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# CSC 443: Web Programming

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## Basic HTML

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# Hypertext Markup Language (HTML)

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- Describes the *content* and structure of information on a web page
- Not the same as the presentation (appearance on screen)
- 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>`

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## XHTML

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- Uses a markup format called XML
- XML + HTML = XHTML
- Standardized in 2000
- A strict XHTML page uses some different syntax and tags than HTML

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# Structure of XHTML page

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```
<!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>
```

HTML

- HTML is saved with extension .html
- Basic structure: tags that enclose content, i.e., elements
- **Header** describes the page
- **Body** contains the page's contents

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## Page Title <title>

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```
...
  <head>
    <title> HARRY POTTER AND THE DEATHLY HALLOWS
- PART 2 </title>
  </head>
...
```

HTML

- Placed within the head of the page
- Displayed in web browser's title mark and when bookmarking the page

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# Paragraph <p>

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```
...  
    <body>  
        <p> Harry Potter and the Deathly Hallows,  
the last book in the series, begins directly after the  
events of the sixth book.  
Voldemort      has completed his ascension to power and  
gains          control of the Ministry of Magic</p>  
    </body>  
...
```

HTML

Harry Potter and the Deathly Hallows, the last book in the series, begins directly after the events of the sixth book. Voldemort has completed his ascension to power and gains control of the Ministry of Magic

output

- Placed within the body of the page

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# Headings <h1>, <h2>, ... <h6>

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```
<h1> Harry Potter </h1>  
<h2> Books </h2>  
<h3> Harry Potter and the Philosopher's Stone </h3>
```

HTML

## Harry Potter

### Books

#### Harry Potter and the Philosopher's Stone

output

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# Horizontal rule `<hr />`

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

HTML

First Paragraph

Second Paragraph

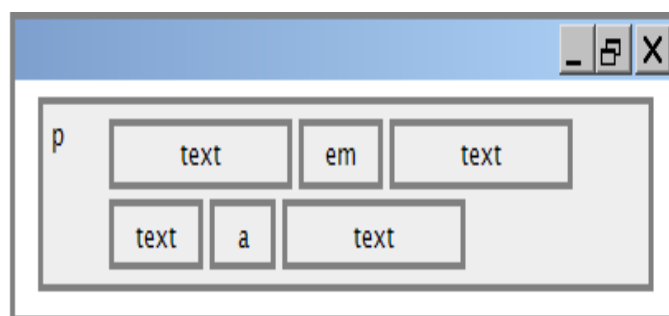
output

- Should be immediately closed with `/>`

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## Block and Inline Statements

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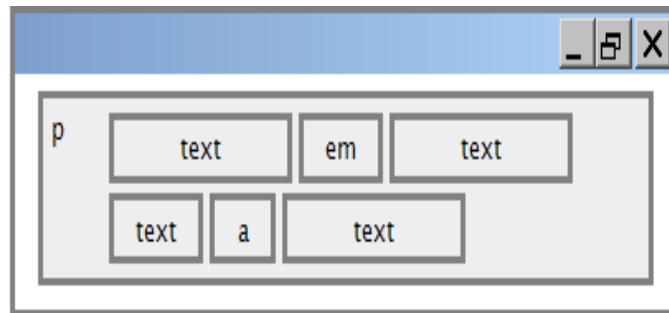


- Block elements contain an entire large region of content
  - ▣ examples: paragraphs, lists, table cells
  - ▣ the browser places a margin of whitespace between block elements for separation

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# Block and Inline Statements (cont.)

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- Inline elements affect a small amount of content
  - ▣ examples: bold text, code fragments, images
  - ▣ the browser allows many inline elements to appear on the same line
  - ▣ must be nested inside a block element

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## More HTML tags

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- Some tags can contain additional information called attributes
  - ▣ syntax:  
**<element attribute="value" attribute="value">  
content </element>**
  - ▣ example: `<a href="page2.html">Next page</a>`

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# More HTML tags

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- Some tags don't contain content; can be opened and closed in one tag
  - ▣ syntax:  
`<element attribute="value" attribute="value" />`
  - ▣ example: `<hr />`
  - ▣ example:  
``

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## Links `<a>`

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

HTML

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

output

- The **href** attribute specifies the destination URL
- Links or *anchors* are inline elements, so they must be placed inside a block element such as a `p` or `h1`

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# More about anchors

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```
<p><a href="deathlyHallows-book.html">Harry Potter and the  
Deathly Hallows Book</a></p>
```

```
<p><a href="http://en.wikipedia.org"  
title="Search">Wikipedia</a></p>
```

HTML

[Harry Potter and the Deathly Hallows](#)

[Wikipedia](#)

output

- Types of URLs that can appear in anchors:
  - ▣ Absolute: to another web site
  - ▣ Relative: to another page on this web site

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## Nesting tags

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Bad

```
<p>  
<a href=" deathlyHallows-book.html"> Harry Potter and the  
Deathly Hallows Book </p>  
<p>  
This text also links to Harry Potter Book</a>  
</p>
```

HTML

- 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

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# Images <img>

17

```

```

HTML



- The src attribute specifies source of the image URL
- XHTML also requires an alt attribute describing the image

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## More about images

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```
<a href="http://harrypotter.net/">  
  
</a>
```

HTML



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

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# Line Break <br>

19

```
<p>One Ring to rule them all, One Ring to find them, <br /> One Ring to bring them all and in the darkness bind them.</p>  
<p> In the Land of Mordor where the Shadows lie. </p>
```

HTML

One Ring to rule them all, One Ring to find them,  
One Ring to bring them all and in the darkness bind them

In the Land of Mordor where the Shadows lie.

output

- ❑ br should be immediately closed with />
- ❑ br should not be used to separate paragraphs or used multiple times in a row to create spacing

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# Comments <!-- ... -->

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```
<!-- My web page, by Bob Student  
CSE 380, Fall 2048 -->  
<p>CS courses are <!-- NOT --> a lot of fun!</p>
```

HTML

CS courses are a lot of fun!

output

- ❑ Comments are useful for disabling sections of a page
- ❑ Comments cannot be nested and cannot contain a --

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## Phrase elements `<em>`, `<strong>`

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

HTML

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

output

- ❑ **em**: emphasized text (usually in italic)
- ❑ **strong**: strongly emphasized text (usually in bold)
- ❑ The tags must be properly nested for a valid page

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## Unordered list: `<ul>`, `<li>`

22

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

HTML

- No shoes
- No shirt
- No problem!

output

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

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# More about unordered lists

23

```
<ul>
<li>Harry Potter characters:
<ul>
<li>Harry Potter</li>
<li>Hermione</li>
<li>Ron</li>
</ul>
</li>
<li>LOTR characters:
<ul>
<li>Frodo</li>
<li>Bilbo</li>
<li>Sam</li>
</ul>
</li>
</ul>
```

HTML

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# More about unordered lists (cont.)

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- Harry Potter characters:
  - Harry Potter
  - Hermione
  - Ron
- LOTR characters:
  - Frodo
  - Bilbo
  - Sam

output

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# Ordered list <ol>

25

```
<p>Apple business model:</p>
<ol>
<li>Beat Microsoft</li>
<li>Beat Google</li>
<li>Conquer the world!</li>
</ol>
```

HTML

Apple business model:

1. Beat Microsoft
2. Beat Google
3. Conquer the world

output

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

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# Common error: Not closing a list

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```
<ul>
<li>No shoes</li>
<li>No shirt</li>
<li>No problem!</li>
<p>Paragraph after list...</p>
```

HTML

- No shoes
- No shirt
- No problem!

Paragraph after list...

output

- ❑ If you leave a list open, subsequent contents will be indented

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# Common Error: Improper nested list placement

27

```
<ul>
<li>Harry Potter characters:</li>
<ul>
<li>Harry Potter</li>
<li>Hermione</li>
<li>Ron</li>
</ul>
</li>
<li>LOTR characters:
<ul>
<li>Frodo</li>
<li>Bilbo</li>
<li>Sam</li>
</ul>
</ul>
```

HTML

- ❑ closing the outer li too early (or not at all) will render correctly in most browsers, but it is incorrect XHTML

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## Definition list <dl>, <dt>, <dd>

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```
<dl>
<dt>newbie</dt> <dd>one who does not have mad skills</dd>
<dt>jaded</dt> <dd>tired, bored, or lacking enthusiasm</dd>
<dt>frag</dt> <dd>a kill in a shooting game</dd>
</dl>
```

HTML

newbie	one who does not have mad skills
jaded	Tired, bored, or lacking enthusiasm
frag	a kill in a shooting game

output

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

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# Tables `<table>`, `<tr>`, `<td>`

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```
<table>
  <tr><td>1,1</td><td>1,2 okay</td></tr>
  <tr><td>2,1 real wide</td><td>2,2</td></tr>
</table>
```

HTML

1,1	1,2 okay
2,1 real wide	2,2

output

- `table` defines the overall table, `tr` each row, and `td` each cell's data
- Useful for displaying large row/column data sets
- NOTE: tables are sometimes used by novices for web page layout, but this is not proper semantic HTML and should be avoided

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## Table headers, captions: `<th>`, `<caption>`

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```
<table>
  <caption>My important data</caption>
  <tr><th>Column 1</th><th>Column 2</th></tr>
  <tr><td>1,1</td><td>1,2 okay</td></tr>
  <tr><td>2,1 real wide</td><td>2,2</td></tr>
</table>
```

HTML

My important data	
Column 1	Column 2
1,1	1,2 okay
2,1 real wide	2,2

output

- `th` cells in a row are considered headers
- a `caption` at the start of the table labels its meaning

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# Quotations <blockquote>

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```
<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>
```

HTML

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.

output

## □ a lengthy quotation

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# Inline quotations <q>

32

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

HTML

Quoth the Raven, "Nevermore."

output

## □ a short quotation

## □ 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;

CSC443: Web Programming ■ using <q> allows us to apply CSS styles to quotations



# HTML Character Entities

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

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## Inline quotations <q>

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

HTML

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

output

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# Computer code `<code>`

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

HTML

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

output

- `code`: a short section of computer code

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# Preformatted text `<pre>`

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```
<pre>
Bill Gates speaks
    You will be assimilated
    Microsoft fans delirious
</pre>
```

HTML

```
Bill Gates speaks
    You will be assimilated
    Microsoft fans delirious
```

output

- Displayed with exactly the whitespace / line breaks given in the text
- Shown in a fixed-width font by default

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# Preformatted text `<pre>`

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

*HTML*

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

*output*

- 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

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## Web Standards

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- 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.

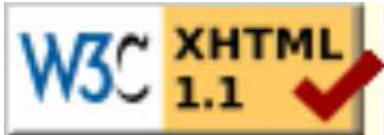
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# W3C XHTML Validator

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```
<p>
    <a href="http://validator.w3.org/check/referer">
        
    </a>
</p>
```

HTML



- checks your HTML code to make sure it meets the official strict XHTML specifications

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## Web page metadata <meta>

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```
<meta name="description"
content="Harry Potter Official Website." />
<meta name="keywords" content="harry potter, harry potter
and the deathly hallows, deathly hallows, ministry of
magic, resurrection stone, clock of invisibility" />
<meta http-equiv="Content-Type"
content="text/html; charset=iso-8859-1" />
```

HTML

- 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

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## meta element to aid browser/web server

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

HTML

- using the Content-Type gets rid of the W3C "tentatively valid" warning

```
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
```

- the meta refresh tag can also redirect from one page to another:

```
<meta http-equiv="refresh" content="5;url=http://www.bjp.com" />
```

- why would we want to do this? (example)

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## meta element to describe the page

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```
<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>
```

HTML

- many WYSIWYG HTML editors place their names in the meta generator tag (why?)

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# meta element to aid search engines

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```
<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>
```

HTML

- these are suggestions to search engines about how to index your page
- the search engine may choose to ignore them (why?)

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## Some cool stuff added by HTML5

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- Audio and Video
  - before HTML5, you need to embed a music player or video player
  - with HTML5 you just do

```
<video>
  <source src="cat.mp4"></source>
</video>
```

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# Some cool stuff added by HTML5

45

- Canvas
  - ▣ You can put a `<canvas></canvas>` on your web page and directly draw on with Javascript
- Drag and Drop
- Geolocation
- WebSocket
- Storage
  
- DEMOS: <http://html5demos.com/>

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## HTML5 Required Readings

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- <http://diveintohtml5.info/>

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