

# Web Design and Programming (0107558) Internet Programming (0107571)<sup>1</sup>

Markup Languages HTML5

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<sup>1</sup>Michael Mendez. *The Missing Link: An Introduction to Web Development and Programming*. Open SUNY Textbooks 2014.

# Introduction

## Document markup

- ▶ Defines how particular pieces of information are meant to be formatted.
- ▶ HTML: hypertext markup language. Standard tags.
- ▶ XML: extensible markup language. User defined tags
- ▶ XHTML: extensible hypertext markup language. Standard tags. Some tags differs from HTML.

# HTML5

## HTML5

- ▶ It is the latest version of HTML.
- ▶ It can be used to embed other file formats like videos, audio files, documents like PDFs and spreadsheets, among others.
- ▶ HTML5 elements are supported by the newer versions of most of the popular browsers.

# W3C Standards

## W3C

- ▶ The World Wide Web Consortium, or W3C (<https://www.w3.org/>), is an international community that supports web development through the creation of open standards that provide the best user experience possible for the widest audience of users.
- ▶ The W3C determines how CSS and HTML should operate, what tags should be included as features, and more.
- ▶ The W3C is also your best reference point in determining the accessibility of your site through the use of tools that analyze your code for W3C compliance.
- ▶ The W3C provides tutorials and examples and is likely the most exhaustive reference you will find.

# CSS: Cascading Style Sheets

- ▶ Creates rules about the color, font, and layout of our pages.
- ▶ Our best approach is to use HTML to define the **structure** (and only structure) of our pages whenever possible, laying the groundwork for CSS to know where to apply the actual style.

# HTML, CSS and JavaScripts

Role of each component of a website



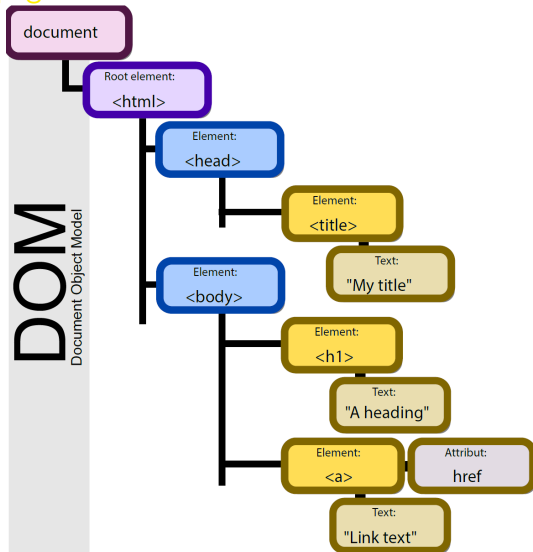
# DOM: Document Object Model

## DOM

- ▶ Every webpage can be broken down into a mathematical tree structure called the Document Object Model (DOM).
- ▶ Each HTML tag is a node in the tree and these nodes have all types of different attributes, such as text, background color, width, etc.

# DOM: Document Object Model

DOM, all pages should follow





# Creating HTML Files

## Format and type

- ▶ Default name is index.htm or index.html
- ▶ The first line of HTML5 file is **<!DOCTYPE html>**

# Creating HTML Files

## Learning HTML

- ▶ In the beginning you worry about **syntax**
  - ▶ What tags are there?
  - ▶ Did I remember to “end” my tag?
- ▶ Later, you will worry about **semantics**
  - ▶ Is there a tag that better conveys the meaning I am trying to get across?
  - ▶ If someone is searching my page can they find what they need and access it easily?

# Page Layout

## Tags, Attributes

hello.html

```
<!DOCTYPE html>
<html>
  <head>
  </head>
  <body>
    <header>
    </header>
    Hello World!
    <footer>
    </footer>
  </body>
</html>
```

Some tags, like those for including images, do not need a closing tag in order to work as no content is necessary inside the tags.

# Creating HTML Files

## Head

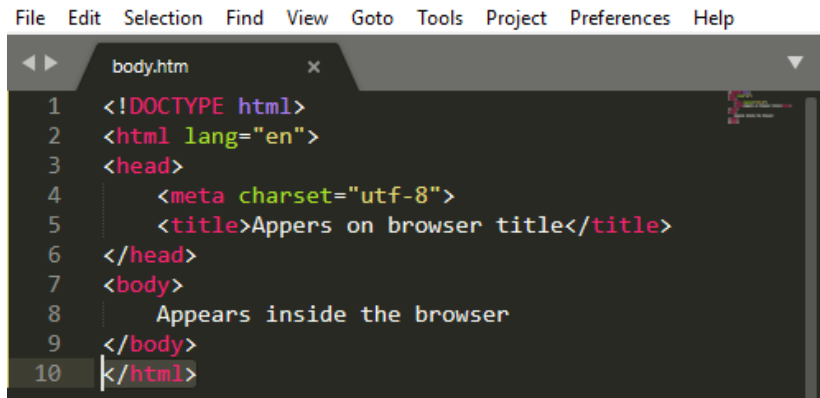
- ▶ Contains additional information:
  - ▶ metadata: language, title.
  - ▶ Connection to any other resources like scripts and files that are not part of the page.
- ▶ Examples of metadata:
  - ▶ title (title tag).
  - ▶ keywords (meta tag).
  - ▶ description (meta tag).
  - ▶ other details (meta tag).
- ▶ Other than title, meta-data is not displayed

```
<head>  
  <title>Our First Page</title>  
  <meta name="keywords" content="beginning html, learning, IP" />  
  <meta name="description" content="A beginning web page for IP course" />  
  <meta name="author" content="Odat" />  
</head>
```

# Creating HTML Files

## body. Bulk of your page

- ▶ Important to write well-formatted (tree-like) code.
- ▶ Most of the content is displayed by the browser, but there may be some meta-data too.

A screenshot of a code editor window titled 'body.htm'. The editor has a menu bar with 'File', 'Edit', 'Selection', 'Find', 'View', 'Goto', 'Tools', 'Project', 'Preferences', and 'Help'. The code is written in a dark-themed editor with syntax highlighting. The code is as follows:

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4     <meta charset="utf-8">
5     <title>Appers on browser title</title>
6 </head>
7 <body>
8     Appers inside the browser
9 </body>
10 </html>
```

# Creating HTML Files

## Validate the Code

- ▶ Go to "<https://validator.w3.org/>".
- ▶ You can validate your code against standard by pasting it there as one option.

# Creating HTML Files

## Tags

- ▶ Tags have beginning and an end.
  - ▶ `<h1> Text </h1>`, (`<h1>`: beginning tag, `</h1>`: closing tag).
  - ▶ ``, (self beginning and closing tag).
- ▶ Some tags have **attributes** (src, href, etc..)

# Display attribute

## The two most common display attributes

[displayinline.htm](#)

- ▶ block (can take width and height): Newline is inserted before and after, e.g. it “Takes up” whole width
- ▶ inline (can not take width and height): Only uses as much space as needed to contain the element.



# Common tags

## Block tags

- ▶ Headings
  - ▶ `<h1>`, `<h2>`, `<h3>`, `<h4>`, `<h5>`, `<h6>`
  - ▶ These tags have syntax and semantics
- ▶ Paragraphs (block)
  - ▶ `<p> ... </p>`
  - ▶ Should only contain inline elements
- ▶ Divs (block)
  - ▶ `<div> ... </div>`
  - ▶ Generic section that is larger than a paragraph

# Common tags

## Inline tags

- ▶ `< span >`
- ▶ `< button >`
- ▶ `< br >`
- ▶ `< input >`
- ▶ `< a >`

# Common tags

## More tags

### Ordered list

```
<ol>
  <li> Item One </li>
  <li> Item Two </li>
</ol>
```

Line breaks: `<br>`

### Unordered list

lists.html

```
<ul>
  <li> Item One </li>
  <li> Item Two </li>
</ul>
```

# Attributes

- ▶ Attributes provide additional information about an element.
- ▶ Always specified in the **start tag**.
- ▶ Attributes come in name/value pairs.

# Images

## Images

img.htm

**Inline tag.** You have to carefully name and resize your image to fit the place.

```
<img src = "myPicture.jpg" alt = "Image of Odat"  
title="Instructor photo" class = "thumbnail"/>
```

# More Attributes

- ▶ class – applies special properties to groups of elements
- ▶ id – specifies a unique id to one element on the page
- ▶ style – specifies a certain visual style (avoid this one!!!)
- ▶ accesskey – a shortcut key to activate an element
- ▶ tabindex – the order elements will come into focus

# Special entities

## Special entities

If you want ...

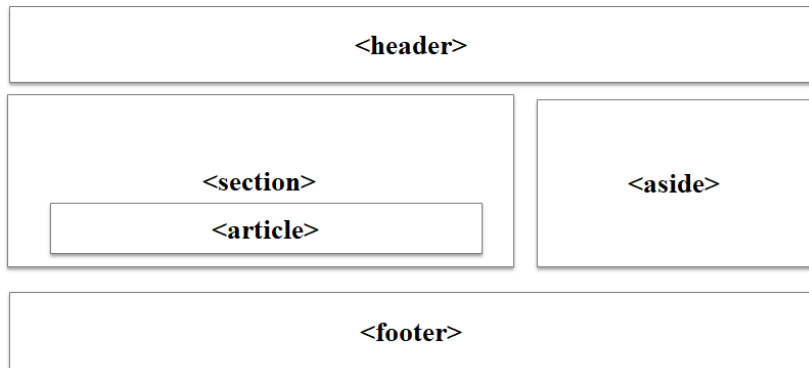
- ▶ <
- ▶ >
- ▶ ©
- ▶ blank space.
- ▶ ¢
- ▶ &

Then use ...

- ▶ &lt;
- ▶ &gt;
- ▶ &copy;
- ▶ &nbsp;
- ▶ &cent;
- ▶ &amp;

<specialentities.html>

# How to design





# How to design

## Using Semantic Tags

- ▶ `<div>` was a way to group related content together.
- ▶ Dirs almost always had special classes/ids associated with them:
  - ▶ `<div class = "header"> ... </div>`
  - ▶ `<div class = "section"> ... </div>`
  - ▶ `<div class = "footer"> ... </div>`

# How to design

`<header>`

A group of introductory or navigational aids: title, navigation links, etc.

```
<header>  
  <h1>This is the Title</h1>  
  <h2>The author is Odat</h2>  
</header>
```

# How to design

## <nav>

- ▶ A section of the page that links to other pages or to parts within the page.

```
<nav>
  <ul>
    <li><a href="#overview">Overview</a></li>
    <li><a href="#history">History</a></li>
    <li><a href="#development">Development</a></li>
  </ul>
</nav>
```

- ▶ Often found in the <header> tag.

# How to design

## <footer>

- ▶ A section that contains info such as copyright data, related documents, and links to social media.

```
<footer>  
  &copy; 2020 by Odat<br>  
  <a href="http://www.ttu.edu.jo">Tafila Technical University</a>  
</footer>
```

- ▶ Typically at the bottom of the page, but not required.

# How to design

## <figure>

- ▶ More semantics than < *img* >. Can include caption.

```
<figure>  
    
  <figcaption>Ghana Will Experience Serious Snow In 2020</figcaption>  
</figure>
```

# How to design

## Other new tags

- ▶ Structural Elements
  - ▶ article, aside, main, menuitem, summary, section
- ▶ Form Elements
  - ▶ datalist, keygen, output
- ▶ Input Types
  - ▶ color, date, email, list
- ▶ Graphics Elements
  - ▶ canvas, svg
- ▶ Media Elements
  - ▶ audio, embed, source, track, video

# How to design

Images. `<img>` tag includes width and height attributes.

- ▶ Default size:

```
<figure>
  
  <figcaption>Default image size</figcaption>
</figure>
```

- ▶ Using width:

```
<figure>
  
  <figcaption>Set image width in pixels</figcaption>
</figure>
```

- ▶ Using width and height:

```
<figure>
  
  <figcaption>Set image width and height in pixels</figcaption>
</figure>
```

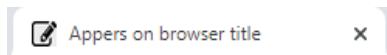
- ▶ Using relative size (to display size):

```
<figure>
  
  <figcaption>Relative image size</figcaption>
</figure>
```

# How to design

## Favicons

- ▶ You can put image/logo/icon next to the title of your page (in the tab)



- ▶ Must go in <head> section

```
<head>  
  <link rel="icon" type="image/png" href="icon.jpg">
```



# Hyperlinks

## Anchor tag <a>

[hyperlinks.htm](http://www.ttu.edu.jo)

```
<a href="http://www.ttu.edu.jo">Tafila Technical University</a>
```

- ▶ The <a> tag stands for anchor link. Needs a hyper-reference AND content:
  - ▶ href: reference to location of new content
  - ▶ content: the “clickable” part (text or image)

# Hyperlinks

## Types of Linking

- ▶ Absolute. "http://www.ttu.edu.jo"
- ▶ Base. Server path "/docs/x.html"
- ▶ Relative Path. "../y.html"
- ▶ Within the Page. See next example

# Hyperlinks

Linking to another part of the page

```
<a name="Our reference"></a>
<figure> ...
</figure>
<figure> ...
</figure>
<figure> ...
</figure>
<figure> ...
</figure>
<a href="#Our reference"> To first image</a>
```

# Hyperlinks

## Targets

Value	Description
<code>_blank</code>	Opens the linked document in a new window or tab
<code>_self</code>	Opens the linked document in the same frame (this is default)
<code>_parent</code>	Opens the linked document in the parent frame
<code>_top</code>	Opens the linked document in the full body of the window
<code>framename</code>	Opens the linked document in a named frame

# Media support

## Media support

- ▶ HTML5 has added both audio and video tags to make it easier to integrate media into our pages.
- ▶ These tags make embedding media easier, but (so far) are limited in the number of file formats they support and it depends on the browser.

Browser	MP4	WebM	Ogg
Internet Explorer	YES	NO	NO
Chrome	YES	YES	YES
Firefox	YES	YES	YES
Safari	YES	NO	NO
Opera	YES (from Opera 25)	YES	YES

# Media support

## <video> attributes

multimedia.htm

- ▶ autoplay: automatically playing
- ▶ looping: looping the file
- ▶ controls: on screen controls
- ▶ preload: preloading the video before it is played
- ▶ onerror: error handling
- ▶ poster: displaying an image when the file is not in use
- ▶ width
- ▶ height
- ▶ src: video file.

```
<video controls>  
  <source src="small.ogv" type="video/ogg">  
  <source src="small.webm" type="video/webm">  
</video>
```

# Media support

<audio>

```
<audio src="applause.ogg" controls=""></audio>
```

# Tables

<table>

tables.htm

- ▶ Keep your table for showing formatted data not for look and feel.
- ▶ Don't use tables for content organization, instead use div or span.

```
<table>
  <tr><th>ID</th><th>Name</th><th>Age</th></tr> <!--Header row-->
  <tr><td>1</td><td>Ali</td><td>23</td></tr><!--First row -->
</table>
```



# Tables

## <table>

- ▶ colspan attribute of <td>.
- ▶ rowspan attribute of <td>.

```
<table>
  <tr>
    <th>ID</th>
    <th>Name</th>
    <th>S</th>
    <th>M</th>
    <th>T</th>
    <th>W</th>
    <th>T</th>
    <th>F</th>
    <th>S</th>
  </tr>
  <tr>
    <td>1</td>
    <td>Ali</td>
    <td colspan="2">Off</td>
    <td>Counter</td>
    <td>Shelfs</td>
    <td>Store</td>
    <td rowspan="2">Closed</td>
    <td>Gate</td>
  </tr>
  <tr>
    <td>2</td>
    <td>Omar</td>
    <td>Counter</td>
    <td>Shelfs</td>
    <td colspan="2">Off</td>
    <td>Gate</td>
    <td>Store</td>
  </tr>
</table>
```

ID	Name	S	M	T	W	T	F	S
1	Ali	Off		Counter	Shelfs	Store	Closed	Gate
2	Omar	Counter	Shelfs	Off		Gate	Closed	Store

# Tables

## Table caption

Adds caption to your table.

```
<table>
  <caption>Students info.</caption>
  <tr><th>ID</th><th>Name</th><th>Age</th></tr> <!--Headr row-->
  <tr><td>1</td><td>Ali</td><td>23</td></tr><!--First row -->
  <tr><td>2</td><td>Omar</td><td>22</td></tr><!--First row -->
</table>
```

Students info.

ID	Name	Age
1	Ali	23
2	Omar	22