Web Development Using HTML

Internet Programming I: Chapter 2

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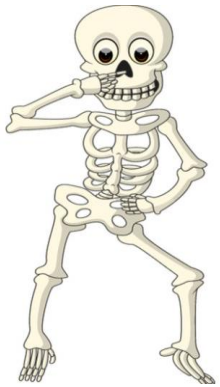
The core Web development technologies

- HTML, CSS and JavaScript are the basic building block and core web development technologies.

HTML	CSS	JavaScript
Structure	**Presentation**	**Behavior**
• Crate the structure of the website	• Stylize the layout of the website	• Add interactivity to the website



What is the Difference

source: https://admin.brytdesigns.com/

HTML
Hypertext Markup Language

Create the structure
- Controls the layout of the content
- Provides structure for the web page design
- The fundamental building block of any web page

CSS
Cascading Style Sheet

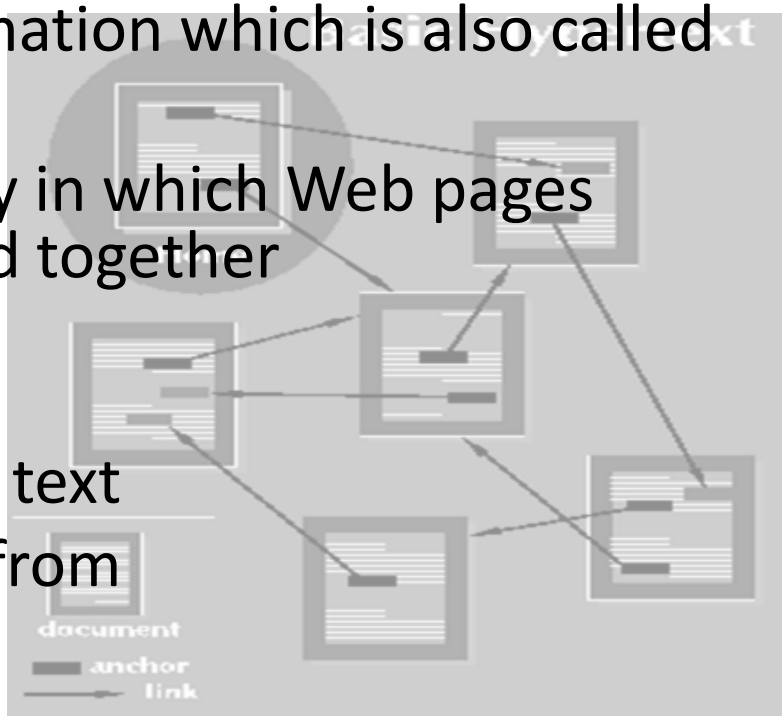
Stylize the website
- Applies style to the web page elements
- Targets various screen sizes to make web pages responsive
- Primarily handles the "look and feel" of a web page

Javascript

Increase interactivity
- Adds interactivity to a web page
- Handles complex functions and features
- Programmatic code which enhances functionality

Hypertext

- HTML Stands for Hypertext Markup Language
- Hypertext basically refers to Non-sequentially linked pieces of text or other information which is also called “Nodes”
- More specifically it is the way in which Web pages (HTML documents) are linked together



Goal

Allow to access and read text and other information from multiple perspectives

Markup Language

- Markup originally refers to the handwritten indicators on an author's manuscripts.
- The idea of markup Notify a typesetter the layout of a document and the typeface to use
- A markup language is a set of characters or symbols that define a document's logical structure.
- In other words, it refers to the use of set of characters within a piece of information that can be used to process or identify that information in a particular way
- It composed of set of symbols called markup tags.

HTML (Hypertext Markup Language)

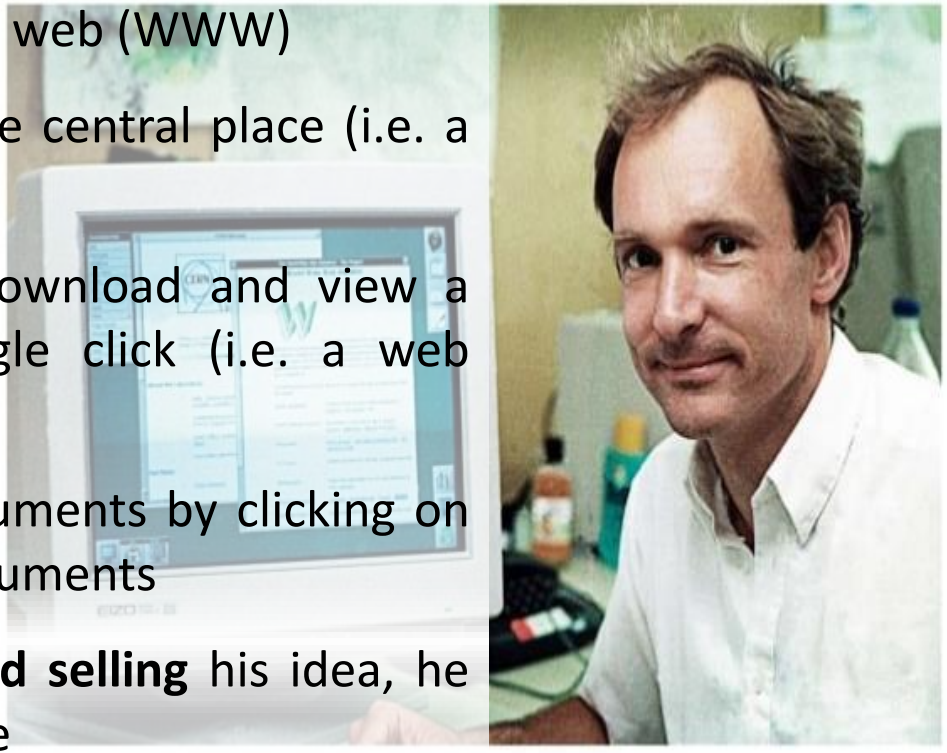
- It is a markup language which based on Standard Generalized Markup Language (SGML)
- SGML is a standard for specifying a markup language or tag set
- SGML Itself is not a document language, but a description of how to specify one and create a document type definition (DTD)
- It define the structure of information on the Web page
- It doesn’t describe the actual presentation of a document
- It tells the web browser what content to display.
- Use a pre-defined set of tags to identify the webpage content types .
- It is not a programming language.

HTML

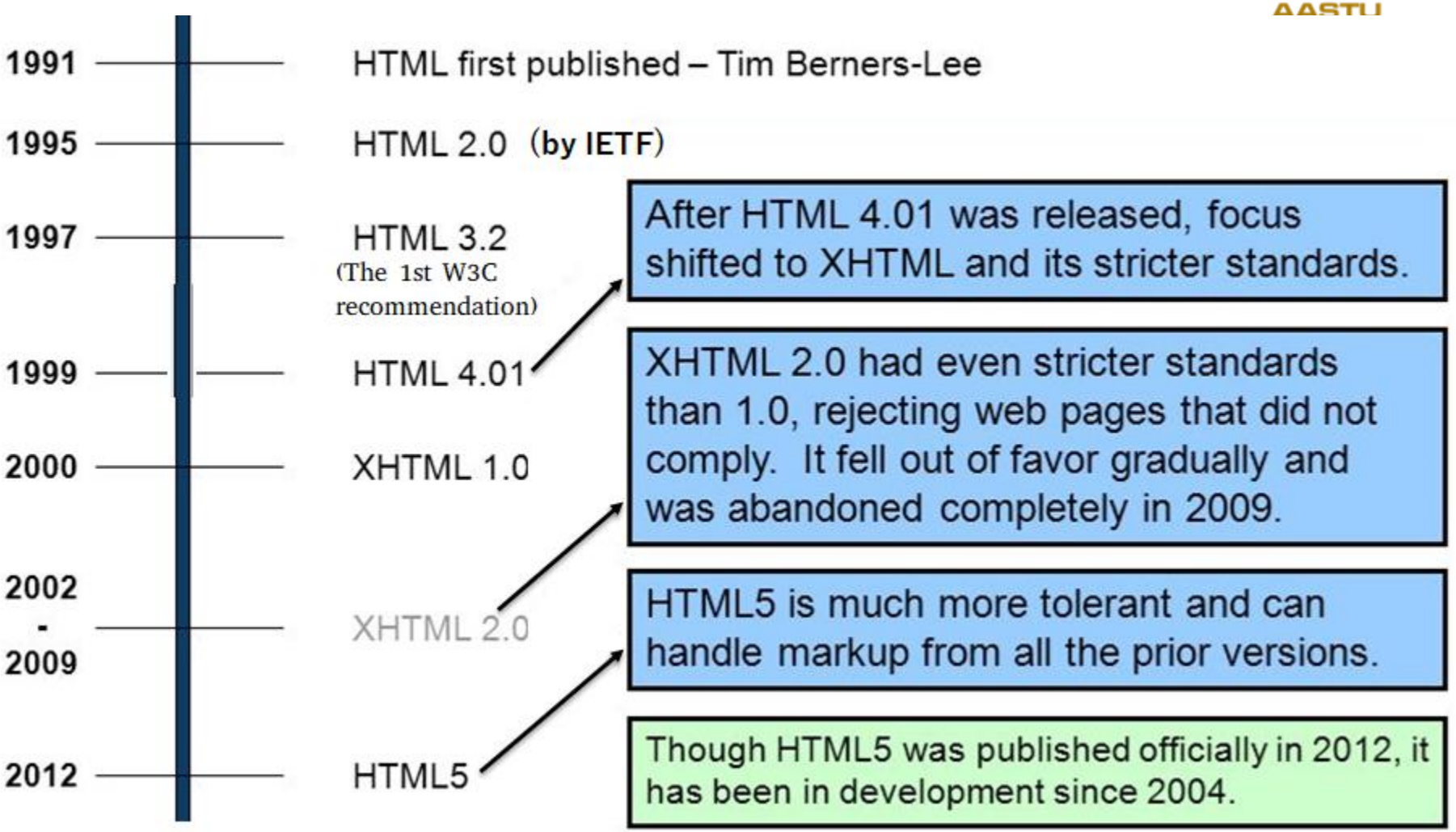
- HTML is a language made up of elements, which can be applied to pieces of text to give them different meaning in a document
  - Is it a paragraph?
  - Is it a bulleted list?
  - Is it part of a table?
- Structure a document into logical sections
  - Does it have a header?
  - Three columns of content?
  - A navigation menu?
- Embed content such as images and videos into a page

The evolution of HTML

- Before 1990 there was no easy way to find, download and view documents over the internet
- HTML, initially invented by in 1991 by Tim Berners Lee
- **Tim** invented a system – the web (WWW)
  - Store documents in one central place (i.e. a web server)
  - Make it possible to download and view a document with a single click (i.e. a web browser)
  - Allow to find new documents by clicking on “links” inside other documents
  - Instead of **licensing and selling** his idea, he made free for every one



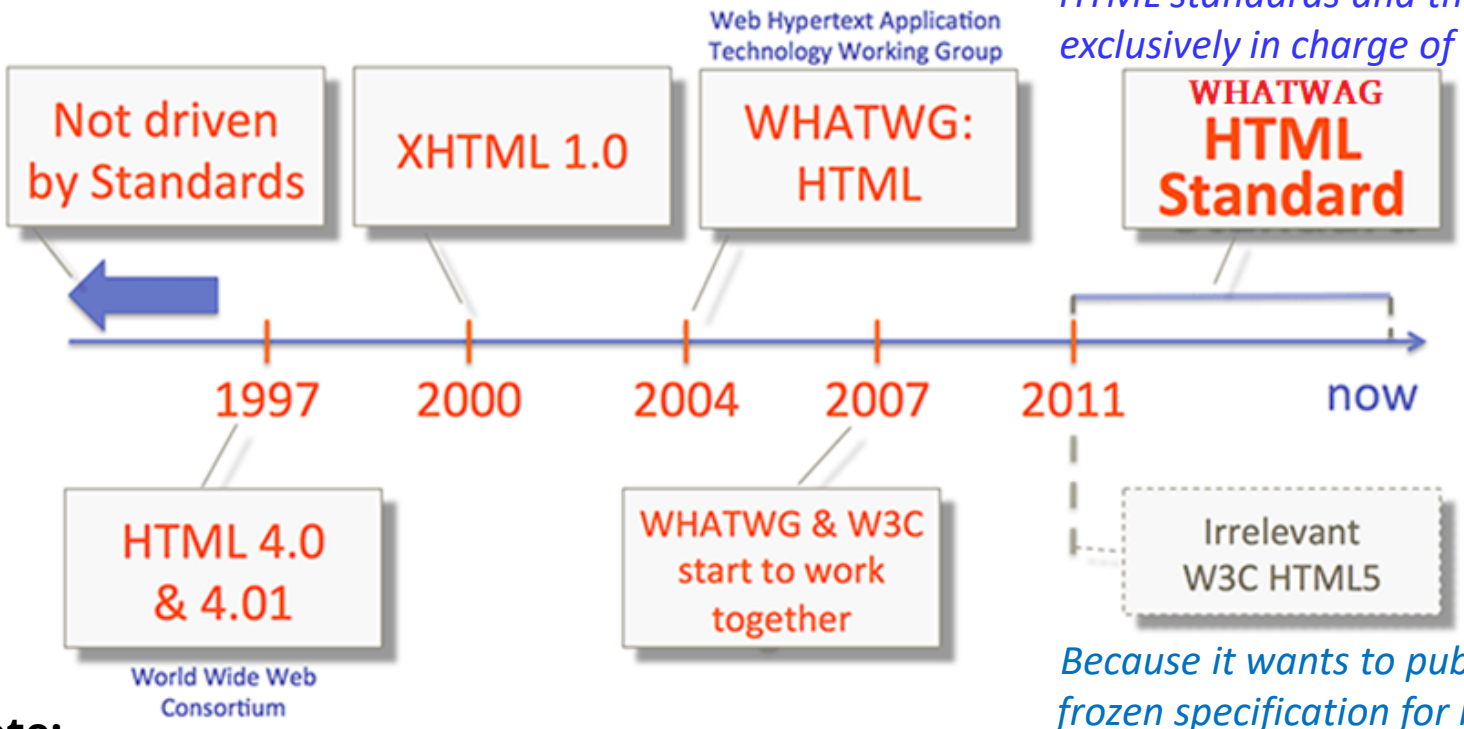
The evolution of HTML cont'd



HTML Standardization history

- Before 1997, there were no HTML standards, so browsers basically did whatever they wanted
- Particularly 1993 – 1997 (The “War” Years), HTML was being defined by the elements that browser software developers chose to implement
- They invented new tags or implemented the same tags differently which was kind of the wild west of the web
- Around 1997, the W3C came up with the first standard that browsers started to pay attention to
- The W3C defined HTML version 4 (or HTML4) which it shortly thereafter updated to HTML4.01

HTML Standardization history cont'd



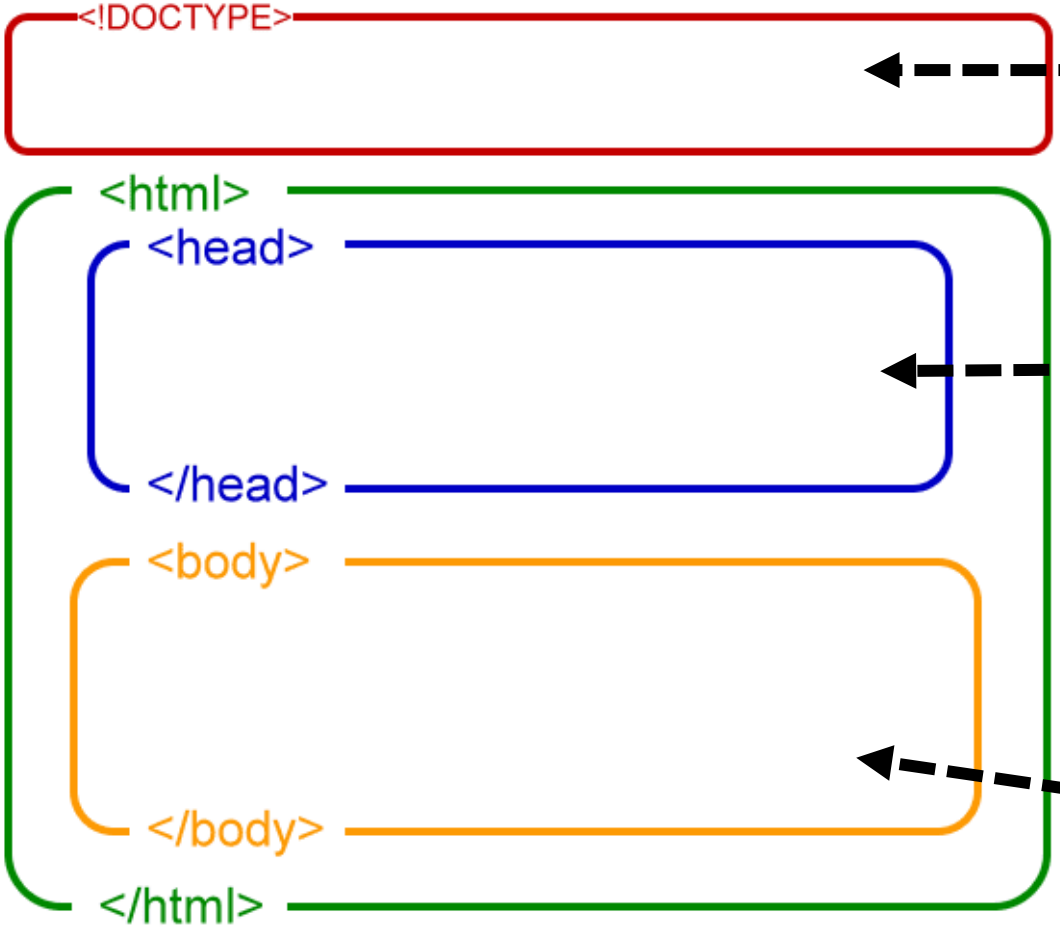
Note:

- **W3C** is the main international standards organization for the Web
- **WHATWG –** established in 2004 by the browser vendors

HTML5

- Current version of standard HTML which was defined in 2012 by WHATWAG
- It is cross-platform. It will display content on a desktop computer, laptop, a tablet, smartphone, a notebook or a Smart TV
- All major browsers support most of the HTML5 elements
- Key features
- Multimedia elements
- Graphics elements
- Offline support
- Semantics markups

Basic Structure of HTML Document



- *Tell the browser the type of HTML standard*
- *Must appear first*

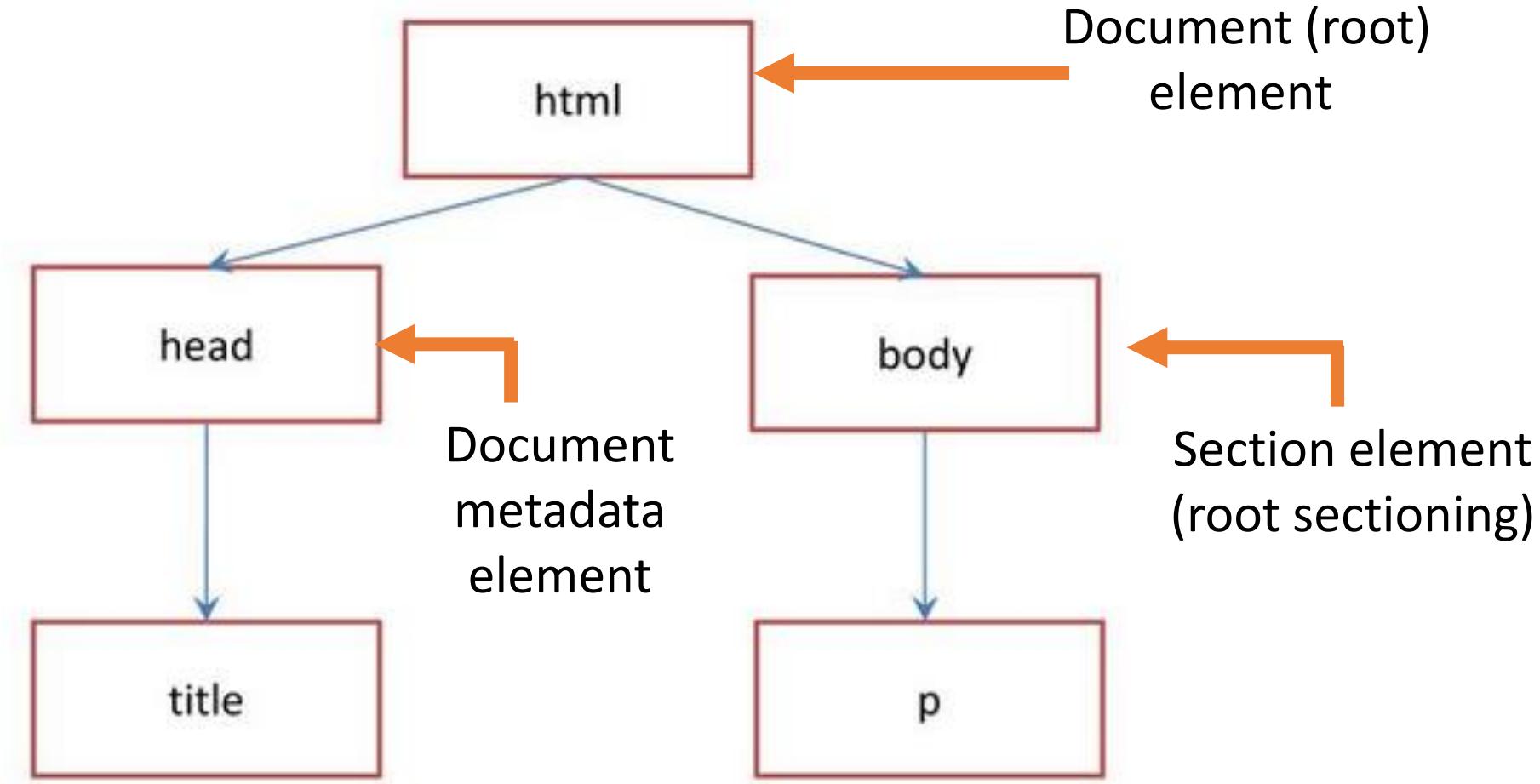
- *Contain html document meta info, links, style sheet and scripts etc.*
- *These are non web displayable info*

- Contains the content that displays in the browser

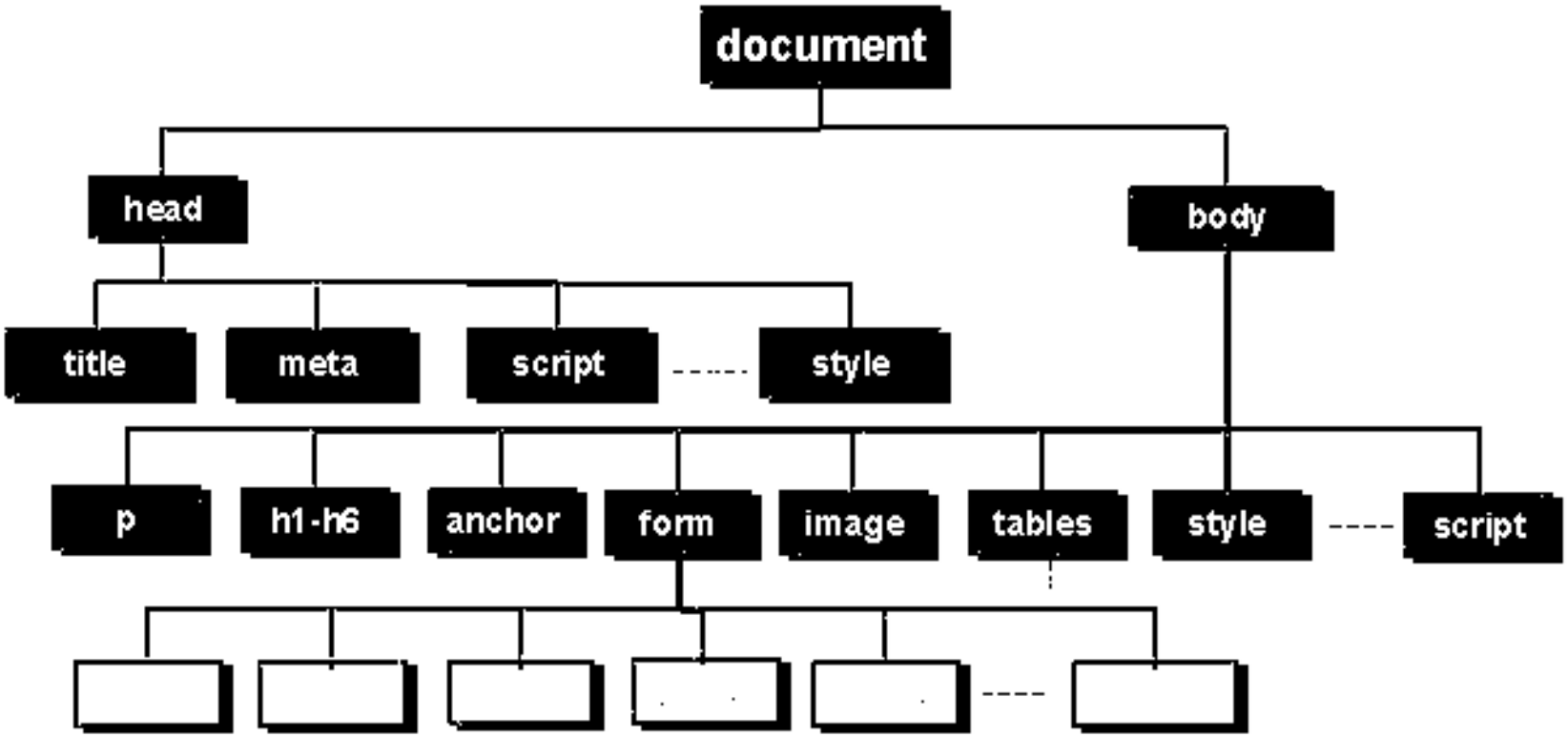
Basic HTML Page Example

```
<html>
    <head>
        <title>Hello World </title>
    </head>
    <body>
        <p>Welcome to the World </p>
    </body>
</html>
```

Tree structure of HTML Document



Tree structure of HTML Document cont'd



Tree structure of HTML Document

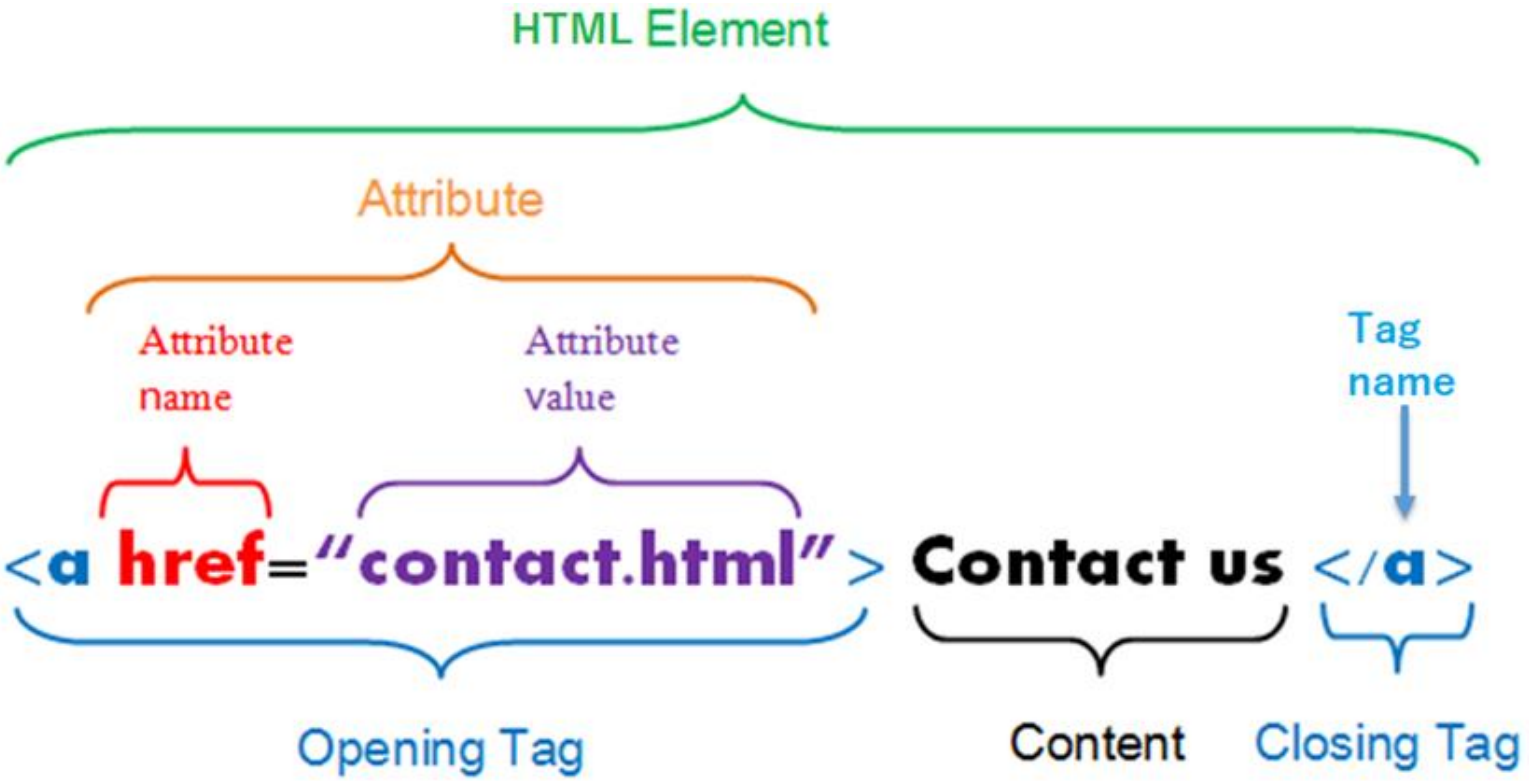
Inside the body section

- Text formatting
- Links
- Table
- From
- Images and multimedia
- Embedded elements
- Interactive elements
- Graphics etc.

Inside the head section

- Title
- Style
- Script /no script
- Meta
- Link
- base

Anatomy of HTML Elements/Tags



- **Syntax:**

  <tag attribute = “Value”> Content </tag>

Anatomy of HTML Elements/Tags cont'd

HTML elements

- Represent some kind of structure
- It is a combination of a tag and its character data (content)
- HTML can be Empty element or Nested element also

Nested Element

- An element that contain other HTML elements

Empty Element

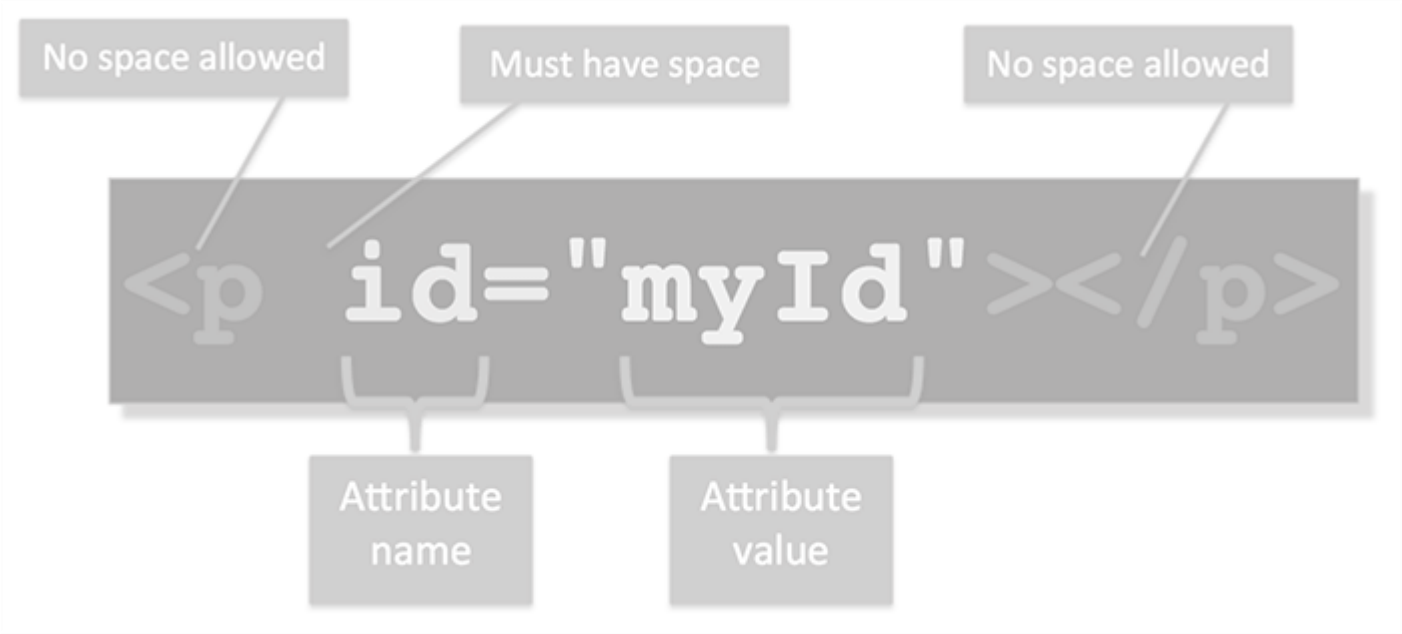
- An element with no character data (content)
- Also called Non-container tags or self closing tags
- Syntax: <self-closing-tag-name/>

Anatomy of HTML Elements/Tags cont'd

- HTML Tags
  - Used to markup the text (content)
  - Most of the tags come in as start and end tag pairs
  - However, empty element tags doesn't come in pairs
  - The start tag may contain an attribute

- HTML attributes
  - Defines a property for an elements
  - It is a way to describe the tags
  - It must enclosed within the start tag
  - It comes in a name/value pairs
  - The value should enclosed within double quote
  - An element can have one or more attributes
  - Global attributes - common to all HTML elements

Simple Rule



Also:

- Don’t forget the End tag.
- Even though HTML is case insensitive use lowercase Tags

HTML elements reference

- The HTML elements are grouped by function to help you find what you have in mind easily
- For details of each element under the below mentioned group just **ctrl +click** on the element category

- Document metadata
- Sectioning root
- Content sectioning
- Text content
- Inline text semantics
- Image and multimedia
- Embedded content
- SVG and MathML
- Scripting
- Demarcating edits
- Table content
- Forms
- Interactive elements
- deprecated elements

Content Model in HTML

- Content Model refers to the **set of rules** that define what type of content each element is allowed to have.
- Mostly, this translates into what other elements are allowed to be nested inside which other elements.
- Prior to the modern HTML specification, HTML elements were either **block-level or inline elements**
- Modern HTML specification split these two content models into seven basic models
- However, in practical terms, you can still think of those seven models as falling into the same traditional categories: block-level and inline elements

Content Model in HTML cont'd

Block-level Elements

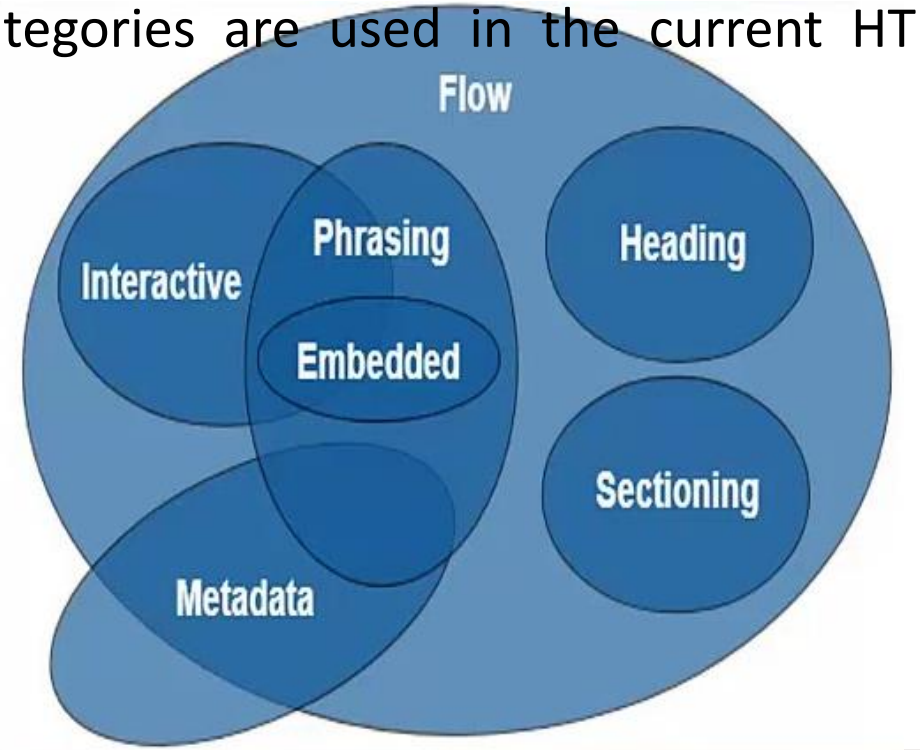
- By default, Block-level elements render (displayed) to begin on a new line (i.e. the browser will automatically place the contents of that element on a new line in the flow of the document

Inline Elements

- Render on the same line by default
- Having new line characters in the content or between the tags in your code won't make any difference
- All those space characters get translated into a single space anyway and the whole bunch of inline elements still be displayed on the same line
- Inline elements are restricted to only contain other inline elements

Modern HTML Content Models

- Each elements in HTML5 falls into zero or more categories that group elements with similar characteristics
- The following broad categories are used in the current HTML specification:
  - Metadata content
  - Flow content
  - Sectioning content
  - Heading content
  - Phrasing content
  - Embedded content
  - Interactive content



Document structure elements

This meta element defines a description of your page:

```
<META name="description" content="Free Web tutorials on HTML, CSS, XML, and XHTML" />
```

This meta element defines keywords for your page: (for search engine)

```
<META name="keywords" content="HTML, DHTML, CSS, XML, XHTML, JavaScript" />
```

This demonstrates how to redirect a user if your site address has changed:

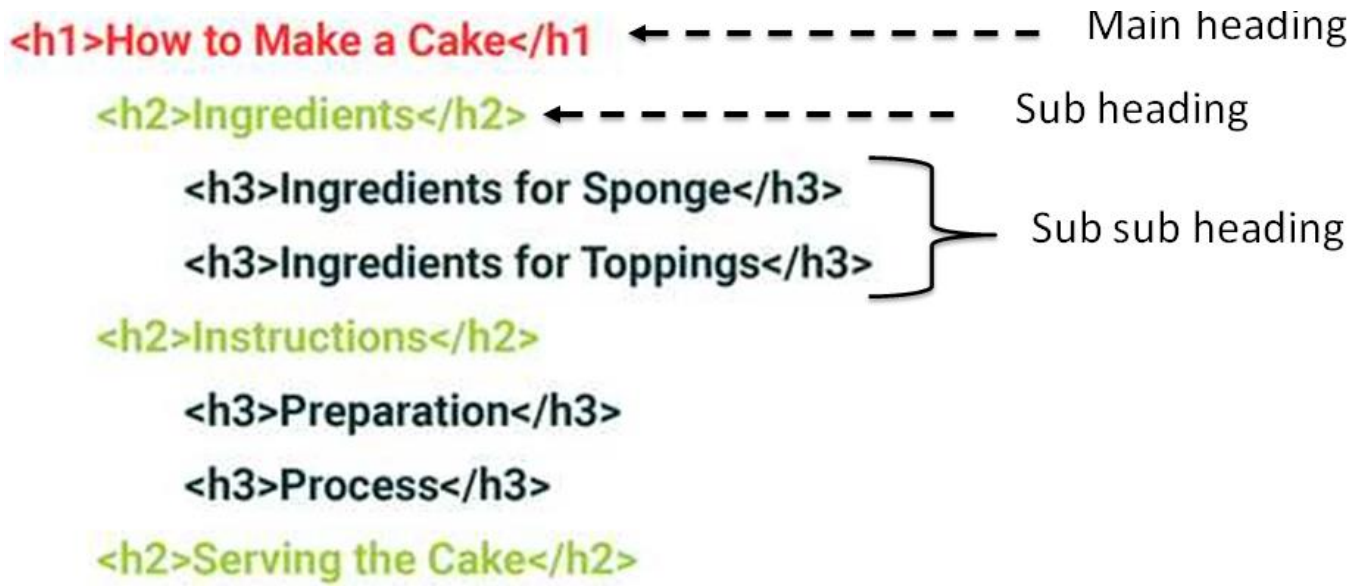
```
<META  http-equiv=“Refresh” content=“5;url=http://www.w3schools.com” />
```

This meta element defines character set:

```
<META http-equiv="Content-Type" content=“text/html; charset=UTF-8” />
```

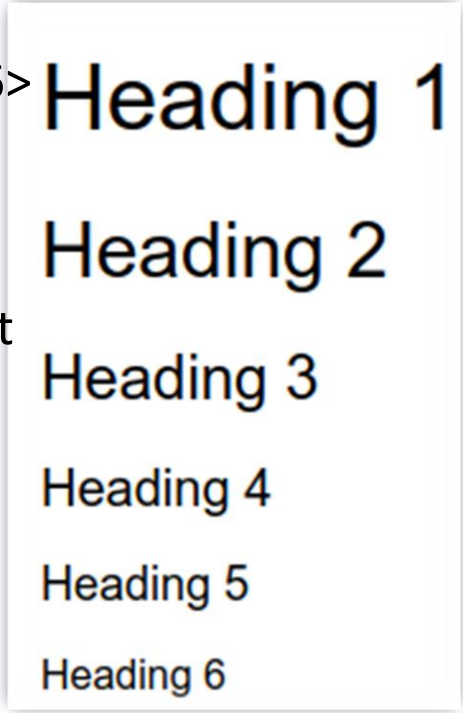
Text Markup Elements

- Heading elements
  - In the same way that a book has the main title, chapter titles, and subtitles, an HTML document can too.



Text Markup Elements cont'd

- Heading elements allow you to specify that certain parts of your content are headings
- HTML contains 6 section heading levels, <h1> to <h6>
- The heading element importance level
  - <h1> define the most important (highest) heading level
  - <h6> define the lowest (less important) headings
- Commonly 3 to 4 heading elements are used at most
- The heading Tags are block level elements.
- It's content model categories are flow content and heading content
- These elements only include the global attributes



Text Markup Elements cont'd

- Heading information
  - Allow search engines to index the structure and content of your web pages
  - Users often skim a page by its headings and determine the content layout of web page automatically.
  - Also it is a common navigation technique for users of screen reading software to jump from heading to heading and quickly determine the content of the page.
- As a result,
  - Avoid skipping heading levels: always start from <h1>, followed by <h2> and so on
  - Use only one <h1> per page or view (considered a best practice)
  - <h1> should concisely describe the overall purpose of the content.
  - It is important to use headings to show the document structure.
  - Avoid using heading elements to resize text (i.e. to make text BIG or bold).

Text Markup Elements cont'd

Paragraph elements

- HTML paragraphs any structural grouping of related content, such as texts, images or form fields
- The <p> HTML element represents a paragraph
- It belongs flow content category
- Paragraphs are block-level elements and
  - Always starts on a new line
  - Browsers automatically add white space (margin) before and after a paragraph
- This element only includes the global attributes
- Breaking up content into paragraphs helps make a page more accessible
- Allow screen-readers to provide shortcuts that let their users skip to the next or previous paragraph, and skim the content

Text Markup Elements cont'd

- **HTML <p> content display**
  - 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 HTML code.
  - The browser will automatically remove any extra spaces and lines.
- **Note:**
  - Don't use empty <p> which is problematic for people who use screen-reading technology.

```
<p>
This paragraph contains a lot of
in the source code,but the browse
ignores it.
</p>

<p>
This paragraph
contains      a lot of spaces
in the source     code,
but the    browser
ignores it.
</p>
```

Output of the example

This paragraph contains a lot of lines in the source code, but the browser ignores it.

This paragraph contains a lot of spaces in the source code, but the browser ignores it.

Text Markup Elements cont'd

<pre> elements

- Represents preformatted text which is to be presented exactly as written in the HTML file
  - The text is typically rendered using a non-proportional, or "monospaced", font
  - Unlike <p> element, it preserves whitespace both spaces and line breaks:
- Provide an alternate description for any images or diagrams
- It is a block-level element which belongs to flow content category

```
<pre>
    _____________________________
&lt; I'm an expert in my field. &gt;
    -----------------------------
        \   ^__^
         \  (oo)\_______
            (__)\       )\/\
                ||----w |
                ||     ||
</pre>
```

Output

```
 _____________________________
< I'm an expert in my field. >
 -----------------------------
      \   ^__^
       \  (oo)\_______
          (__)\       )\/\
              ||----w |
              ||     ||
```

Text Markup Elements cont'd

Line break elements (<hr> and <br>)

<hr/>

- Represents a thematic break between paragraph-level elements:
- E.g., a change of scene in a story, or a shift of topic within a section.
- Displayed as a horizontal rule in visual browsers

**
**

- Produces a line break in text (carriage-return)
- It is useful for writing a poem or an address, where the division of lines is significant
- Only enter line breaks, not to add space between paragraphs

- Both <hr> and <br> support both global attributes and event attributes
- Both are block-level elements,
- <hr> is flow content whereas <br> is phrasing content

Text Markup Elements cont'd

```
<p> §1: The first rule of Fight Club is: You
do not talk about Fight Club. </p>
<hr/>
<p> §2: The second rule of Fight Club is:
Always bring cupcakes. </p>
```

Output

§1: The first rule of Fight Club is: You do not talk about Fight Club.

§2: The second rule of Fight Club is: Always bring cupcakes.

```
<h3>A Poem</h3>

<p> O'er all the hilltops<br>
    Is quiet now,<br>
    In all the treetops<br>
    Hearest thou<br>
    Hardly a breath;<br>
    The birds are asleep in the trees:<br>
    Wait, soon like these<br>
    Thou too shalt rest.
</p>
```

Output

A Poem

O'er all the hilltops
Is quiet now,
In all the treetops
Hearest thou
Hardly a breath;
The birds are asleep in the trees:
Wait, soon like these
Thou too shalt rest.

Text Markup Elements cont'd

List elements

- HTML offers web developers mechanisms to group a set of related items in lists
- HTML lists are used to present list of information in well-formed and semantic way
- There are three main types of list in HTML, each one has a specific purpose

➢ *Used to create a list of related items, in no particular order*

Unordered List

- The first item
- The second item
- The third item
- The fourth item

➢ *Used to create a list of terms and their descriptions.*

Ordered List

1. The first item
2. The second item
3. The third item
4. The fourth item

➢ *Used to create a list of related items, in a specific order.*

Description List

The first item
Description of item
The second item
Description of item

Text Markup Elements cont'd

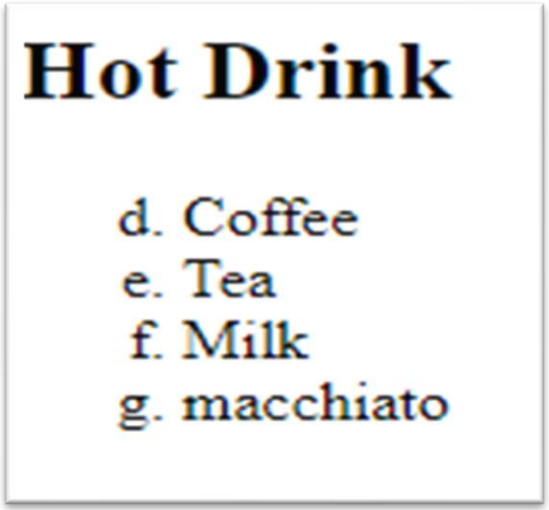
No	List element	Attribute(s)	Attribute value(s)
1		type	Circle / disc / square / triangle
2		reversed	Boolean
		type	1 (default), A / a / I / i
		start	integer - indicates the current ordinal value of list item
3		value	Integer - start counting from for the list items.
		type	1 (default) A / a / I / i
4	<dd>	nowrap	Yes/no (default), If the value is set to yes, the definition text will not wrap

Text Markup Elements cont'd

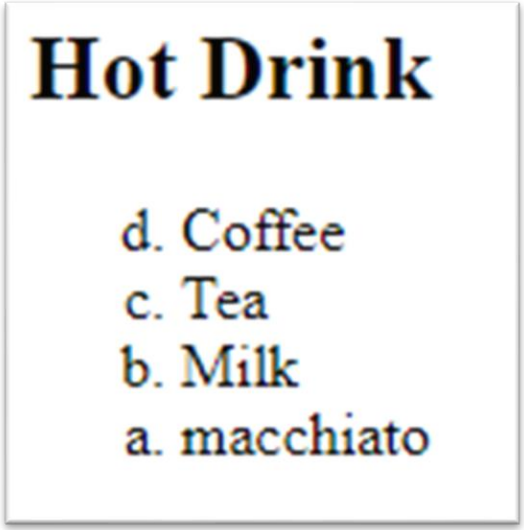
Example: Ordered list

```
<h2>Hot Drink</h2>
<ol>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
  <li>macchiato</li>
</ol>
```


```
<h2>Hot Drink</h2>
<ol type="a" start = "4">
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
  <li>macchiato</li>
</ol>
```




```
<h2>Hot Drink</h2>
<ol type="a" reversed = "1">
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
  <li>macchiato</li>
</ol>
```



Text Markup Elements cont'd

Example: Unordered list

```
<ul>
  <li>Fruit
    <ul>
      <li>Bananas</
      <li>Apples
        <ul>
          <li>Gree
          <li>Red</
        </ul>
      </li>
      <li>Pears</li>
    </ul>
  </li>
  <li>Vegetables</li>
  <li>Meat</li>
</ul>
```

- Fruit
  - Bananas
  - Apples
    - Green
    - Red
  - Pears
- Vegetables
- Meat

Nested list

```
<ol>
  <li>Fruit
    <ul type = "disc">
      <li>Bananas</li>
      <li>Apples
        <ul type = "circle">
          <li>Green</li>
          <li>Red</li>
        </ul>
      </li>
      <li>Pear</li>
    </ul>
  </li>
  <li>Vegetab</li>
  <li>Meat</li>
</ol>
```

1. Fruit
   - Bananas
   - Apples
     - Green
     - Red
   - Pears
2. Vegetables
3. Meat

Text Markup Elements cont'd

Example: Description list

```
<h2>Acronym List</h2>

<dl>
  <dt>HTML</dt>
  <dd>- Hypertext Markup Langu
  <dt>CSS</dt>
  <dd>- Cascading Style Sheet</dd>
  <dt>PHP</dt>
  <dd>- Hypertext Preprocessor</dd>
</dl>
```

Text Markup Elements cont'd

Text formatting elements

- HTML provides several tags that you can use to make some text on your web pages to appear differently than normal text
- Formatting elements were designed to display special types of text:

Tag	Description
<b>	Defines bold text
<big>	Defines big text
	Defines emphasized text
<i>	Defines italic text
<small>	Defines small text
	Defines strong text

Tag	Description
<sub>	Defines subscripted text
<sup>	Defines superscripted text
<s>	Renders text with a strikethrough but not important when indicating document edits
<u>	Deprecated. But in use for different purpose

Text Markup Elements cont'd

Demarcating and Quotation Elements

Tag	Description
<ins>	Defines inserted text
<del>	Defines deleted text
<mark>	Marked text
<samp>	sample output of a computer program
<code>	To show the computer code - Like a programming code
<kbd>	keyboard input text
<var>	To display the text as a variable - Like Programming variable

Text Markup Elements cont'd

Example

`<i>Italic</i>`	*Italic*
`<b>Bold</b>`	**Bold**
`<em>Emphasized</em>`	*Emphasized*
`<strong>Strong</strong>`	**Strong**
`<small>small</small>`	small
`<del>Deleted</del>`	~~Deleted~~
`<ins>Inserted</ins>`	Inserted
`v<sub>f</sub>`	v_f
`a<sup>2</sup>`	a^2
`<mark>Marked</mark>`	Marked

Text Markup Elements cont'd

HTML Citations and Definition Elements

Tag	Description
<abbr>	Defines an abbreviation
<acronym>	Defines an acronym
<address>	Defines contact information for the author/owner of a document
<bdo>	Defines the text direction
<blockquote>	Defines a long quotation
<q>	Defines a short quotation
<cite>	Defines a citation
<dfn>	Defines a definition term

HTML Entity and Comment

- A piece of text ("string") that begins with an ampersand (&) and ends with a semicolon (;)
- Frequently used to display
- Reserved characters (which would otherwise be interpreted as HTML code)
- Invisible characters (like non-breaking spaces).
- Characters that are difficult to type with a standard keyboard.
- Syntax:
  - &entity_name; OR &#entity_number;
- An entity name is easy to remember but browsers may not support all entity names. Therefore, the support for entity numbers is good.

HTML Entity and Comment cont'd

- HTML reserved character Entities

Character	Description	Entity Name	Entity Number
	non-breaking space		
<	less than	&lt;	&#60;
>	greater than	&gt;	&#62;
&	ampersand	&amp;	&#38;
"	double quotation mark	&quot;	&#34;
'	single quotation mark (apostrophe)	&apos;	&#39;
«	Left-pointing double angle quotation mark	&laquo;	&#171;
»	Right-pointing double angle quotation mark	&raquo;	&#187;

HTML Entity and Comment cont'd

- HTML reserved character Entities

Character	Entity Name	Entity Number	Description
¢	¢	¢	Cent
£	£	£	Pound
¤	¤	¤	General currency
€	€	€	Euro
¢	¢	¢	Cent
©	©	©	Copyright
®	®	®	Registered
™	™	™	Trademark

HTML Comment

- The syntax to add comments to your HTML source is as follow

```
<!-- Write your comments
goes here -->
```

- Notice that there is an exclamation point (!) in the start tag, but not in the end tag.
- Used to hide content - comments are not displayed by the browser, but they can help document your HTML source code.
- With comments you can place notifications and reminders in your HTML code and improve code readability.

HTML Comment cont'd

- Example: Comment

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

<p>This is a paragraph.</p>
<!--
<p>Look at this cool image:</p>
<img border="0" src="pic_trulli.jpg" alt="Trulli">
-->
<p>This is a paragraph too.</p>

</body>
</html>
```

This is a paragraph.

This is a paragraph too.