



UNIVERSITÀ DI PAVIA

Collegio Alessandro Volta  
Via Adolfo Ferrata, 17, Pavia (PV)



# WEB DESIGN

Lecture 2 – Structuring the Web with HTML

**Giovanni Nicola D'Aloisio**

Department of Physics – University of Pavia  
Classe di Scienze, Tecnologie e Società – IUSS Pavia

E-Mail: [giovanninicola.daloisio01@universitadipavia.it](mailto:giovanninicola.daloisio01@universitadipavia.it)

# What HTML is

HTML (HyperText Markup Language) is the code that is used to structure a web page and its content. For example, content could be structured within a set of paragraphs, a list of bulleted points, or using images and data tables.

It **ISNT** a programming language. HTML is a markup language (like LaTeX, see you at Thursday class) that defines the structure of your content. HTML consists of a series of elements, which you use to enclose, or wrap, different parts of the content to make it appear a certain way, or act a certain way. The enclosing tags can make a word or image hyperlink to somewhere else, can italicize words, can make the font bigger or smaller, and so on.



# First examples



# Opening tag

## Closing tag

`<p>`My cat is very grumpy`</p>`

# Content

## Element

Attribute

```
<p class="editor-note">My cat is very grumpy</p>
```



# Usage of tags

Each element of a HTML page consists of:

- The opening tag – It depends on the kind of element, wrapped in opening and closing angle brackets, and this states where the element begins or the tag starts to take effect;
- The closing tag – This is the same as the opening tag, except that it includes a forward slash before the element name. This states where the element ends;
- The content – Obviously!


Sometimes the closing tag is not required... But failing to add a closing tag is one of the standard beginner errors and can lead to strange results!

# Tag attributes

Attributes contain extra information about the element that you don't want to appear in the actual content.

The class attribute allows you to give the element a non-unique identifier that can be used to target it (and any other elements with the same class value) with style information and other things.

An attribute should always have the following structure (keeping the quotation marks):



```
<p class="editor-note">My cat is very grumpy</p>
```

# Nesting elements

You can put elements inside other elements too; this is called nesting. If we wanted to state that our cat is very grumpy, we could wrap the word "very" in a `<strong>` element, which means that the word is to be strongly emphasized:

```
<p>My cat is <strong>very</strong> grumpy.</p>
```

My cat is **very** grumpy.

You do however need to make sure that your elements are properly nested. In the example above, we opened the `<p>` element first, then the `<strong>` element; therefore, we have to close the `<strong>` element first, then the `<p>` element. The following is incorrect:

```
<p>My cat is <strong>very grumpy.</p></strong>
```

My cat is **very** grumpy.



# Void elements


- A void element is an element that cannot have any child nodes (i.e., nested elements or text nodes).
- In HTML, a void element must not have an end tag. For example, `<input type="text"></input>` is invalid.
- In HTML, they are `<area>`, `<base>`, `<br>`, `<col>`, `<embed>`, `<hr>`, `<img>`, `<input>`, `<link>`, `<meta>`, `<param>`, `<source>`, `<track>`, `<wbr>`.
- Self-closing tags (`<tag />`) do not exist in HTML.

**HTML and Image File**

mysite.com

index.html


image1.jpg



```
<html>
<head>
<title>Picture Page</title>
</head>
<body>
Here's a picture:<br>

</body>
</html>
```

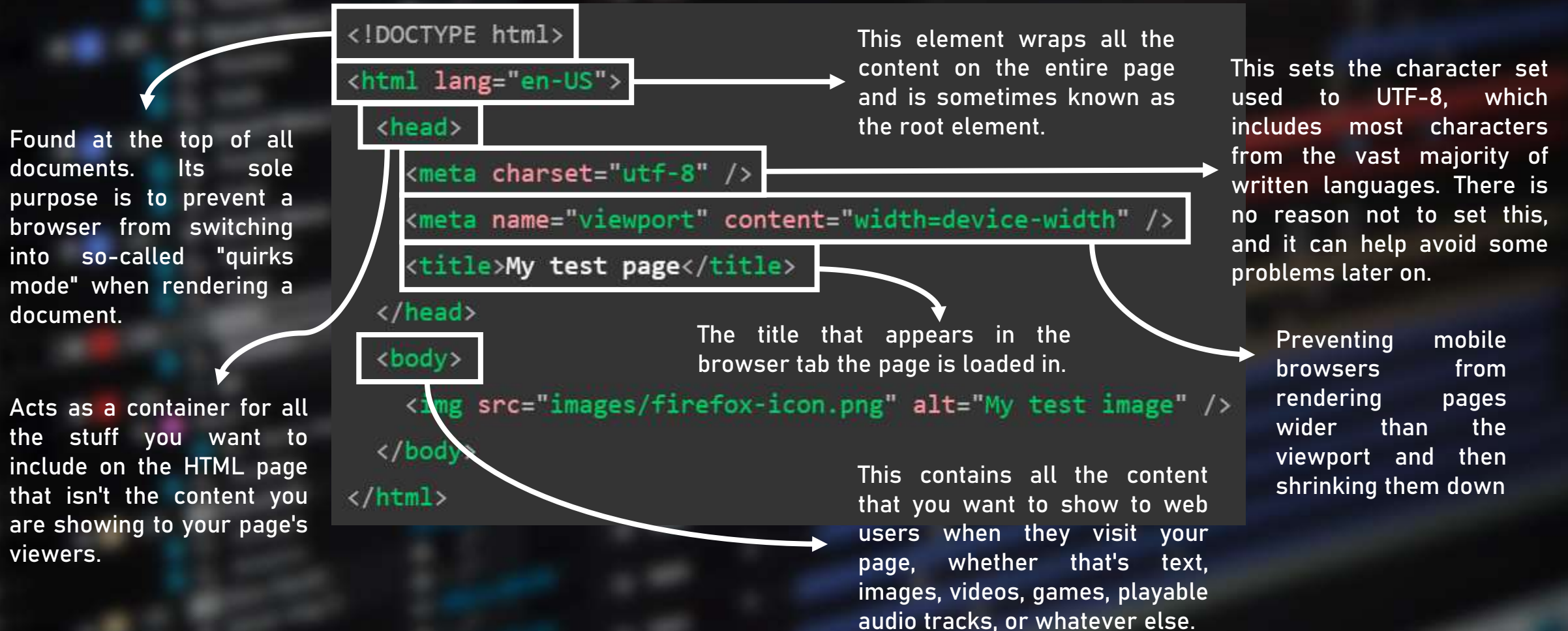
**Resulting Page:**



optional and ignored forward slash

```
<input type="url" />
```

# Anatomy of an HTML document






# Marking up text

- Heading elements allow you to specify that certain parts of your content are headings.
- In the same way that a book has the main title, chapter titles and subtitles, an HTML document does.
- HTML contains 6 heading levels, `<h1>`-`<h6>`, although you'll commonly only use 3 to 4 at most.

```
<!-- 4 heading levels: -->  
<h1>My main title</h1>  
<h2>My top level heading</h2>  
<h3>My subheading</h3>  
<h4>My sub-subheading</h4>
```



**Main title**

**Second title**

**Third title**


**Fourth title**

**Note:** Anything in HTML between `<!--` and `-->` is an **HTML comment**. The browser ignores comments as it renders the code. In other words, they are not visible on the page - just in the code. HTML comments are a way for you to write helpful notes about your code

# Paragraphs

- The HTML `<p>` element defines a paragraph.
- A paragraph always starts on a new line, and browsers automatically add some white space (a margin) before and after a paragraph.
- You cannot be sure how HTML will be displayed.
- Large or small screens, and resized windows will create different results.
- With HTML, you cannot change the display by adding extra spaces or extra lines in your HTML code.
- The browser will automatically remove any extra spaces and lines when the page is displayed:

```
<html>
  <head></head>
  <body>
    <p>Main paragraph</p>
    <p>Other paragraph</p>
  </body>
</html>
```



Main paragraph

Other paragraph

# Special rules

- The `<hr>` tag defines a thematic break in an HTML page, and is most often displayed as a horizontal rule. It is used to separate content (or define a change) in an HTML page, and it is an empty tag.
- The HTML `<br>` element defines a line break. Use `<br>` if you want a line break (a new line) without starting a new paragraph. It is an empty tag.
- The HTML `<pre>` element defines preformatted text. The text inside a `<pre>` element is displayed in a fixed-width font (usually Courier), and it preserves both spaces and line breaks:

```
<html>
  <head></head>
  <body>
    Something<br>is happening           in the air
    I don't know what... <hr>
    <pre>
      But my time is going..

      too      fast.
    </pre>
  </body>
</html>
```

Something  
is happening in the air I don't know what...

---

But my time is going..

too fast.



# Lists

A lot of the web's content is lists and HTML has special elements for these. Marking up lists always consists of at least 2 elements. The most common list types are ordered and unordered lists:

- Unordered lists are for lists where the order of the items doesn't matter, such as a shopping list. These are wrapped in a `<ul>` element;
- Ordered lists are for lists where the order of the items does matter, such as a recipe. These are wrapped in an `<ol>` element.

Each item inside the lists is put inside an `<li>` (list item) element.

```
<ul>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ul>

<h2>An Ordered HTML List</h2>

<ol>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ol>
```

## An Unordered HTML List

- Coffee
- Tea
- Milk

## An Ordered HTML List

1. Coffee
2. Tea
3. Milk

# Lists

HTML also supports description lists.

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

<h2>A Description List</h2>

<dl>
  <dt>Coffee</dt>
  <dd>- black hot drink</dd>
  <dt>Milk</dt>
  <dd>- white cold drink</dd>
</dl>

</body>
</html>
```

## A Description List

Coffee

- black hot drink

Milk

- white cold drink

# Tables

```
<h2>HTML Table</h2>
```

```
<table>
```

```
  <tr>
```

```
    <th>Company</th>
```

```
    <th>Contact</th>
```

```
    <th>Country</th>
```

```
  </tr>
```

```
  <tr>
```

```
    <td>Alfreds Futterkiste</td>
```

```
    <td>Maria Anders</td>
```

```
    <td>Germany</td>
```

```
  </tr>
```

```
  <tr>
```

```
    <td>Centro comercial Moctezuma</td>
```

```
    <td>Francisco Chang</td>
```

```
    <td>Mexico</td>
```

```
  </tr>
```

```
  <tr>
```

```
    <td>Ernst Handel</td>
```

```
    <td>Roland Mendel</td>
```

```
    <td>Austria</td>
```

```
  </tr>
```

```
  <tr>
```

```
    <td>Island Trading</td>
```

```
    <td>Helen Bennett</td>
```

```
    <td>UK</td>
```

```
  </tr>
```

```
</table>
```

## HTML Table

Company	Contact	Country
Alfreds Futterkiste	Maria Anders	Germany
Centro comercial Moctezuma	Francisco Chang	Mexico
Ernst Handel	Roland Mendel	Austria
Island Trading	Helen Bennett	UK



# Images

- The HTML `<img>` tag is used to embed an image in a web page.
- Images are not technically inserted into a web page; images are linked to web pages. The `<img>` tag creates a holding space for the referenced image.
- The `<img>` tag is empty, it contains attributes only, and does not have a closing tag.
- The `<img>` tag has two required attributes:
  - `src` - Specifies the path to the image;
  - `alt` - Specifies an alternate text for the image.
- The `width` and `height` attributes always define the width and height of the image in pixels.

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

<h2>Image Size</h2>

<p>Here we specify the width and
height of an image with the width and
height attributes:</p>



</body>
</html>
```

## Image Size

Here we specify the width and height of an image



# Links

- HTML links are hyperlinks, so you can click on a link and jump to another document;
- The HTML `<a>` tag defines a hyperlink;
- The most important attribute of the `<a>` element is the `href` attribute, which indicates the link's destination. The link text is the part that will be visible to the reader. Clicking on the link text, will send the reader to the specified URL address:

```
<a href="https://www.w3schools.com/">Visit W3Schools.com!</a>
```

- By default, an unvisited link is underlined and blue, a visited link is underlined and purple, and an active link is underlined and red;
- By default, the linked page will be displayed in the current browser window. To change this, you must specify another target for the link.

# Quotation and citation

- The HTML `<blockquote>` element defines a section that is quoted from another source. Browsers usually indent `<blockquote>` elements.
- The HTML `<q>` tag defines a short quotation. Browsers normally insert quotation marks.
- The HTML `<abbr>` tag defines an abbreviation. Marking abbreviations can give useful information to browsers, translation systems and search engines.
- The HTML `<cite>` tag defines the title of a creative work (e.g. a book, a poem, a sculpture, etc.).
- `<bdo>` stands for Bi-Directional Override. This tag is used to override the current text direction

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

<p>Browsers usually insert quotation marks around the q element.</p>

<p>WWF's goal is to: <q>Build a future where people live in harmony
with nature.</q></p>

</body>
</html>
```

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

<p>Browsers usually indent blockquote elements.</p>

<blockquote cite="http://www.worldwildlife.org/who/index.html">
For nearly 60 years, WWF has been protecting the future of nature. The world's leading
conservation organization, WWF works in 100 countries and is supported by more than one
million members in the United States and close to five million globally.
</blockquote>

</body>
</html>
```



# Quotation and citation

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

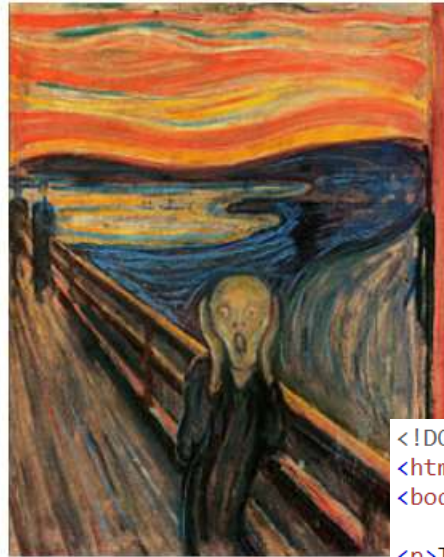
```
<p>The HTML cite element defines the title of a work.</p>
<p>Browsers usually display cite elements in italic.</p>
```

```

<p><cite>The Scream</cite> by Edvard Munch. Painted in 1893.</p>
```

```
</body>
</html>
```

The HTML cite element defines the title of a work.  
Browsers usually display cite elements in italic.



*The Scream* by Edvard Munch

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

```
<p>The <abbr title="World Health Organization">WHO</abbr> was founded in 1948.</p>
```

```
<p>Marking up abbreviations can give useful information to browsers, translation systems and search-engines.</p>
```

```
</body>
</html>
```

The WHO was founded in 1948.

Marking **World Health Organization**

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

```
<p>The next line will be written from right to left:</p>
```

```
<bdo dir="rtl">This line will be written from right to left</bdo>
```

```
</body>
</html>
```

The next line will be written from right to left:

tfel ot thgir morf nettirw eb lliw enil sihT

# Forms

- The `<form>` element is a container for different types of input elements, such as: text fields, checkboxes, radio buttons, submit buttons, etc.
- The HTML `<input>` element is the most used form element. An `<input>` element can be displayed in many ways, depending on the type attribute. The `<input type="text">` defines a single-line input field for text input.
- The form itself is not visible. Also note that the default width of an input field is 20 characters.
- More details about [HTML Form Elements](#), [HTML Input Types](#).

# Forms

```
<h2>Text input fields</h2>
```

```
<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="John"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Doe">
</form>
```

```
<p>Note that the form itself is not visible.</p>
```

## Text input fields

First name:

Last name:

Note that the form itself is not visible.

Also note that the default width of text input fields is 20 characters.

```
<h2>Radio Buttons</h2>
```

```
<p>Choose your favorite Web language:</p>
```

```
<form>
  <input type="radio" id="html" name="fav_language" value="HTML">
  <label for="html">HTML</label><br>
  <input type="radio" id="css" name="fav_language" value="CSS">
  <label for="css">CSS</label><br>
  <input type="radio" id="javascript" name="fav_language" value="JavaScript">
  <label for="javascript">JavaScript</label>
</form>
```

## Radio Buttons

Choose your favorite Web language:

- ☐ HTML
- ☐ CSS
- ☐ JavaScript



# Forms

```
<h2>Checkboxes</h2>
<p>The <strong>input type="checkbox"</strong> defines a checkbox:</p>

<form action="/action_page.php">
  <input type="checkbox" id="vehicle1" name="vehicle1" value="Bike">
  <label for="vehicle1"> I have a bike</label><br>
  <input type="checkbox" id="vehicle2" name="vehicle2" value="Car">
  <label for="vehicle2"> I have a car</label><br>
  <input type="checkbox" id="vehicle3" name="vehicle3" value="Boat">
  <label for="vehicle3"> I have a boat</label><br><br>
  <input type="submit" value="Submit">
</form>
```

## Checkboxes

The **input type="checkbox"** defines a checkbox:

- ☐ I have a bike
- ☐ I have a car
- ☐ I have a boat

```
<h2>HTML Forms</h2>

<form action="/action_page.php">
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="John"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Doe"><br><br>
  <input type="submit" value="Submit">
</form>

<p>If you click the "Submit" button, the form-data will be sent to a page called
"/action_page.php".</p>
```

## HTML Forms

First name:  
  
Last name:

If you click the "Submit" button, the form-data will be sent to a page called "/action\_page.php".

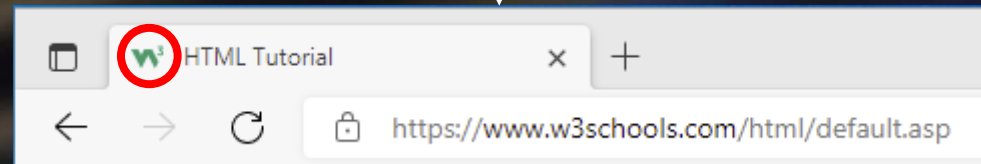
# Favicon

- A favicon is a small image displayed next to the page title in the browser tab.
- You can use any image you like as your favicon, or you can create your own on sites like <https://www.favicon.cc/>.
- To add a favicon to your website save your favicon image to the root directory of your webserver or create a folder in the root directory and save it there. A common name for a favicon image is "favicon.ico". Then write the 5<sup>th</sup> line of code on the right of this slide.
- You are now an HTML expert!

```
<!DOCTYPE html>
<html>
<head>
  <title>My Page Title</title>
  <link rel="icon" type="image/x-icon" href="/images/favicon.ico">
</head>
<body>

<h1>This is a Heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```



**SINCE WHEN YOU BECOME AN  
EXPERT IN HTML**

**</LAST NIGHT>**

*MemesHappen*