Hyper Text Markup Language
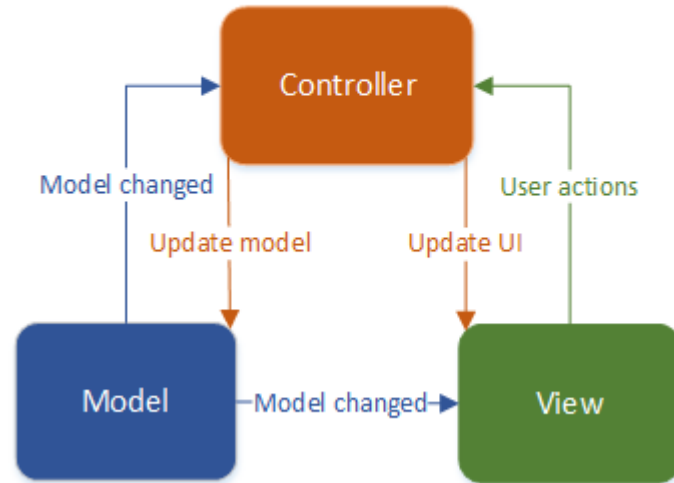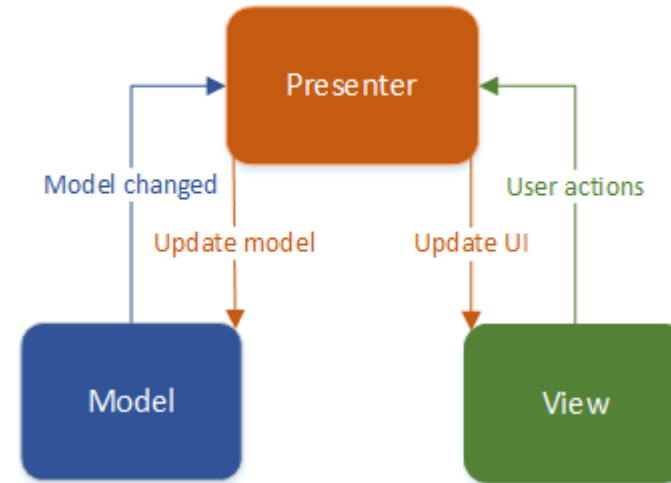
Model – View – Controller (MVC) and Model – View – Presenter (MVP) Architectures

The major differences are how the patterns are implemented and in some advanced scenarios. Let's look at some of the key differences:

<u>Coupling</u>: The view and the model are tightly coupled in MVC but loosely coupled in MVP
<u>Communication</u>: In MVP, communication between the View-Presenter and Presenter-Model happens via an interface. However, the controller and view layer falls in the same activity/fragment in MVC
<u>User Input</u>: In MVC, user inputs are handled by the Controller that instructs the model for further operations. But in MVP, user inputs are handled by the view that instructs the presenter to call appropriate functions.
<u>Type of Relation</u>: A many-to-one relationship exists between the controller and view. One Controller can select different views based upon required operations in MVC. On the other hand, the presenter and view have a one-to-one relationship in MVP, where one presenter class manages one view at a time.
<u>Main Component</u>: In MVC, the controller is in charge. It creates the appropriate view and interacts with the model according to the user's request. On the contrary, in MVP, the view is in charge. The view call methods on the presenter, which further directs the model
<u>Unit Testing</u>: Due to tight coupling, MVC has limited support for unit testing. On the other hand, unit Testing is well supported in MVP.

https://www.baeldung.com/mvc-vs-mvp-pattern

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HTML Basics
Tags, Elements, Attributes
Document Structure

What is HTML?

- **Hypertext** is text containing hyperlinks (links) to other texts. These links allow the user to jump to some other place in the same web page, or other web pages.

- **Markup Language** is a language that allows users to *mark-up* a text document with special symbols called *tags*. These tags tell the browser how to display the text.

- Each html document or web page is basically a normal text file having *.html* file extension.

- Two tools required for working with HTML documents are:

  - HTML Editor (*WYSIWYG* or *Text*) – for creating the document

  - Web Browser – for viewing the document

HTML Tags

- Tags act as building blocks for a web page. They define how the web browser must format and display the information on the web page.

- Tags are <mark>enclosed in angle brackets</mark>, and are placed before and after the text being marked up.

- Most tags have two parts, an <mark>opening tag</mark> (aka ON tag) and a <mark>closing tag (</mark>aka OFF tag).

  <h1>The Sun – Source of Life on Earth</h1>

  <p>The Sun is a big ball of gas. It lies at the center of our solar system.</p>

- When using nested tags, the tags must be closed in the order in which they were opened. For example:

  <p>Tags opened first must be closed last.</p>

HTML Elements

- HTML elements are of <mark>two types:</mark>

  - <mark>Container Element</mark>

    - Defined by a *ON tag*, *some content*, and an *OFF tag*:

      *<ON tag>*Content goes here*</OFF tag>*

    - Eg. – Paragraph element

      <p>The Sun is a big ball of gas. It lies at the center of our solar system.**</p>**

  - <mark>Void or Empty Element</mark>

    - Void elements contain only ON tags. They do not enclose any content, and have no OFF tags.

    - Eg.- <img> (image),
 (break), <hr> (horizontal rule), and <meta> tags.

HTML Attributes

- Enhance the functionality of an HTML element by providing additional information.

- They are always specified in the opening tag.

- Attributes consists of two parts − name and value.
  - The name is the property you want to set.
  - The value is the option chosen for the property.
  - Eg.-
    - <p align="left"> { Here, *align* is the attribute name and *left* is the value assigned to it }
    - <img src="moon.jpg" alt="A photo of the moon">
    - Jaypee Institute of Information Technology, Noida
    - <h1 style="color:blue; font-size:30px;">This is a heading</h1>

- A void element can have attributes

Rules for writing HTML Code

- Always *declare the document type* as the first line in your document. {<!DOCTYPE html>}

- Tag and attribute names are *case-insensitive*.

- Tag name is always *surrounded by angle brackets*.

- Tag names *don't contain spaces*.

- *Closing of container elements* must be ensured.

- Attribute values are usually enclosed in *double quotes*, although single quotes can also be used.

- For most tags *attributes are optional*. However, for some tags specifying attributes is mandatory such as for <img> and <a>.

- When using *nested tags*, you have to close the inner tag before closing the outer tag.

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HTML Document Structure

- HTML document (web page) has two sections: *Head* and *Body*

- Head
  - Provides general information about the web page, which does not get displayed on the web page, and hence is not visible to the user.
  - May contain the elements: <title>, <style>, <meta>, <link>, <script>, and <base>
- Body
  - Encloses the content to be displayed on the web page.
  - It includes text, graphics, tags and attributes.

- <HTML> tag is also called the *Root Element*.

```
<HTML>

<HEAD>

<TITLE> Example </TITLE>

</HEAD>

<BODY>

   This is where you would include
   the text and images on your Web
   page.

</BODY>

</HTML>
```
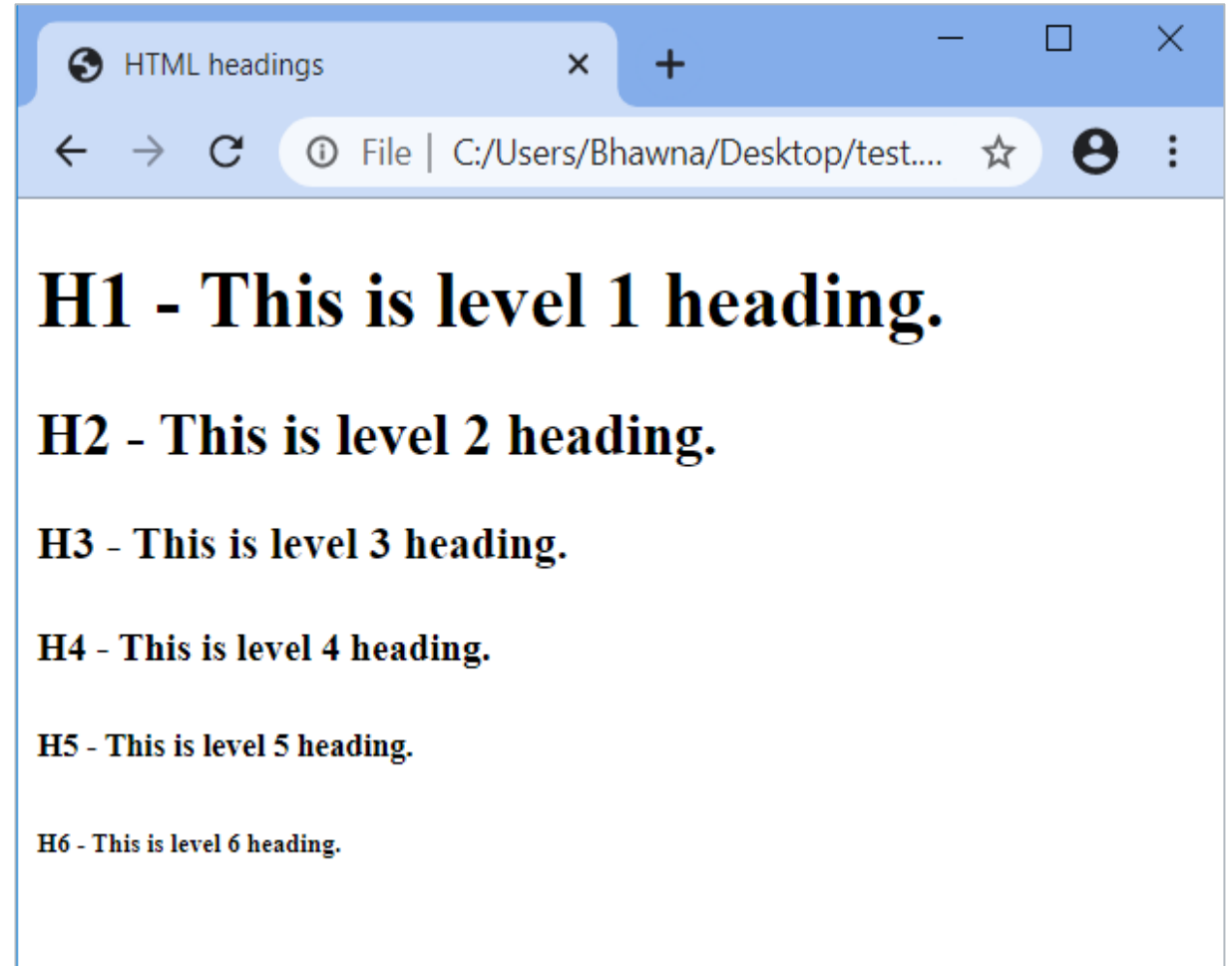
HTML Headings

- HTML heading corresponds to a title/ subtitle to be displayed on the web page.

- HTML offers six levels of headings: <h1> to <h6>.

- <h1> signifies the largest heading and <h6> the smallest.

- <h1> signifies the most important heading, whereas <h6> signifies the least important heading.

- Font size is keeps getting smaller as we move from <h1> to <h6>.

- By default, headings are displayed in larger and bolder font than normal text.

- By default, empty white space (margin) is inserted above and below a heading.

- Default style of HTML heading can be altered using the style attribute.

- It is not mandatory to use the heading levels in hierarchy.

6 HTML Heading Levels

```
<!DOCTYPE html>
<html>
        <head>
        <title>HTML headings</title>
        </head>

        <body>
        <h1>H1 - This is level 1 heading.</h1>
        <h2>H2 - This is level 2 heading.</h2>
        <h3>H3 - This is level 3 heading.</h3>
        <h4>H4 - This is level 4 heading.</h4>
        <h5>H5 - This is level 5 heading.</h5>
        <h6>H6 - This is level 6 heading.</h6>
        </body>
</html>
```
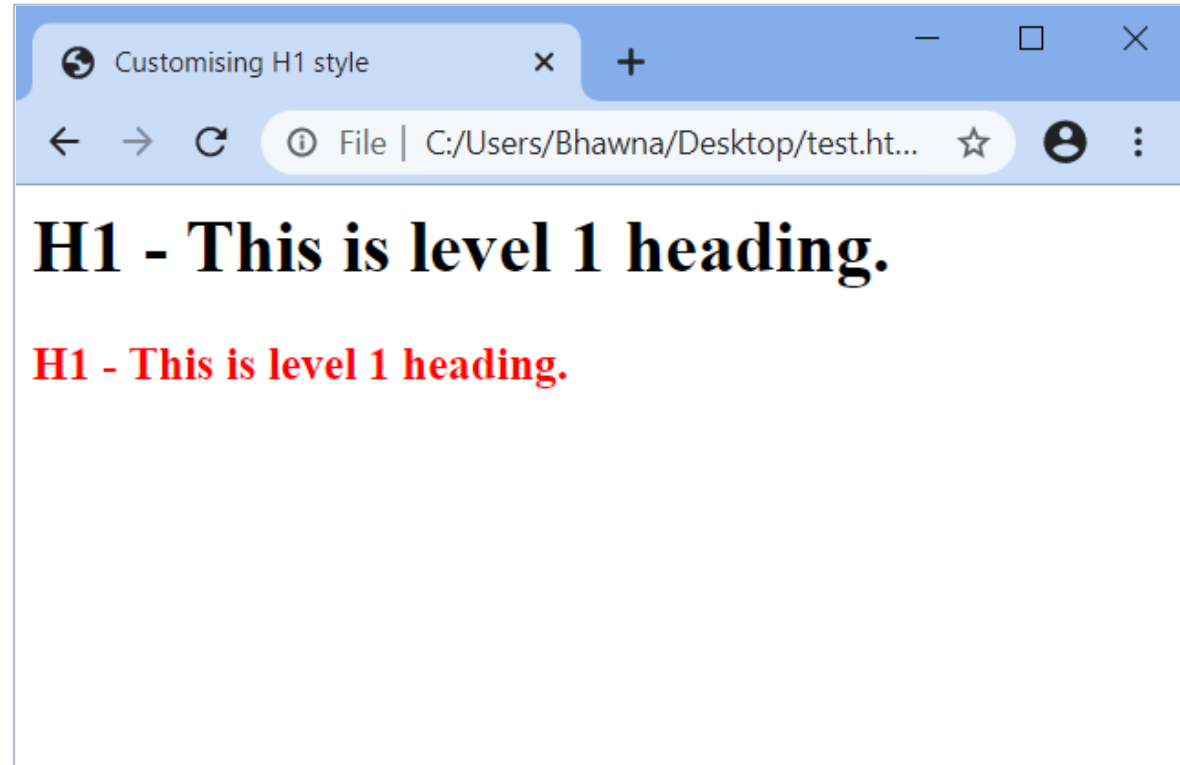
Default style of HTML heading can be altered using the [style] attribute.

```
<!DOCTYPE html>
<html>
          <head>
          <title>Customising H1 style</title>
          </head>

          <body>
          <h1>H1 - This is level 1 heading.</h1>

          <h1 style="font-size:20px; color:red;">
                    H1 - This is level 1 heading.
          </h1>
          </body>
</html>
```

HTML Paragraphs

- A paragraph is used to display a block of text on the web page.

- A paragraph always starts on a new line.

- <p>…</p> element is used to define a paragraph.

- By default, empty white space (called margin) is inserted before and after a paragraph.

-
 tag is used for inserting a line break.

- <hr> tag can be used to insert horizontal rules.

- Any extra spaces and lines within the <p> element are automatically removed by the browser. So, the HTML entity * * is used for creating non-breaking consecutive spaces.

HTML Inline/ Block Elements

Inline vs Block Level Element

- Every HTML element has a default display value.

- There are two display values: inline and block elements.

Inline	Block
Takes up only as much width as is required by the content	Takes up the full width available
Does not start on a new line	Always starts on a new line
span, a, img, button, b, i, em, strong and most of the formatting element	div, p, all headings, ol, ul, li, hr, table, form, video

 | <div> | <p>

Earth is fifth largest planet in our Solar System ****It is the only known planet where life is present. **** Around 71% of the earth's surface is covered by water. Hence, it is also called the "Blue Planet".

Earth is fifth largest planet in our Solar System. It is the only known planet where life is present. Around 71% of the earth's surface is covered by water. Hence, it is also called the "Blue Planet".

Earth is fifth largest planet in our Solar System **<div>**It is the only known planet where life is present. **</div>** Around 71% of the earth's surface is covered by water. Hence, it is also called the "Blue Planet".

Earth is fifth largest planet in our Solar System
It is the only known planet where life is present.
Around 71% of the earth's surface is covered by water. Hence, it is also called the "Blue Planet".

Earth is fifth largest planet in our Solar System **<p>**It is the only known planet where life is present. **</p>** Around 71% of the earth's surface is covered by water. Hence, it is also called the "Blue Planet".

Earth is fifth largest planet in our Solar System.

It is the only known planet where life is present.

Around 71% of the earth's surface is covered by water. Hence, it is also called the "Blue Planet".

HTML Formatting Tags

\<b\> - bold text

\<strong\> - important text

\<i\> - italic text

\<em\> - emphasized text

\<mark\> - highlighted text

\<code\> - computer code

\<small\> - smaller text

\<del\> - deleted text

\<ins\> - inserted text

\<sub\> - subscript text

\<sup\> - superscript text

\<u\> - underline text (now deprecated)

\<strike\> - strike text (now deprecated)

HTML Images

- Images are used to enhance the visual appeal of a web page.

- Images do not get inserted, rather they get linked to the web page.

- \<img> tag is used to place images in the web page.

- \<img> is an empty element which contains attributes only.

- \<img> tag requires following two attributes:

  - [src] – the path to the image

  - [alt] – an alternate text to be displayed in case the image does not load

- Syntax used to embed an image is

  ```
  <img src="image url" alt="alternate text">
  ```

HTML Links & Lists

HTML Links

- Links are specified using <a> tag, which is also known as the anchor tag.

- Syntax for creating a link :

```
<a href="url" [target] [title]>content</a>
```

- [href] attribute specifies the location (URL) of the destination web page.

- [target] attribute specifies where to open the linked web page

- [title] attribute specifies extra information which gets displayed as a tooltip text.

- The content is the part that will be visible to the reader.

- By default, links appear as follows in all browsers:

  - An <u>unvisited</u> link is underlined and blue

  - A <u>visited</u> link is underlined and purple

  - An <u>active</u> link is underlined and red

Anchor Links

- Anchors enable a user to jump to a specific place on a web site or to some specific part of the same web page.

- Two steps are necessary to create an anchor:
  - create the anchor
  - create a link to the anchor from another point in the document

- To create the anchor itself, type

  `<a name="anchor name">link text</a>`

  at the point in the web page where you want the user to jump to

- To create the link, type

  `<a href="#anchor name">link text</a>`

  at the point in the text where you want the link to appear

Sample Links

- **Text Link**

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- **Image Link**

   <img src="flower.jpg" alt="flower in the garden">
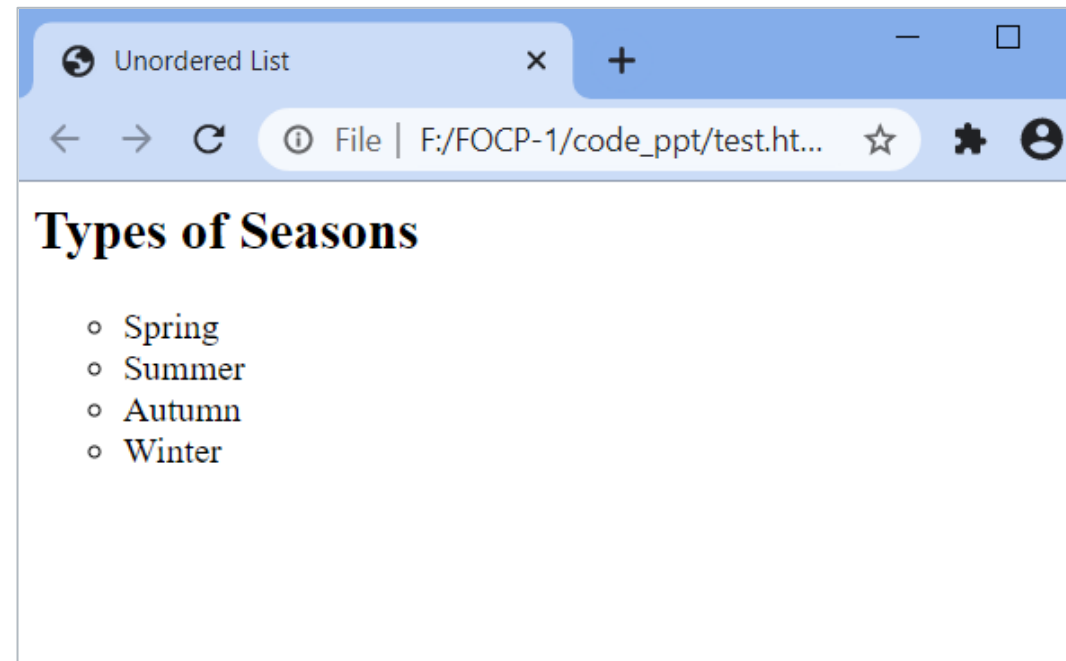
- **Mail Link**

  Send an email

- **Download Link**

  Click to download sample PDF file

HTML Lists

- In HTML three types of lists can be created:

  - Unordered Lists –list items are in no particular order

  - Ordered Lists –list items are in a specific order

  - Description Lists –list items are a combination of a term and its description

- A list item can contain text, images, links, tables, video etc.

- Nested list – when an entire list is specified as a list item, i.e. list within a list.

Unordered List

- Created using <ul> element.

- Each list item starts with <li> tag.

- By default, the list item marker is a bullet.

- The [style] attribute can be used to change the default settings.

```
<!DOCTYPE html>
<html>
        <head>
        <title>Unordered List</title>
        </head>

        <body>
        <h2>Types of Seasons</h2>
        <ul style="list-style-type:circle;">
                <li>Spring</li>
                <li>Summer</li>
                <li> Autumn</li>
                <li>Winter</li>
        </ul>
        </body>
</html>
```

Ordered List

- Created using <ol> element.

- Each list item starts with <li> tag.

- By default, the list item marker is a number.

- By default, numbering starts with '1'. Counting can be started from a specified number, using the [start] attribute

- The [type] attribute allows you to change the type of the list item marker (A, a, I, i)

```
<!DOCTYPE html>
<html>
        <head>
        <title>Unordered List</title>
        </head>

        <body>
        <h2>Types of Seasons</h2>
        <ol type="A">
                <li>Spring</li>
                <li>Summer</li>
                <li> Autumn</li>
                <li>Winter</li>
        </ol>
        </body>
</html>
```

Types of Seasons

A. Spring
B. Summer
C. Autumn
D. Winter
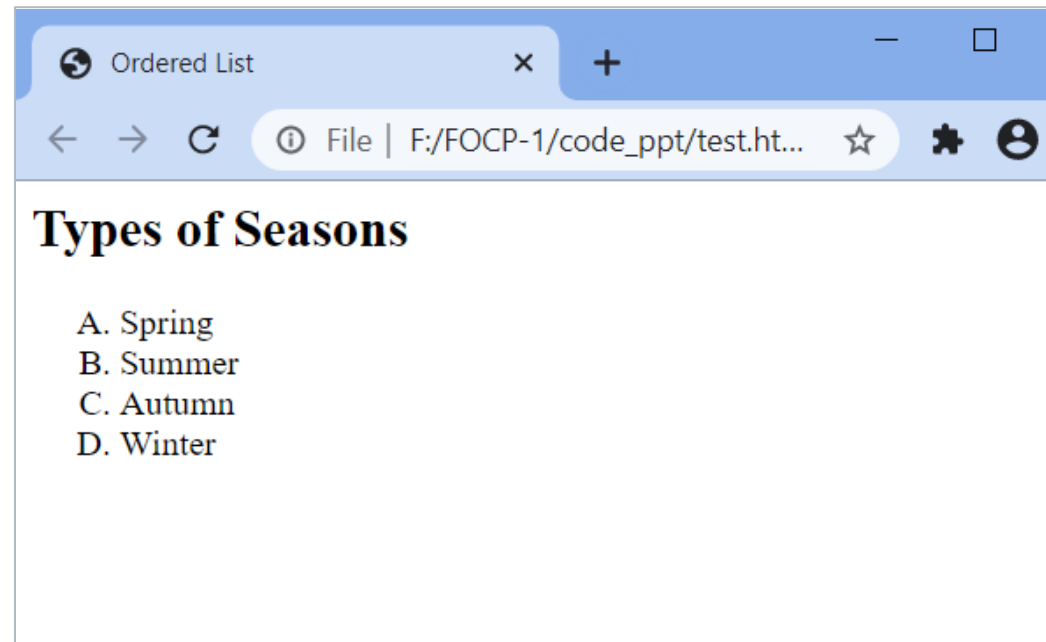
Description List

- Created using <dl> element.

- <dt> element defines the term name.

- <dd> element specifies the term's description.
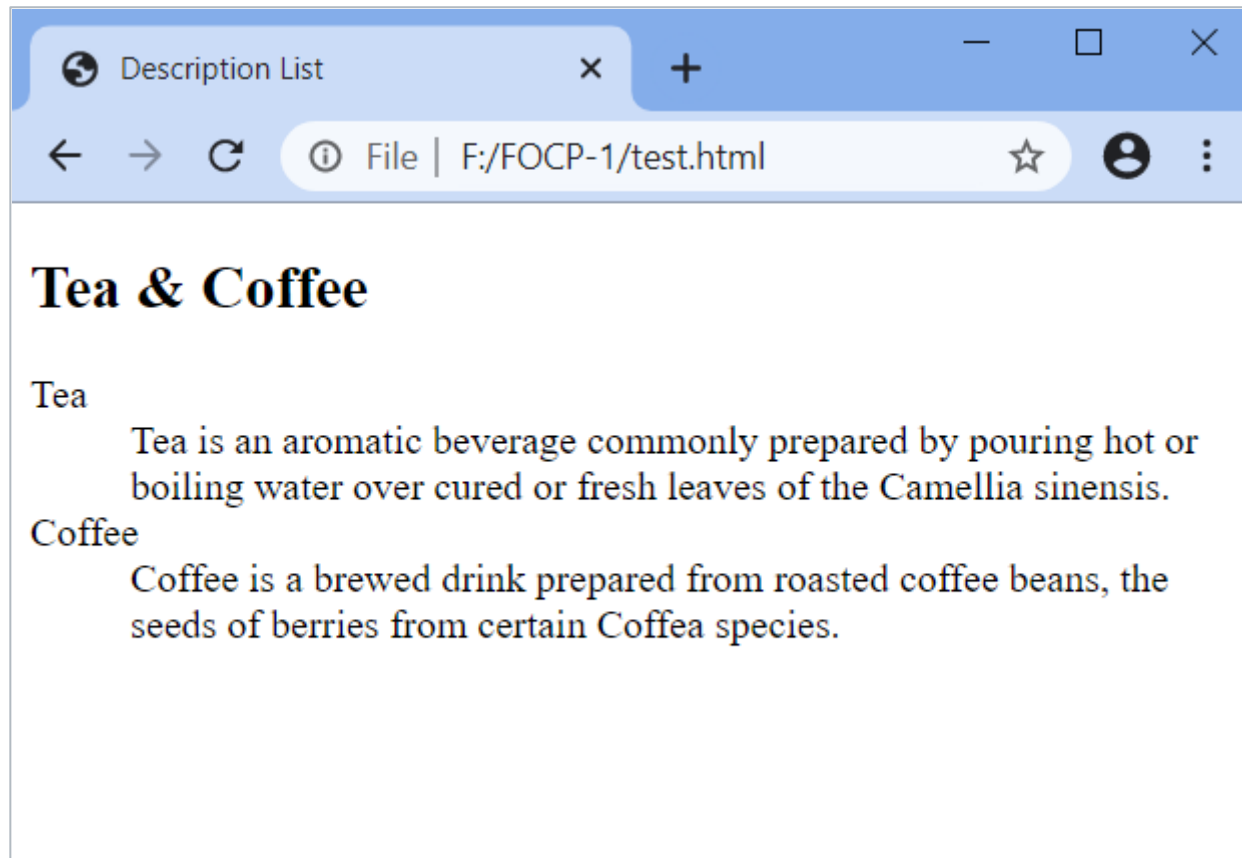

```
<!DOCTYPE html>
<html>
        <head>
        <title>Description List</title>
        </head>

        <body>
        <h2>Tea & Coffee</h2>
        <dl>
                <dt>Tea</dt>
                <dd>Tea is an aromatic beverage
commonly prepared by pouring hot or boiling water over
cured or fresh leaves of the Camellia sinensis.</dd>

                <dt> Coffee</dt>
                <dd>Coffee is a brewed drink
prepared from roasted coffee beans, the seeds of berries
from certain Coffea species.</dd>
        </dl>
        </body>
</html>
```
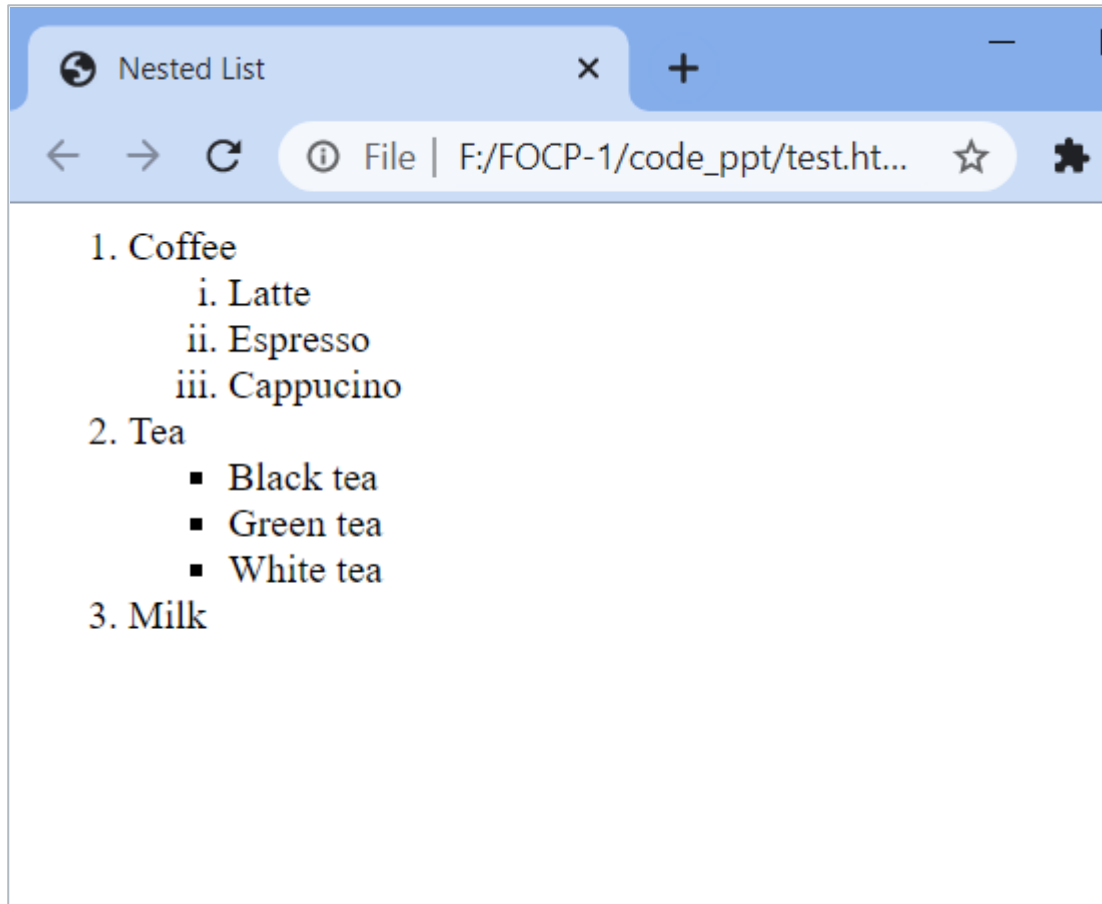
Nested List

When an entire list is specified as a list item,
i.e., list within a list.


```html
<!DOCTYPE html>
<html>
        <head>
        <title>Nested List</title>
        </head>

        <body>
        <ol>
        <li>Coffee
                <ol type="i">
                <li>Latte</li>
                <li>Espresso</li>
                <li>Cappucino</il>
                </ol>
        </li>
        <li>Tea
                <ul style="list-style-type:square;">
                <li>Black tea</li>
                <li>Green tea</li>
                <li>White tea</li>
                </ul>
        </li>
        <li>Milk</li>
        </ol>
        </body>
</html>
```

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HTML Tables & Forms

HTML Tables

- HTML tables are created using the <table> element.

- <tr> element specifies a row

- <th> element specifies a table header

- <td> element specifies a data cell within a row

- By default, content within <th> element is bold and center aligned

- By default, content within <td> element is regular and left aligned

- Border can be added using attribute [border]

- Space in and around data cell can be added by using attribute [cellpadding] and [cellspacing]

- Use attribute [colspan] for defining cell that spans more than one column.

- Use attribute [rowspan] for defining cell that spans more than one row

- Use <caption> element for specifying the caption for a table

HTML Tables

```
<!DOCTYPE html>
<html>
        <head>
        <title>Creating Table</title>
        </head>

        <body>
        <h2>HTML Table</h2>
        <table>
        <tr>
                <th>S. No. </th>
                <th>Name </th>
                <th>City </th>
        </tr>
        <tr>

                <td>1</td>
                <td>Shweta</td>
                <td>Amritsar</td>
        </tr>
        <tr>

                <td>2</td>
                <td>Rohit</td>
                <td>Mumbai</td>
        </tr>
        </table>
        </body>
</html>
```
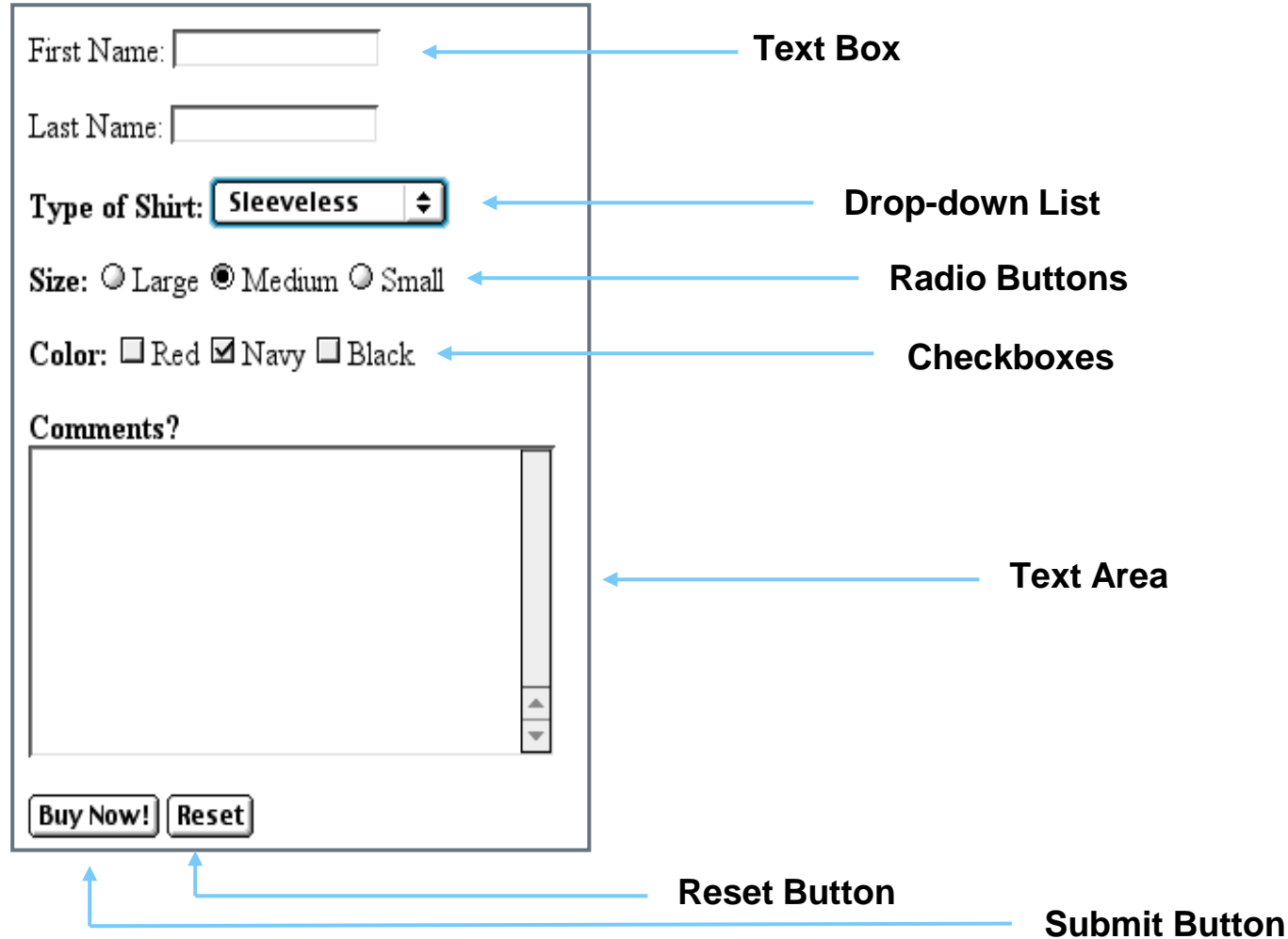
HTML Forms

- HTML forms are used to collect user input like, personal information, opinions in polls, user preferences, which is then sent to a server for processing.

- Two basic components of a form are:

  - The Shell – the part that the user fills out

  - The Script – which processes the information.

- Examples of form controls are – text fields, text areas, radio buttons, checkboxes, drop-down lists, buttons.

Sample Form

First Name: [   ] → **Text Box**

Last Name: [   ]

Type of Shirt: [Sleeveless ▲▼] → **Drop-down List**

Size: ○ Large ● Medium ○ Small → **Radio Buttons**

Color: ☐ Red ☑ Navy ☐ Black → **Checkboxes**

Comments?
[   ] → **Text Area**

[Buy Now!] [Reset]

→ **Reset Button**

→ **Submit Button**

HTML Form

- Form element is used to create data input forms.

- A document can have several forms, but the forms should not be nested.

```
<form action = "Script URL" method = "GET|POST" target = "_blank | _parent | _top">
        form elements like input, textarea, button etc.
</form>
```

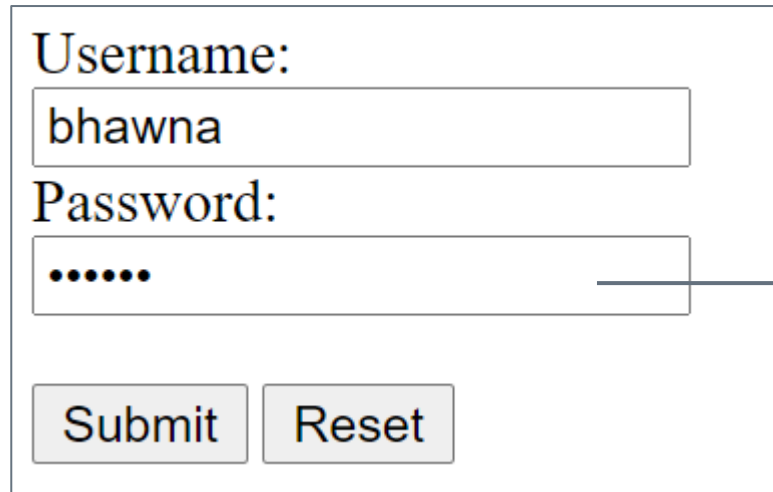| Attribute	Description
action	Defines the action to be performed when the form is submitted. Usually, on submission the form data is sent to a server for processing. If no URL is specified, the URL of the current document containing the form is used.
method	Method to be used when submitting the form data. The default method is GET GET - the form data will be visible in the page's address field. POST - does not display the form data in the page address field
target	Specifies if the submitted result will open in a new window, a frame, or in the current window. It takes values like _blank, _self, _parent, _top

Form Controls

- Text input controls

- Buttons

- Checkboxes

- Radio buttons

- Select boxes (aka drop-down menus or drop-down lists)

- File select boxes

- Hidden controls

<input> element

"type"	Usage
text	Defines a single-line text input field
password	Defines a password field
submit	Defines a button for submitting form data
reset	Defines a reset button that will reset all form values to their default values
radio	Defines a radio button
checkbox	Defines a checkbox
button	Defines a button
date	Defines an input field that contains date
file	Defines a file-select field and a "Browse" button for file uploads
number	Defines a numeric input field
hidden	Defines a hidden input field. A hidden field let web developers include data that cannot be seen or modified by users when a form is submitted

Text Courtesy: https://www.w3schools.com/html/html_form_input_types.asp

<input type = 'text | password | submit | reset'>

```html
<form>
  <label for="username">Username:</label><br>
  <input type="text" id="username" name="username"><br>
  <label for="pwd">Password:</label><br>
  <input type="password" id="pwd" name="pwd"><br>
  <input type="submit" value="Submit">
  <input type="reset">
</form>
```

Username:

bhawna

Password:

•••••

Submit   Reset

The characters in a password field are masked (shown as asterisks or circles).

<input type='date'>

```
<form>
  Date of Joining: <input type="date" id="doj" name="doj">
</form>
```

Date of Joining: dd-mm-yyyy 📅

August, 2020 ▾   ↑   ↓

Mo	Tu	We	Th	Fr	Sa	Su
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

Today

Date of Joining: 04-08-2020 📅

<input type='file'>

```
<form>
  Upload your assignment:
  <input type="file" name="myassignment" multiple>
</form>
```
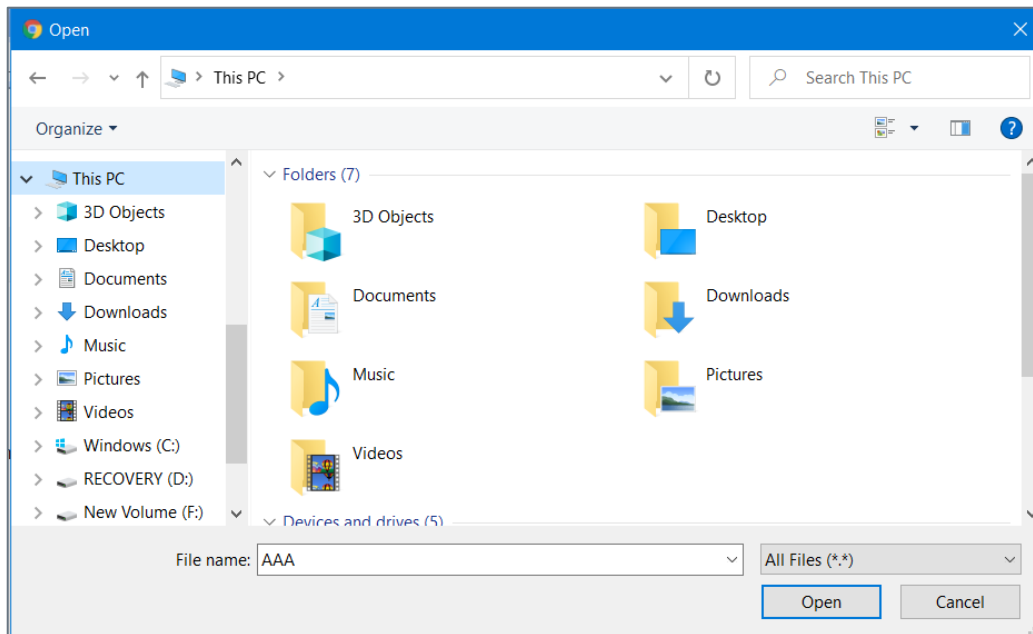

The [multiple] attribute allows the user to select more than one files in one go.

<select> element

Use SELECT and OPTION to create dropdown list.

```
<form>
  <label for="fruits">Choose a fruit:</label
  <select id="fruits" name="fruits" size="4" multiple>
    <option value="apple">Apple</option>
    <option value="orange">Orange</option>
    <option value="banana" selected>Banana</option>
    <option value="pear">Pear</option>
  </select>
  <input type="submit" value="Submit">
</form>
```

4 options visible, with 1 selected

Multiple selections possible

<textarea> element

- Defines a multi-line input field (a text area).

- [rows] attribute specifies the number of lines visible on display.

- [cols] attribute specifies the visible width.

```
<form>
  <textarea name="message" rows="10" cols="30">
    The cat was playing in the garden.
  </textarea>
  <input type="submit" value="Submit">
</form>
```
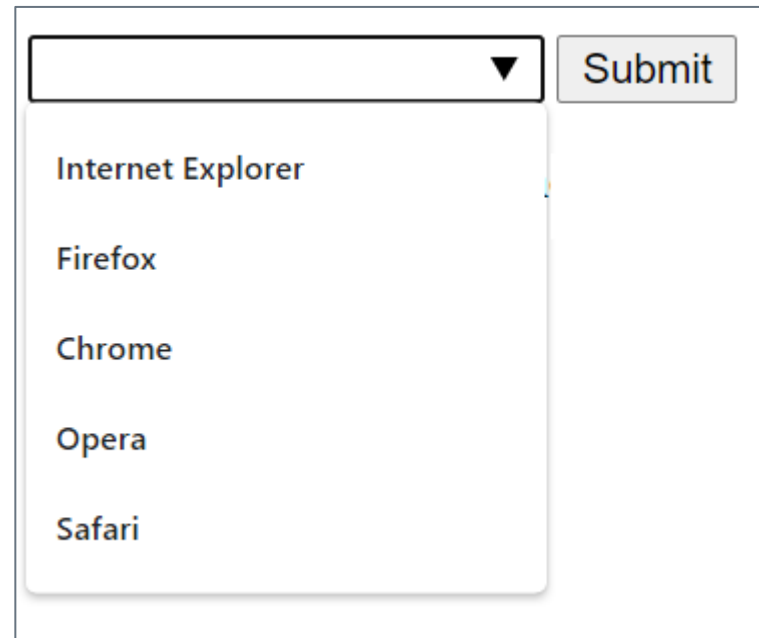
The cat was playing in the garden.

Submit

<datalist> element

- The <datalist> element specifies a list of pre-defined options for an <input> element.

- On clicking the input field, a drop-down list of the pre-defined options gets displayed.

- [list] attribute of <input> element, must refer to [id] attribute of the corresponding <datalist> element.

```html
<form>
  <input list="browsers">
  <datalist id="browsers">
    <option value="Internet Explorer">
    <option value="Firefox">
    <option value="Chrome">
    <option value="Opera">
    <option value="Safari">
  </datalist>
  <input type="submit" value="Submit">
</form>
```

<form action = "mailto:email-address">

```
<form action="mailto:someone@example.com">
  Name: <input type="text" name="name"><br>
  Email: <input type="text" name="email"><br>
  Tel: <input type="number" name="tel" maxlength="10"><br>
  <textarea name="message" rows="10" cols="20"></textarea><br>
  <input type="submit" value="Submit">
  <input type="reset"value="Clear">
</form>
```

You can specify a mailto:email-address in the <form> element's [action] attribute.

WHAT THIS WILL DO - allow the user's email client to create an email prepopulated with the data

filled in fields in the <form>.

WHAT THIS WILL NOT DO - send an email.

Useful Reference Links

- https://www.w3schools.com/html/default.asp

- https://www.tutorialrepublic.com/html-tutorial/

- https://www.html-5-tutorial.com/

- https://www.tutorialspoint.com/html/index.htm

- https://learn.shayhowe.com/html-css/