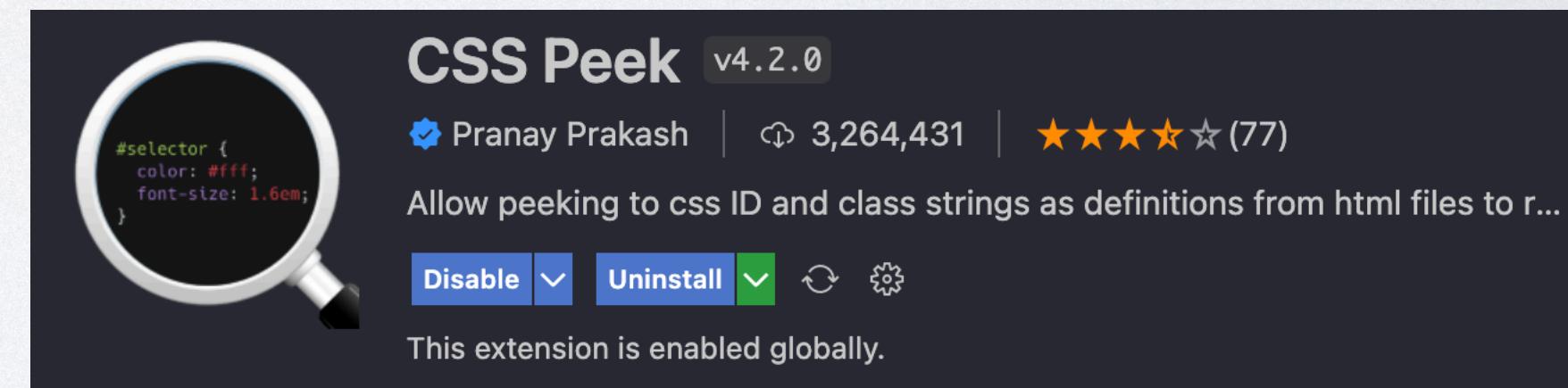
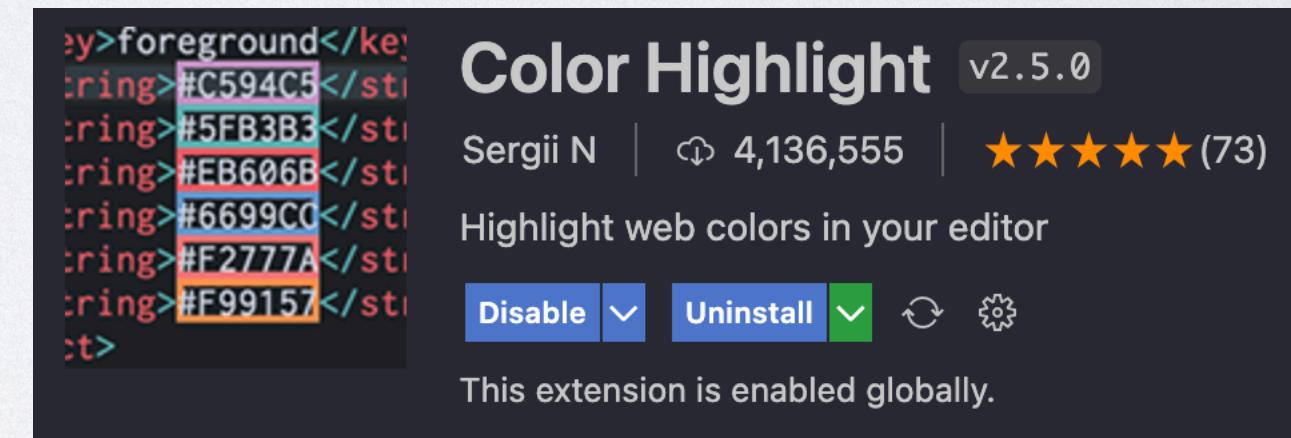
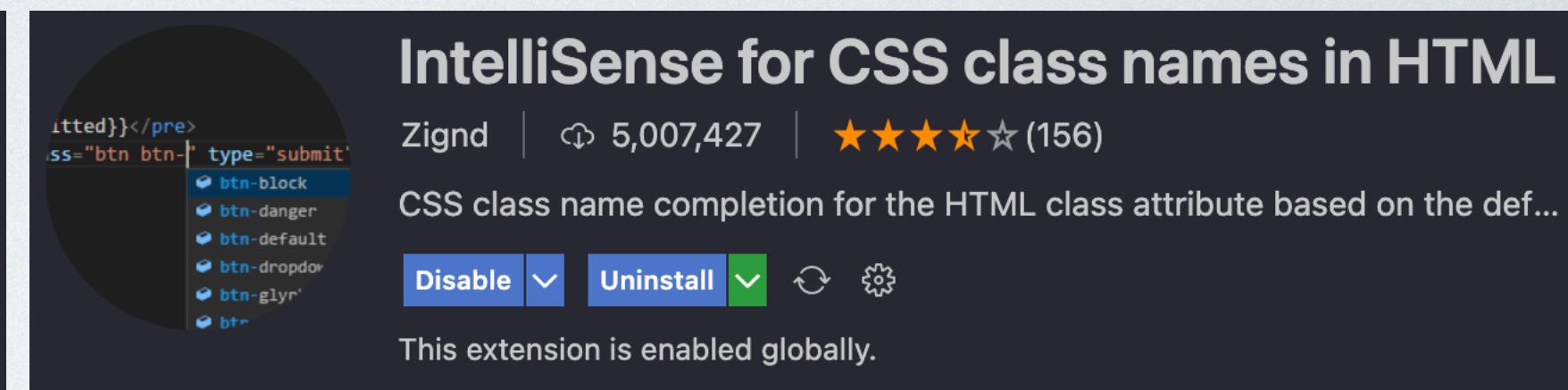
## Basics



## HTML



## CSS



# W3C

- The World Wide Web Consortium (W3C) sets the international standards for web technologies, which ensure compatibility on all platforms and simplifies the list of skills necessary to develop web applications.
- Ex: Languages that run natively in browsers are HTML, CSS, JavaScript, and WebAssembly.

# HTML

- HTML (HyperText Markup Language) is the most basic building block of the Web. It defines the meaning and structure of web content.
- HTML uses "markup" to annotate text, images, and other content for display in a Web browser. HTML markup includes special "elements" such as `<head>`, `<title>`, and `<body>`.
- The name of an element inside a tag is case-insensitive, but we most commonly use lowercase tags, which is recommended by W3C.  
`<HEAD>` = `<HEad>` = `<head>`

# HTML5

- HTML5 is the most updated version and is the current W3C recommendation.
- New attributes (charset, async), new elements (video, nav, section, canvas), support for vector graphics and mathematical notations, deprecated elements (center, font, strike)
- `<!doctype html>` or `<!DOCTYPE HTML>`

# ELEMENTS AND ATTRIBUTES

- **Elements** are made up of a start tag, content, and end tag. They can contain other elements (nesting).
- **Tags** are like names for an element. Different elements have different default properties.
- **Attributes** provide additional information about elements in the start tag. They are specified using name-value pairs.

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

# ELEMENTS AND ATTRIBUTES (2)

- Tag Categories: [https://www.w3schools.com/tags/ref\\_byfunc.asp](https://www.w3schools.com/tags/ref_byfunc.asp)
  - **basics**: doctype, html, head, title, link, style, body, script
  - **content organization**: main, header, nav, footer, article, section, aside, div, span
  - **text formatting**: i/em/cite/dfn, b/strong, mark, u/ins, s/del, q, sub, sup
  - **content**: a, ol/ul (li), dl (dt/dd), br, figure (figcaption/img), details (summary), hr, h1-h6, p, pre, table (caption, thead/tbody/tfoot, tr/th/td), svg
  - **user input**: form, fieldset, input, label, button, select (optgroup, option), textarea
- Global attributes: id, class, style, title, ...
  - **<input>**: type (text/radio/checkbox/date/time/number/password/file), readonly, disabled, placeholder, required, name, value

# BASICS

- **<!DOCTYPE html>**: tells the browser what document type to expect
- **<html>**: root of an HTML document, should contain all other HTML elements
- **<head>**: contains metadata about the HTML page
  - **<title>**: specifies a title for the HTML document, shown in the page tab, important for SEO
  - **<link>**: define relationship between HTML document and external resource, only has attributes
  - **<style>**: specify internal CSS
- **<body>**: refers to the document body and contains all visible content
- **<script>**: contains JS code or points to external script file

```
<!DOCTYPE html>
<html lang="en">

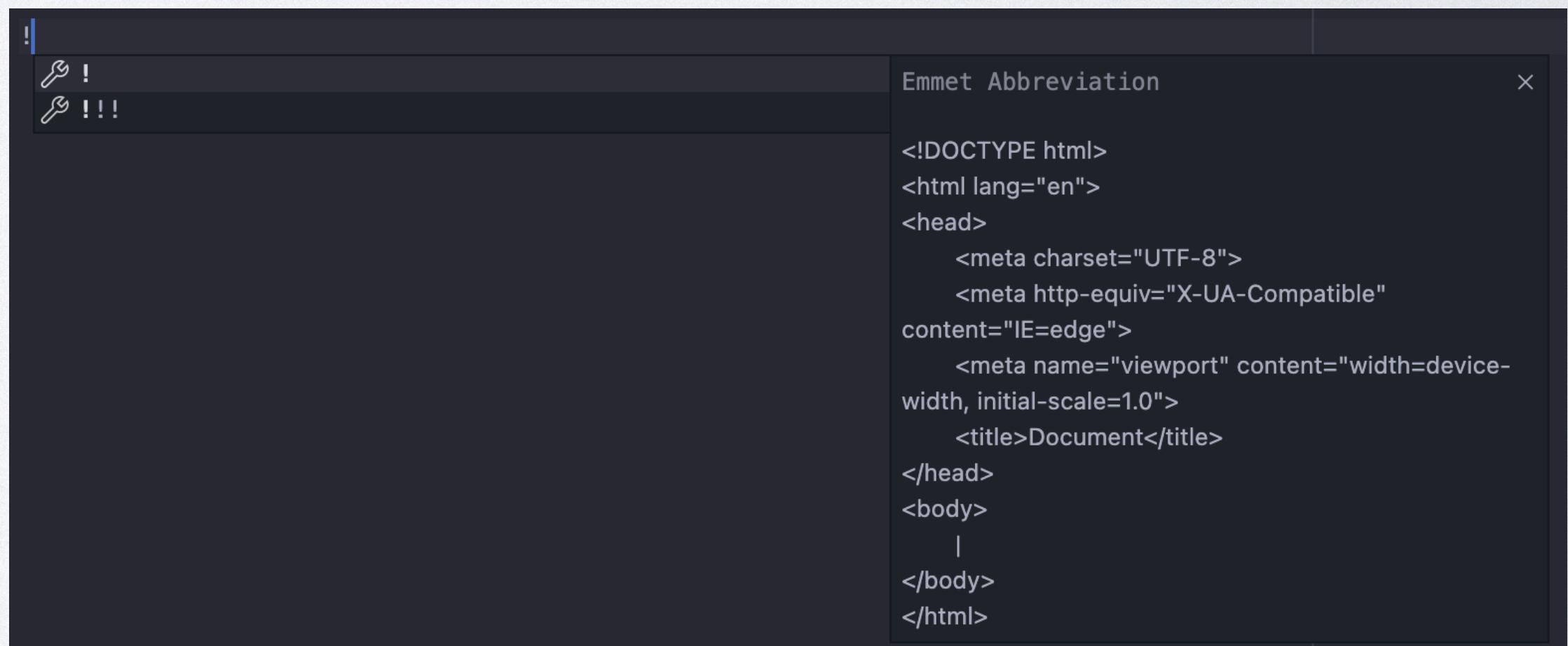
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>Document</title>
<link rel="stylesheet" href="styles.css">
<style></style>
</head>

<body>

</body>

<script></script>

</html>
```



# <META>

- The <meta> tag defines metadata (information about data) for an HTML document. It's important in SEO. Some attributes are:
- **charset**: specifies the character encoding for the HTML document (ASCII)
- **name**: specifies a name for the metadata (application-name, author, description, generator, keywords, viewport)
- **content**: specifies values for name or http-equiv (another attribute)

```
<head>
  <meta charset="UTF-8">
  <meta name="description" content="Free Web tutorials">
  <meta name="keywords" content="HTML, CSS, JavaScript">
  <meta name="author" content="John Doe">
  <meta name="viewport" content="width=device-width, initial-
  scale=1.0">
</head>
```

# BLOCK ELEMENT

- All HTML elements have a default display type: block or inline.
- A block-level element:
  - Always starts on a new line.
  - Always takes up the full width available (stretches out to the left and right as far as it can).
  - Is affected by a margin on all sides (top, bottom, left, right).

<code>&lt;address&gt;</code>	<code>&lt;article&gt;</code>	<code>&lt;aside&gt;</code>	<code>&lt;blockquote&gt;</code>	<code>&lt;canvas&gt;</code>	<code>&lt;dd&gt;</code>
<code>&lt;div&gt;</code>	<code>&lt;dl&gt;</code>	<code>&lt;dt&gt;</code>	<code>&lt;fieldset&gt;</code>	<code>&lt;figcaption&gt;</code>	<code>&lt;figure&gt;</code>
<code>&lt;footer&gt;</code>	<code>&lt;form&gt;</code>	<code>&lt;h1&gt;–&lt;h6&gt;</code>	<code>&lt;header&gt;</code>	<code>&lt;hr&gt;</code>	<code>&lt;li&gt;</code>
<code>&lt;main&gt;</code>	<code>&lt;nav&gt;</code>	<code>&lt;noscript&gt;</code>	<code>&lt;ol&gt;</code>	<code>&lt;p&gt;</code>	<code>&lt;pre&gt;</code>
<code>&lt;section&gt;</code>	<code>&lt;table&gt;</code>	<code>&lt;tfoot&gt;</code>	<code>&lt;ul&gt;</code>		<code>&lt;video&gt;</code>

# INLINE ELEMENT

- An inline element:
  - Does not start on a new line.
  - Only takes up as much width as necessary.
  - Is only affected by a left & right margin.

<a>	<abbr>	<acronym>	<b>	<bdo>	<big>
 	<button>	<cite>	<code>	<dfn>	<em>
<i>	<img>	<input>	<kbd>	<label>	<map>
<object>	<output>	<q>	<samp>	<script>	<select>
<small>	<span>	<strong>	<sub>	<sup>	<textarea>
<time>	<tt>	<var>			

# SEMANTIC ELEMENTS

- Semantic elements have tags that specifically describe the contents that they contain.
- Non-semantic: div, span
- Semantic: header, footer, nav, article, section
- [https://www.w3schools.com/html/html5\\_semantic\\_elements.asp](https://www.w3schools.com/html/html5_semantic_elements.asp)

# CONTENT ORGANIZATION

- **<div>**: division, a general-purpose block element container
  - **<main>**: main content of a document, should be unique
  - **<header>**: introductory content or set of navigation links
  - **<nav>**: a set of navigation links
  - **<article>**: independent, self-contained content
  - **<section>**: thematic grouping of content, usually with a heading
  - **<aside>**: content indirectly related to surrounding content (placed in sidebar)
  - **<footer>**: footer for a document or section
- **<span>**: a general-purpose inline-element container



# TEXT FORMATTING

- Italics: i, em, cite, dfn
- Bold: b, strong
- Highlight: mark
- Underline: u, ins
- Strikethrough: s, del
- Quote: q
- Subscript: sub
- Superscript: sup

```
&lti&gt; <i>italics</i> <br>
&ltem&gt; <em>emphasis</em> <br>
&amplttcite&gt; <cite>title of a work</cite> <br>
&ltdfn&gt; <dfn>definition of a term</dfn><br>

<br>
&ltb&gt; <b>bold</b> <br>
&ltstrong&gt; <strong>important text</strong> <br>

<br>
&ltmark&gt; <mark>marked or highlighted text</mark><br>

<br>
&ltu&gt; <u>underline</u> <br>
&ltins&gt; <ins>text that was inserted into a document</ins> <br>

<br>
&lts&gt; <s>text that is no longer correct</s> <br>
&ltdel&gt; <del>text that was deleted from a document</del> <br>

<br>
&ltq&gt; <q>quoted text</q> <br>
<br>
&ltsub&gt; <sub>subscript text</sub><br>
<br>
&ltsup&gt; <sup>superscript text</sup><br>
```

**<i>**: *italics*  
**<em>**: *emphasis*  
**<cite>**: *title of a work*  
**<dfn>**: *definition of a term*

**<b>**: **bold**  
**<strong>**: **important text**

**<mark>**: **marked or highlighted text**

**<u>**: underline  
**<ins>**: text that was inserted into a document

**<s>**: text that is no longer correct  
**<del>**: text that was deleted from a document

**<q>**: “quoted text”

**<sub>**: subscript text

**<sup>**: superscript text

# CONTENT

- Lists: ol/ul (li), dl (dt/dd)
- Text: h1-h6, p, pre, details, summary
- Table: table (caption, thead/tbody/tfoot, tr/th/td)
- Other: br, hr, a, iframe, figure (figcaption/img), svg

# LIST

- Numbered list
  - **<ol>**: ordered list
  - **<li>**: list item
- Bulleted list
  - **<ul>**: unordered list
  - **<li>**: list item
- Indented list
  - **<dl>**: description list
  - **<dt>**: term/name in a description list
  - **<dd>**: description of the term/name

```
<!-- Ordered list: numbered list items-->
<ol>
  <li>HTML</li>
  <li>CSS</li>
  <li>JavaScript</li>
  <ol>
    <li>Nested ordered list</li>
  </ol>
</ol>

<!-- Unordered list: bulleted list items -->
<ul>
  <li>HTML</li>
  <li>CSS</li>
  <li>JavaScript</li>
  <ul>
    <li>Nested unordered list</li>
  </ul>
</ul>

<!-- Description list: terms with indented descriptions-->
<dl>
  <dt>Web Development Languages</dt>
  <dd>HTML</dd>
  <dd>CSS</dd>
  <dd>JavaScript</dd>
  <ul>
    <dd>Nested ul</dd>
    <dd>Nested ul</dd>
  </ul>
  <ol>
    <dd>Nested ol</dd>
    <dd>Nested ol</dd>
  </ol>
</dl>
```

1. HTML
2. CSS
3. JavaScript
  1. Nested ordered list

- HTML
- CSS
- JavaScript
  - Nested unordered list

## Web Development Languages

HTML  
CSS  
JavaScript

Nested ul  
Nested ul

Nested ol  
Nested ol

BeaconFire

# TEXT

- **<h1>,...,<h6>**: html headings
- **<p>**: paragraph
- **<pre>**: pre-formatted text
- **<details>**: text that can be toggled to display
- <summary>**: visible caption or heading for **<details>**

```
<!-- Page headings -->
<h1>&lth1&gt;</h1>
<h2>&lth2&gt;</h2>
<h3>&lth3&gt;</h3>
<h4>&lth4&gt;</h4>
<h5>&lth5&gt;</h5>
<h6 id="six">&lth6&gt;</h6>

<!-- Paragraph: line breaks do not matter -->
<p>&ltp&gt;: Lorem ipsum dolor sit amet consectetur adipisicing elit. Amet, ipsum libero? Quibusdam debitis consequuntur illum? Temporibus nam sapiente earum vel laboriosam illum blanditiis cumque itaque, nobis harum ea, sed adipisci!
</p>

<!-- Preformatted Text: line breaks matter -->
<pre>&lt;pre&gt;: Lorem ipsum dolor sit amet consectetur adipisicing elit. Culpa, reprehenderit blanditiis facere, nulla doloremque dolores voluptates at amet ducimus atque numquam quas cum neque beatae magni. Illum dicta officia maiores?
</pre>

<!-- Details: toggle to display -->
<details>
    <summary>Click to display or hide</summary>
    <p>Lorem ipsum dolor sit amet consectetur adipisicing elit. Ipsum accusamus incident eos! Ipsum nostrum facilis ipsam reprehenderit cum veniam odio reiciendis molestiae perferendis vel. Doloribus quae perferendis libero quis nisi?</p>
</details>
```

**<h1>**

**<h2>**

**<h3>**

**<h4>**

**<h5>**

**<h6>**

<p>: Lorem ipsum dolor sit amet consectetur adipisicing elit. Amet, ipsum libero? Quibusdam debitis consequuntur illum? Temporibus nam sapiente earum vel laboriosam illum blanditiis cumque itaque, nobis harum ea, sed adipisci!

<pre>: Lorem ipsum dolor sit amet consectetur adipisicing elit. Culpa, reprehenderit blanditiis facere, nulla doloremque dolores voluptates at amet ducimus atque numquam quas cum neque beatae magni. Illum dicta officia maiores?

▼ Click to display or hide

Lorem ipsum dolor sit amet consectetur adipisicing elit. Ipsum accusamus incident eos! Ipsum nostrum facilis ipsam reprehenderit cum veniam odio reiciendis molestiae perferendis vel. Doloribus quae perferendis libero quis nisi?

# TABLE

- HTML tables consist of table cells inside a row-column structure.
  - **<table>**: the table container
  - <caption>**: table caption
  - <thead>**: groups header content
  - <tbody>**: groups body content
  - <tfoot>**: groups footer content
  - <tr>**: table row
  - <th>**: table header, cell contents of header
  - <td>**: table data, cell contents of body & footer

The diagram illustrates the structure of an HTML table. It consists of three main parts: the code, the visual representation, and the final output.

**Code:**

```
<table>
  <caption>Caption</caption>
  <thead>
    <tr>
      <th>Header1</th>
      <th>Header2</th>
    </tr>
  </thead>
  <tbody>
    <tr>
      <td>r1c1</td>
      <td>r1c2</td>
    </tr>
    <tr>
      <td>r2c1</td>
      <td>r2c2</td>
    </tr>
    <tr>
      <td>r3c1</td>
    </tr>
  </tbody>
  <tfoot>
    <tr>
      <td>r3c1</td>
    </tr>
  </tfoot>
</table>
```

**Visual Representation:**

The visual representation shows the hierarchical structure of the table elements. The `<table>` element contains `<caption>`, `<thead>`, `<tbody>`, and `<tfoot>`. The `<thead>` contains one `<tr>` with two `<th>` cells. The `<tbody>` contains three `<tr>` cells, each with two `<td>` cells. The `<tfoot>` contains one `<tr>` with one `<td>` cell.

**Final Output:**

| Header1 | Header2 |
|---------|---------|
| r1c1    | r1c2    |
| r2c1    | r2c2    |
| r3c1    |         |
| r3c1    |         |

# BR, HR, A

- **<br>**: line break
- **<hr>**: horizontal rule
- **<a>**: anchor, for defining hyperlinks that link pages and redirect to one another
  - **href**: the link's destination, which can be:
    - url
    - local path that is relative (./, ../) or absolute (/)
    - '#' (jump to top of page), etc.
  - **target**: where to open the linked document (\_self, \_blank, \_parent, \_top)
    - 'javascript:void(0)': stay on the same page, no effect when clicked

```
<!-- Line breaks and horizontal rules -->
<span>Span1 (inline element)</span>
<br> <br> <br>
<span>Span2, 3 lines below</span>
<hr>

<!-- Links with onclick functionality -->
<!-- Redirecting to another domain -->
<a href='https://www.google.com'>Google</a> <br>

<!-- target attribute lets you specify where to open linked documents
     _self (default): same frame as it was clicked
     _blank: new window or tab
     _parent: parent frame
     _top: full body of the window
-->
<a href='https://www.google.com' target='_self'>Google "_self"</a> <br>
<a href='https://www.google.com' target='_blank'>Google "_blank"</a> <br>

<!-- Redirect to local .html page -->
<a href='./pages/page1.html'>Page One (Relative)</a> <br>
<a href='../pages/page1.html'>Page One in Another folder (Relative)</a> <br>
<!-- absolute wont work if using live server extension -->
<a href='/Users/ethan/Desktop/training/Demos/Lec02_htmlcss_Demo/pages/page1.html'>
    Page One (Absolute)</a> <br>

<!-- Do nothing -->
<a href="javascript:void(0)">javascript:void(0)</a> <br>

<!-- Jump to different elements -->
<a href="#">#</a> <br>
<a href="#six">Jump to last heading</a> <br>
```

Span1 (inline element)

Span2, 3 lines below

[Google](#)  
[Google " self"](#)  
[Google " blank"](#)  
[Page One \(Relative\)](#)  
[Page One in Another folder \(Relative\)](#)  
[Page One \(Absolute\)](#)  
[javascript:void\(0\)](#)  
<#>  
[Jump to last heading](#)

# IFRAME

- **<iframe>**: inline frame for embedding an HTML document within the current HTML document.
- **src**: address of the document to be embedded, a url
- **title**: for screen readers to read out a description of the iframe contents
- **width, height**: specify the size of the embedded document



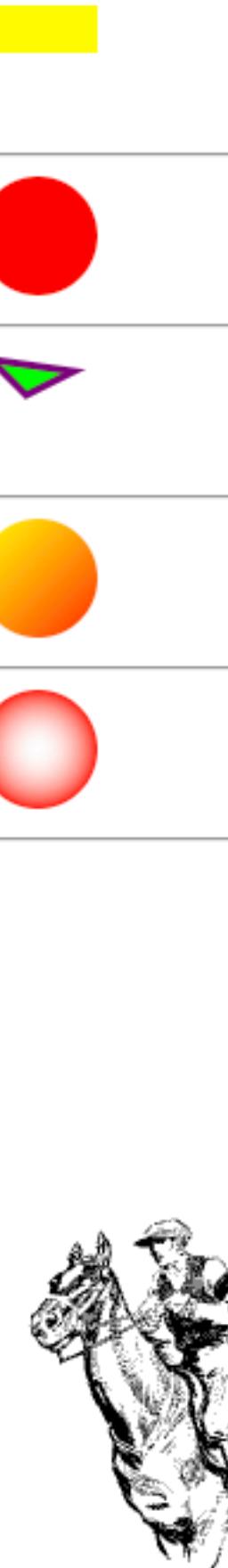
```
<iframe src="./pages/page1.html" title="Page1" width="300px" height="300px"></iframe>
```

# FIGURE, IMG

- **<figure>**: self-contained content (illustrations, diagrams, photos, ...)
  - **<figcaption>**: caption that is usually first or last child of `<figure>` elements
  - **<img>**: to embed an image in a web page
    - **src**: specifies the path to the image
    - **alt**: specifies an alternate text for the image when it can't be displayed
    - **width, height**: the size of the image, should be specified or the page will
    - img formats: jpeg/jpg, gif, png, base64

```
<figure>
   <br>
  <figcaption>Fig. 1- Landscape</figcaption>
</figure>
 <br>


    <rect width="50px" height="20px" style="fill: yellow" />
  </svg>
  <hr>
  <svg height="50" width="50">
    <circle cx="25" cy="25" r="25" fill="red" />
  </svg>
  <hr>
  <svg height="50" width="50">
    <polygon points="5,5 20,20 40,10 " style="fill: lime; stroke: purple; stroke-width: 3" />
  </svg>
  <hr>
  <svg height="50" width="50">
    <defs>
      <!--defs element is used to store graphical objects that will be used at a later time -->
      <linearGradient id="linearGradient" x1="0%" y1="0%" x2="100%" y2="100%">
        <stop offset="0%" style="stop-color: yellow" />
        <stop offset="100%" style="stop-color: red" />
      </linearGradient>
    </defs>
    <circle cx="25" cy="25" r="25" fill="url(#linearGradient)" />
  </svg>
  <hr>
  <svg height="50" width="50">
    <defs>
      <!-- The cx, cy and r attributes define the outermost circle and the fx and fy define the innermost circle -->
      <radialGradient id="radialGradient" cx="50%" cy="50%" r="50%" fx="50%" fy="50%">
        <stop offset="0%" style="stop-color: white; stop-opacity: 0" />
        <stop offset="100%" style="stop-color: red" />
      </radialGradient>
    </defs>
    <circle cx="25" cy="25" r="25" fill="url(#radialGradient)" />
  </svg>
  <hr>
  
  
</body>
```



BeaconFire

# USER INPUT

- **<form>**: a form for user input, usually to collect data and send in a request to the server
  - **<fieldset>**: group related elements together, displayed in a box
  - **<legend>**: a caption for fieldsets
- **<input>**: to collect user input
  - **<label>**: define labels for input, select, textarea, and other elements
    - used for accessibility, like screen readers & people who struggle to click tiny regions)
- **<select>**: a drop-down list
  - **<optgroup>**: group related options inside <select> elements
  - **<option>**: an option in a select list
- **<textarea>**: multi-line text input
- **<button>**: clickable button

```
<form>
  <fieldset>
    <legend>Text Inputs and Labels</legend>
    <!-- for should have a value equal to the input id -->
    <label for="fname">First name:</label>
    <input type="text" id="fname" name="fname"><br><br>
    <label for="lname">Last name:</label>
    <input type="text" id="lname" name="lname"><br><br>
    <label for="email">Email:</label>
    <input type="email" id="email" name="email"><br><br>
    <input type="submit" value="Submit">
  </fieldset>

  <fieldset>
    <legend>Dropdown List</legend>
    <!-- Dropdown with various options using select -->
    <label for="cars">Choose a car:</label>
    <!-- name attribute is needed to get the data -->
    <select name="cars" id="cars">
      <optgroup label="Swedish Cars">
        <option value="volvo">Volvo</option>
        <option value="saab">Saab</option>
      </optgroup>
      <optgroup label="German Cars">
        <option value="mercedes">Mercedes</option>
        <option value="audi">Audi</option>
      </optgroup>
    </select>
  </fieldset>

  <fieldset>
    <legend>Textarea with a button</legend>
    <textarea></textarea>
    <br>
    <button>Button</button>
  </fieldset>
</form>
```

Text Inputs and Labels

First name:

Last name:

Email:

**Submit**

Dropdown List

Choose a car:

German Cars

Mercedes Audi

Textarea with a button

**Submit**

# INPUT ATTRIBUTES

- **type:** text, radio, checkbox, date, time, number, password, file
  - checkboxes let users select | + options from a list
  - radio buttons let users select | option from a list (must assign the same “name” attribute)
- readonly, disabled, placeholder, required, name, value

```
<form>
<fieldset>
<legend>Simple Inputs</legend>
<label>Disabled Email</label>
<input type="text" placeholder="Disabled email" name='email' disabled="true"> <br>
<label>Readonly Email</label>
<input type="text" name='email2' readonly="true"> <br>
<label>Required Email</label>
<input type="text" name='email3' required="true"> <br>
<label>Username</label>
<input type="text" name='name'> <br>
<label>Password</label>
<input type="password" placeholder="your password" name='psw' value="hello"> <br>
<label>Date</label>
<input type="date" name='date'> <br>
<label>Time</label>
<input type="time" name='time'> <br>
<label>Number</label>
<input type="number" name='number'> <br>
<label>File</label>
<input type="file" name='file'> <br>
</fieldset>

<fieldset>
<legend>Radio Inputs</legend>
<input type="radio" id="male" name="gender" value="male">
<label for="male">Male</label> <br>
<input type="radio" id="female" name="gender" value="female">
<label for="female">Female</label>
</fieldset>

<fieldset>
<legend>Checkbox Inputs</legend>
<input type="checkbox" id="java" name="java" value="java">
<label for="java">Java</label> <br>
<input type="checkbox" id="javascript" name="JavaScript" value="JavaScript">
<label for="javascript">JavaScript</label>
</fieldset>

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

Simple Inputs

Disabled Email

Readonly Email

Required Email

Username

Password

Date

Time

Number

File  No file chosen

Radio Inputs

Male

Female

Checkbox Inputs

Java

JavaScript

ANY QUESTIONS?