

# LECTURE 02: HYPERTEXT MARKUP LANGUAGE (HTML)

## Web Programming



**INSTRUCTOR: DR. HOSSAM ZAWBAA**

# HTML HISTORY

Version	Year
Tim Berners-Lee invented www	1989
Tim Berners-Lee invented <b>HTML</b>	<b>1991</b>
Dave Raggett drafted HTML+	1993
HTML Working Group defined HTML 2.0	1995
W3C Recommended HTML 3.2	1997
W3C Recommended HTML 4.01	1999
W3C Recommended <b>XHTML</b> 1.0	<b>2000</b>
<b>HTML5</b> WHATWG First Public Draft	2008
HTML5 WHATWG Living Standard	2012
<b>HTML5</b> W3C Final Recommendation	<b>2014</b>

The Web Hypertext Application Technology Working Group (**WHATWG**) is a community of people interested in evolving HTML and related technologies.

# HTML BASICS

## HYPertext MARKUP LANGUAGE (HTML)

- describes the content and structure of information on a web page
- surrounds text content with opening and closing tags
- each tag's name is called an element
  - syntax: `<element> content </element>`
  - example: `<p>This is a paragraph</p>`
- **most whitespace is insignificant in HTML**  
(it gets ignored or collapsed into a single space)

# XHTML

- A newer version of HTML, standardized in 2000
- Uses a markup format called XHTML (XML + HTML = XHTML)
- Though the browser will accept some distorted HTML, we'll write "strict" XHTML that complies to the official web standards
- **A strict XHTML page uses some different syntax and tags**

# STRUCTURE OF AN XHTML PAGE

- the header describes the page and the body contains the page's contents
- an HTML page is saved into a file ending with extension **.html**

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
"http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">

<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    information about the page
  </head>

  <body>
    page contents
  </body>
</html>
```

# PAGE TITLE: <TITLE>

- describes the title of the web page
- placed within the head of the page
- displayed in the web browser's title bar and when bookmarking the page

## HTML

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN" "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title>Faculty of Computers and Information - Beni Suef University</title>
</head>
```

## Output



# PARAGRAPH: <P>

- paragraphs of text (block)
- placed within the body of the page

## HTML

```
<body>  
  
<p>You're not your job. You're not how much money you have in the bank.  
You're not the car you drive. You're not the contents of your wallet. You're not your khakis. You're  
the all-singing, all-dancing crap of the world.</p>
```

## Output

You're not your job. You're not how much money you have in the bank. You're not the car you drive. You're not the contents of your wallet. You're not your khakis. You're the all-singing, all-dancing crap of the world.

# HEADINGS: <H1>, <H2>, ..., <H6>

- headings to separate major areas of the page (block)

## HTML

```
<h1>Beni Suef University</h1>  
<h2>Faculty of Computers and Information</h2>  
<h3>Information Technology Department</h3>
```

## Output

**Beni Suef University**  
**Faculty of Computers and Information**  
**Information Technology Department**



# HORIZONTAL RULE: <HR>

- a horizontal line to visually separate sections of a page (block)
- should be immediately closed with />

## HTML

```
<p>First paragraph</p>  
<hr />  
<p>Second paragraph</p>
```

## Output

First paragraph

---

Second paragraph

# MORE ABOUT HTML TAGS

- some tags can contain additional information called attributes
  - syntax: `<element attribute="value" attribute="value"> content </element>`
  - example: `<a href="page2.html">Next page</a>`
- some tags don't contain content; can be opened and closed in one tag
  - syntax: `<element attribute="value" attribute="value" />`
  - example: `<hr />`
  - example: ``

# LINKS: <A>

- links, or "anchors", to other pages (inline)
- uses the href attribute to specify the destination URL
- They must be placed inside a block element such as **p** or **h1**

## HTML

```
<p>  
  Search  
  <a href="http://www.google.com/">Google</a>  
  now!  
</p>
```

## Output

Search [Google](http://www.google.com/) now!

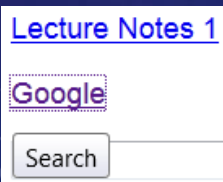
# MORE ABOUT ANCHORS

- types of URLs that can appear in anchors:
  - **absolute** (to another web site)
  - **relative** (to another page on this web site)
- to make links that open in new windows, we'll need to learn Javascript (later)

## HTML

```
<p><a href="1-internet.html">Lecture Notes 1</a></p>  
<p><a href="http://www.google.com/"  
title="Search">Google</a></p>
```

## Output



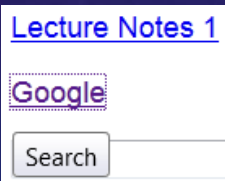
# NESTING TAGS

- tags must be correctly nested
- (a closing tag must match the most recently opened tag)
- the browser may render it correctly anyway, but it is invalid XHTML

## HTML

```
<p><a href="1-internet.html">Lecture Notes 1</a></p>  
<p><a href="http://www.google.com/"  
title="Search">Google</a></p>
```

## Output



# IMAGES: <IMG>

- inserts a graphical image into the page (inline)
- the src attribute specifies the image URL
- XHTML also requires an alt attribute describing the image

## HTML

```

```

## Output



# MORE ABOUT IMAGES

- if placed inside an anchor, the image will become a link
- the title attribute specifies an optional tooltip

## HTML

```
<a href="http://fci-students.net/">   
</a>
```

## Output



# LINE BREAK: <BR>

- forces a line break in the middle of a block element (inline)
- br should be immediately closed with />
- br should not be used to separate paragraphs or used multiple times in a row to create spacing

## HTML

```
<p> The use of computers to help radiologists in the interpretation of medical images is well established. <br /> Recently, computer softwares have been developed for use in clinical practice <br /> that aid radiologists in detecting abnormalities on diagnostic radiology tests.</p>
```

## Output

The use of computers to help radiologists in the interpretation of medical images is well established. Recently, computer softwares have been developed for use in clinical practice that aid radiologists in detecting abnormalities on diagnostic radiology tests.



# COMMENTS: <!-- ... -->

- comments to document your HTML file or "comment out" text
- many web pages are not completely commented (or not at all)
- comments are still useful for disabling sections of a page

## HTML

```
<!-- My web page, by FCI Student (IT371), 2nd semester -->  
<p>IT courses are <!-- NOT --> a lot of fun!</p>
```

## Output

IT courses are a lot of fun!

# PHRASE ELEMENTS : <EM>, <STRONG>

- em: emphasized text (usually rendered in italic)
- strong: strongly emphasized text (usually rendered in bold)

## HTML

```
<p>  
  HTML is <em>really</em>,  
  <strong>REALLY</strong> fun!  
</p>
```

## Output

HTML is *really*, **REALLY** fun!

# UNORDERED LIST: <UL>, <LI>

- **ul** represents a bulleted list of items (block)
- **li** represents a single item within the list (block)

## HTML

```
<ul>  
  <li>No shoes</li>  
  <li>No shirt</li>  
  <li>No problem!</li>  
</ul>
```

## Output

- No shoes
- No shirt
- No problem!

# MORE ABOUT UNORDERED LISTS

- a list can contain other lists:

## HTML

```
<ul>
  <li>IT Department:
    <ul>
      <li>Ahmed</li>
      <li>Mohamed</li>
    </ul>
  </li>
  <li>CS Department:
    <ul>
      <li>Ibrahim</li>
      <li>Reda</li>
    </ul>
  </li>
</ul>
```

## Output

- IT Department:
  - Ahmed
  - Mohamed
- CS Department:
  - Ibrahim
  - Reda

# ORDERED LIST: <OL>

- `ol` represents a numbered list of items (block)
- we can make lists with letters or Roman numerals using CSS (later)

## HTML

```
<p>You have to do three things:</p>
<ol>
  <li>Think</li>
  <li>Plan</li>
  <li>Do!</li>
</ol>
```

## Output

You have to do three things:

1. Think
2. Plan
3. Do!

# DEFINITION LIST: <DL>, <DT>, <DD>

- **dl** represents a list of definitions of terms (block)
- **dt** represents each term, and **dd** its definition

## HTML

```
<dl>  
  <dt>newbie</dt> <dd>one who does not have mad skills</dd>  
  <dt>own</dt> <dd>to soundly defeat  
    (e.g. I owned that newbie!)</dd>  
  <dt>frag</dt> <dd>a kill in a shooting game</dd>  
</dl>
```

## Output

```
newbie  
    one who does not have mad skills  
own  
    to soundly defeat (e.g. I owned that newbie!)  
frag  
    a kill in a shooting game
```

# QUOTATIONS: <BLOCKQUOTE>

- a lengthy quotation (block)

## HTML

```
<p>As Lincoln said in his famous Gettysburg Address:</p>
<blockquote>
  <p>Fourscore and seven years ago, our fathers brought forth
    on this continent a new nation, conceived in liberty, and
    dedicated to the proposition that all men are created equal.</p>
</blockquote>
```

## Output

As Lincoln said in his famous Gettysburg Address:

Fourscore and seven years ago, our fathers brought forth on this continent a new nation, conceived in liberty, and dedicated to the proposition that all men are created equal.

# INLINE QUOTATIONS: <Q>

- a short quotation (inline)

## HTML

```
<p>Quoth the Raven, <q>Nevermore.</q></p>
```

## Output

Quoth the Raven, “Nevermore.”

- **Why not just write the following?**  
`<p>Quoth the Raven, "Nevermore."</p>`
- **We don't use " marks for two reasons:**
  - XHTML shouldn't contain literal quotation mark characters; they should be written as `&quot;`;
  - using `<q>` allows us to apply CSS styles to quotations. (seen later)



# HTML CHARACTER ENTITIES

- a way of representing any Unicode character within a web page

character(s)	entity
< >	&lt; &gt;
é è ñ	&eacute; &egrave; &ntilde;
™ ©	&trade; &copy;
π δ Δ	&pi; &delta; &Delta;
И	&#1048;
" &	&quot; &amp;

# INLINE QUOTATIONS: <Q>

- To display the link text in a web page, its special characters must be encoded as shown :

## HTML

```
&lt;p&gt;  
  &lt;a href=&quot;http://google.com/search?q=marty&amp;ie=utf-8&amp;aq=t&quot;&gt;  
    Search Google for Marty  
  &lt;/a&gt;  
&lt;/p&gt;
```

## Output

```
<p> <a href="http://google.com/search?q=marty&ie=utf-8&aq=t"> Search Google for Marty </a> </p>
```

# COMPUTER CODE: <CODE>

- code: a short section of computer code (usually rendered in a fixed-width font)

## HTML

```
<p>  
  The <code>ul</code> and <code>ol</code>  
  tags make lists.  
</p>
```

## Output

```
The ul and ol tags make lists.
```

# PREFORMATTED TEXT: <PRE>

- a large section of pre-formatted text (block)

HTML

```
<pre>
    Steve Jobs speaks loudly
        reality distortion
        Apple fans bow down
</pre>
```

Output

```
Steve Jobs speaks loudly
    reality distortion
    Apple fans bow down
```

# USING PRE AND CODE TOGETHER

- When showing a large section of computer code, enclose it in a `pre` to preserve whitespace and a `code` to describe the semantics of the content

## HTML

```
<pre><code>
    public static void main(String[] args) {
        System.out.println("Hello, world!");
    }
</code></pre>
```

## Output

```
public static void main(String[] args) {
    System.out.println("Hello, world!");
}
```

# WEB STANDARDS

- **It is important to write proper XHTML code and follow proper syntax.**
- **Why use XHTML and web standards?**
  - **more rigid and structured language**
  - **more interoperable across different web browsers**
  - **more likely that our pages will display correctly in the future**
  - **can be interchanged with other XML data: SVG (graphics), MathML, MusicML, etc.**

# WEB PAGE METADATA: <META>

- **information about your page (for a browser, search engine, etc.)**
- **placed in the head of your XHTML page**
- **meta tags often have both the name and content attributes**
  - some meta tags use the http-equiv attribute instead of name

## HTML

```
<meta name="description"
  content="Authors' web site for Building Java Programs." />
<meta name="keywords" content="java, textbook" />
<meta http-equiv="Content-Type"
  content="text/html; charset=iso-8859-1" />
```

# META ELEMENT TO AID BROWSER / WEB SERVER

```
<meta http-equiv="Content-Type"
  content="type of document (character encoding)" />
<meta http-equiv="refresh"
  content="how often to refresh the page (seconds)" />
</head>
```

```
<head>
<meta name="author"
  content="web page's author" />
<meta name="revised"
  content="web page version and/or last modification date" />
<meta name="generator"
  content="the software used to create the page" />
</head>
```



# META ELEMENT TO AID SEARCH ENGINES

```
<head>
<meta name="description"
  content="how you want search engines to display your page" />
<meta name="keywords"
  content="words to associate with your page (comma-separated)" />
</head>
```

- **these are suggestions to search engines about how to index your page**

# WHAT IS HTML5?

- **HTML5 is the newest version of HTML, only recently gaining partial support by the makers of web browsers.**
- **It incorporates all features from earlier versions of HTML, including the stricter XHTML.**
- **It adds a diverse set of new tools for the web developer to use.**
- It is still a work in progress.
- No browsers have full HTML5 support. It will be many years – perhaps not until 2018 or later - before being fully defined and supported.

# GOALS OF HTML5

- **Support all existing web pages.** With HTML5, there is no requirement to go back and revise older websites.
- **Reduce the need for external plugins and scripts to show website content.**
- **Improve the semantic definition** (i.e. meaning and purpose) of page elements.
- **Make the rendering of web content universal and independent of the device being used.**
- **Handle web documents errors in a better and more convenient fashion.**

# NEW ELEMENTS IN HTML5

<code>&lt;article&gt;</code>	<code>&lt;figcaption&gt;</code>	<code>&lt;progress&gt;</code>
<code>&lt;aside&gt;</code>	<code>&lt;footer&gt;</code>	<code>&lt;section&gt;</code>
<code>&lt;audio&gt;</code>	<code>&lt;header&gt;</code>	<code>&lt;source&gt;</code>
<code>&lt;canvas&gt;</code>	<code>&lt;hgroup&gt;</code>	<code>&lt;svg&gt;</code>
<code>&lt;datalist&gt;</code>	<code>&lt;mark&gt;</code>	<code>&lt;time&gt;</code>
<code>&lt;figure&gt;</code>	<code>&lt;nav&gt;</code>	<code>&lt;video&gt;</code>

These are just some of the new elements introduced in HTML5. We will be exploring each of these during this course.

# OTHER NEW FEATURES IN HTML5

- **Built-in audio and video support** (without plugins)
- **Enhanced form controls and attributes**
- **The Canvas** (a way to draw directly on a web page)
- **Drag and Drop functionality**
- **Support for CSS3** (the newer and more powerful version of CSS)
- **More advanced features for web developers, such as data storage and offline applications.**

# FIRST LOOK AT HTML5

Remember the DOCTYPE declaration from XHTML?

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"  
  "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

In HTML5, there is just one possible DOCTYPE declaration and it is simpler:

```
<!DOCTYPE html>
```

Just 15 characters!

The DOCTYPE tells the browser which type and version of document to expect. This should be the last time the DOCTYPE is ever changed. From now on, all future versions of HTML will use this same simplified declaration.

# THE <HTML> ELEMENT

This is what the <html> element looked like in XHTML:

```
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en"
      lang="en">
```

Again, HTML5 simplifies this line:

```
<html lang="en">
```

The **lang** attribute in the <html> element declares which language the page content is in. Though not strictly required, it should always be specified, as it can assist search engines and screen readers.

Each of the world's major languages has a two-character code, e.g. Spanish = "es", French = "fr", German = "de", Chinese = "zh", Arabic = "ar".

# THE <HEAD> SECTION

Here is a typical XHTML <head> section:

```
<head>
  <meta http-equiv="Content-type" content="text/html; charset=UTF-8" />
  <title>My First XHTML Page</title>
  <link rel="stylesheet" type="text/css" href="style.css" />
</head>
```

And the HTML5 version:

```
<head>
  <meta charset="utf-8">
  <title>My First HTML5 Page</title>
  <link rel="stylesheet" href="style.css">
</head>
```

Notice the simplified character set declaration, the shorter CSS stylesheet link text, and the removal of the trailing slashes for these two lines.



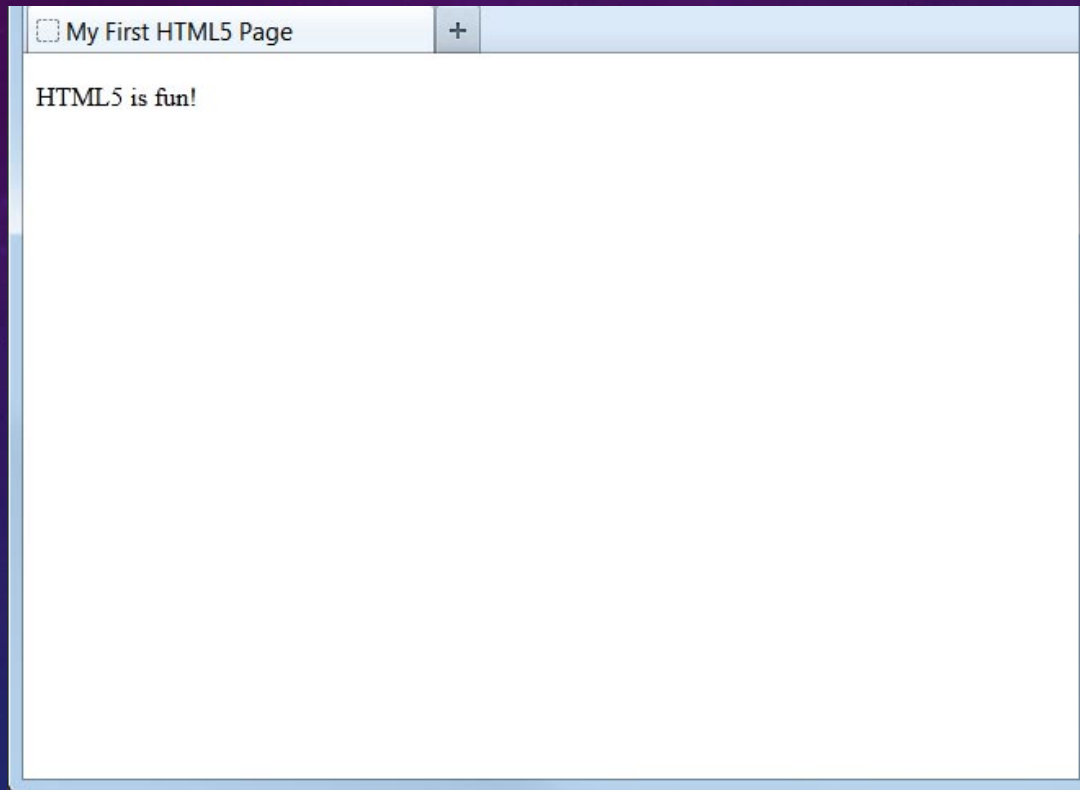
# BASIC HTML5 WEB PAGE

Putting the prior sections together, and now adding the `<body>` section and closing tags, we have our first complete web page in HTML5:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <title>My First HTML5 Page</title>
  <link rel="stylesheet" href="style.css">
</head>
<body>
  <p>HTML5 is fun!</p>
</body>
</html>
```

Let's open this page in a web browser to see how it looks...

# VIEWING THE HTML5 WEB PAGE



Even though we used HTML5, the page looks exactly the same in a web browser as it would in XHTML. Without looking at the source code, web visitors will not know which version of HTML the page was created with.