



# Web Programming

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# HTML Fundamentals

HTML 5



# Contents

**01**

**Hypertext Markup Language**

**02**

**HTML Terminology**

**03**

**HTML Document Structure**

**04**

**HTML Common Elements**

**05**

**Section Elements**

**06**

**Semantic web**



```
1  <!DOCTYPE html>
2  <html>
3      <head>
4          <title>Example</title>
5          <link rel="stylesheet" href="sty
6      </head>
7      <body>
8          <h1>
9              <a href="/">Header</a>
10         </h1>
11         <nav>
12             <a href="one/">One</a>
13             <a href="two/">Two</a>
14             <a href="three/">Three</a>
15         </nav>
```

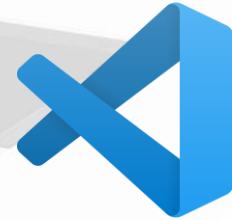
# 1. Hypertext Markup Language

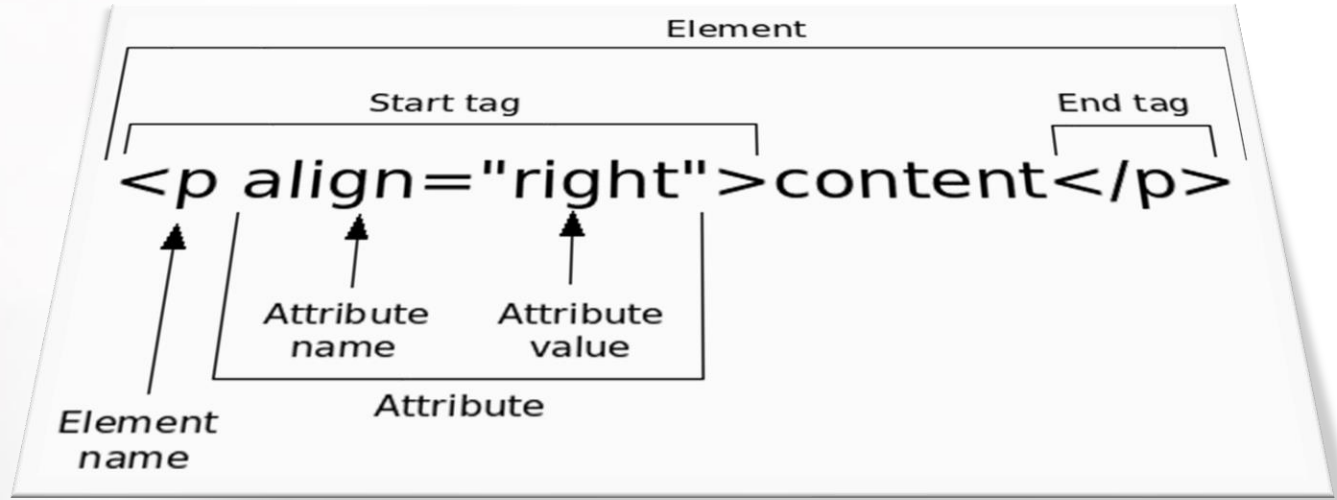
# Hypertext Markup Language

- **HTML – HyperText Markup Language**
  - A **notation for describing**
    - ✓ document structure (semantic markup)
    - ✓ formatting (presentation markup - deprecated)
  - Looks like:  
A Microsoft Word document
- The markup tags **provide information** about the page content structure
- An **HTML** document **consists of many tags**

# Creating HTML Pages

- An **HTML** document must have an **.htm** or **.html** file extension
- **HTML** files can be created with text editors:
  - Notepad / Notepad++
  - Sublime Text
  - Eclipse IDE
  - Visual Studio Code
- Or **HTML** editors (WYSIWYG Editors):
  - Adobe Dreamweaver
  - Microsoft Visual Studio





## 2. HTML Terminology

Tags, Attributes and Elements

# HTML Terminology

## Concepts in **HTML**:

### ▪ **Tag**

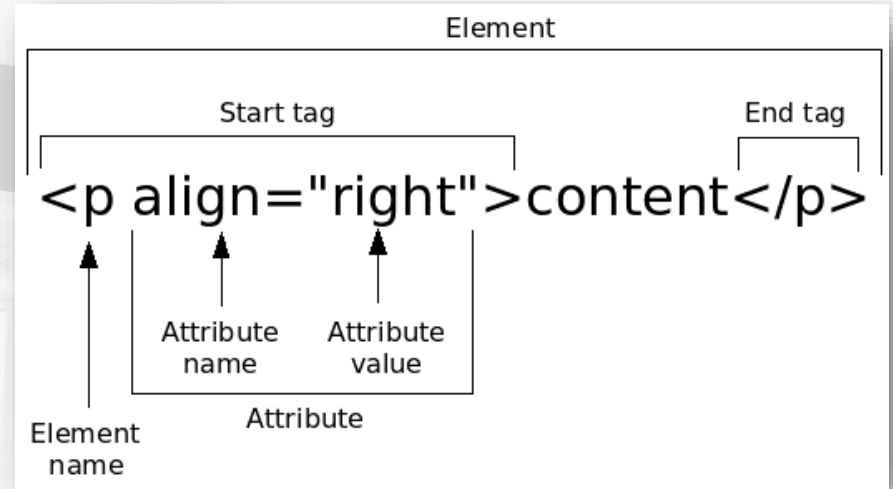
- Opening tag and closing tag
- The smallest piece in HTML

### ▪ **Attributes**

- Properties of the tag
- Size, color, etc.

### ▪ **Elements**

Combination of opening, closing tag and attributes





# HTML Tag

- **Tag** is the **smallest piece** in HTML Document

Start with **<** and end with **>**

- Two kinds of tags

- **Opening**

- Mark the start of an HTML element

- **Closing**

- ✓ Mark the end of an HTML element
    - ✓ Starts with **</**

- **Note:**

Some tags do not have closing tag, such as: img, hr, br,...

```
<html>
  <body>
    <h1>Hello World!</h1>
  </body>
</html>
```

# Attribute

Attribute are a **property of HTML Elements**

- Used to **set** size, color, border, etc.
- Put **directly in the tags**
- Has value surrounded by **single** ' ' or **double** " " quotes  
The value is always a string

```
<!-- makes a hyperlink to Google -->  
<a href="https://google.com">Go to Google</a>
```

```
<!-- makes a horizontal line -->  
<hr width="95%" size="3px" />
```

```
<!-- adds an image in a web page -->  

```

# Most Common Attributes

- There are some **common attributes** for every HTML element
  - **id**, e.g. id = "Footer"
  - **class**, e.g. class = "section-title text-center mb-3"
  - **name**, e.g. name = "FullName"
  - **style**, e.g. style = "color: blue; text-align: center;"
- Some attributes are **specific**

For example:

The attribute **src** of the **img** element

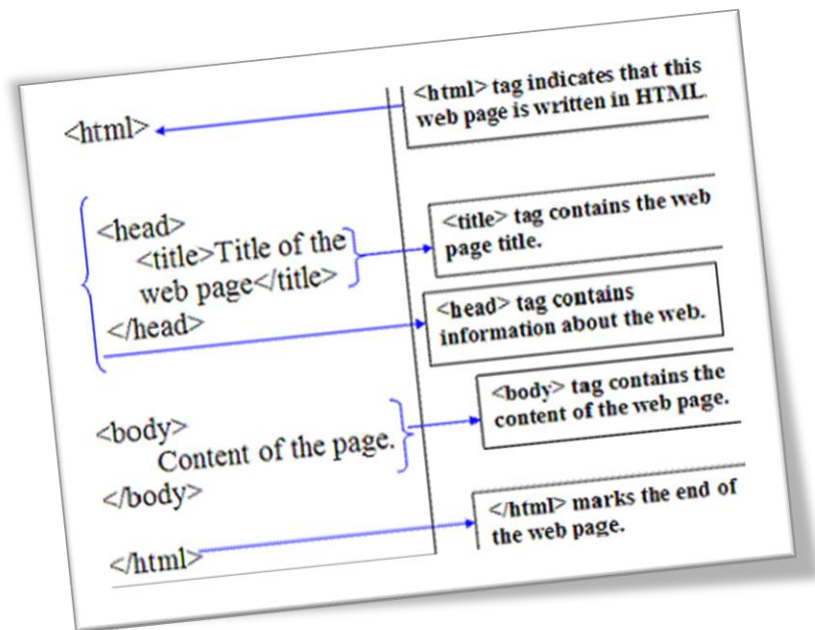
Shows the path to the image to be shown

# HTML Element

HTML Element is **combination of tags and attributes**.

Opening tag with some or none attributes and a closing tag

```
<a href="https://google.com">Go to Google</a>  
<html>...</html>
```



### 3. HTML Document Structure

HTML Document, Doctype, Head, Body

# HTML Document Structure

- Some elements are **essential** to each HTML Document:  
html, head, body, doctype
- The **html** element
  - Used to **mark the beginning** and **ending** of a HTML document
  - All the content of the web page is inside this tag

```
<html>  
    <!-- Content goes here -->  
</html>
```

# Head Element

- The **head** tag contains markup that is not visible to the user  
But **helps the browser** to render correctly the HTML document
- **What is in there?**
  - Styles, scripts
  - Declare encodings
  - ...
  - The **title** tag - the text in the tab of a browser

# Body Element and Doctype

- **body** element contains **all the visible markup to the user**
  - Headings, text, hyperlinks, images,...
  - Textboxes, sliders, buttons,...
- **Doctype** is kind of the validator of the page
  - **Tells the browser** in which version of HTML the page is written
  - HTML 5 Doctype

```
<!DOCTYPE html>
```



# HTML Document Structure Template

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <title>Your web title</title>

    <link rel="icon" href="./images/fav.png" type="image/png">
    <!-- Your styles and scripts here -->
  </head>
  <body>
    <!-- Your code here -->
  </body>
</html>
```



#### DOCUMENT TAGS

<code>&lt;html&gt;...&lt;/html&gt;</code>	The entire document
<code>&lt;head&gt;...&lt;/head&gt;</code>	Document head
<code>&lt;body&gt;...&lt;/body&gt;</code>	Document body
<code>&lt;title&gt;...&lt;/title&gt;</code>	Document title

#### STYLE TAGS

<code>&lt;a&gt;...&lt;/a&gt;</code>	Hyperlink
<code>&lt;b&gt;...&lt;/b&gt;</code>	Bold text
<code>&lt;em&gt;...&lt;/em&gt;</code>	Emphasized text
<code>&lt;font&gt;...&lt;/font&gt;</code>	Changed font

## 4. HTML Common Elements

Used in 90% of all the sites

# Text Formatting

Text formatting tags **modify the text** between the opening tag and the closing tag

- Example: `<b>Hello</b>` makes “**Hello**” bold
- Many of the formatting tags are deprecated

Use CSS instead

# Text Formatting - Tags

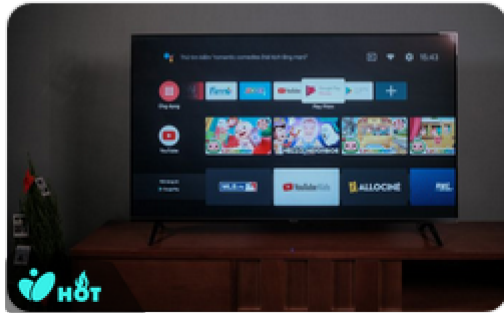
Tags	Meaning
<code>&lt;b&gt;&lt;/b&gt;</code>	
<code>&lt;i&gt;&lt;/i&gt;</code>	
<code>&lt;u&gt;&lt;/u&gt;</code>	
<code>&lt;sup&gt;&lt;/sup&gt;</code>	
<code>&lt;sub&gt;&lt;/sub&gt;</code>	
<code>&lt;strong&gt;&lt;/strong&gt;</code>	
<code>&lt;em&gt;&lt;/em&gt;</code>	

# Text Formatting - Tags

Tags	Meaning
<b></b>	<b>Bold</b>
<i></i>	<i>Italicized</i>
<u></u>	<u>Underlined</u>
<sup></sup>	sample <sup>superscript</sup>
<sub></sub>	sample <sub>subscript</sub>
<strong></strong>	<b>Strong</b>
<em></em>	<i>Emphasized</i>

# How many element types are there?

## Thông tin mới



### Ba vấn đề về việc TV VSmart dùng tấm nền của LG Display (Phần 1)

Chào anh em Tinh Tế, hôm nay mình muốn mở một chủ đề thảo luận xoay quanh VinSmart KE8500, chiếc smart TV vừa ra mắt nhận được nhiều sự chú ý của anh em.



**AmbitiousMan** - 12 giờ trước - 15.367 xem

# Some Simple Tags

- Hyperlink Tag

```
<a href="https://google.com" title="Google link">Go to Google</a>
```

- Image Tag

```

```

```

```

- Text formatting tags

This text is `<em>emphasized.</em>`

`<br/>`new line`<br/>`

This one is `<strong>more emphasized.</strong>`





# What do we call the lists below?

## **LIST 1**

1. Apple
2. Samsung
3. Nokia

## **LIST 2**

- Apple
- Samsung
- Nokia

## **LIST 3**

HTML

A markup language...

CSS

Language used to...

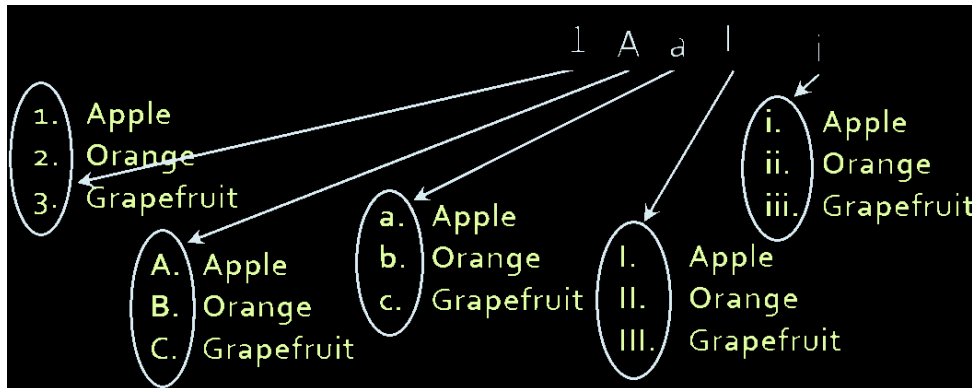
# Ordered Lists: <ol> Tag

- Create an **Ordered List** using <ol></ol>:

```
<ol type="1">  
  <li>Apple</li>  
  <li>Orange</li>  
  <li>Grapefruit</li>  
</ol>
```

← List Item

- Attribute values for **type** are 1, A, a, I, or i

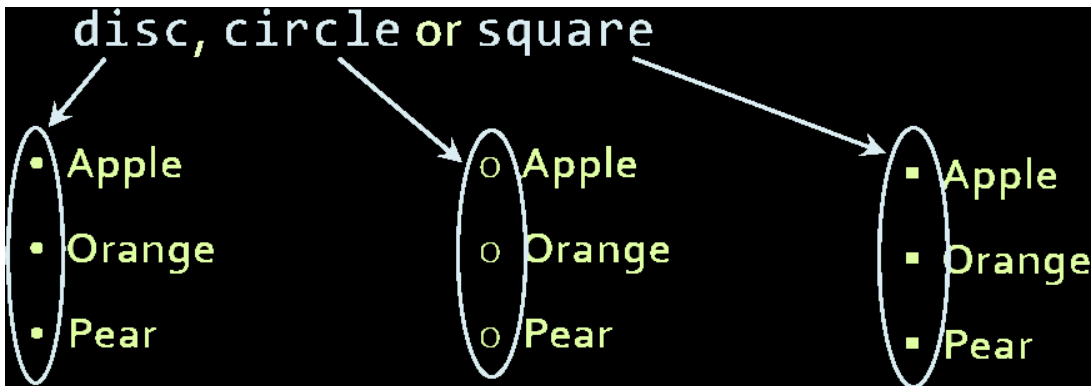


# Unordered Lists: <ul> Tag

- Create an **Unordered List** using <ul></ul>:

```
<ul type="disc">  
  <li>Apple</li>  
  <li>Orange</li>  
  <li>Grapefruit</li>  
</ul>
```

- Attribute values for **type** are: disc, circle or square



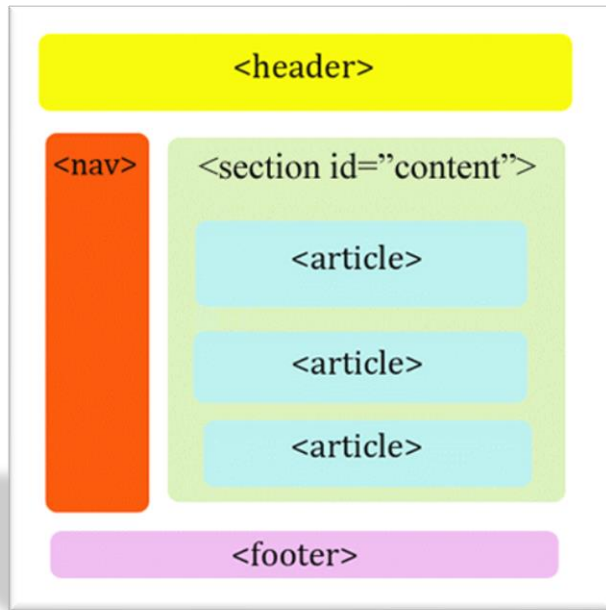
# Definition lists: <dl> tag

Create **definition lists** using **<dl></dl>**

- Pairs of text and associated definition:
  - **text** is in <dt></dt> tag,
  - **definition** in <dd></dd> tag
- Renders **without bullets**
- Definition is **indented**

```
<dl>
  <dt>HTML</dt>
  <dd>A markup language ...</dd>

  <dt>CSS</dt>
  <dd>Language used to ...</dd>
</dl>
```



## 5. Section Elements

The `<div>` and the `<span>`

# The <div> Tag

- <div> creates logical **divisions** within a page
  - **Block** element
  - Used with CSS
  - **Can contains other HTML elements**
- Example:

```
<div style="font-size: 24px; color: red">DIV example</div>
<p>This one is
  <span style="color: red; font-weight: bold">only a test</span>.
</p>
```

# The <span> Tag

- **Inline style** element
- Useful for **modifying a specific portion** of text  
Don't use it to create a separate area (paragraph)  
in the document
- Mainly used to style parts of a text

This one is **only a test.**

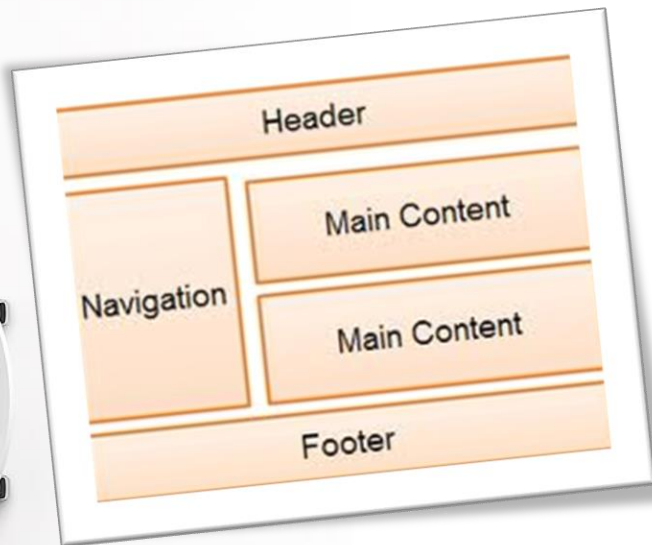
This one is another **TEST.**

```
<p>This one is  
  <span style="color:red; font-weight:bold">only a test</span>.  
</p>  
<p>This one is another  
  <span style="font-size:32px; font-weight:bold">TEST</span>.  
</p>
```



## 6. Semantic Web





```
<address> <div>  
<ul> </fieldset> <  
</em> <h1>  
<form>  
<a> </ol> <head>  
<p> <table> <abl  
..
```

# The Semantic HTML

About 13,140,000,000 results (1.06 seconds)

www.w3schools.com > html > html\_intro ▾

## Introduction to HTML - W3Schools

**HTML** stands for Hyper Text Markup Language. **HTML** is the standard markup language for creating Web pages. **HTML** describes the structure of a Web page. **HTML** consists of a series of elements. **HTML** elements tell the browser how to display the content.

### People also ask

What is HTML simple definition? ▾

What is HTML and why it is used? ▾

What is HTML for beginners? ▾

What is HTML in computer? ▾

Feedback

www.w3schools.com > whatis > whatis\_html ▾

## What is HTML - W3Schools

Example Explained · The <! · The <html> element is the root element of an **HTML** page · The lang attribute defines the language of the document · The <meta> ...

en.wikipedia.org > wiki > HTML ▾

## HTML - Wikipedia



## HTML

Programming language

Hypertext Markup Language is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets and scripting languages such as JavaScript. [Wikipedia](#)

**Developed by:** WHATWG

**Type of format:** Document file format

**Extended from:** SGML

**Extended to:** XHTML

**Container for:** HTML elements

**Contained by:** Web browser

Font size

# Semantic HTML

- Semantic HTML is:
  - The use of HTML markup to reinforce the semantics of the information in Web pages  
Make the **content understandable** for computers
  - Rather than merely to define its presentation
  - A kind of **metadata** about the HTML content
- Semantic HTML is processed by regular Web browsers and other user agents  
CSS is used to suggest its presentation to human users

# Why Use Semantic HTML?

Semantic HTML is:

- Easier to read by developers, parsers, bots, machines, AIs
- A way to the search engines show the correct content



# How To Write Semantic HTML?

Just follow some guidelines when creating a Web site:

- Use **HTML5** semantic **tags**

`<header>`, `<nav>`, `<main>`, `<section>`, `<article>`, `<aside>`, `<footer>`

- Use **Headings** when you need to structure the content into sub-headings

In increasing order, starting with `<h1>`

- Do **not** use **empty tags**

Like a clearing `<div>`





Semantic Tags for better SEO

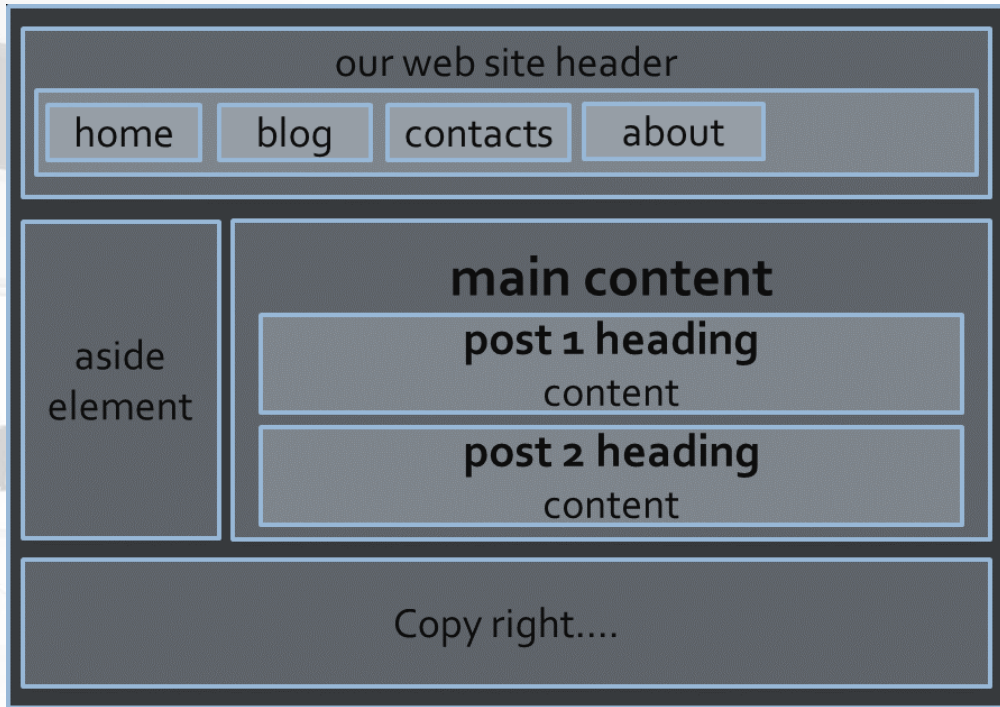
# HTML5 Semantic Tags

# HTML5 Semantic Tags

HTML5 introduces semantic structure tags

- Imagine the following site:

- This is a common Web page structure  
Used in 90% of the web sites



# HTML5 Semantic Tags

- This can be created using all kind of HTML elements
  - <div>, <span>, even <p>
  - Browsers will render invalid / wrong / valid HTML
- **The correct way:** use the HTML 5 semantic tags:
  - <header> ... </header>
  - <nav> ... </nav>
  - <main> ... </main>
  - <article> ... </article>
  - <section> ... </section>
  - <aside> ... </aside>
  - <footer> ... </footer>



# HTML5 Structure Tags

- **<main>**
  - Specifies the **main content** of a document
  - There must **not be more than one** <main> element in a document
- **<header>**
  - Site header or section header or article header
  - Could include navigation (<nav>)
- **<footer>**
  - Site footer (sometime can be a section footer)
  - Providing author, copyright data,...

# HTML5 Structure Tags

- **<nav>**
  - Defines a set of navigation links
  - E.g. site navigation (usually in the header)
- **<aside>**
  - Content slightly related to primary content
  - E.g. sidebar (usually on the left or on the right)
- **<section>**
  - Grouping of content usually with a heading, similar to chapters
  - Site section (e.g. news, comments, links,...)

# HTML5 Structure Tags

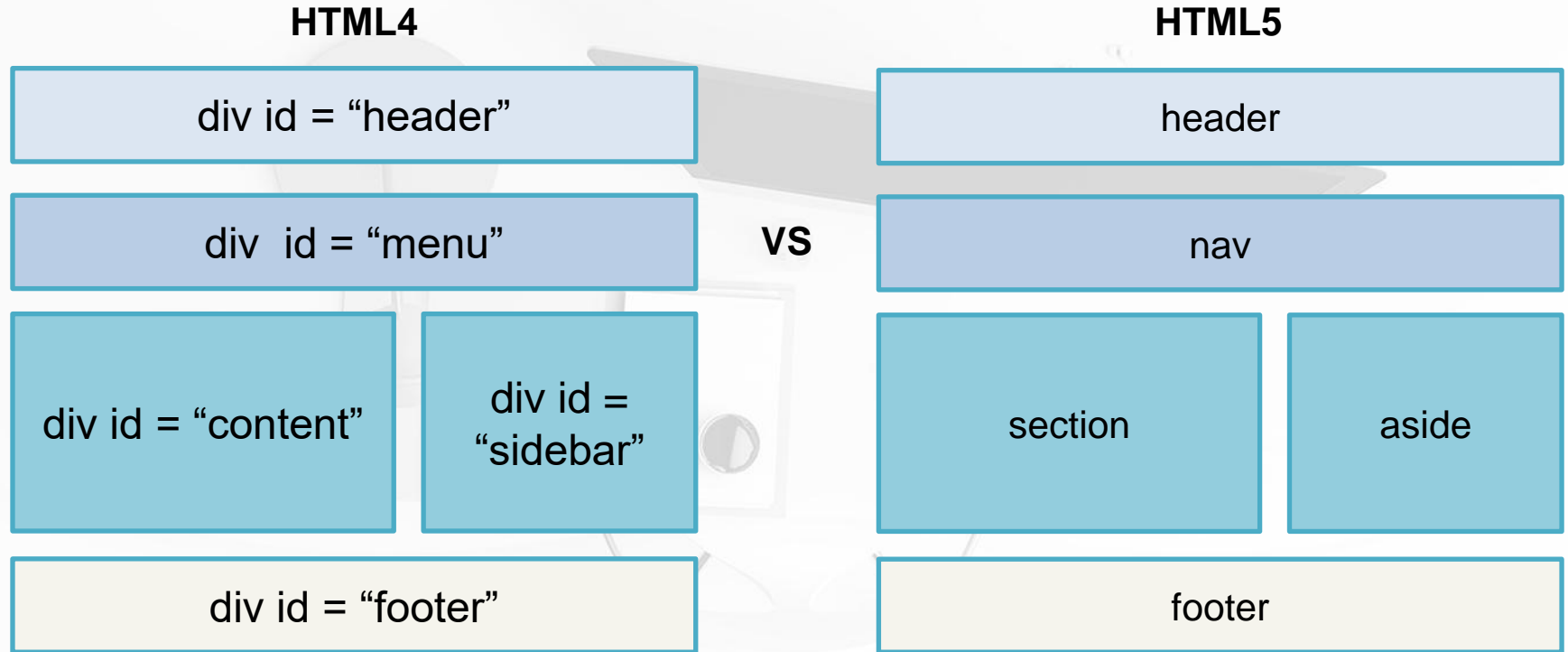
- **<article>**  
Independent content such as blog post or an article (e.g. news item)
- **<time>**  
Specifies date/time (for a post / article / news)
- **<figure>**
  - Grouping stand-alone content (video or image)
  - Figure (a figure, e.g. inside an article)
- **<figcaption>**  
A caption of a figure (inside the <figure> tag)
- [More info](#)

# The Structure of a Web Page

A sample layout structure of a Web Page



# Differences between HTML4 and HTML5



# The “HTML 4 and Before” Way

Using **divs** with **IDs**

```
<html>
<head>...</head>
<body>
  <div id="header">...</div>
  <div id="navigation">...</div>
  <div id="sidebar">...</div>
  <div id="content">...</div>
  <div id="footer">...</div>
</body>
</html>
```

# The HTML5 Way

- In **HTML5**, there are **semantic tags** for layout  
<nav>, <header>, <footer>, <main>
- Work only in **newer browsers**

```
<html>
<head>...</head>
<body>
  <header>...</header>
  <nav>...</nav>
  <aside>...</aside>
  <main>...</main>
  <footer>...</footer>
</body>
</html>
```



# Other Semantics

Headings, ems, strongs



# Other Semantics

## ▪ Headings

Always use headings (**<h1> – <h6>**) when you need a heading or title

- Like in a MS Word document
- Google uses it to mark important content

## ▪ Strong **<strong>** vs. Bold **<b>**

- **<b>** does not mean anything

It just makes the text bolder

- **<strong>** marks the text is “stronger” than the other, surrounding text

# What do we call the lists below?

- Emphasis `<em>` vs. Italic `<i>`

- Emphasis does not always mean, that the code should be italic

It could be bolder, italic and underlined

- The styles for the emphasis text should be set with CSS

Not by HTML

- A screen reader will pronounce the words in `<em>` with an emphasis, using verbal stress.



# Search Engine Optimization

Getting ahead in search engines

# Search Engine Optimization

- Search engines use so-called “**crawlers**” to get the content of the page and index it
- The crawlers weigh the data on the page
  - **<title>**, **page URL** and **headings** have great weight
  - Links from highly valued pages to your page increase its value (Google **Page Rank**)
  - Add **alt** text and **loading=“lazy”** attribute to images
  - Use relevant keywords in the content and **<meta>** tags
- **No SEO technique will replace good content**



MICRODATA



# Structured Data Markup

Annotate your content so machines can understand it

# Structured Data Markup

- A standard way to annotate your content so machines can understand it
- Google (and other search engines) can
  - use that data to index your content better
  - present it more prominently in search results

**Spanakopita (Greek Spinach Pie) Recipe - Allrecipes.com**  
 [allrecipes.com/recipe/spanakopita-greek-spin...](https://allrecipes.com/recipe/spanakopita-greek-spin...) Allrecipes.com  
★★★★★ Rating: 4.5 - 431 reviews - 1 hr 30 mins - 528 cal  
This is an authentic, really rich pie stuffed with spinach, onions, cheeses and herbs that are all enfolded by crispy, flaky phyllo dough.  
[Read Reviews](#) - [29 Photos](#) - [Recipes Like](#)

- provide answers from the Knowledge Graph



Keith Urban > Upcoming events

Feb 14 San Antonio, TX  
Sat San Antonio Livestock Show

Jun 12 Hunter, NY  
Fri Taste of Country Music Festival at Hu...

Jun 18 Sheridan, WY  
Thu

Jun 19 Grand Junction, CO  
Fri

# Structured Data Markup

Three alternative formats:

- **Microdata** and **RDFa**

- Define new HTML attributes
- [More info](#)

- **JSON-LD**

- Newest and simplest markup format
- Embed a block of JSON data inside a script tag
- ✓ [Specification](#)
- ✓ [Examples](#)

# Remember

- It is important to have the **correct vision** and **attitude** towards HTML
  - **HTML is only about structure**, not appearance
  - Browsers **tolerate invalid HTML code** and parse errors – you should not
  - Always think about **semantics**
- The **W3C HTML Validator** is a way to validate HTML  
<http://validator.w3.org/>



# Summary

- HTML structure
- The common tag attributes: class, id, name, style
- Text Formatting tags: b, strong, i
- Structural tags: header, nav, main, section, aside, footer
- The common tags: a [href], img [src, alt, loading="lazy"], h1-h6, p, div, span, ul, ol, li
- All tags:
  - <https://www.w3schools.com/TAGs/default.asp>
  - <https://developer.mozilla.org/en-US/docs/Web/HTML/Element>

# Exercise

Write the HTML tags of the Lani & Dani webpage.





**Q&A**