Web Programming

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HTML Syntax

HTML is the standard markup language for creating Web pages

The term "markup language" refers to the way text is annotated with **tags** to define elements, such as headings, paragraphs, links, images, and more

These tags provide instructions to web browsers on what content to include and how to structure it

Basic HTML Structure

```
<!DOCTYPE html>
```
All HTML documents must start with a **<!DOCTYPE>** declaration (the declaration is not an HTML tag).

```
<html>
```
The **<html>** tag represents the root (top-level element) of an HTML document. This tag is the container for all other HTML elements.

```
<head>
    …
    …
    …
</head>
```
The **<head>** element is a container for metadata (which is data about the HTML document and it is not displayed as the content) and it is placed between the <html> tag and the <body> tag.

```
<body>
    …
    …
    …
</body>

</html>
```
The **<body>** element contains all the contents of an HTML document, such as paragraphs, headings, images, hyperlinks, tables, lists, etc.

HTML Example

```
<!DOCTYPE html>
<html>

<head>
  <title>Welcome</title>
</head>

<body>
  <h1>My First HTML Webpage</h1>
  <br>
  <p>This tag defines a paragraph.</p>
</body>
</html>
```

<title> defines the title of the document. The title must be text-only, and it is shown in the browser's title bar or in the page's tab
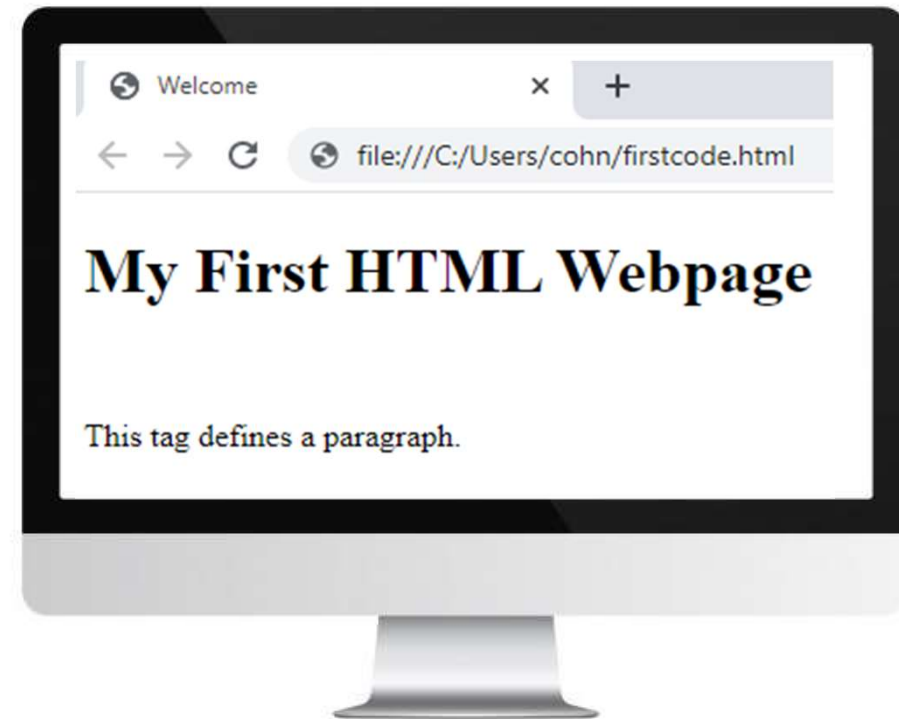
<h1>–<h6> elements represent six levels of section headings. <h1> is the highest section level and <h6> is the lowest

**
** element produces a line break in (continuous) text

<p> element represents a paragraph

HTML Example

```html
<!DOCTYPE html>
<html>

<head>

  <title>Welcome</title>
</head>

<body>

  <h1> My First HTML Webpage </h1>
  <br>
  <p>This tag defines a paragraph.</p>

</body>

</html>
```

Anatomy of an HTML Tag

<h1> My First HTML Webpage </h1>   - - - - - - ->   HTML Element

Starting tag   Content   Closing tag
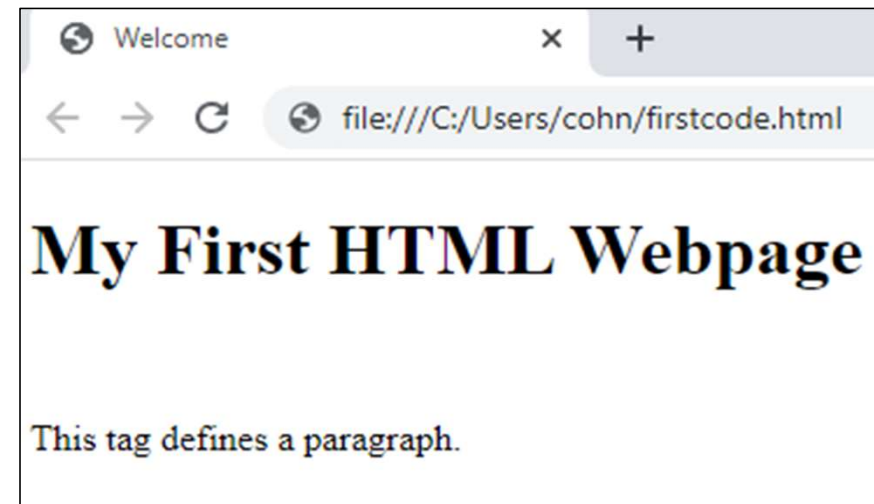

Self-closing tag

<hr>   The <hr> (horizontal rule) element is most often displayed as a
           horizontal line that is used to separate content in an HTML page.

Self-closing tag

HTML Comment Tag

- To insert comments in the source code we use **<!--   -->** tag
- Comments are not displayed in the browsers
- Comments are used to explain the code, and may help when you or anyone else edit the source code at a later date

- Example:

```
<!DOCTYPE html>
<html>
<head>
<title>Welcome</title>
</head>
<body>
<!-- The HTML <h1>–<h6> elements represent six levels
of section headings -->
<h1> My First HTML Webpage </h1>
<br>
<p> This tag defines a paragraph.</p>
</body>
</html>
```

HTML Attributes

HTML attributes provide additional information about HTML elements.

- Attributes are always specified in the start tag
- Attributes usually come in name/value pairs like: name="value"

Example:

- HTML links are defined with the <a> tag and the link address is specified in the href attribute:

Visit Loughborough University website

HTML Attribute (usually come in as name = "value")

Visit Loughborough University website

Space character

HTML Attributes: id and class

- The **id** attribute is used to specify a <u>unique</u> id (within the document) for an HTML element
- It is used by CSS and JavaScript to access the element with the specific id (will be discussed later)
- Example

    `<a **id**="firstLink" href ="https://www.lboro.ac.uk">Visit  Lboro</a>`

- The **class** specifies one or more class names for an element
- It is used by CSS and JavaScript to access HTML elements with the specified class (will be discussed later)
- Example

    `<a **class**="mainPart" id="firstLink" href ="https://www.lboro.ac.uk">Visit  Lboro</a>`

    `<p **class**="mainPart"> This is a paragraph.</p>`

    `<p **class**="mainPart highlight"> This is a paragraph.</p>`

    Assigning multiple classes

An Empty HTML Template

➢ HTML 4

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD  HTML 4.01 Transitional//EN"
   "https://www.w3.org/TR/html4/loose.dtd">
<html lang="en">
<head>
  <title></title>
   <meta http-equiv="Content-Type"
       content="text/html;charset=utf-8" />
</head>

<body>

</body>
</html>
```

➢ HTML 5 ✔

```
<!DOCTYPE html>
<html lang ="en">
<head>
  <title></title>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
</head>

<body>

</body>
</html>
```

Use Online Documents

- https://www.w3schools.com/
- https://developer.mozilla.org/

Example: How to insert an image into an HTML document?

- What is the HTML element to define image?
- What are the attributes can be used in this element?

Q w3schools html images ✕ 🎤 📷 🔍

Q mdn html image ✕ 🎤 📷 🔍

https://www.w3schools.com/tags/tag_img.asp
https://developer.mozilla.org/en-US/docs/Web/HTML/Element/img

- HTML image element example:

HTML Attributes. If a browser cannot find an image,
it will display the value of the alt attribute

Self-closing tag

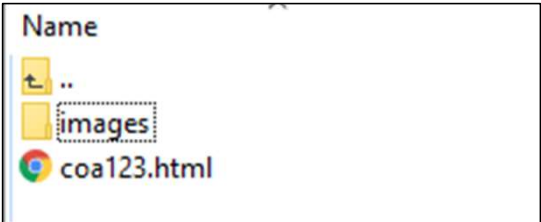height and width can be
defined in CSS as well which is
more recommended.

`<img src="Lboro-Logo.png" alt="lboro's logo" width="300" height="70">`

HTML Attributes. source of image can either be a URL so it can fetch it from the internet, or it can
be a local image that's included in the same directory as your website

Example

```
<!DOCTYPE html>
<html lang ="en">
<head>
  <meta charset="utf-8">
  <title>COA123</title>
</head>

<body>
  <img src="images/Lboro-Logo.png" alt="lboro's logo" width="300" height="70">
  <h1> COA123 - Web Programming </h1>
  <hr>
  <p> The aim of this <a href="https://learn.lboro.ac.uk/course/view.php?id=15267">module</a> is to
      introduce students to concepts and techniques of modern web programming languages and
      associated technologies in web application development.</p>
  <h3> Content</h3>
  <ul>
        <li>HTML web design basics</li>
        <li><em>Client-side</em> programming</li>
        <li><strong>Server-side</strong> programming</li>
  </ul>
</body>
</html>
```

Name
..
images
coa123.html

Loughborough University

COA123 - Web Programming

The aim of this module is to introduce students to concepts and techniques of modern web programming languages and associated technologies in web application development.

Content

- HTML web design basics
- *Client-side* programming
- **Server-side** programming

Using <ul> tag together with the <li> tag to create unordered lists
For ordered lists, use the <ol> tag instead of

HTML Tables

- HTML tables are used to structure and represent data into rows and columns
- The <table> tag defines an HTML table
- Each table row is defined with a <tr> tag
- Each table header is defined with a <th> tag
- Each table cell is defined with a <td> tag

Football Tournament Table

Team	PTS
Barcelona	6
Real Madrid	3
Sevilla	0

This border doesn't appear on the browser. By default, the border size is 0

```
<h2>Football Tournament Table</h2>
    <table>
      <tr>
        <th>Team</th>
        <th>PTS</th>
      </tr>
      <tr>
        <td>Barcelona</td>
        <td>6</td>
      </tr>
      <tr>
        <td>Real Madrid</td>
        <td>3</td>
      </tr>
      <tr>
        <td>Sevilla</td>
        <td>0</td>
      </tr>
    </table>
```

```
<table>
  <thead>
    <tr>
      <th>Item</th>
      <th>Price</th>
    </tr>
  </thead >
  <tbody>
    <tr>
      <td>Pizza</td>
      <td>10</td>
    </tr>
    <tr>
      <td>Burger</td>
      <td>8</td>
    </tr>
  </tbody >
  <tfoot>
    <tr>
      <td colspan ="2">Total:18</td>
    </tr>
  </tfoot>
</table>
```

- The colspan attribute defines the number of columns a cell should extend

Item	Price
Pizza	10
Burger	8
Total:18	

HTML Tables for Layout

> **Not recommended !**

```html
<html>
    <head><title>HTML Layout using Tables</title></head>
    <body>
        <table width = "100%">
            <tr>
                <td colspan = "2">
                    <h3>Page Header</h3>
                </td>
            </tr>
            <tr>
                <td width = "10%">
                    <h3>Menu bar</h3>
                    HTML<br/>
                    JavaScript
                </td>
                <td width = "90%">
                    Todays it is not recommended to use table to create a layout for the whole page!
                </td>
            </tr>
            <tr>
                <td colspan = "2">
                    <h3>Page Footer</h3>
                </td>
            </tr>
        </table>
    </body>
</html>
```

Page Header	
Menu bar HTML JavaScript	Todays it is not recommended to use table to create a layout for the whole page!
Page Footer	

HTML Content Division Element <div>

- The <div> tag is a **container** that is used to define a division or a section

- It is used to group HTML elements which is then styled with CSS or manipulated with JavaScript

- It has no effect on the content or layout until styled using CSS

```
<h2>COA123</h2>
<p>Computer Science - Web Programming Module</p>
<p>This is some text outside the div element.</p>
```

```
<div>
<h2>COA123</h2>
 <p>Computer Science - Web Programming Module</p>
</div>
<p>This is some text outside the div element.</p>
```

COA123

Computer Science - Web Programming Module

This is some text outside the div element.

HTML Forms

- HTML forms can be used to collect user input
- The user input is most often sent to a server for processing
- The HTML <**form**> element represents a document section containing interactive controls (text fields, checkboxes, radio buttons, submit buttons, etc) for submitting information:

```
<form>
.
form elements
.
</form>
```

- One of the most used element in HTML forms is the <**input**> element

<**input type**="text">	Displays a single-line text input field	
<**input type**="radio">	Displays a radio button (for selecting one of many choices)	○ ●
<**input type**="checkbox">	Displays a checkbox (for selecting zero or more of many choices)	☑ ☐ ☑
<**input type**="submit">	Displays a submit button (for submitting the form)	Submit
<**input type**="email">	Displays a field for an e-mail address	
<**input type**="date">	Displays a date picker	dd/mm/yyyy
List of all available input types	https://www.w3schools.com/html/html_form_input_types.asp	

HTML Forms - Continued

- Some more HTML form elements:

\<label\>	Defines a label for many form elements	**Name** ☐
\<textarea\>	Defines a multi-line text input control	
\<select\>	Defines a drop-down list	
\<button\>	Defines a clickable button	Click Me!
List of all HTML form elements	https://www.w3schools.com/html/html_form_elements.asp	

HTML name Attribute

- Specifies the name of the element. Can be used as a reference when the data is submitted or to reference elements in a JavaScript.

```
<h1>HTML name Attribute</h1>

<form action="/action_page.php">
  <label>First name:</label><br>
  <input type="text" name="firstname"><br>
  <label >Last name:</label><br>
  <input type="text" name="lastname"><br><br>
  <input type="submit">
</form>
```


HTML name Attribute

First name:
John

Last name:
Smith

Submit

Submitted Form Data

Your input was received as:

firstname=John&lastname=Smith

HTML value Attribute

- Defines a default value which will be displayed in the element on page load.

```
<h1>HTML value Attribute</h1>

<form action="/action_page.php">
    <label>Quantity</label>
    <input type="number" name="quantity" value="1">
    <input type="submit">
</form>
```

HTML value Attribute

Quantity [1_____] [Submit]

Example. An enrolment form

```html
<form   action="mailto:username@lboro.ac.uk" method="post " enctype="text/plain">
    <label> First Name </label>
    <input type="text" name="firstname" value="">
    <p> Please select your gender: </p>
    <label> Male </label>
    <input type="radio" name="gender" value="male">
    <label> Female </label>
    <input type="radio" name="gender" value="female">
    <label> Other </label>
    <input type="radio" name="gender" value="other">
    <br><br>
    <label> Email </label>
    <input type="email" name="email" value="">
    <p> Please choose the course that you want to enrol:
    <select name="course">
      <option value="Web Programming">Web Programming</option>
      <option value="Game Development">Game Development</option>
      <option value="Machine Learning">Machine Learning</option>
    </select>
    </p>
    <input type="submit" value="Submit">
</form>
```

First Name | John |

Please select your gender:

Male ● Female ○ Other ○

Email | j.smith@test.test |

Please choose the course that you want to enrol: | Web Programming ▾ |

Submit

Untitled - Message (HTML)

File   Message   Insert   Options   Format Text   Review   Help   Acrobat

Calibri   11   B   I   U   ...
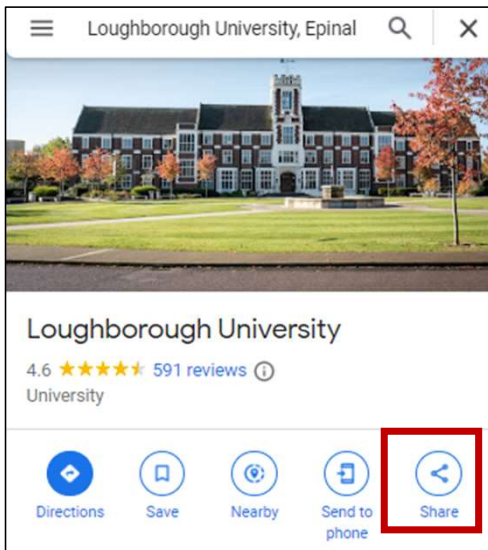
Send

To   ○ username@lboro.ac.uk

Cc

Subject

firstname=John
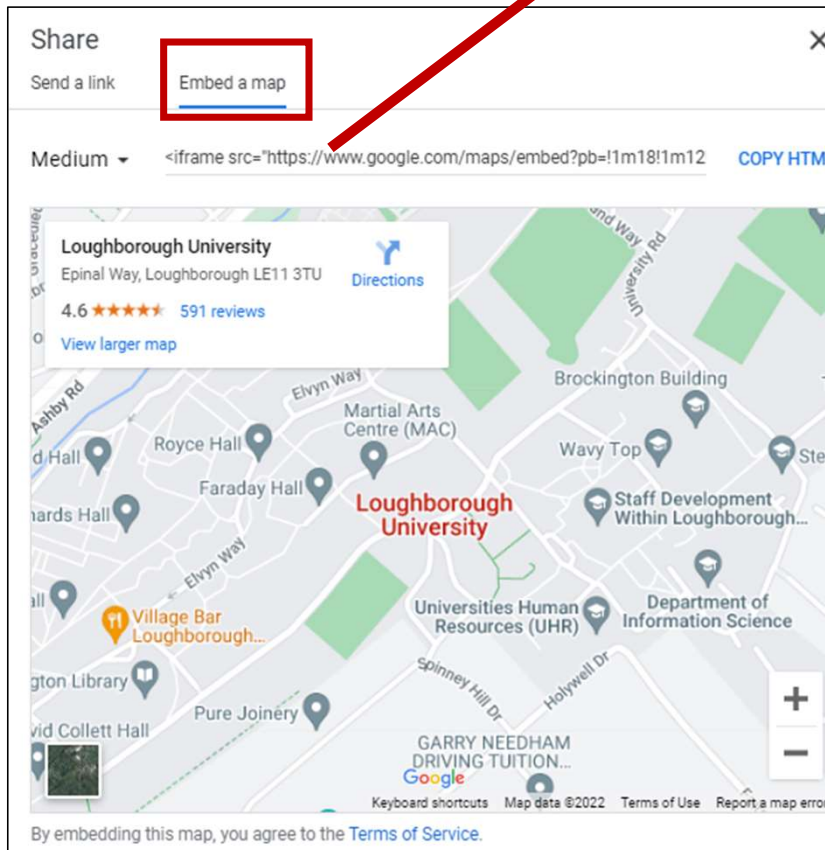gender=male
email=j.smith@test.test
course=Web Programming

HTML Inline Frame

- The `<iframe>` tag specifies an inline frame
- For embedding another document within the current HTML document
- Example:

Google Map

```html
<h1>You can find us here:</h1>
<iframe
src="https://www.google.com/maps/embed?pb
=!1m18!1m12!1m3!1d2870.9590170171978!2d-
1.2348031062256446!3d52.7650426512113!2m3
!1f0!2f0!3f0!3m2!1i1024!2i768!4f13.1!3m3!
1m2!1s0x4879e0dc88a46507%3A0xc2a50dfab7f3
83aa!2sLoughborough%20University!5e0!3m2!
1sen!2suk!4v1671021750668!5m2!1sen!2suk"
width="300" height="225"
style="border:0;" allowfullscreen=""
loading="lazy" referrerpolicy="no-
referrer-when-downgrade"></iframe>
```
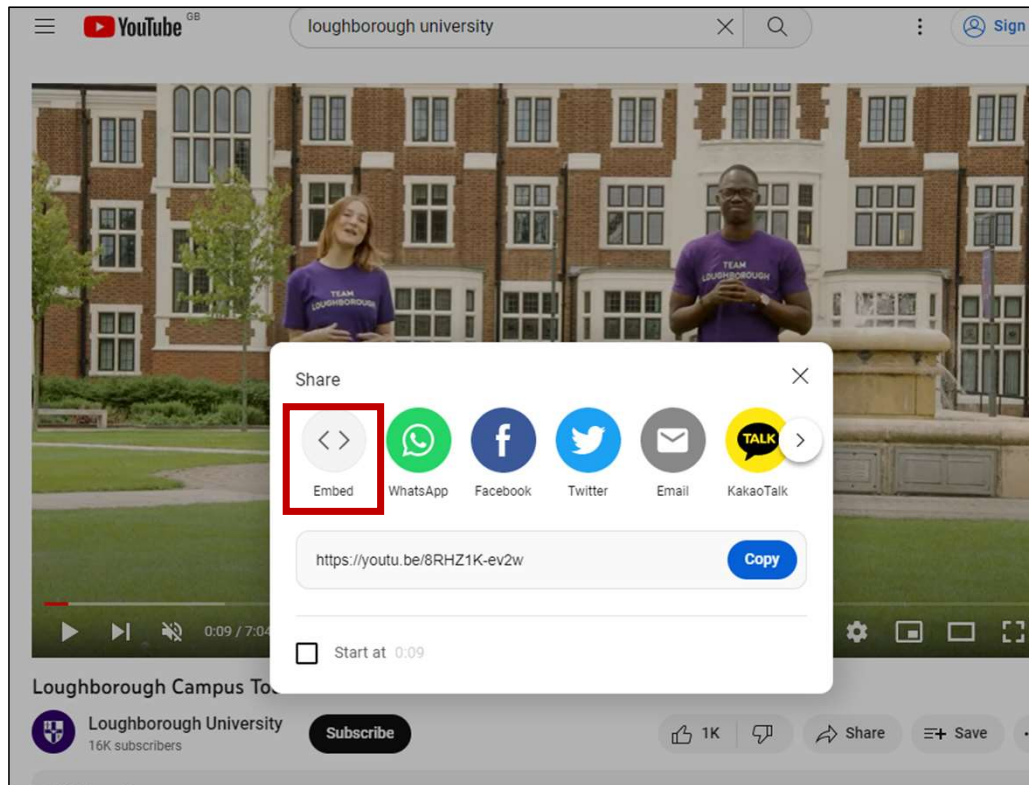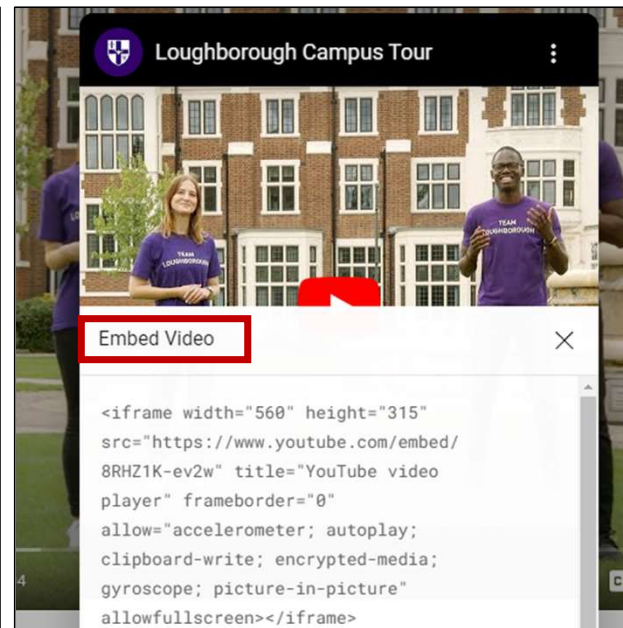

Your Webpage

YouTube Website

Loughborough Campus Tour

Embed Video

```
<iframe width="560" height="315"
src="https://www.youtube.com/embed/
8RHZ1K-ev2w" title="YouTube video
player" frameborder="0"
allow="accelerometer; autoplay;
clipboard-write; encrypted-media;
gyroscope; picture-in-picture"
allowfullscreen></iframe>
```

Your Webpage

Loughborough Campus Tour:


```
<h1>Loughborough Campus Tour:</h1>
<iframe width="560" height="315"
src="https://www.youtube.com/embed/8RHZ1K-ev2w" title="YouTube
video player" frameborder="0" allow="accelerometer; autoplay;
clipboard-write; encrypted-media; gyroscope; picture-in-
picture" allowfullscreen></iframe>
```

Your Webpage