

Web Development & HTML5

Fundamentals

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WEB DEVELOPMENT

Web Development Content

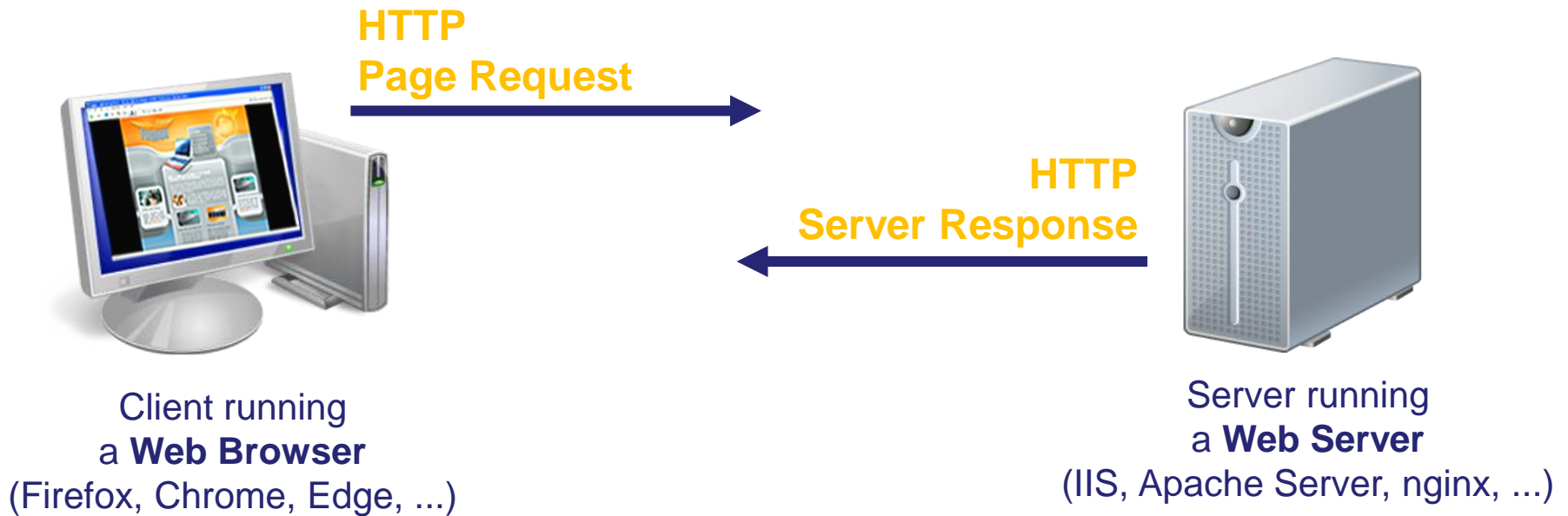
- **World Wide Web**
- **WWW Address**
- **Web Pages**
- **Learning Resources**

World Wide Web

- **WWW**
 - World Wide Web
 - Information system where documents and other resources are stored in servers and made available for consultation over the Internet
 - Invented by Sir Timothy John Berners-Lee in 1989
- **The resources**
 - Files with content: text, image, video, audio
 - Published to servers using web servers
 - Transferred from servers using HTTP
 - Accessible to users through a browser

World Wide Web

- Classical client / server architecture



WWW Address

[http:// www.xpto.pt/contato.aspx](http://www.xpto.pt/contato.aspx)

- http
 - HTTP, Hypertext Transfer Protocol
 - protocolo de comunicação
- www.xpto.pt
 - URL, Uniform Resource Locator
 - localização do recurso
- [contato.aspx](http://www.xpto.pt/contato.aspx)
 - URN, Uniform Resource Name
 - nome do recurso
- <http://www.xpto.pt/default.aspx>
 - URI, Uniform Resource Identifier
 - caminho completo para aceder a um recurso

Web Pages

- **Web pages are text files containing HTML**
- **HTML**
 - Hypertext Markup Language
 - HTML is the language in which websites are written
 - Notation for describing document structure (semantic markup) and content (presentation markup)
 - Browsers tolerate invalid HTML code and parse errors
 - HTML5 is the last version
- **Markup tags**
 - Provide information about page structure and content
 - Examples
 - `<section> ... </section>` → structure SEMÂNTICA!
 - `<p> ... </p>` → content

Learning Resources

- <https://developer.mozilla.org/en-US/docs/Learn/HTML>
- <https://www.w3schools.com/html/>
- <https://html.com/>
- <https://www.tutorialspoint.com/html/index.htm>
- <https://www.tutorialrepublic.com/html-tutorial/html-elements.php>

HTML5

HTML5 Content

- **HTML Structure**
- **Code Formatting**
- **Entender e usar HTML semântico**
- **Trabalhar com conteúdo:**
 - Texto, imagem, vídeo e áudio
- **Manipular hiperligações**
- **Trabalhar com tabelas**
- **Criar formulários**
- **Entender e usar HTML responsivo**

HTML Structure

- **HTML**
 - Describes document structure using two main areas: <head> and <body>
 - Is a bundle of elements and tags

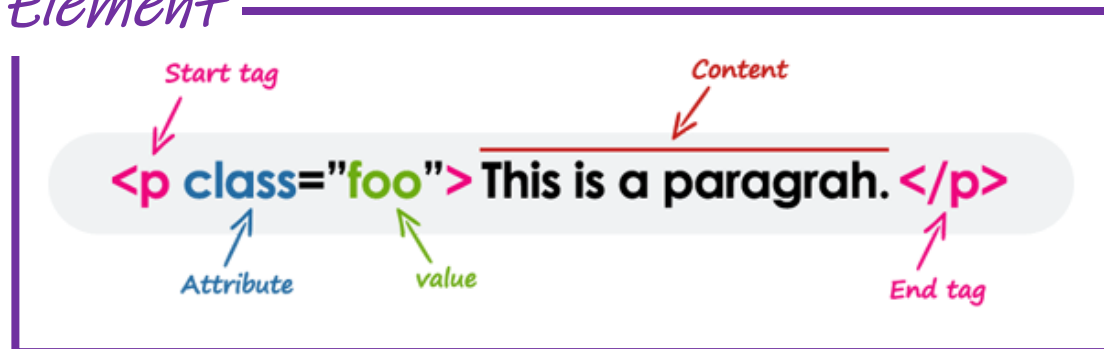
```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8"/>
    <title>...</title>
  </head>
  <body>
    <p>Parágrafo de texto</p>
  </body>
</html>
```

HTML Elements

- **Elements**

- Are individual components of an HTML document
- Are written with a start and an end tag, with content in between
- Can have attributes and these have values
- Can be nested one inside another

Element



HTML Structure

- First HTML page

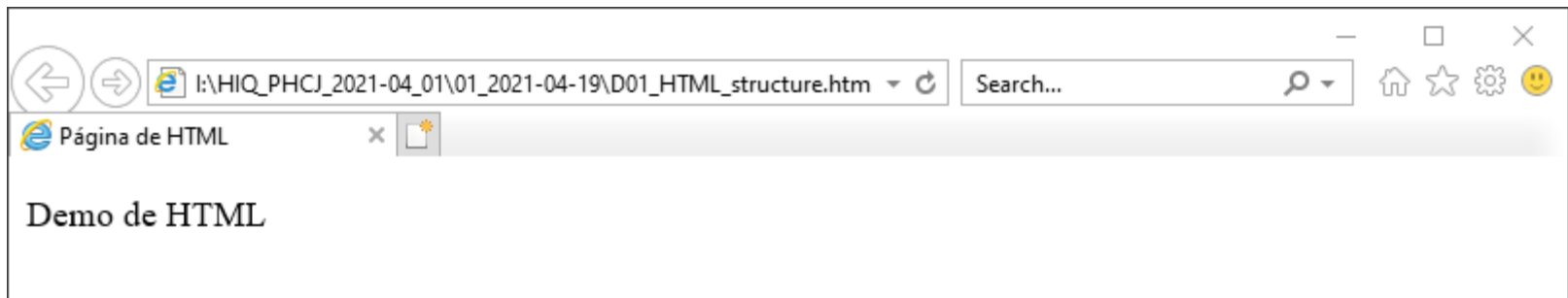
```
<!DOCTYPE html> <!-- Diretiva ao browser para processar a página como HTML5 -->

<html> <!-- Início da página -->

    <head> <!-- Início do cabeçalho -->
        <title>Página de HTML</title> <!-- Elemento de cabeçalho -->
        <meta charset="utf-8" /> <!-- Elemento de metadados -->
    </head> <!-- Fim do cabeçalho -->

    <body> <!-- Início do corpo -->
        <p>Demo de HTML</p> <!-- Elemento de parágrafo -->
    </body> <!-- Fim do corpo -->

</html> <!-- Fim da página -->
```



Code Formatting

- **HTML source code**

- It should be formatted to increase readability and facilitate debugging
- Every block element should start on a new line
- Every nested (block) element should be indented
- Browsers ignore multiple whitespaces in the page source, so formatting is harmless
- Auto-format code in VS Code: Shift+Alt+F

Document <head>

- Used to specify a title in the window title bar
- Contains information that doesn't show directly on the viewable page
- Starts after the <!doctype> declaration
- Begins with <head> and ends with </head>
- Search engines and people rely on titles
- Contains mandatory <title> tag
- Can contain other tags
 - <meta>
 - <script>
 - <style>
 - <!-- comments -->

```
<!DOCTYPE html>
<html>
<head>
  <title>HTML Meta</title>
  <meta charset="utf-8"></meta>
  <meta name="description" content="HTML tutorial" />
  <meta name="keywords" content="html, metadata" />
  <meta name="author" content="MRS" />
</head>
<body>
</body>
</html>
```


HTML Semantics

- **Semantic elements** [More info](#)
 - Clearly describes its meaning to both the browser and the developer
 - Examples of non-semantic elements: `<div>` and `` - Tells nothing about its content
 - Examples of semantic elements: `<form>` and `<table>` - defines its content

Tag	Description
<code><article></code>	Defines independent, self-contained content
<code><aside></code>	Defines content aside from the page content
<code><details></code>	Defines additional details that the user can view or hide
<code><figcaption></code>	Defines a caption for a <code><figure></code> element
<code><figure></code>	Specifies self-contained content, like illustrations, diagrams, photos, etc.
<code><footer></code>	Defines a footer for a document or section
<code><header></code>	Specifies a header for a document or section
<code><main></code>	Specifies the main content of a document
<code><mark></code>	Defines marked/highlighted text
<code><nav></code>	Defines navigation links
<code><section></code>	Defines a section in a document
<code><summary></code>	Defines a visible heading for a <code><details></code> element
<code><time></code>	Defines a date/time

HTML Semantics - demo

```
<!DOCTYPE html>
<html>
  <head>
    <title>HTML Semantics</title>
    <meta charset="utf-8"/>
  </head>
  <body>
    <header><h2>HTML Semantics</h2></header>
    <nav>
      <a href="https://www.w3schools.com/html/html5_semantic_elements.asp" target="_blank">W3Schools</a>
      <a href="https://www.freecodecamp.org/news/semantic-html5-elements/" target="_blank">Free Code Camp</a>
    </nav>
    <main>
      <section>
        <h3>Section vs Article</h3>
        <article><p>Section defines a section in a document, typically with a heading.</p></article>
        <article><p>Article specifies independent, self-contained content.</p></article>
      </section>
    </main>
    <footer><p><a href="mailto:milena.reis.sousa@hotmail.com">MRS</a></p></footer>
  </body>
</html>
```

HTML Semantics

[W3Schools](https://www.w3schools.com/html/html5_semantic_elements.asp) [Free Code Camp](https://www.freecodecamp.org/news/semantic-html5-elements/)

Section vs Article

The section element defines a section in a document, typically with a heading.

The article element specifies independent, self-contained content.

[MRS](mailto:milena.reis.sousa@hotmail.com)

Basic Tags

- **Text**

```
<p>Text</p>
```

- **Lines**

```
<br>  
<hr>
```

- **Image**

```

```

- **Hyperlink**

```
<a href="https://www.w3schools.com/tags/tag_a.asp" title="W3Schools">Tag a</a>
```

```
<p>  
  Link image:  
  <a href="https://www.w3schools.com">  
      
  </a>  
</p>
```

Basic Tags

- **Headings**

```
<h1>Heading 1</h1>
<h2>Sub heading 2</h2>
...
<h6>Sub heading 3</h6>
```

- **Divisions: div + span**

```
<div>
  This is a <span><em>div</em></span>
</div>
```

- **Lists**

```
<ol>
  <li>HTML</li>
  <li>CSS</li>
  <li>JavaScript</li>
</ol>
```

```
<ul style="list-style-type:square">
  <li>HTML</li>
  <li>CSS</li>
  <li>JavaScript</li>
</ul>
```

- **Comment**

```
<!--Comment line-->
```

Basic Tags - demo

```
<!DOCTYPE html>
<html>
  <head>
    <title>Basic Tags</title>
    <meta charset="utf-8" />
  </head>
  <body>
    <!--Paragraph-->
    <p>Text</p>
    <!--Break line-->
    <br>
    <!--Horizontal rule-->
    <hr>
    <!--Image-->
    
    <hr>
    <!--Hyperlink - text-->
    <p>Tag <a href="https://www.w3schools.com/tags/tag_a.asp" title="W3Schools" target="_blank">&lt;a&gt;</a></p>
    <!--Hyperlink - image-->
    <p>An image as a link<a href="https://www.w3schools.com/html/default.asp" title="W3Schools" target="_blank">
      </a></p>
    <hr>
    <!--Headings-->
    <h1>Heading 1</h1>
    <h2>Sub heading 2</h2>
    <h3>Sub heading 3</h3>
    <hr>
    <!--Divisions: div + span-->
    <div>This is a <span><em>div</em></span> <!--Má prática formatar com HTML - usar estilos!--></div>
    <hr>
    <!--Ordered list-->
    <ol><li>HTML</li><li>CSS</li><li>JavaScript</li></ol>
    <!--Unordered list-->
    <ul style="list-style-type:square"><li>HTML</li><li>CSS</li><li>JavaScript</li></ul>
  </body>
</html>
```

Text



Tag <a>



Heading 1

Sub heading 2

Sub heading 3

This is a div

1. HTML
2. CSS
3. JavaScript

- HTML
- CSS
- JavaScript

Media Tags

- **Image**

```

```

Abbreviation	File Format	File Extension
APNG	Animated Portable Network Graphics	.apng
GIF	Graphics Interchange Format	.gif
ICO	Microsoft Icon	.ico, .cur
JPEG	Joint Photographic Expert Group image	.jpg, .jpeg, .jfif, .pjpeg, .jpp
PNG	Portable Network Graphics	.png
SVG	Scalable Vector Graphics	.svg

Media Tags

- Video

```
<video width="320" height="240" autoplay muted>  
  <source src="../../media/movie.mp4" type="video/mp4">  
  <source src="../../media/movie.ogg" type="video/ogg">  
Your browser does not support the video tag.  
</video>
```

Format	File	Description
Ogg	.ogg	Supported by HTML
WebM	.webm	Supported by HTML
MP4	.mp4	Commonly used in video cameras and TV hardware Supported by all browsers and recommended by YouTube

Media Tags

- **Audio**

```
<audio controls>
  <source src="../../media/horse.ogg" type="audio/ogg">
  <source src="../../media/horse.mp3" type="audio/mpeg">
  Your browser does not support the audio element.
</audio>
```

Format	Browser	MP3	WAV	OGG
MP3	Edge/IE	YES	YES*	YES*
WAV	Chrome	YES	YES	YES
PGG	Firefox	YES	YES	YES
	Safari	YES	YES	NO
	Opera	YES	YES	YES

*From Edge 79

Media Tags - demo

```
<!DOCTYPE html>
<html>
  <head>
    <title>Media Tags</title>
    <meta charset="utf-8" />
  </head>
  <body>
    <section>
      <h2>Media Tags</h2>
      <article>
        <h4>Image</h4>
        
      </article>
      <article>
        <h4>Video</h4>
        <video style="width:10%;height:10%" controls>
          <source src="../../media/movie.mp4" type="video/mp4">
          Your browser does not support the video tag.
        </video>
      </article>
      <article>
        <h4>Audio</h4>
        <audio controls>
          <source src="../../media/horse.ogg" type="audio/ogg">
          Your browser does not support the audio element.
        </audio>
      </article>
    </section>
  </body>
</html>
```

Media Tags

Image



Video



Audio



Hyperlinks - demo

```
<!DOCTYPE html>
<html>
  <head>
    <title>Link Tags</title>
    <meta charset="utf-8" />
  </head>
  <body>
    <p id="pLink">
      Link
      <a href="https://www.w3schools.com/tags/tag_a.asp" title="W3Schools" target="_blank">&lt;a&gt;</a>
    </p>
    <p>
      Link file
      <a href="D01_HTMLStructure.html" title="File" target="_blank">File</a>
    </p>
    <p>
      Link image
      <a href="https://www.w3schools.com/html/default.asp" title="W3Schools" target="_blank">
        
      </a>
    </p>
    <p>
      Link email
      <a href="mailto:milena.reis.sousa@hotmail.com">MRS</a>
    </p>
    <p>
      Link document location
      <a href="#pLink">Goto Link</a>
    </p>
  </body>
</html>
```

Link [<a>](#)

Link file [File](#)

Link image 

Link email [MRS](mailto:milena.reis.sousa@hotmail.com)

Link document location [Goto Link](#)

HTML Entities

- **HTML Special Characters**

- Reserved characters in HTML must be replaced with character entities

`&entity_name;`
OR
`&#entity_number;`

```
<p>&lt;p&gt;</p>
```

Result	Description	Entity Name	Entity Number
	non-breaking space	 	
<	less than	<	<
>	greater than	>	>
&	ampersand	&	&
"	double quotation mark	"	"
'	single quotation mark (apostrophe)	'	'
¢	cent	¢	¢
£	pound	£	£
¥	yen	¥	¥
€	euro	€	€
©	copyright	©	©
®	registered trademark	®	®

HTML Entities - demo

```
<!DOCTYPE html>
<html>
  <head>
    <title>HTML Entities</title>
    <meta charset="utf-8" />
  </head>
  <body>
    <p>[&gt;&gt;&nbsp;&nbsp;&nbsp;Welcome&nbsp;&nbsp;&nbsp;&lt;&lt;]</p>
    <p>&#9658;I have the sfollowing cards: A&#9827;, K&#9830; and 9&#9829;</p>
    <p>&#9658;I prefer hard rock &#9835;music&#9835;</p>
    <p>&copy;2006 by Svetlin Nakov &amp; his team</p>
  </body>
</html>
```

[>> Welcome <<]

► I have the sfollowing cards: A♣, K♦ and 9♥

► I prefer hard rock 🎵music🎵

©2006 by Svetlin Nakov & his team

HTML Tables

- **Table**
 - Tables represent tabular data
 - A table consists of one or several rows
 - Each row has one or more columns
 - Tables should not be used for layout
 - Core tags:

Element	Description
<code><table></table></code>	Begin/end of the table
<code><thead></code>	Table header section
<code><tbody></code>	Table body section
<code><tfoot></code>	Table footer section
<code><th></th></code>	Table header
<code><tr></tr></code>	Table row
<code><td></td></code>	Table data/cell

HTML Tables – demo 1

```
<table border="1">

  <thead>
    <th>#</th>
    <th>Type</th>
    <th>Name</th>
  </thead>

  <tbody>

    <tr>
      <td>1</td>
      <td>Front-end</td>
      <td>HTML, CSS, JavaScript</td>
    </tr>

    <tr>
      <td>2</td>
      <td>Back-end</td>
      <td>SQL Server, C#, ASP.NET</td>
    </tr>

  </tbody>

</table>
```

#	Type	Name
1	Front-end	HTML, CSS, JavaScript
2	Back-end	SQL Server, C#, ASP.NET

HTML Tables – demo 2

```
<table border="1">
  <tr>
    <th>#</th>
    <th>Type</th>
    <th colspan="3">Name</th>
  </tr>
  <tr>
    <td>1</td>
    <td>Front-end</td>
    <td>HTML</td>
    <td>CSS</td>
    <td>JavaScript</td>
  </tr>
  <tr>
    <td>2</td>
    <td>Back-end</td>
    <td>SQL Server</td>
    <td>C#</td>
    <td>ASP.NET</td>
  </tr>
</table>
```

#	Type	Name		
1	Front-end	HTML	CSS	JavaScript
2	Back-end	SQL Server	C#	ASP.NET

```
<table border="1">
  <tr>
    <th>#</th>
    <td>1</td>
    <td>2</td>
  </tr>
  <tr>
    <th>Type</th>
    <td>Front-end</td>
    <td>Back-end</td>
  </tr>
  <tr>
    <th rowspan="3">Name</th>
    <td>HTML</td>
    <td>SQL Server</td>
  </tr>
  <tr>
    <td>CSS</td>
    <td>C#</td>
  </tr>
  <tr>
    <td>JavaScript</td>
    <td>ASP.NET</td>
  </tr>
</table>
```

#	1	2
Type	Front-end	Back-end
Name	HTML	SQL Server
	CSS	C#
	JavaScript	ASP.NET

HTML Form

- **Forms**

- An HTML form is used to collect user input
- The user input is most often sent to a server for processing.
- In order to store data, the form will to work with background techonologies like ASP.NET or PHP, and a data storage like SQL Server or MySQL
- Each page can only have one form tag

- **Form Tag**

- Name: identifier needed to send data to server
- Method: how the form data will be sent (GET/POST)
- Action: where the form data will be sent (path/file)

HTML

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

Servidor

```
<form id="formStudent" name="formStudent" method="post" action="../DataPages/formStudentData.aspx">
  <fieldset>
    <!--related form elements-->
  </fieldset>
  <!--form elements-->
</form>
```


HTML Form

- **Form Fields** [Ver W3schools](#)

Element	Entity Name
<code><input type="text"></code>	Displays a single-line text input field
<code><input type="radio"></code>	Displays a radio button (for selecting one of many choices)
<code><input type="checkbox"></code>	Displays a checkbox (for selecting zero or more of many choices)
<code><input type="submit"></code>	Displays a submit button (for submitting the form)
<code><input type="reset"></code>	Displays a reset button (for resetting the form)
<code><input type="button"></code>	Displays a clickable button that will have a JavaScript function in order to work
<code><label></code>	Defines a label for many form elements Is useful for screen-reader users, because it will read it out loud when the user focus on the input element

HTML Form - demo

Academic information	
Degree	<input type="text" value="Master of Business Administration"/>
Student ID	<input type="text"/>
Classes attended	<div>Geography Mathematics English</div>
Personal Details	
First Name	<input type="text"/>
Last Name	<input type="text"/>
Gender:	<input type="radio"/> Male <input checked="" type="radio"/> Female
Email	<input type="text"/>
TERMS AND CONDITIONS...	
<div>Send Form</div> <div>Clear Form</div>	