#### HTML: Part I

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#### Markup Language

#### Markup Language

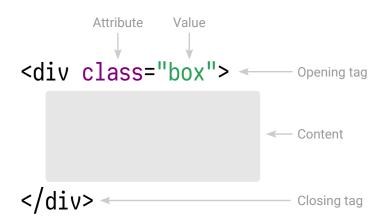
A language which lets us define documents by writing annotations which are distinct from the text.

#### HTML

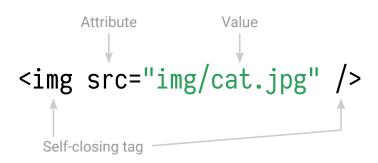
#### HTML: Hyper-Text Markup Language

A **standard** language for documents to be displayed in a web browser.

https://html.spec.whatwg.org/dev/



#### Self-closing Tag



#### **Empty element**

If a tag specifies an element which does not have any content, it does not **need** to have a closing tag (or be self-closing).



#### Writing angle brackets in HTML

Since the characters "<" and ">" are used by HTML, how do we write them in a document?

```
<html>
<head>...</head>
<body>I am in the &lt;body&gt;</body>
</html>
```

#### **Entities**

Entities are special pieces of text that begin with "&" and end with ";"

Used to write reserved characters

There are over two thousand entities

#### Comments

Comments are a special kind of tag:

```
<!-- This is a comment in HTML -->
```

Comments can span multiple lines:

```
<!-- This comment has multiple lines:
This is the second line
This is the third line -->
```

However, comments *cannot* be used within tags, so you can't comment an attribute.

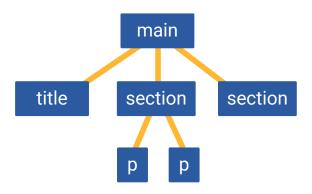
#### Tags within tags

#### Tags can be nested

```
<main>
<title>My document</title>
<section>
First paragraph in the first section
Second paragraph in the first section
</section>
<section>Second section</section>
</main>
```

#### Tree of elements

The representation of an HTML document is a tree:



#### Minimal HTML Page

```
<!doctupe html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Hello!</title>
 </head>
  <body>
   <h1>Hello World!</h1>
   This is the shortest page ever.
 </body>
</html>
```

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## The DOM

#### Browser tasks

#### Fetch

Perform network requests to get resources (i.e., HTML)

#### Parse

Convert the text to in-memory structures that represent the elements written in the page.

#### Show the UI

Paint the pixels on the screen using the specified structure and styles.

#### Listen to events

React to UI events such as clicks, scrolls, key presses, etc.

#### The Document Object Model

The browser has to **parse** and create an internal representation of a document.

There is a one-to-one correspondence between HTML tags and in-memory **objects**.

The tree of objects resulting from parsing an HTML page is a live memory structure called the **DOM** (Document Object Model).

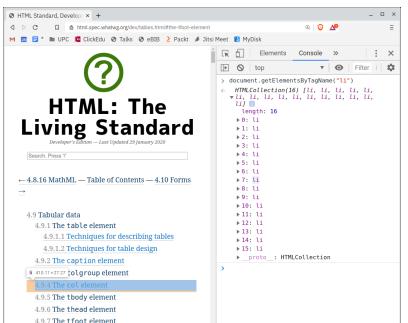
#### The DOM API

By using Javascript, we can manipulate the DOM in many ways:

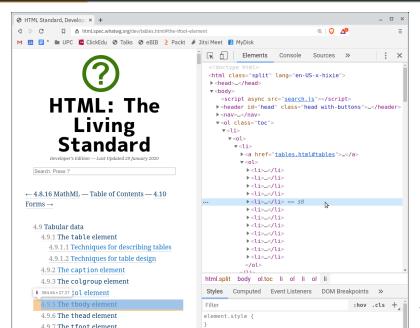
- · Create new elements.
- · Change existing elements.
- · Traverse the tree.
- · Query the tree to find specific elements (or sets of them).
- · Set event handlers to receive events (clicks, keypresses, etc.).

• ..

#### The Browser Console



#### The Browser Inspector



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# Structure tags

#### doctype

The **doctype** defines the type of document, and it must be the first line in an HTML document.

This line tells the browser what version of HTML we are using.

#### <!doctype html>

The version implied by this form is HTML 5 (HTML version 5).

#### The **html** tag

The <a href="html">html</a> defines the root of the document
It contains one <a href="head">head</a> tag and one <a href="hody">body</a> tag (in this order).

```
<html>
<head>...</head>
<body>...</body>
</html>
```

#### The **head** tag

The (head) tag contains metadata about the document:

It can contain these tags:

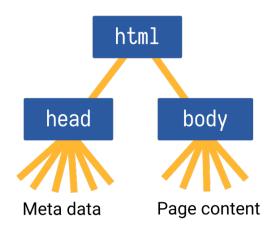
- · title
- · link
- · style
- · script
- · meta
- · ... and some more.

#### The **body** tag

The **body** tag represents the contents of the document.

What we see on a browser window are the children elements of  $\boxed{\text{body}}$  .

#### Base structure



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### Document metadata

#### The **title** tag

The **title** tag can only appear once in the head and it sets the page's title.

```
<html>
<head>
<title>This title will appear in the browser!</title>
...
</head>
<body>...</body>
</html>
```

#### The **link** tag

The <u>link</u> tag states a relationship of the current document with an external resource. (It is an empty element.)

#### Attributes:

- **href** : The URL of the linked resource
- **rel**: The relationship with the resource.
- type : The type of the resource.
- · ... and many more.

There can be many (link) tags in the (head) of a document.

#### Stylesheets and icons

To include a stylesheet

```
<link href="main.css" rel="stylesheet">
```

To use an icon

```
k href="favicon.ico" rel="icon">
```

To use different stylesheets depending on the medium

```
<link href="print.css" rel="stylesheet" media="print">
link href="web.css" rel="stylesheet" media="screen">
```

#### The **style** tag

The **(style)** tag is used to include styles directly in HTML

```
<html>
<head>
<style>
body { font-size: 100px; }
</style>
</head>
<body>This text will be large!</body>
</html>
```

#### The **script** tag

The **script** tag is used to include Javascript code directly in HTML

#### The **meta** tag

The **meta** tag is used to add metadata to the document which cannot be represented with the other tags

To declare a character set

```
<meta charset="utf8">
```

To redirect to a page after 3 seconds

```
<meta http-equiv="refresh" content="3;url=https://pauek.info">
```

### The **viewport** meta tag

Mobile phones simulate a larger viewport to be able to render normal web pages (designed for much bigger screens).

But if a website's CSS is optimized for mobile, this virtual viewport should be the *real* width of the device, not larger.

To set the width of the viewport and the zoom level (initial-scale) on first load:

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# Sections

#### The main tag

The **main** tag represents the dominant content of the document.

The content of **main** should be unique to the document. (No sidebars, navigation, copyright info, logos, etc.)

```
<main>
  <h1>Nice articles</h1>
  Articles found on the internet
  <article>...</article>
  <article>...</article>
  <article>...</article>
  <article>...</article>
  <article>...</article>
  <article>...</article>
  </main>
```

### The **article** tag

The **(article)** tag contains a complete, or self-contained, composition in a document.

```
<article>
  <img src="/6wSr6W1rz_500.jpg" alt="People having fun">
  Happy 2nd birthday Masif Saturdays!!!
  <footer>Posted 3 weeks ago</footer>
</article>
```

#### The **section** tag

The **(section**) tag marks a generic section of a document or application.

```
<section>
  <h1>The facts</h1>
  1500+ shows, 14+ countries
</section>
  <section>
  <h1>2010/2011 figures per year</h1>
  100+ shows, 8+ countries
</section>
```

#### The **nav** tag

The **(nav)** tag marks the section of a page with navigation links.

#### Headings

Headings describe the topic they precede. From **h1** to **h6**.

**h1**) defines the most important heading.

**h6** defines the least important heading.

```
<h1>Book title</h1>
<h2>Section title</h2>
<h3>Subsection title</h3>
<h4>Subsubsection title</h4>
```

#### The **header** tag

The (header) marks a group of introductory or navigational aids.

```
<header>
    <h1>How to win a lot of money on the Internet</h1>
    by Flippant Selfish
</header>

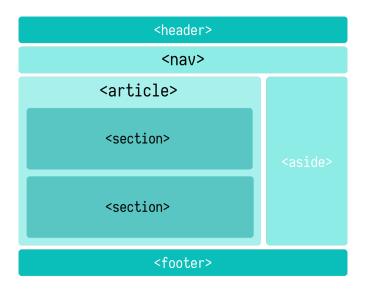
As many of you may know, there is a lot of money to be made in this world...
```

### The **footer** tag

The **footer** marks information about a section (authors, related documents, copyright data, etc.)

```
<footer>
  Last modified: January 28th, 2020.
</footer>
```

## Structural tags diagram



#### The **div** tag

The (div) tag is a generic marker for a section within a document.

```
<section>
 <h1>Unimaginative blog post title</h1>
 Equally dull blog post abstract,
    but a little bit longer.
</section>
<div class="comments">
 >
   <span class="user">pauek
   You are so cool...
 </div>
```

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## Text-level tags

#### The p tag

The **p** tag marks paragraphs, which are visualized as separated boxes of text.

Geckos are a group of usually small, usually nocturnal lizards. They are found on every continent except Australia.

Some species live in houses where they hunt insects attracted by artificial light.

#### The **br** tag

The **br** is an empty element that produces a *line break* in text (a "carriage return").

```
Si el món fos escrit amb llapis, <br>
podria esborrar la lletra <br>
que vol ferir; <br>
podria esborrar mentides <br>
que no cal dir; <br>
...
```

#### The **em** tag

The **em** tag marks text that is *emphasized*.

```
En HTML lo que importan son los <em>tags</em>.
```

(The (i) is its predecessor.)

#### The **strong** tag

The **strong** tag marks text that is marked as **important**.

```
En HTML lo que importan son los <strong>tags</strong>.
```

(The **b** is its predecessor.)

#### The **code** tag

The **code** tag marks text that is in some **computer code**.

```
The value of the <code>message</code> variable is <code>"error"</code>.
```

(The (tt) is its predecessor, and is obsolete.)

#### The **pre** tag

The **pre** tag marks preformatted text, which is shown verbatim in a monospaced font.

```
>
This is the <em>Hello, world!</em> program:
#include <stdio.h&gt;
int main(int argc, char *argv[]) {
 printf("Hello, world!");
```

#### The **a** tag

The **a** represents a hyperlink (a hypertext anchor) labeled by its contents.

#### Attributes:

• **href** : the destination URL.

```
You can go to
    <a href="https://google.com">Google</a>
    to search for more.
```

## Links to specific elements

If an element has an attribute **id**, links can point to that specific element

```
<section id="first">
  The first section
</section>
<section>

    The second section <br>
        <a href="#first">Go to first</a>

</section>
```

#### The **span** tag

The **span** tag is a **generic** marker for a piece of text within a paragraph.

```
He was admitted to the hospital
on <span class="date">May 13th, 1956</span>
```

It is typically styled with CSS

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#### The **ol** tag

The (o1) stands for "ordered list", and shows a numbered list.

The (li) stands for "list item".

```
<h1>The Three Musketeers</h1>

Athos
Porthos
Aramis
```

## ol tag attributes

- reversed : To reverse the order of the list.
- **start** : Starting value of the list.
- · [type]: Kind of list marker
  - · 1 decimal
  - · a lower alpha
  - · A upper alpha
  - $\cdot$  i lower roman
  - I upper roman

#### 1i attributes

```
(value): Set a specific value (an integer) to the item.
(Only within an ol .)

    First
    value="3">Second?
```

### The **ul** tag

The **(ul)** tag stands for "unordered list", which shows a **bulleted** list. (The **(li)** tag is the "list item".)

```
<h1>Coldplay</h1>

Chris Martin
Will Champion
Jonny Buckland
Guy Berryman
```

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# Tables

### The **table** tag

A **table** shows data in two dimensions.

#### It contains:

• **tr** : Several table rows

#### Each contains:

- **(th)**: Several **t**able **h**eader elements (header cells).
- [td]: Several table data elements (cells).

#### A **table** example

```
    FruitPrice
    Kiwi5.5€
    Apple1.7€
    Apple2.7€
    Blackberries2.7€
```

### The **thead** and **thody** tags

```
thead better marks the header of a tabletbody marks the body of the table (when thead is present)
```

```
<thead>
 FruitPrice
 </thead>
Kiwi5.5
 Apple
Blackberries2.7
```

### Tag omission

```
    <thead>

            > Fruit > Price

                 < tth>> in €

                       > 5.5

                       Apple > 1.7

                        > Blackberries > 2.7
```

#### Attributes for th and td

**colspan**: number of columns that the cell occupies.

**rowspan**: number of rows that a cell occupies.

## Other tags

**caption**: Description about the table.

**tfoot**: footer equivalent of the **thead**.

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# Embedded content

# The **image** tag

The img tag embeds an image into the page.

- (src): URL of the image to embed into the page.
- · alt : text description of the image (for accessibility).

```
<img src="https://imgs.xkcd.com/comics/tags.png"
alt="XKCD Comic strip about web developers" />
```

## The **picture** tag

The **picture** tag contains **source** elements and an **img** element to offer alternative versions of an image.

### **source** attributes:

- (srcset): URL of the source.
- (media): conditions to show this version (media query).

```
<picture>
    <source srcset="logo-big.png" media="(min-width: 1200px)">
    <source srcset="logo-medium.png" media="(min-width: 600px)">
    <img src="logo.png" alt="Company Logo">
    <picture>
```

## How the picture chooses the source

The browser will consider each **source** and choose the best match among them.

lf...

- · no matches are found, or
- the browser doesn't support the **picture**

the URL of the img is selected.

The image is presented in the space occupied by the [img].

## The video tag

The **video** tag embeds a video player in the browser. It uses **source** elements to provide different versions.

#### Attributes

- height, width: Size of the element.
- **autoplay** : Play as soon as the page is loaded.
- (controls): Show UI to control the video.
- (muted): Start with muted audio.
- **poster** : Image to show while the video downloads.

```
<video controls muted>
    <source src="/videos/cat-jump.webm" type="video/webm">
      <source src="/videos/cat-jump.mp4" type="video/mp4">
      Your browser does not support embedded videos
</video>
```

## The audio tag

The **(audio)** tag embeds an audio track in the browser. It uses **(source)** elements to provide different versions.

#### Attributes

- **autoplay**: Play as soon as the page is loaded.
- (controls): Show UI to control the video
- **muted** : Start with muted audio.
- · loop : Play in a loop.
- **preload**: Load in advance (hint to the browser).

```
<audio controls>
    <source src="audio/chiquito.mp3">
    Your browser does not support the <code>audio</code> element
</audio>
```

Without (controls), nothing is shown on the screen

## The **iframe** tag

The **iframe** tag represents an *nested browsing context*, embedding a different page.

#### **Attributes**

```
• height, width: Size of the element.
```

 $\boldsymbol{\cdot}$   $\boxed{\boldsymbol{\mathsf{src}}}$  : URL of the page to embed.

.

```
<iframe id="bcn-map" title="Map of Barcelona"
width="600" height="400"
src="https://www.openstreetmap.org/export/embed.html?bbox=...">
</iframe>
```

## Scalable Vector Graphics

XML-based format to represent vector 2D images.

Scalable: images of any size (good for high-resolution displays).

Compressed: the vector representation is much smaller than the pixels.

# Using SVG in the **img** tag

To show an SVG, it is enough to put it in an **[img**]:

<img src="/img/logo.svg" alt="HTML5 Logo" />

## **Embedding SVG**

But you can directly embed SVG in HTML.

Embedding an SVG lets you style it with CSS.