SWE 363: Web Engineering & Development

Module 2-1

Markup Languages (HTML5)

Objectives

❑ Identify the role of markup languages in Web Development

❑ Learn basic structure and components of an HTML document

Outline

- ❑ Introduction to Markup Languages
- ❑ Introduction to HTML
- ❑ HTML Document Components
- ❑ HTML Elements
    - ▪ Basic Tags, meta tags, Text Formatting, Lists Hyperlinks, Images, Image Maps, Tables, Special Characters

References

- ❑ Most of the materials were taken from:
  - Deitel, Harvey, and Abbey Deitel. Internet and World Wide Web How to Program. Prentice Hall Press, 5th Edition. [Chapter 2]
  - Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015. [Chapter 2]

- ❑ Some useful links with examples and other resources:
  - W3Schools at http://www.w3schools.com/
    - ➢ http://www.w3schools.com/html/
  - HTML Tutorial http://www.davesite.com/webstation/html/index.shtml
  - For a full description of meta tags refer to http://www.html-reference.com/META.htm

- ❑ A markup language is a computer language that uses tags to define elements within a document.
- ❑ It is human-readable, meaning markup files contain standard words, rather than typical programming syntax.
- ❑ Designed for processing, definition and presentation of text.
- ❑ A common feature of many markup languages is that they intermix the *text of a document* with *markup instructions* in the same data stream or test file.
- ❑ Markup languages such as HTML, Tex, XML, and XHTML allow users to control how text and visual elements will be laid out and displayed.

Markup Languages

- XHTML (Extensible HyperText Markup Language) - a version of HTML that used stricter **XML** (extensible markup language) syntax rules
  - It is HTML redesigned as XML
  - The goal of XHTML with its strict rules was to make page rendering more predictable by forcing web authors to create web pages without **syntax errors**.
  - To help web authors, two main versions of XHTML were created: **XHTML 1.0 Strict** and **XHTML 1.0 Transitional**.
  - **XHTML 4.01 Strict**
    - This DTD (Document Type Definition) contains all HTML elements and attributes, but does NOT INCLUDE presentational or deprecated elements (like font). Framesets are not allowed.
  - **XHTML 1.0 Transitional**
    - This DTD contains all HTML elements and attributes, INCLUDING presentational and deprecated elements (like font). Framesets are not allowed.
  - **XHTML 1.0 Frameset**
    - This DTD is equal to XHTML 1.0 Transitional, but allows the use of frameset content.

HTML
(HyperText Markup Language)

- ❑ HTML has evolved to its most recent version, HTML5 which adds a diverse set of new tools for the web developer to use.

- ❑ HTML5 is a <u>cooperation</u> between the World Wide Web Consortium (W3C) and the Web Hypertext Application Technology Working Group (WHATWG).
  - ▪ WHATWG was working with <u>web forms and applications</u>, and W3C was working with <u>XHTML 2.0</u>. In 2006, they decided to cooperate and create ***a new version of HTML***.

- ❑ HTML5 is deigned to deliver almost everything you want to do online <u>without requiring additional plugins</u> (like Flash).
  - ▪ It ***does everything*** from animation to apps, music to movies, and can also be used to build complicated applications that run in your browser.

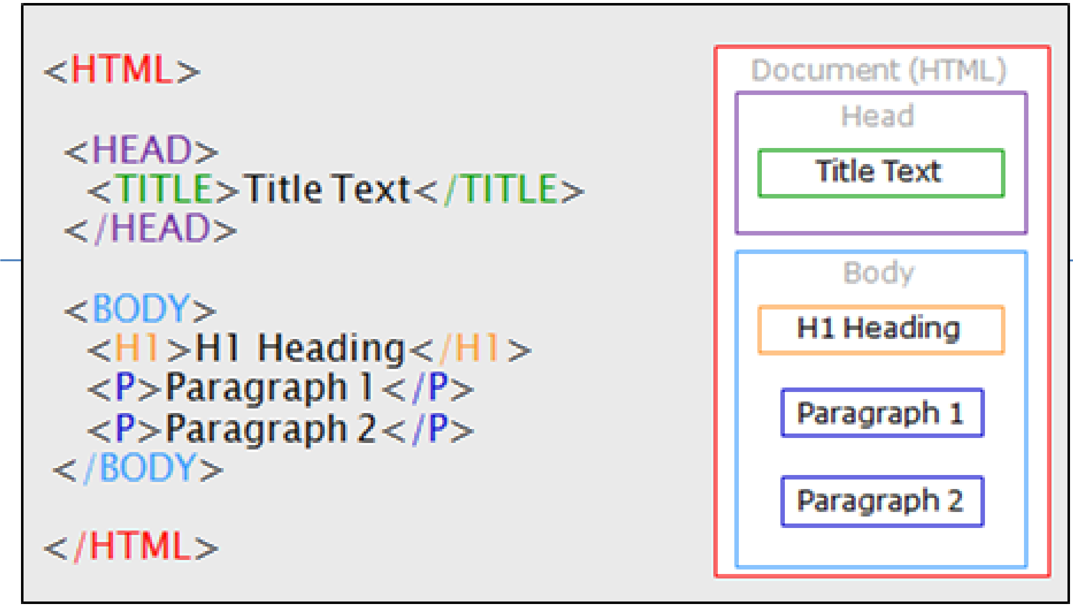
- ❑ HTML5 is also *cross-platform*
  - ▪ It doesn't care whether you are using a tablet or a smartphone, a notebook or a Smart TV.
- ❑ However, NOT ALL browsers and all versions have full HTML5 support for HTML5.
  - ▪ HTML5 is a language that evolves and develops over time. As such, every browser will support a gradually increasing subset of HTML5 capabilities.

HTML
(HyperText Markup Language)

- HTML5 is not yet an official standard (a work in progress),
  - Not all browsers have full support, however all major browsers (Safari, Chrome, Firefox, Opera, Internet Explorer) continue to add new HTML5 features to their latest versions.
- However, it is the current W3C recommendation for web development

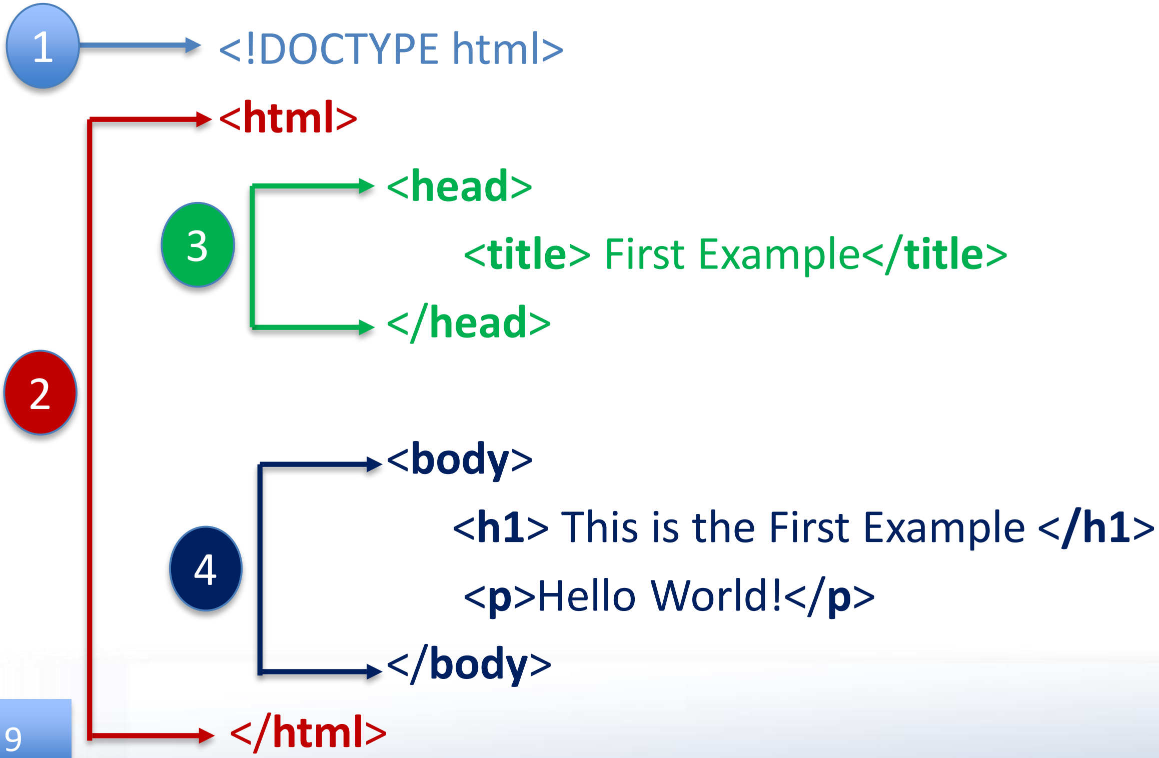
- Some of the most interesting new features in HTML5 :
  - Introducing new features based on HTML, CSS, DOM and JavaScript
  - Reducing the need for external plugins and scripts to show website content.
  - Improving the semantic definition (i.e. meaning and purpose) of page elements.
    - New content specific elements, like article, footer, header, nav, section
  - Rendering of web content universal and independent of the device being used.
  - Providing enhanced form controls and attributes (new form controls, like calendar, date, etc)
  - Providing video and audio elements for media playback
  - Providing Canvas (a way to draw directly on a web page)
  - Supporting Drag and Drop functionality
  - *More advanced features for web developers*, such as data storage and offline applications.

HTML
Document’s Structure

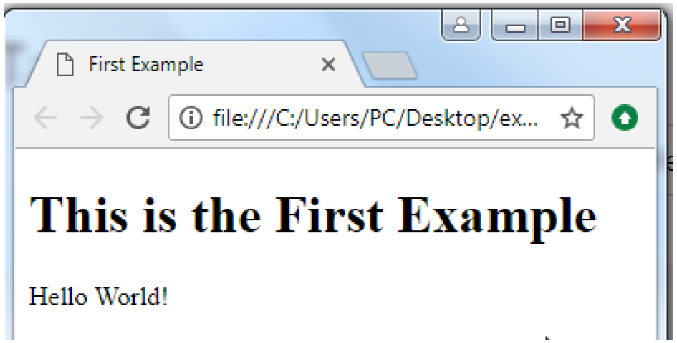


```
<HTML>

 <HEAD>
  <TITLE>Title Text</TITLE>
 </HEAD>

 <BODY>
  <H1>H1 Heading</H1>
  <P>Paragraph 1</P>
  <P>Paragraph 2</P>
</BODY>

</HTML>
```

An HTML file is a text file with filename extension: htm or html



```
<!DOCTYPE html>
<html>
      <head>
           <title> First Example</title>
      </head>

      <body>
           <h1> This is the First Example </h1>
           <p>Hello World!</p>
      </body>
</html>
```



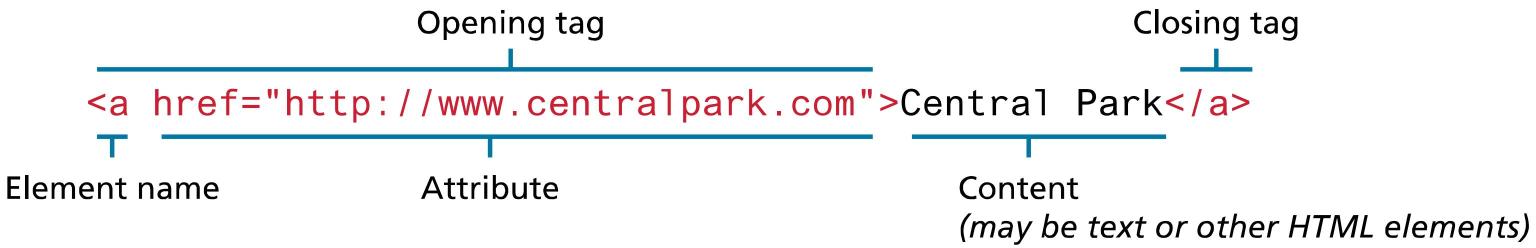
This is the First Example

Hello World!

HTML Syntax
Elements and Attributes

- HTML documents are composed of textual content and HTML elements

- HTML element encompasses the element name within angle brackets (i.e., the tag) Each tag has a purpose
  - Most tags come in pairs: an opening (start) tag and a closing (end) tag like <p> and </p>
  - HTML tags are *not case sensitive*, e.g. <b> and <B> are equivalent
  - HTML elements can also contain attributes.



Opening tag

Closing tag

```
<a href="http://www.centralpark.com">Central Park</a>
```

Element name

Attribute

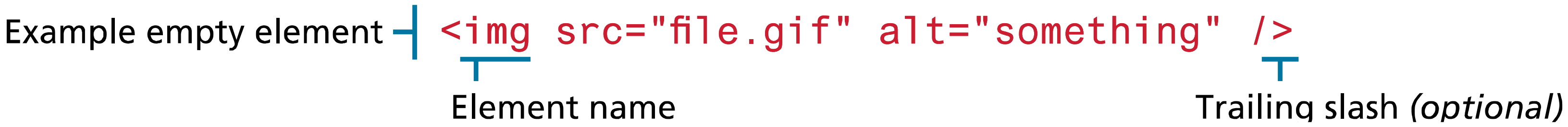
Content
(may be text or other HTML elements)

- Many start tags may contain *attributes* to provide additional information about the element   <body bgcolor=“blue">
  - Each attribute has **name** and value separated by equal sign (=)
  - Attribute **values** should always be enclosed in quotes

HTML Syntax..

Elements and Attributes

- ❑ An empty element does not contain any text content; instead, it is an instruction to the browser to do something.
  - In XHTML, empty elements had to be terminated by a trailing slash.
  - In HTML5, the trailing slash in empty elements is optional.



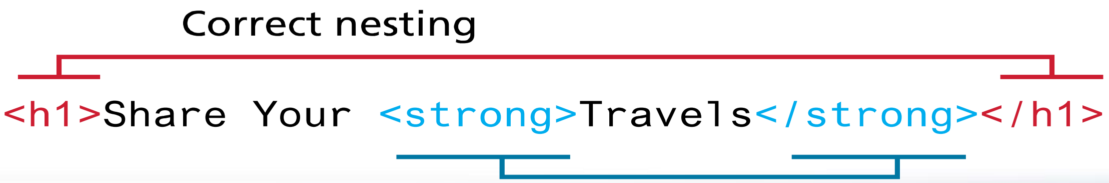
Example empty element

```
<img src="file.gif" alt="something" />
```

Element name

Trailing slash *(optional)*

- ❑ Often an HTML element will contain other HTML elements (Nesting HTML elements)

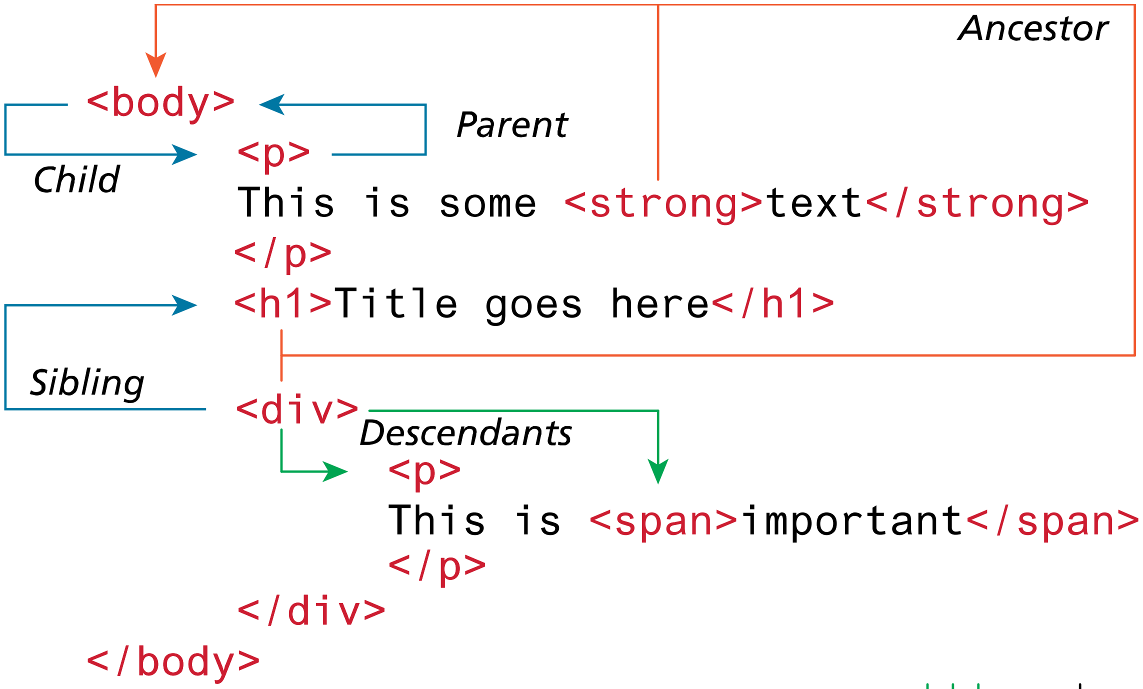


Correct nesting

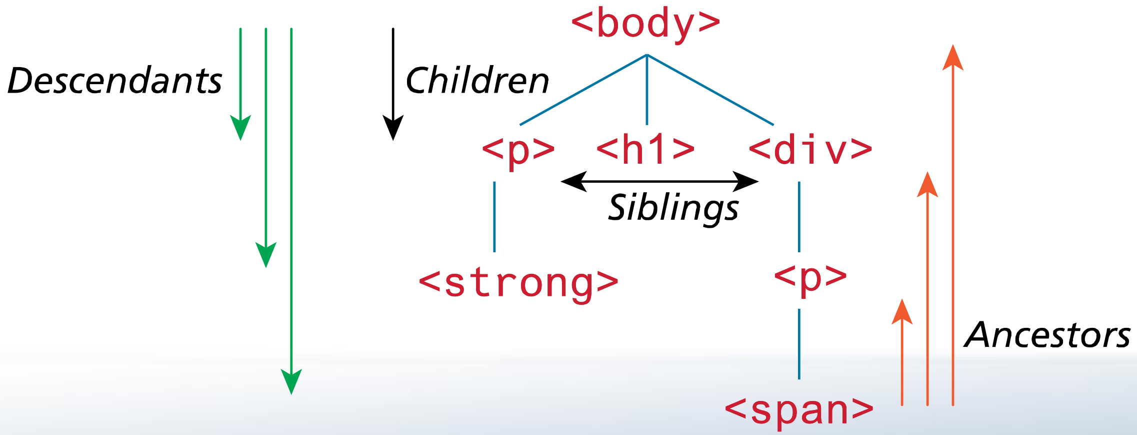
```
<h1>Share Your <strong>Travels</strong></h1>
```

HTML Syntax..

Nesting HTML Elements



```
<body>
    <p>
    This is some <strong>text</strong>
    </p>
    <h1>Title goes here</h1>
    <div>
        <p>
        This is <span>important</span>
        </p>
    </div>
</body>
```

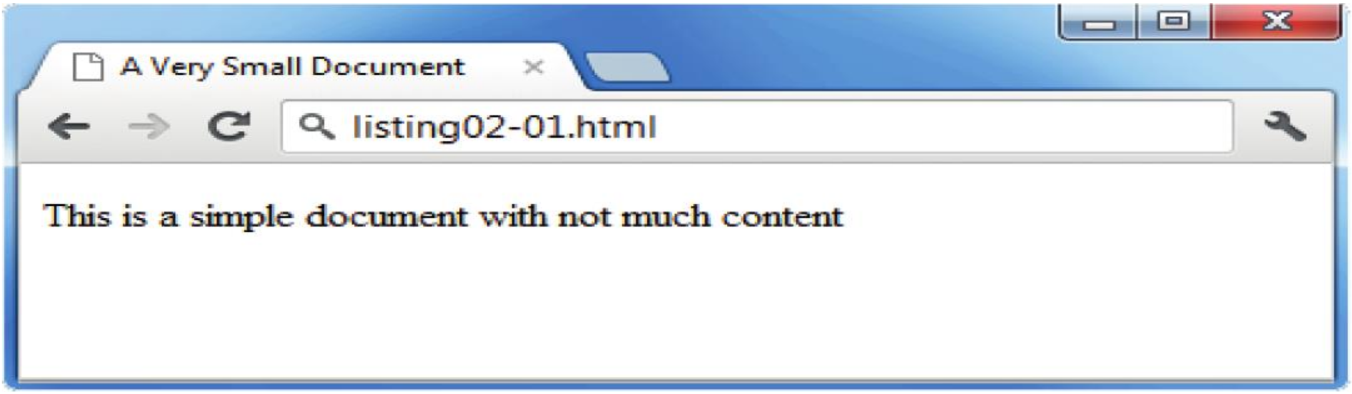


Structure of HTML Documents

A simple example

1

```
<!DOCTYPE html>
<title>A Very Small Document</title>
<p>This is a simple document with not much content</p>
```

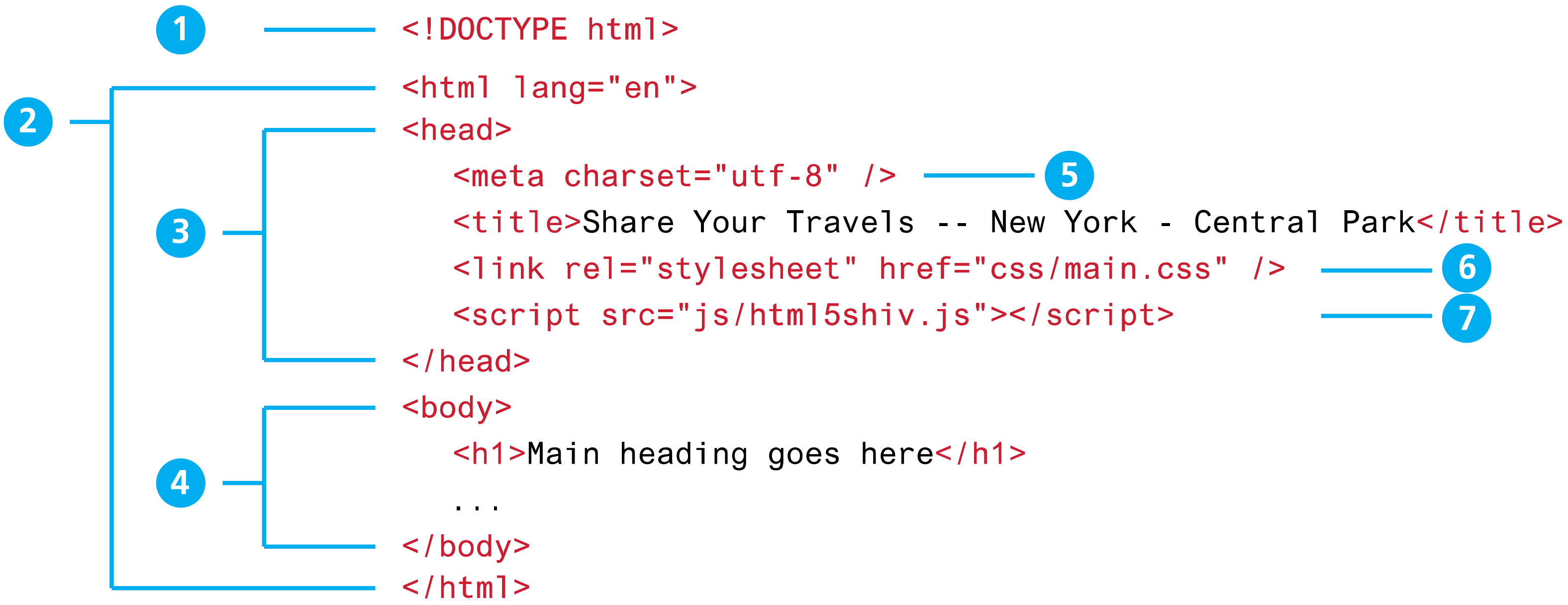


This is a simple document with not much content

HTML5 does not require the use of the **<html> , <head>** , and **<body>** elements (but most developers continue to use them).

Structure of HTML Documents

A slightly more complex document



```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="utf-8" />
   <title>Share Your Travels -- New York - Central Park</title>
   <link rel="stylesheet" href="css/main.css" />
   <script src="js/html5shiv.js"></script>
</head>
<body>
   <h1>Main heading goes here</h1>
   ...
</body>
</html>
```

- (Item 1) The DOCTYPE declaration refers to Document Type Definition (DTD): it is an instruction to the web browser about what version of HTML the page is written in.
- (item 2) <html> contains all the other HTML elements in the document
- (Item 3) <head> contains descriptive elements about the document, such (title, style sheets, etc.)
- (Item 4) <body> contains content to be displayed by the browser
- (Item 5) <meta> element declares that the character encoding for the document is UTF-8.
- (Item 6) specifies an external CSS style sheet file with <link> that is used with this document.
- (Item 7) references an external JavaScript file using <script>

Structure of HTML Documents
DOCTYPE

- ❑ The DOCTYPE declaration refers to Document Type Definition (DTD)
- ❑ The DTD specifies the rules for the markup language, so that the browsers render the content correctly.

- ❑ The <!DOCTYPE> declaration is not an HTML tag; it tells the browser what type of document it is about to process
  - ▪ must be the very first thing in a document, before the <html> tag

- ❑ DOCTYPE *is required in HTML5 documents* so that browsers render the page in standards mode.
- ❑ In HTML 4.01, all <!DOCTYPE> declarations require a reference to a DTD (Document Type Definition),

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN"
"http://www.w3.org/TR/html4/strict.dtd">
```

- ❑ HTML5 does not require a reference to a DTD: `<!DOCTYPE html>`

Note: <!DOCTYPE> has no closing tag

Structure of HTML Documents..
head section

- ❑ The head section contains general information (meta-information) about a document
  - ▪ an information about the HTML5 document, such as the character set (UTF-8, the most popular character-encoding scheme for the web) that the page use—which helps the browser determine how to render the content.
  - ▪ a special document-formatting instructions called CSS3 style sheets and client-side programs called scripts for creating dynamic web pages.

Using this is optional, but recommended.

- ❑ Head tags
  - ▪ <title>: defines the document title

```
<title>Web Design</title>
```

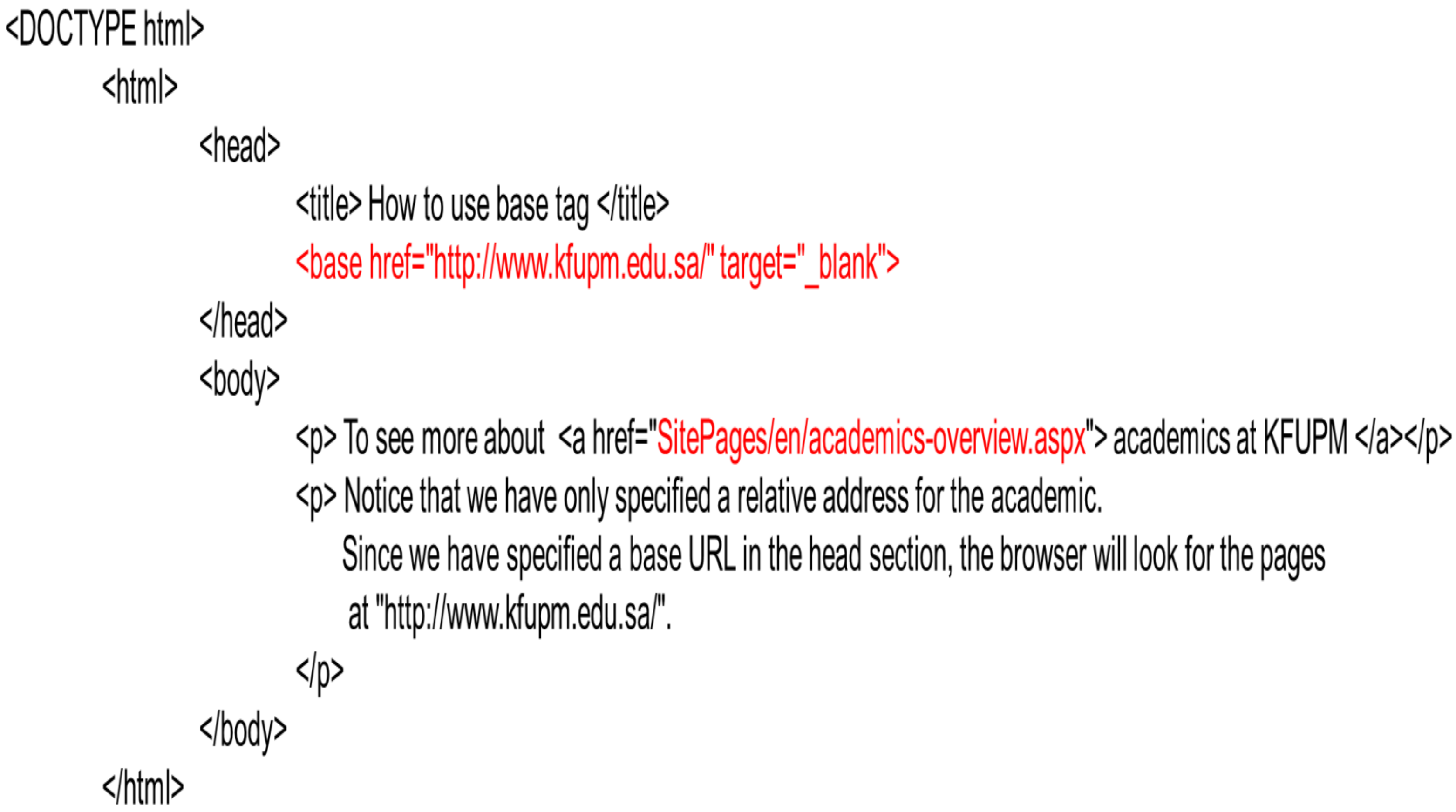
  - ▪ <base>: specify a default URL and a default target for all links on a page

```
<base href="http://www.w3schools.com/images/" />
```

Read more about character-encoding:
https://www.w3.org/International/questions/qa-what-is-encoding

Structure of HTML Documents..

head section…



```
<DOCTYPE html>
        <html>
                <head>
                        <title> How to use base tag </title>
                        <base href="http://www.kfupm.edu.sa/" target="_blank">
                </head>
                <body>
                        <p> To see more about  <a href="SitePages/en/academics-overview.aspx"> academics at KFUPM </a></p>
                        <p> Notice that we have only specified a relative address for the academic.
                            Since we have specified a base URL in the head section, the browser will look for the pages
                             at "http://www.kfupm.edu.sa/".
                        </p>
                </body>
        </html>
```

Structure of HTML Documents..

head section…

- Head tags
  - <title>: defines the document title

    ```
    <title>Web Design</title>
    ```

  - <base>: specify a default URL and a default target for all links on a page

    ```
    <base href="http://www.w3schools.com/images/" />
    ```

  - <link>: defines a resource reference

    ```
    <link rel="stylesheet" type="text/css" href="theme.css" />
    ```

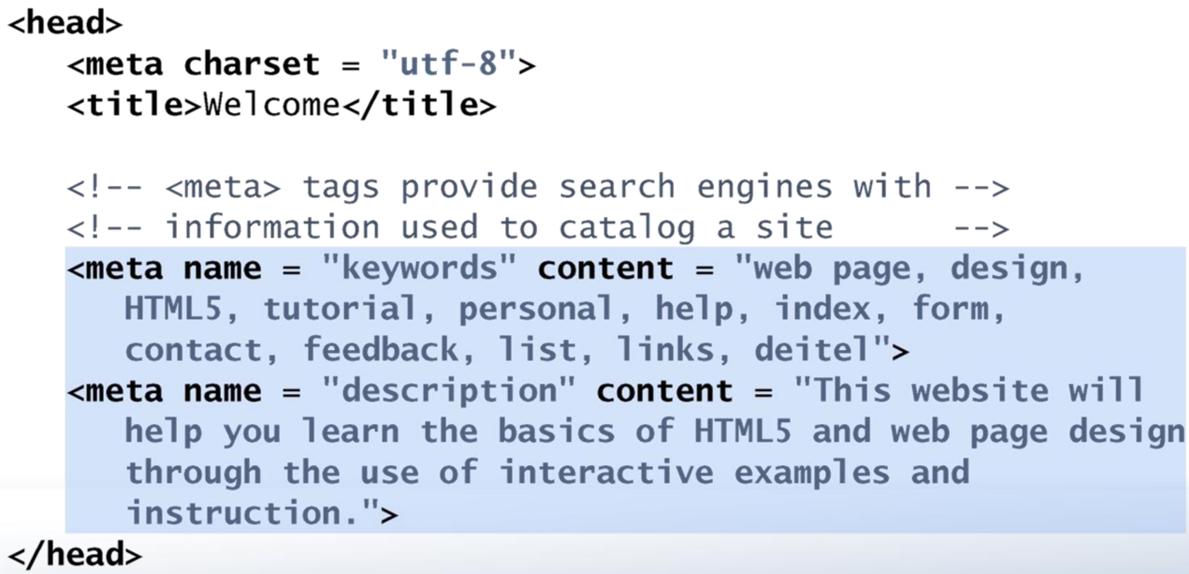
  - <meta>: defines meta information about your page, such as descriptions and keywords for search engines and refresh rates

Read more about character-encoding:
https://www.w3.org/International/questions/qa-what-is-encoding

Structure of HTML Documents..

Meta Tags

- Meta elements are not visible to users (unless the user selects to 'view source‘)
  - They must be placed inside the head section of your HTML document; otherwise they will not be read by search engines.
- One way that search engines catalog pages is by reading the `meta` element’s contents.
  - Of a `keywords meta` element: provides search engines with a list of words that describe a page, which are compared with words in search requests
  - Of a `description meta` element: provides a three- to four-line description of a site in sentence form, used by search engines to catalog your site. This text is sometimes displayed as part of the search result



```
<head>
   <meta charset = "utf-8">
   <title>Welcome</title>

   <!-- <meta> tags provide search engines with -->
   <!-- information used to catalog a site       -->
   <meta name = "keywords" content = "web page, design,
      HTML5, tutorial, personal, help, index, form,
      contact, feedback, list, links, deitel">
   <meta name = "description" content = "This website will
      help you learn the basics of HTML5 and web page design
      through the use of interactive examples and
      instruction.">
</head>
```

Meta Tags..
Automatic Refreshing

- ❑ Auto refreshing means that once one page loads, you can set a certain number of seconds and then the browser will load another page automatically.
  - Redirect a user if the site address has changed
  - Refresh the document to update the data

- ❑ Supported by popular web browsers
- ❑ The basic structure is as follows:

```
<meta http-equiv="refresh" content="x_seconds;
url=http://www.yourhost.com/pagetosendto.html">
```

http-equiv tells that this is the refresh or redirect meta tag

content gives number of seconds to wait

Example: refresh to davesite.com after 5 seconds

```
<meta http-equiv="refresh" content="5; URL=https://www.google.com.sa/">
```

Meta Tags..
Controlling Page Indexing

- You can use the following meta tag to control which pages to be indexed by all search engines and which to be crawled

```
<meta name=“robots" content=“text">
```

- where text can be any one of the following:

all	Same as index, follow.
index,follow	The default, meaning index the page and follow all links from the page.
noindex, follow	don't index the page but do follow all links from the page.
index, nofollow	index the page, but do not proceed to the links from the page.
noindex, nofollow	do not index the page and do not proceed to links from the page.
none	same as noindex,nofollow.
noimageindex	Prevents the images on the page from being indexed, but the text on the page can still be indexed. May be included index, noindex, follow and nofollow.

- You can also control a specific engine by changing the name value

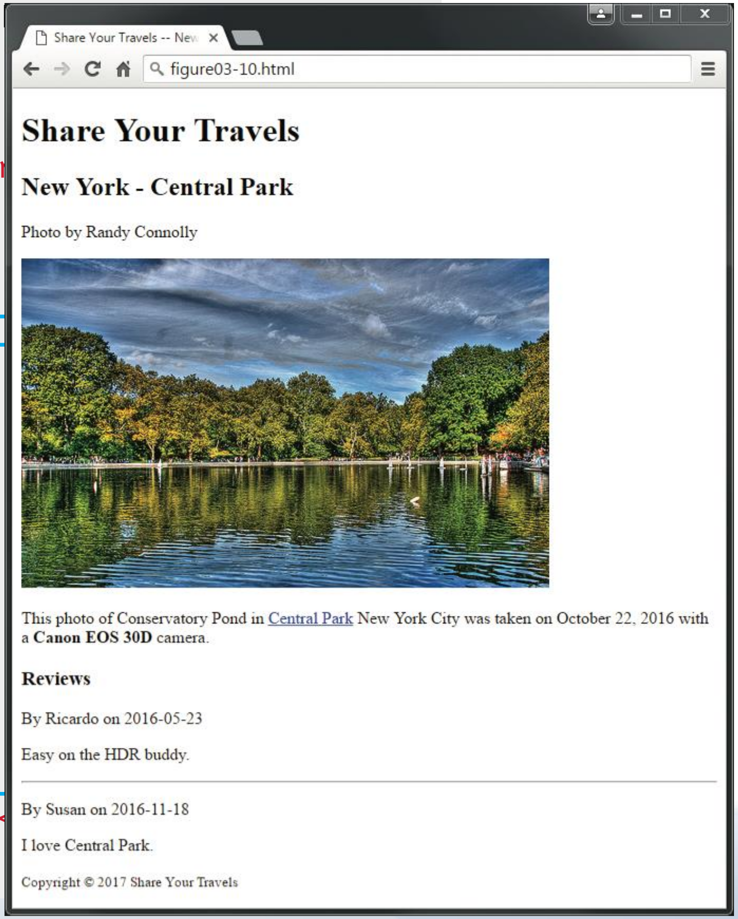
```
<meta name=“robots" content=“noindex, nofollow">
<meta name=“googlebot” content=“noindex”>
```

HTML body section is a main section of web page all contain that will be seen when the user loads the webpage.

HTML Elements

A document to walk through

```
        <body>
1          <h1>Share Your Travels</h1>
           <h2>New York - Central Park</h2>
2          <p>Photo by Randy Connolly</p>
           <p>This photo of Conservatory Pond in
              <a href="http://www.centralpark.com/">Central Park</a>   3
              New York City was taken on October 22, 2016 wit
              <strong>Canon EOS 30D</strong> camera.
           </p>                                                        4
5          <img src="images/central-park.jpg" alt="Central Par

           <h3>Reviews</h3>
6          <div>
              <p>By Ricardo on <time>2016-05-23</time></p>
              <p>Easy on the HDR buddy.</p>
           </div>
8          <hr>
           <div>
              <p>By Susan on <time>2016-11-18</time></p>
              <p>I love Central Park.</p>
           </div>          9

           <p><small>Copyright &copy; 2017 Share Your Travels<
        </body>                    10
```



Share Your Travels

New York - Central Park

Photo by Randy Connolly

This photo of Conservatory Pond in Central Park New York City was taken on October 22, 2016 with a **Canon EOS 30D** camera.

Reviews

By Ricardo on 2016-05-23

Easy on the HDR buddy.

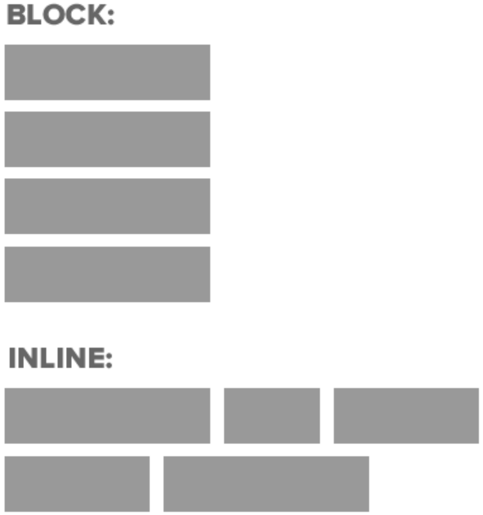
By Susan on 2016-11-18

I love Central Park.

Copyright © 2017 Share Your Travels

HTML Block Elements

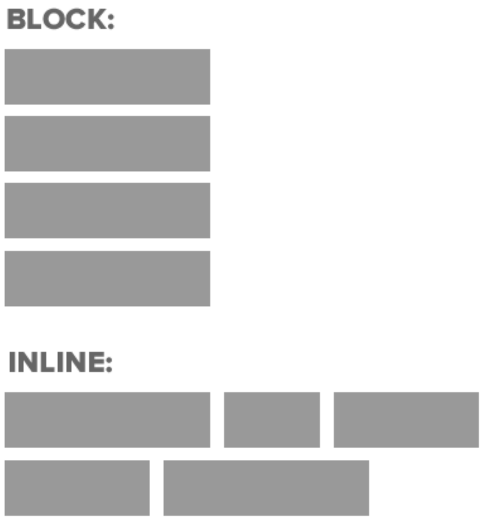
- ❑ Block-level Elements - Creates a large block of content
  - New lines before and after element
  - Consumes the whole width available
    - **<p>** - Paragraph
    - **<h1>** - **<h6>** Headings
    - **<form>** - Forms
    - **<div>** - div tags



- ❑ The <div> element
  - is often used as a container for other HTML elements.
  - The <div> element has no required attributes, but both style and class are common.

HTML Inline Elements

- Inline Level Element - they do not disrupt the flow
  - No new lines
  - Can be placed aside other elements
  - Can not define width
    - **<a>** - Links
    - **<strong>** and **<b>** - Bold
    - **<input />** - Input
    - **<span>** - Span tags

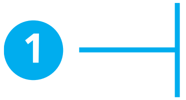


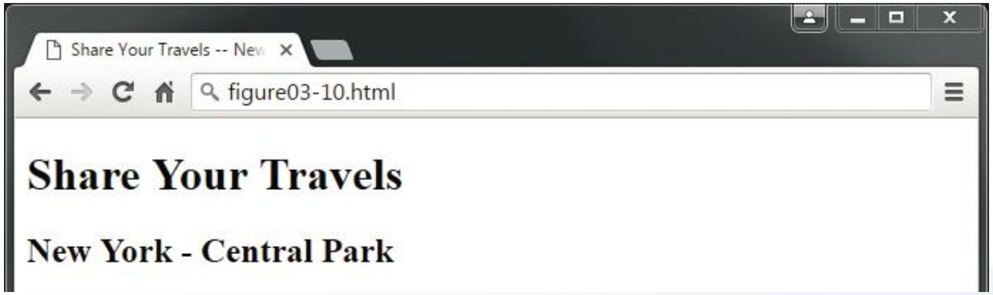
- The <span> element
  - is often used as a container for some text.
  - The <span> element has no required attributes, but both style and class are common.

HTML Elements
Headings

- ❑ There are six headings with different font sizes to specify the relative importance of information
- ❑ Headings are defined with the <h1> to <h6> tags
- ❑ *The actual font size used to display each heading element can vary significantly between browsers*

```
<body>
    <h1>Share Your Travels</h1>
    <h2>New York - Central Park</h2>
```





Share Your Travels

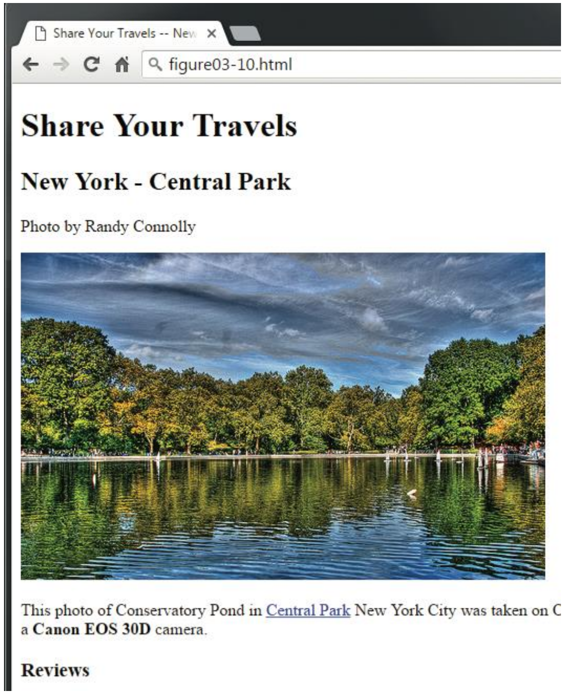
New York - Central Park

HTML Elements
Paragraphs and Divisions

- <p> tag is a container for text and other HTML elements
- <div> also a container element and is used to create a logical grouping of content
- HTML automatically adds an extra blank line before and after a paragraph

2

```
<p>Photo by Randy Connolly</p>
<p>This photo of Conservatory Pond in
   <a href="http://www.centralpark.com/">Cen
   New York City was taken on October 22, 20
   <strong>Canon EOS 30D</strong> camera.
</p>
```



Share Your Travels

New York - Central Park

Photo by Randy Connolly

This photo of Conservatory Pond in Central Park New York City was taken on C
a **Canon EOS 30D** camera.

Reviews

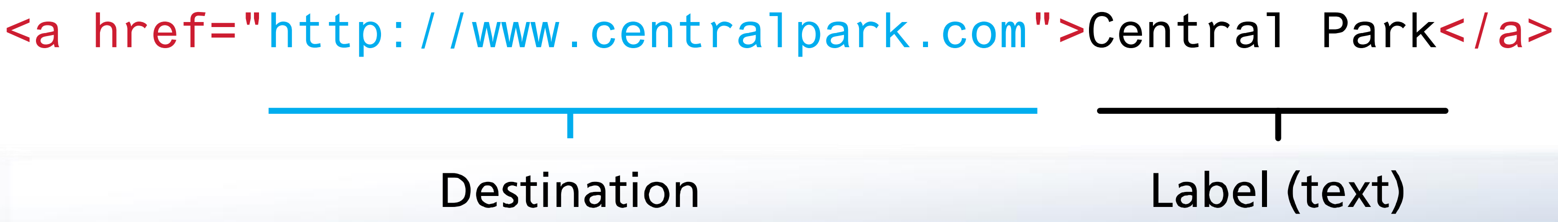
- Line Breaks
  - The <br> tag is used when you want to end a line,
  - Causes the next element or text to display on a new line

HTML Elements
Links

- Links are an essential feature of all web pages
- Links use the <a> element (the “a” stands for anchor).

- Web browsers typically *underline* text hyperlinks and color them *blue* by default.

- Attribute href (hypertext reference) specifies a *resource’s location*
  - a web page or location within a web page
  - a file
  - an e-mail address



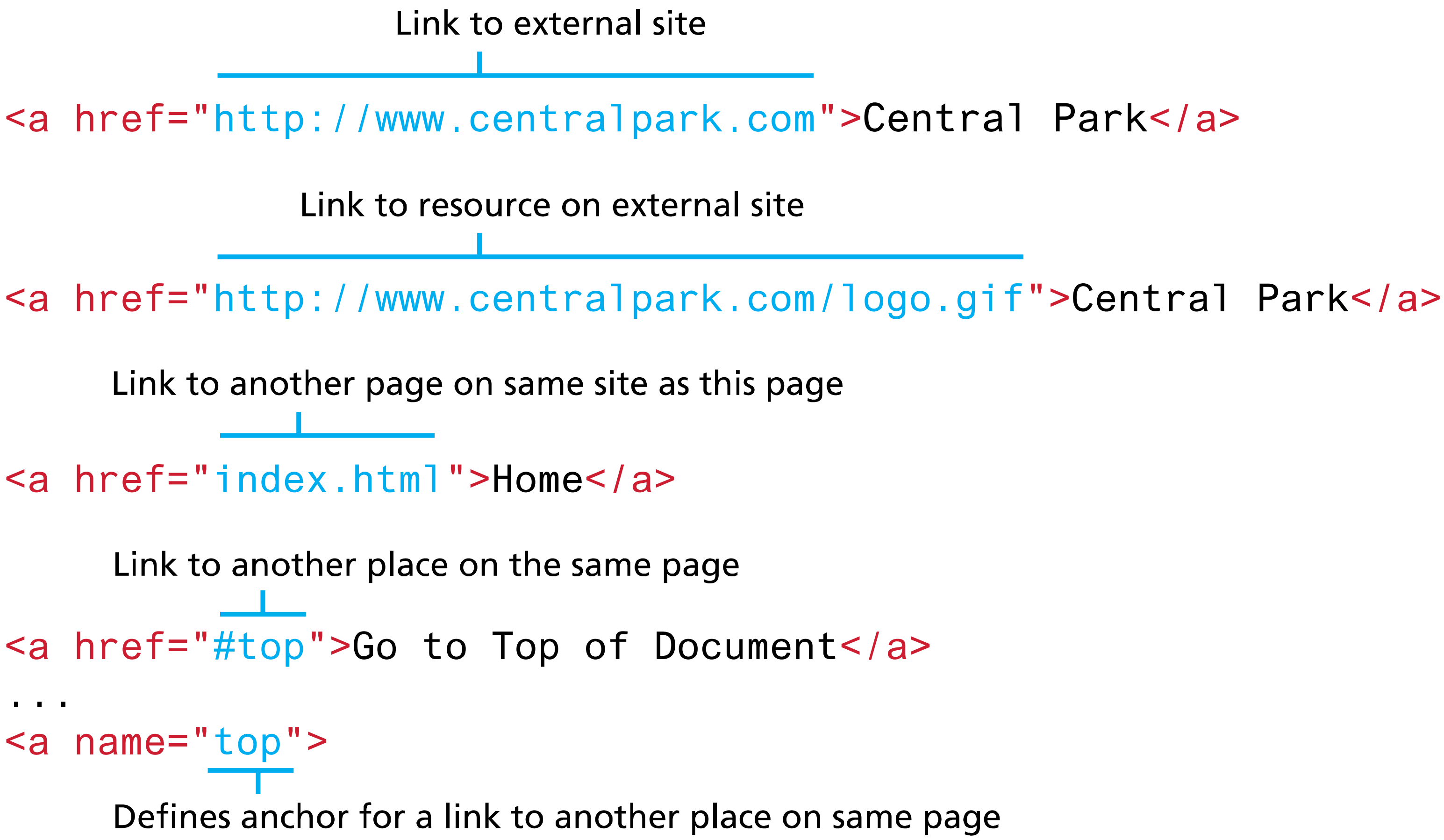
```
<a href="http://www.centralpark.com">Central Park</a>
```

HTML Elements
Links

- ❑ When a URL does not indicate a specific document on the website,
  - the web server returns a default web page.
  - This page is often called index.html, but most web servers can be configured to use any file as the default web page for the site.

- ❑ If the web server cannot locate a requested document, it returns an error indication to the web browser (known as a 404 error), and the browser displays a web page containing an error message.

HTML Elements
Links



Link to external site

```
<a href="http://www.centralpark.com">Central Park</a>
```

Link to resource on external site

```
<a href="http://www.centralpark.com/logo.gif">Central Park</a>
```

Link to another page on same site as this page

```
<a href="index.html">Home</a>
```

Link to another place on the same page

```
<a href="#top">Go to Top of Document</a>
...
<a name="top">
```

Defines anchor for a link to another place on same page

HTML Elements

Links

Link to specific place on another page

```
<a href="productX.html#reviews">Reviews for product X</a>
```

Link to email

```
<a href="mailto:person@somewhere.com">Someone</a>
```

Link to JavaScript function

```
<a href="javascript:OpenAnnoyingPopup();">See This</a>
```

Link to telephone (automatically dials the number when user clicks on it using a smartphone browser)

```
<a href="tel:+18009220579">Call toll free (800) 922-0579</a>
```

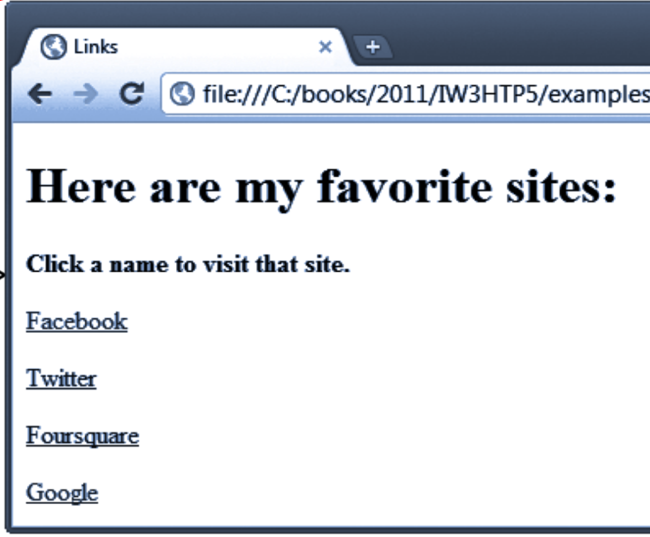
HTML Elements

Links

- ❑ Hyperlinking to a webpage

```
<body>
   <h1>Here are my favorite sites:</h1>
   <p><strong>Click a name to visit that site.</strong></p>

   <!-- create four text hyperlinks -->
   <p><a href = "http://www.facebook.com">Facebook</a></p>
   <p><a href = "http://www.twitter.com">Twitter</a></p>
   <p><a href = "http://www.foursquare.com">Foursquare</a></p>
   <p><a href = "http://www.google.com">Google</a></p>
</body>
```

The strong element indicates that the content has high importance. Browsers typically render such text in a bold font.



Here are my favorite sites:

Click a name to visit that site.

Facebook

Twitter

Foursquare

Google

- ❑ The target attribute specifies where to open the linked document:

_blank	Opens the linked document in a new window or tab
_self	Opens the linked document in the same frame as it was clicked (this is default)
_parent	Opens the linked document in the parent frame
_top	Opens the linked document in the full body of the window
framename	Opens the linked document in a named frame

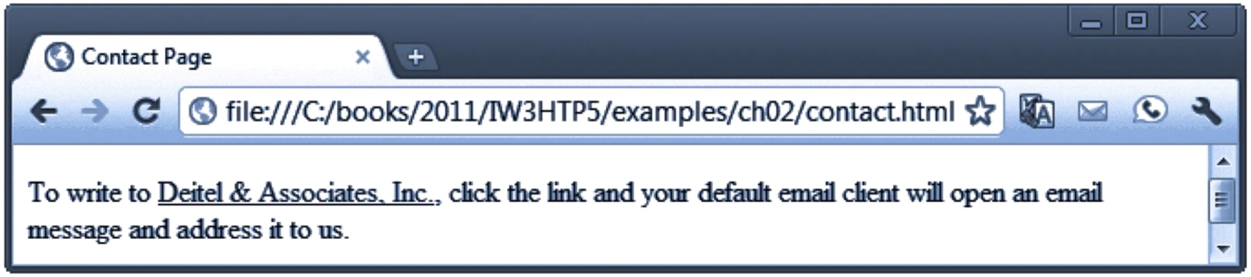
Example: https://www.w3schools.com/tags/att_a_target.asp

HTML Elements
Links

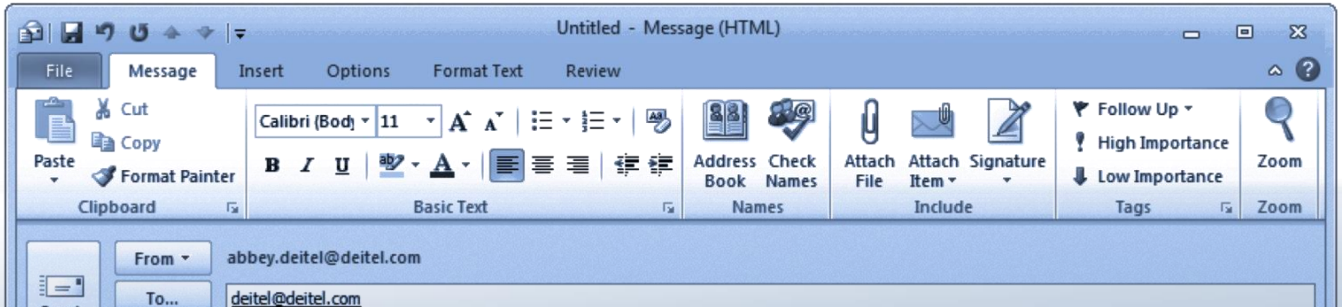
- ❑ Hyperlinking to an E-Mail Address

Anchors can link to an e-mail address using a mailto: URL

```
<body>
   <p>
      To write to <a href = "mailto:deitel@deitel.com">
      Deitel & Associates, Inc.</a>, click the link and your default
      email client will open an email message and address it to us.
   </p>
</body>
```



To write to Deitel & Associates, Inc., click the link and your default email client will open an email message and address it to us.



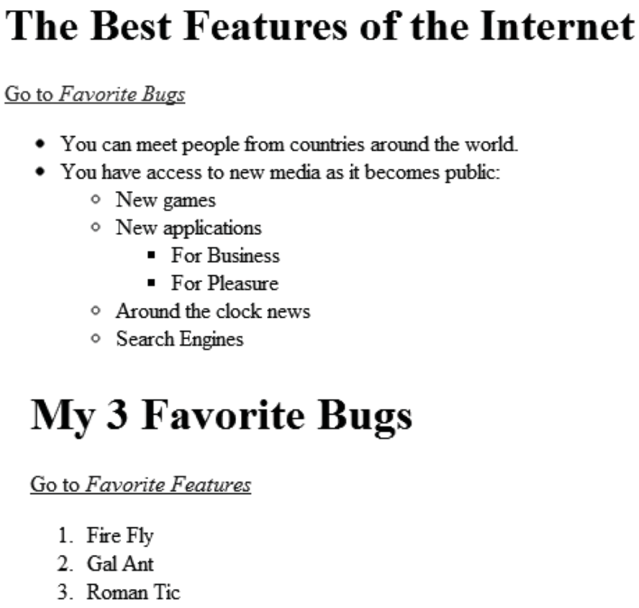
From abbey.deitel@deitel.com

To... deitel@deitel.com

HTML Elements
Internal Linking (Bookmark)

- The a tag can be used to link to another section of the same document by specifying the element’s id as the link’s href.
  - To link internally to an element with its id attribute set, use the syntax #id.

```
<!-- id attribute creates an internal hyperlink destination -->
<h1 id = "features">The Best Features of the Internet</h1>

<!-- an internal link's address is "#id" -->
<p><a href = "#bugs">Go to <em>Favorite Bugs</em></a></p>



<!-- id attribute creates an internal hyperlink destination -->
<h1 id = "bugs">My 3 Favorite Bugs</h1>
<p>
   <!-- internal hyperlink to features -->
   <a href = "#features">Go to <em>Favorite Features</em></a>
</p>
```



The Best Features of the Internet

Go to *Favorite Bugs*

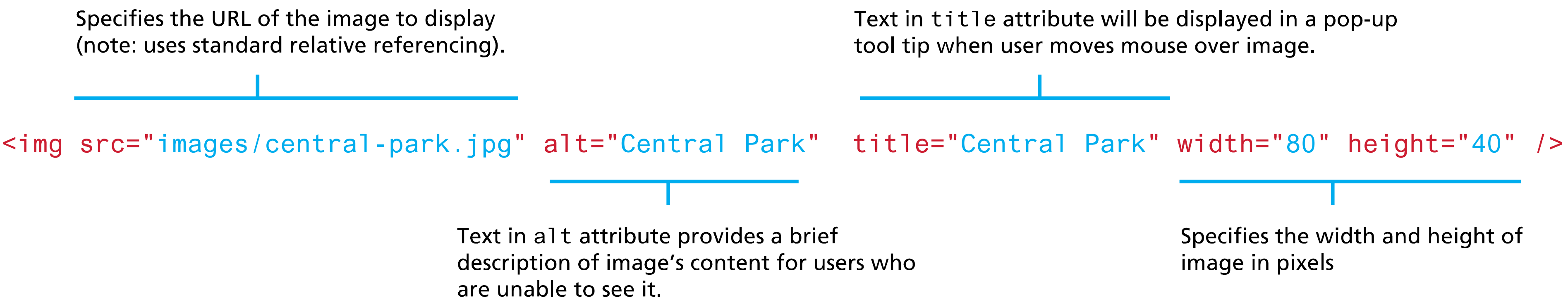
- You can meet people from countries around the world.
- You have access to new media as it becomes public:
  - New games
  - New applications
    - For Business
    - For Pleasure
  - Around the clock news
  - Search Engines

My 3 Favorite Bugs

Go to *Favorite Features*

1. Fire Fly
2. Gal Ant
3. Roman Tic

HTML Elements
Images



Specifies the URL of the image to display (note: uses standard relative referencing).

Text in `title` attribute will be displayed in a pop-up tool tip when user moves mouse over image.

```
<img src="images/central-park.jpg" alt="Central Park" title="Central Park" width="80" height="40" />
```

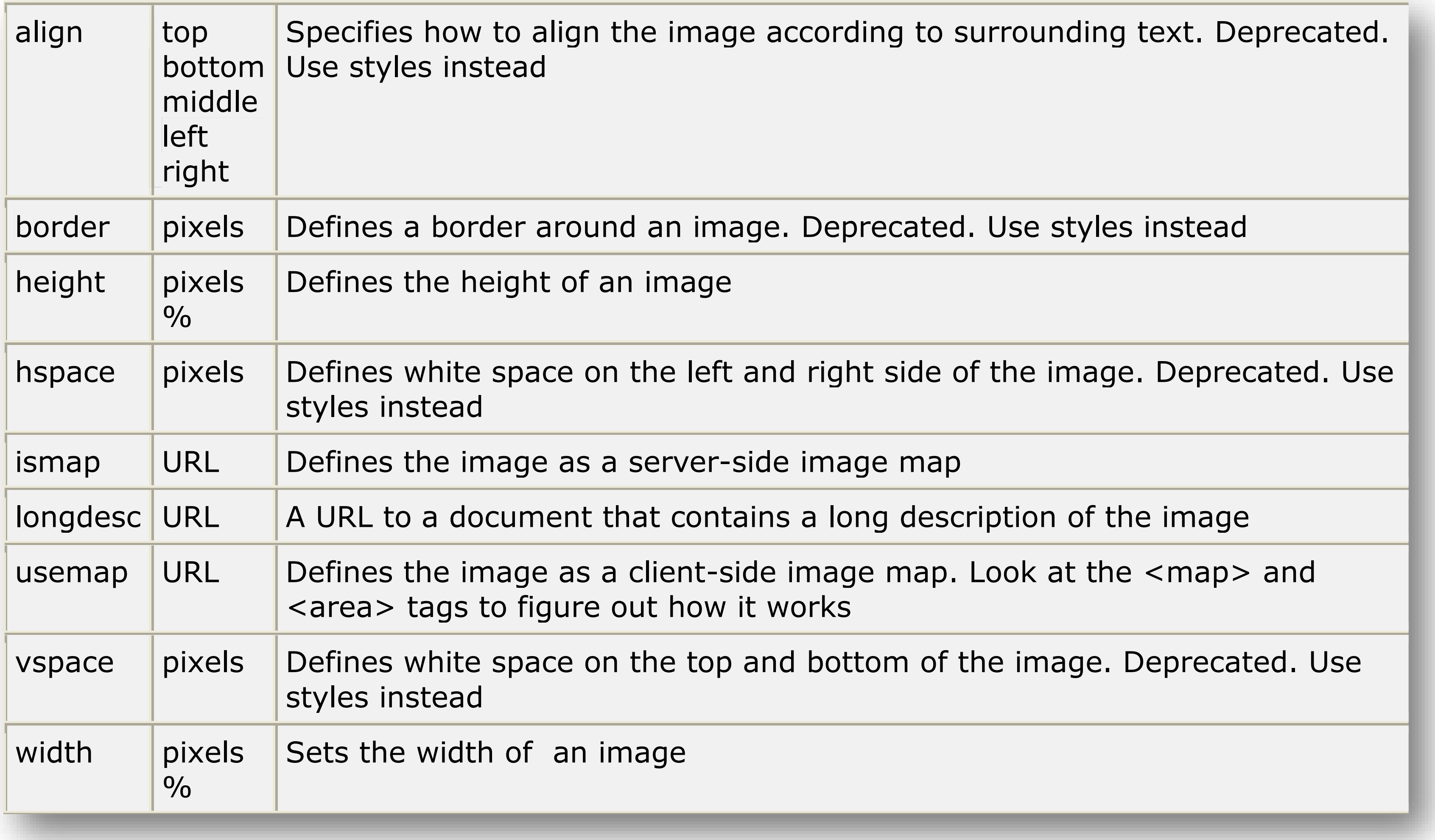
Text in `alt` attribute provides a brief description of image’s content for users who are unable to see it.

Specifies the width and height of image in pixels

- ❑ The img element’s src attribute specifies an image’s location
  - ▪ Width and height are optional attributes
    - ➢ If omitted, the browser uses the image’s actual width and height
    - ➢ Images are measured in pixels
- ❑ Images can be used as hyperlinks. It can be used to create *graphical web pages* that link to other resources.
- ❑ Every img element in an *HTML5 document* must have an alt attribute.
  - ▪ If a browser cannot render an image, the browser displays the alt attribute’s value.

HTML Elements

Images – more attributes



align	top bottom middle left right	Specifies how to align the image according to surrounding text. Deprecated. Use styles instead
border	pixels	Defines a border around an image. Deprecated. Use styles instead
height	pixels %	Defines the height of an image
hspace	pixels	Defines white space on the left and right side of the image. Deprecated. Use styles instead
ismap	URL	Defines the image as a server-side image map
longdesc	URL	A URL to a document that contains a long description of the image
usemap	URL	Defines the image as a client-side image map. Look at the <map> and <area> tags to figure out how it works
vspace	pixels	Defines white space on the top and bottom of the image. Deprecated. Use styles instead
width	pixels %	Sets the width of an image

https://www.w3schools.com/tags/tag_img.asp

Image Maps

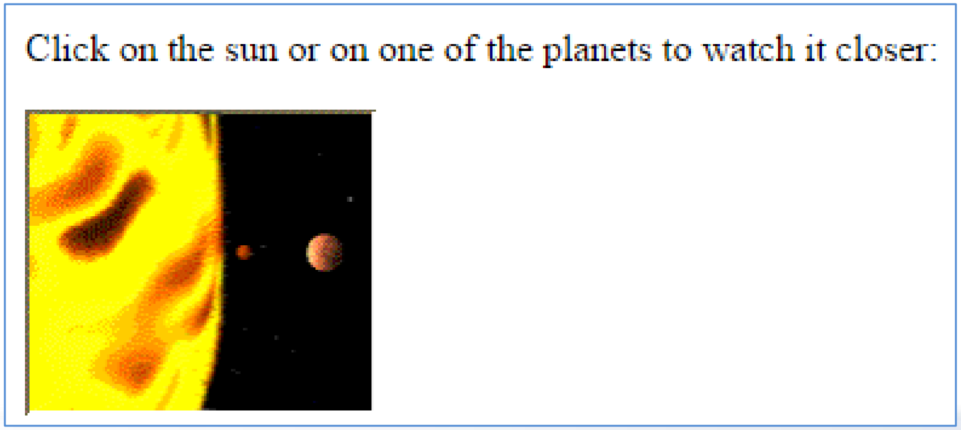
- Allow *linking different parts of an image to different URLs* according to where you click on the image
  - Useful for creating links on maps, diagrams, etc.
- The *map* element defines the areas of the image and the URLs that associate to different areas

- There are two types of image maps:
  - Client-side image map (usemap attribute):
    - When a user activates a region of the map with a mouse, the pixel coordinates are interpreted by the client and the client selects a link that was specified for the activated region and follows it

  - Server-side image map (ismap attribute):
    - When a user activates a region of the map with a mouse, the pixel coordinates are sent to the server-side agent specified by the href attribute of the anchor element which interprets the coordinates and performs some action

Image Maps
Example..

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

<p>Click on the sun or on one of the planets to watch it closer:</p>

<img src="planets.gif" width="145" height="126" alt="Planets" usemap="#planetmap">

<map name="planetmap">
  <area shape="rect" coords="0,0,82,126" alt="Sun" href="sun.htm">
  <area shape="circle" coords="90,58,3" alt="Mercury" href="mercur.htm">
  <area shape="circle" coords="124,58,8" alt="Venus" href="venus.htm">
</map>

</body>
</html>
```



Click on the sun or on one of the planets to watch it closer:

http://www.w3schools.com/tags/tryit.asp?filename=tryhtml_areamap

HTML Elements
Lists

- ❑ Ordered list element
  - starts with the <ol> tag.
  - Each list item starts with the <li> tag.

- ❑ Unordered list
  - starts with the <ul> tag.
  - Each list item starts with the <li> tag.
  - The list items will be marked with bullets (small black circles) by default

- ❑ Nested loops
  - Lists may be *nested* to represent *hierarchical* relationships, as in a multi-level outline.

- ❑ Description List
  - is a list of terms, with a description of each term.
  - The <dl> tag defines the description list, the <dt> tag defines the term (name), and the <dd> tag describes each term [dl, dt , dd --> list, term, description]

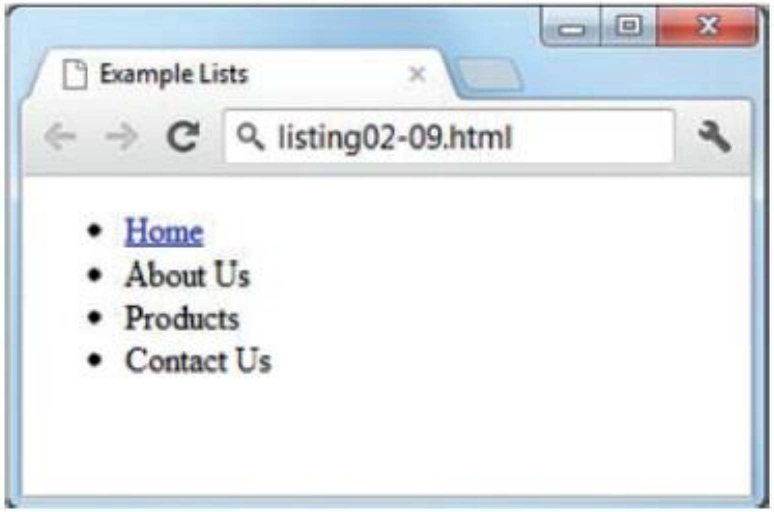
More examples: https://www.w3schools.com/html/html_lists.asp

HTML Elements
Lists

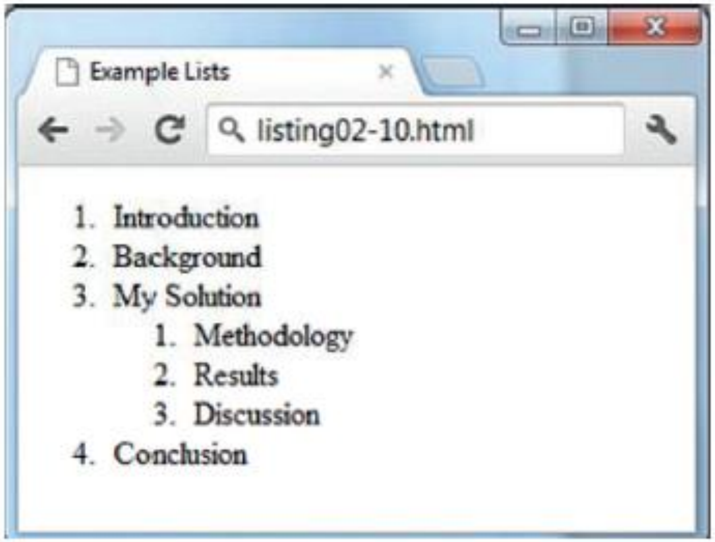
Notice that the list item element can contain other HTML elements.

```
<ul>
   <li><a href="index.html">Home</a></li>
   <li>About Us</li>
   <li>Products</li>
   <li>Contact Us</li>
</ul>
```

```
<ol>
   <li>Introduction</li>
   <li>Background</li>
   <li>My Solution</li>
   <li>
    <ol>
       <li>Methodology</li>
       <li>Results</li>
       <li>Discussion</li>
    </ol>
   </li>
   <li>Conclusion</li>
</ol>
```

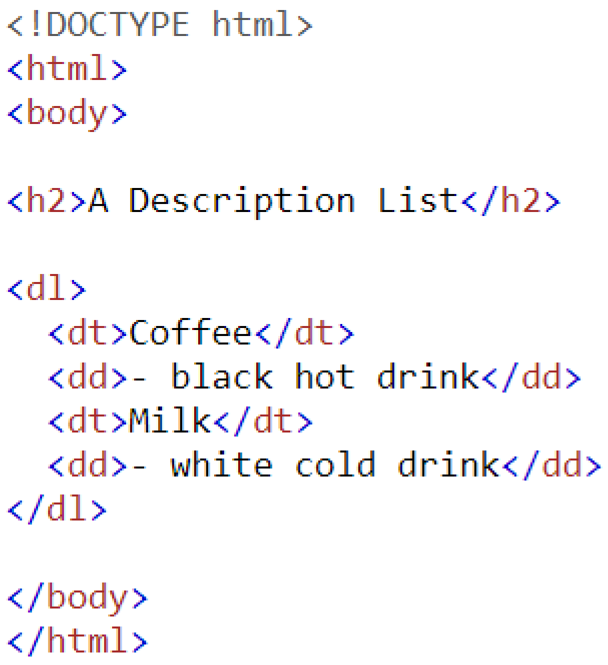


- Home
- About Us
- Products
- Contact Us

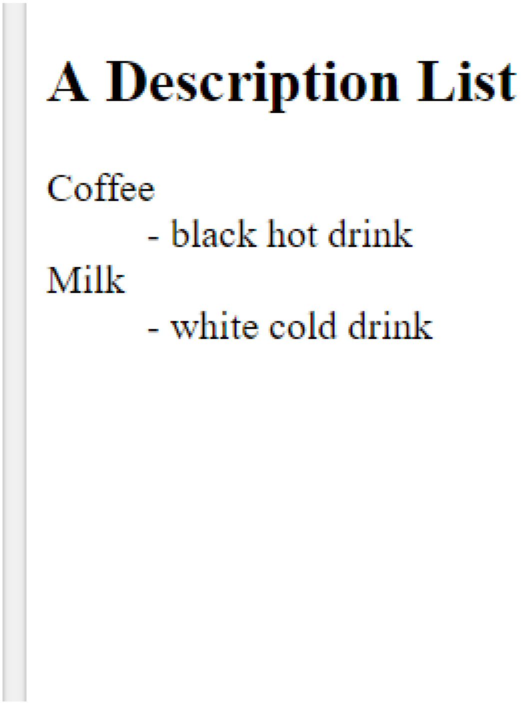


1. Introduction
2. Background
3. My Solution
    1. Methodology
    2. Results
    3. Discussion
4. Conclusion

HTML Elements
Lists



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

<h2>A Description List</h2>

<dl>
  <dt>Coffee</dt>
  <dd>- black hot drink</dd>
  <dt>Milk</dt>
  <dd>- white cold drink</dd>
</dl>

</body>
</html>
```

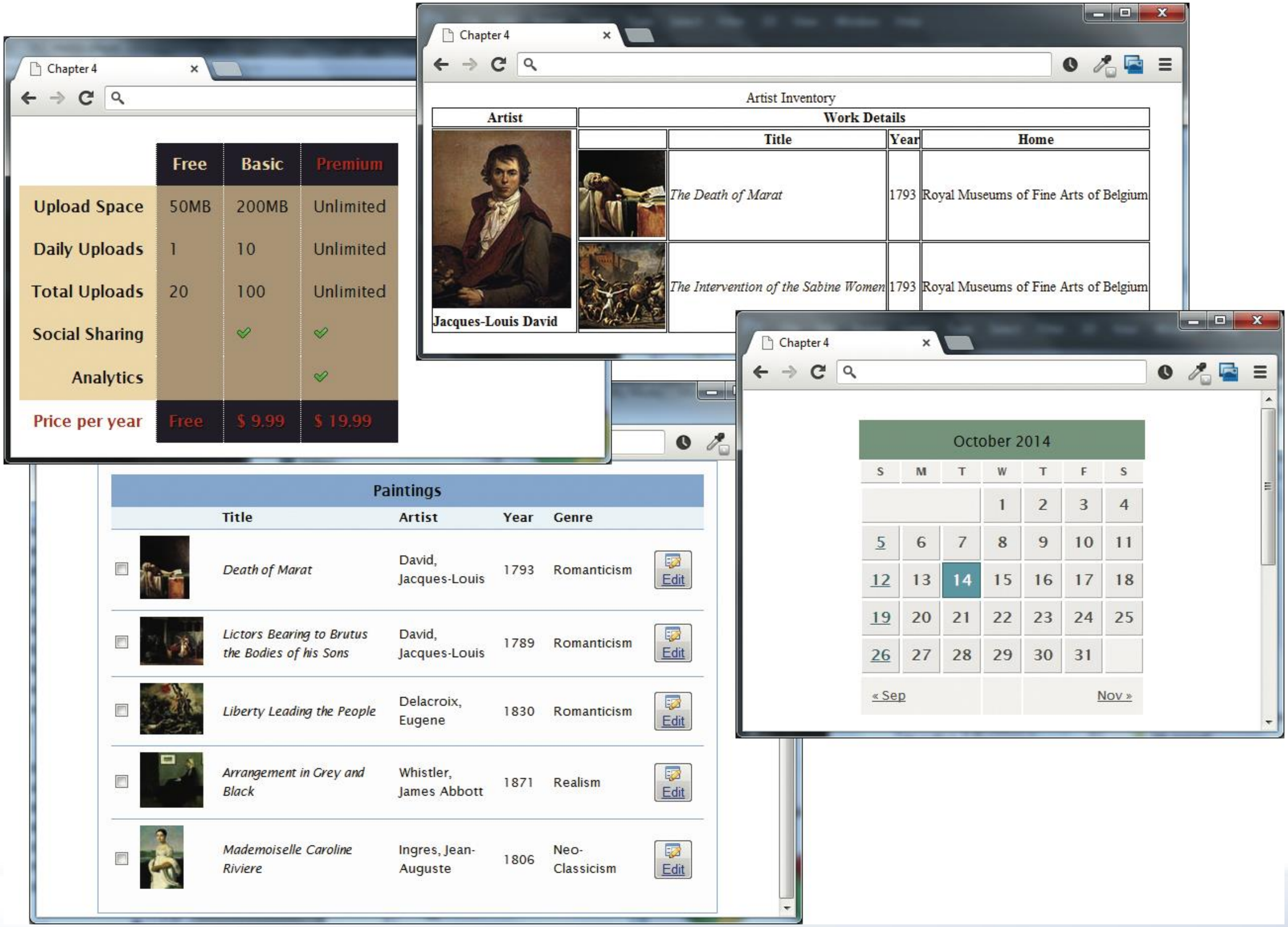


A Description List

Coffee
        - black hot drink
Milk
        - white cold drink

HTML Elements

Basic Table Structure



	Free	Basic	Premium
Upload Space	50MB	200MB	Unlimited
Daily Uploads	1	10	Unlimited
Total Uploads	20	100	Unlimited
Social Sharing		✓	✓
Analytics			✓
Price per year	Free	$ 9.99	$ 19.99

Artist Inventory

Artist	Work Details			
		Title	Year	Home
Jacques-Louis David		*The Death of Marat*	1793	Royal Museums of Fine Arts of Belgium
		The Intervention of the Sabine Women	1793	Royal Museums of Fine Arts of Belgium

Paintings

		Title	Artist	Year	Genre	
☐		*Death of Marat*	David, Jacques-Louis	1793	Romanticism	Edit
☐		*Lictors Bearing to Brutus the Bodies of his Sons*	David, Jacques-Louis	1789	Romanticism	Edit
☐		*Liberty Leading the People*	Delacroix, Eugene	1830	Romanticism	Edit
☐		*Arrangement in Grey and Black*	Whistler, James Abbott	1871	Realism	Edit
☐		*Mademoiselle Caroline Riviere*	Ingres, Jean-Auguste	1806	Neo-Classicism	Edit

October 2014

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	
« Sep					Nov »	

Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

HTML Elements
Tables

Tables are defined with the <table> tag

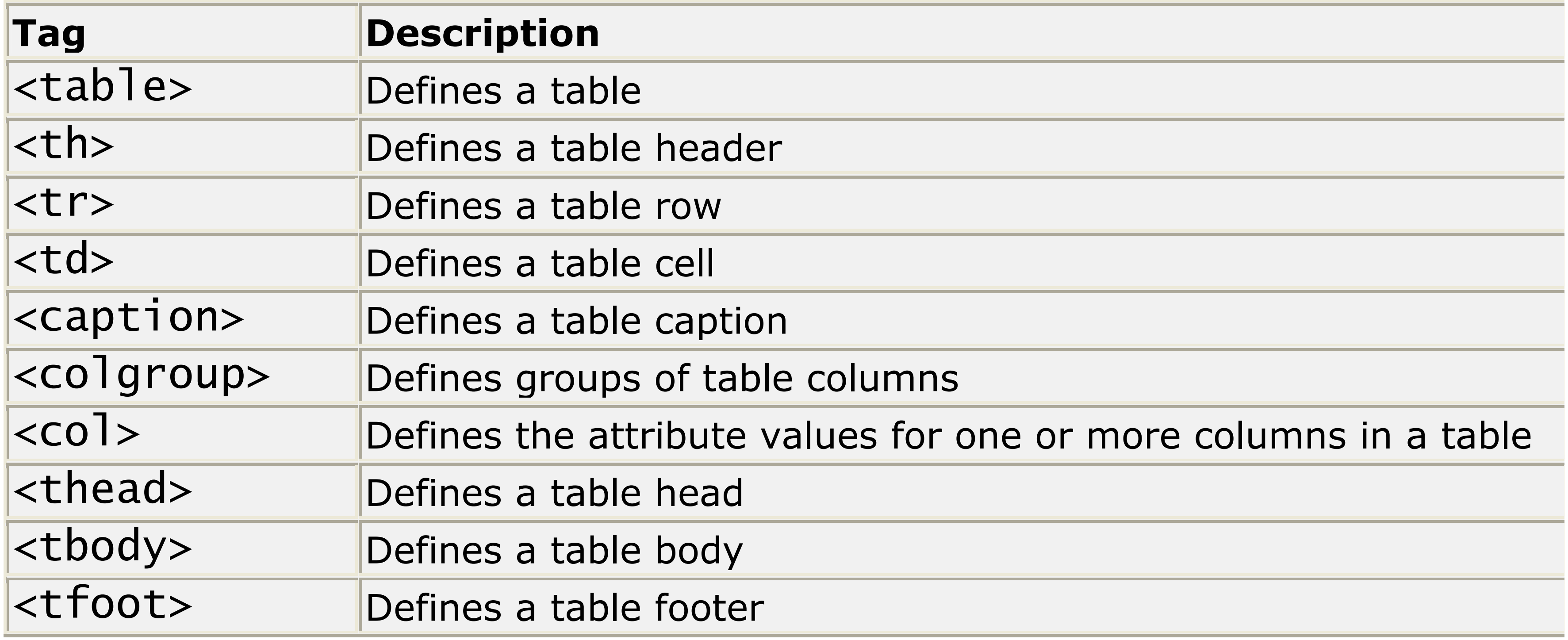
- ❑ is divided into rows using the <tr> tag
  - ▪ You may defined default attributes for the entire row: *align* (left, center, right) and/or *valign* (top, middle, bottom)

- ❑ A row is divided into data cells with <td> tag
  - ▪ By default the text in this cell is aligned left and centered vertically.
  - ▪ A data cell can contain text, images, lists, paragraphs, forms, horizontal rules, tables, etc

- ❑ <caption> defines the table caption (title)
  - ➢ To change the caption position use *align attribute*

HTML Elements

Table tags

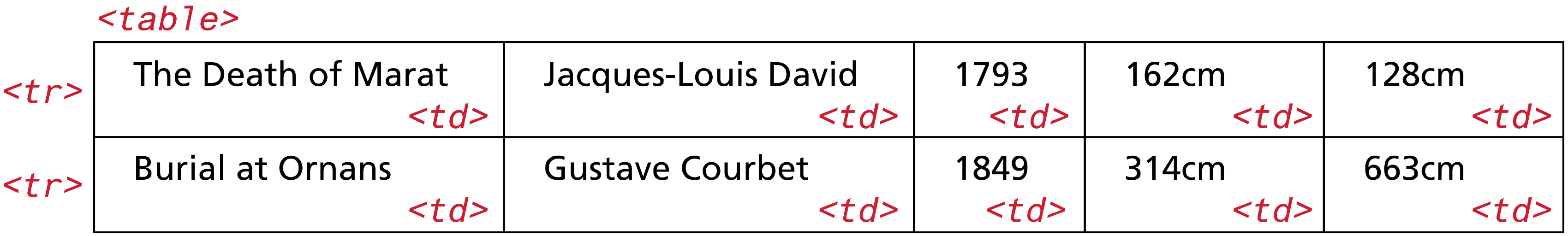


Tag	Description
<table>	Defines a table
<th>	Defines a table header
<tr>	Defines a table row
<td>	Defines a table cell
<caption>	Defines a table caption
<colgroup>	Defines groups of table columns
<col>	Defines the attribute values for one or more columns in a table
<thead>	Defines a table head
<tbody>	Defines a table body
<tfoot>	Defines a table footer

HTML Elements

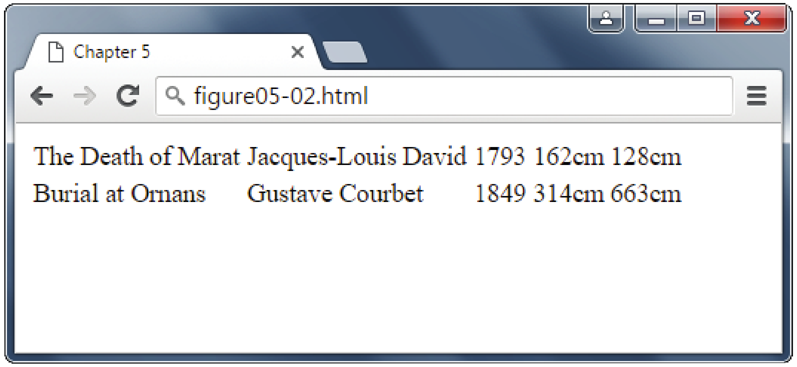
Tables

Basic table structure - some browsers do not by default display borders for the table; however, we can do so via CSS.



The Death of Marat	Jacques-Louis David	1793	162cm	128cm
Burial at Ornans	Gustave Courbet	1849	314cm	663cm

```
<table>
   <tr>
      <td>The Death of Marat</td>
      <td>Jacques-Louis David</td>
      <td>1793</td>
      <td>162cm</td>
      <td>128cm</td>
   </tr>
   <tr>
      <td>Burial at Ornans</td>
      <td>Gustave Courbet</td>
      <td>1849</td>
      <td>314cm</td>
      <td>663cm</td>
   </tr>
</table>
```



```
The Death of Marat Jacques-Louis David 1793 162cm 128cm
Burial at Ornans      Gustave Courbet      1849 314cm 663cm
```

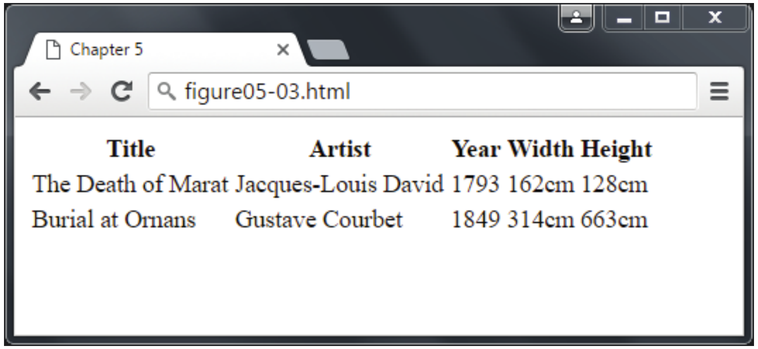
Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

HTML Elements
Tables- Adding headings <th>

<table>

<tr>	Title <th>	Artist <th>	Year <th>	Width <th>	Height <th>
<tr>	The Death of Marat <td>	Jacques-Louis David <td>	1793 <td>	162cm <td>	128cm <td>
<tr>	Burial at Ornans <td>	Gustave Courbet <td>	1849 <td>	314cm <td>	663cm <td>

```
<table>
   <tr>
      <th>Title</th>
      <th>Artist</th>
      <th>Year</th>
      <th>Width</th>
      <th>Height</th>
   </tr>
   <tr>
      <td>The Death of Marat</td>
      <td>Jacques-Louis David</td>
      <td>1793</td>
      <td>162cm</td>
      <td>128cm</td>
   </tr>
   <tr>
      <td>Burial at Ornans</td>
      <td>Gustave Courbet</td>
      <td>1849</td>
      <td>314cm</td>
      <td>663cm</td>
   </tr>
</table>
```

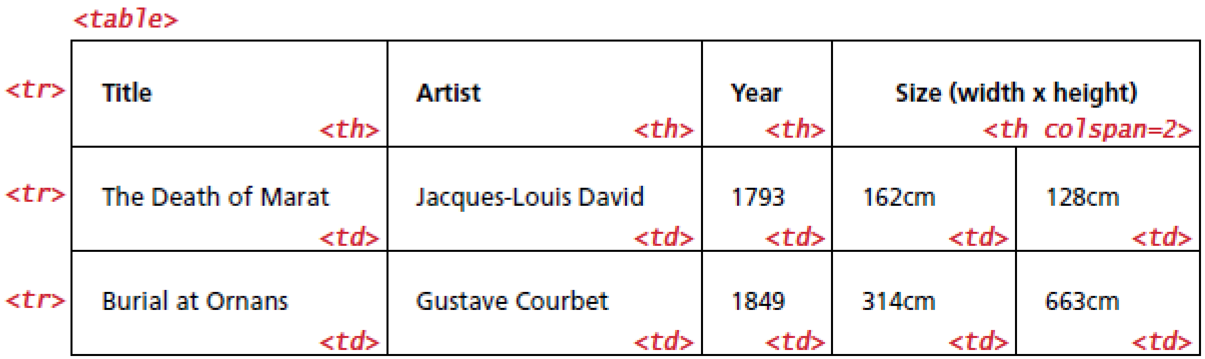


Title	Artist	Year	Width	Height
The Death of Marat	Jacques-Louis David	1793	162cm	128cm
Burial at Ornans	Gustave Courbet	1849	314cm	663cm

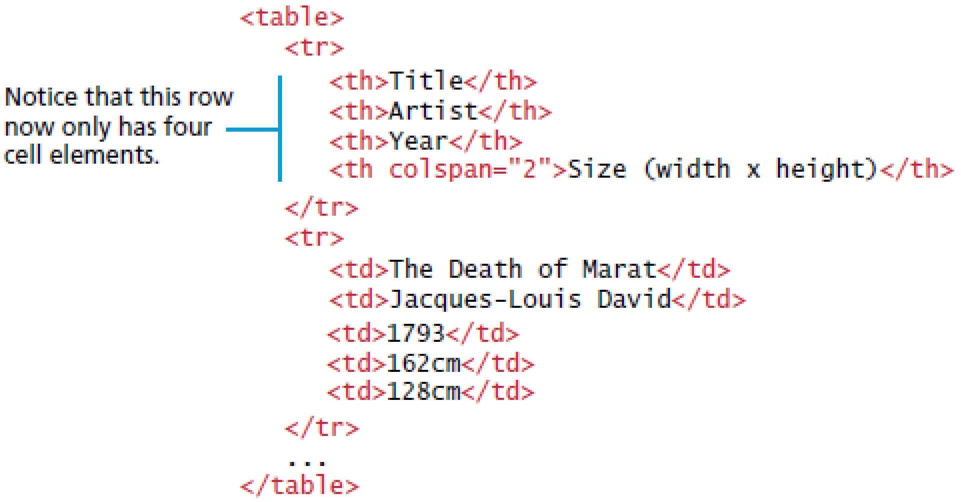
Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

Tables
rowspan and colspan

- If you want a given cell to cover several columns or rows, then you can do so by using the colspan or rowspan attributes
  - The values of these attributes specify the number of rows or columns occupied by the cell.
  - Can be placed inside any data cell or table header cell.



Title	Artist	Year	Size (width x height)	
The Death of Marat	Jacques-Louis David	1793	162cm	128cm
Burial at Ornans	Gustave Courbet	1849	314cm	663cm



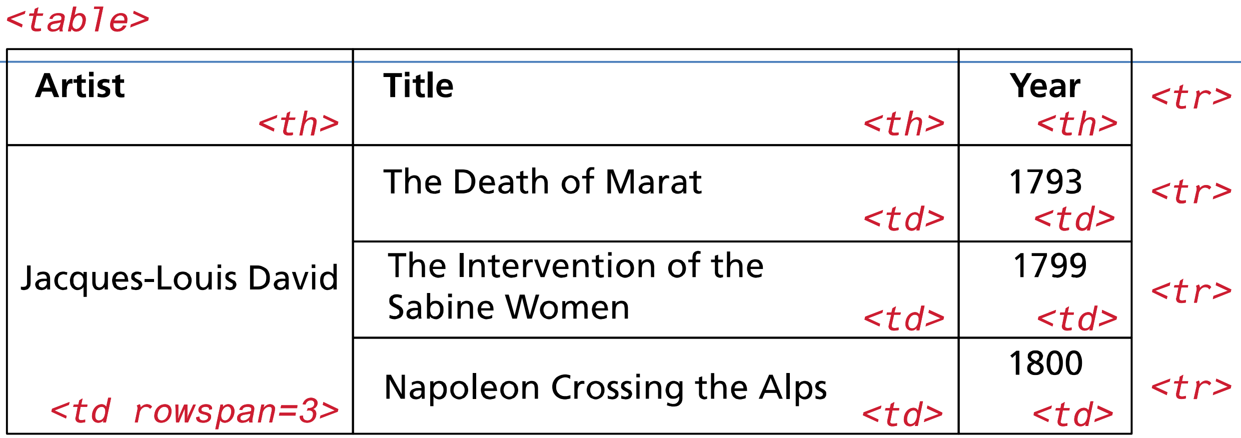
Notice that this row now only has four cell elements.

```
<table>
   <tr>
      <th>Title</th>
      <th>Artist</th>
      <th>Year</th>
      <th colspan="2">Size (width x height)</th>
   </tr>
   <tr>
      <td>The Death of Marat</td>
      <td>Jacques-Louis David</td>
      <td>1793</td>
      <td>162cm</td>
      <td>128cm</td>
   </tr>
   ...
</table>
```

Source: Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

Another example: http://www.w3schools.com/tags/tryit.asp?filename=tryhtml_tbody

Tables
rowspan and colspan



<table>

Artist <th>	Title <th>	Year <th>	<tr>
Jacques-Louis David <td rowspan=3>	The Death of Marat <td>	1793 <td>	<tr>
	The Intervention of the Sabine Women <td>	1799 <td>	<tr>
	Napoleon Crossing the Alps <td>	1800 <td>	<tr>

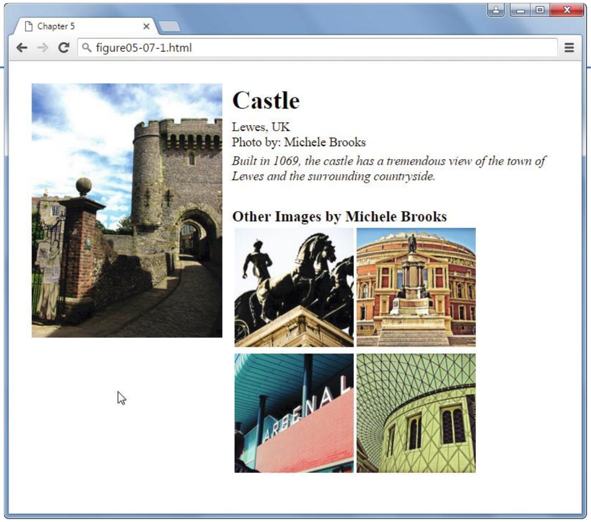
```
<table>
   <tr>
      <th>Title</th>
      <th>Artist</th>
      <th>Year</th>
   </tr>
   <tr>
      <td rowspan="3">Jacques-Louis David</td>
      <td>The Death of Marat</td>
      <td>1793</td>
   </tr>
   <tr>
      <td>The Intervention of the Sabine Women</td>
      <td>1799</td>
   </tr>
   <tr>
      <td>Napoleon Crossing the Alps</td>
      <td>1800</td>
   </tr>
</table>
```

Notice that these two rows now only have two cell elements.

Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

Tables

Using Tables for Layout



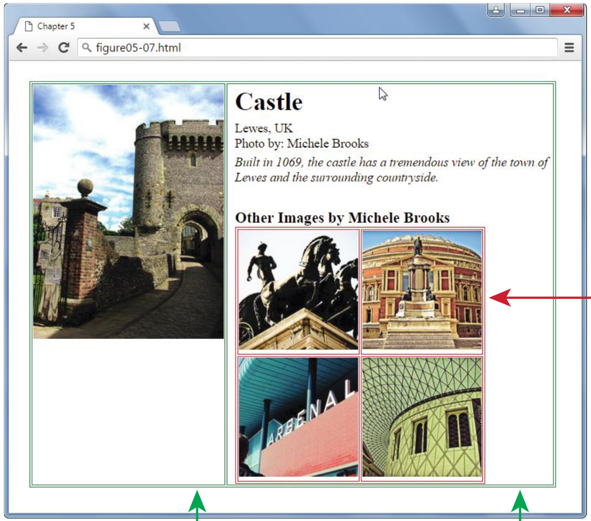
Castle

Lewes, UK

Photo by: Michele Brooks

Built in 1069, the castle has a tremendous view of the town of Lewes and the surrounding countryside.

Other Images by Michele Brooks



Castle

Lewes, UK

Photo by: Michele Brooks

Built in 1069, the castle has a tremendous view of the town of Lewes and the surrounding countryside.

Other Images by Michele Brooks

```
<table>
  <tr>
    <td>
      <img src="images/959.jpg" alt="Castle"/>
    </td>
    <td>
      <h2>Castle</h2>
      <p>Lewes, UK</p>
      <p>Photo by: Michele Brooks</p>
      <p>Built in 1069, the castle has a tremendous
         view of the town of Lewes and the
         surrounding countryside.
      </p>

      <h3>Other Images by Michele Brooks</h3>

      <table>
        <tr>
           <td><img src="images/464.jpg" /></td>
           <td><img src="images/537.jpg" /></td>
        </tr>
        <tr>
           <td><img src="images/700.jpg" /></td>
           <td><img src="images/828.jpg" /></td>
        </tr>
      </table>
    </td>
  </tr>
</table>
```

Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

HTML Styles

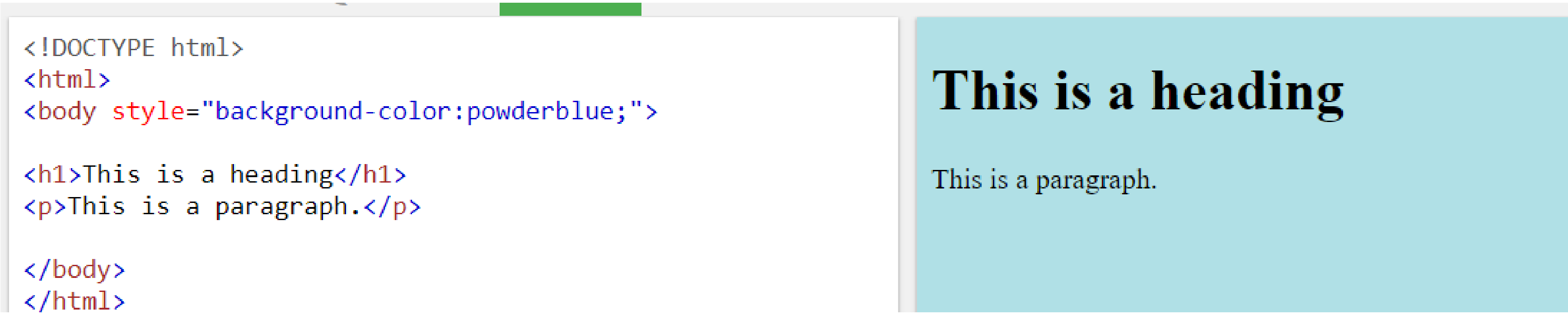
- ❑ Setting the style of an HTML element, can be done with the style attribute.
- ❑ Styles can be added to HTML elements in 3 ways:

  - **Inline** - by using the style attribute in HTML elements
  - **Internal** - by using a `<style>` element in the `<head>` section
  - **External** - by using an external CSS file

HTML Styles…

- The HTML style attribute has the following syntax:

<*tagname* style="*property:value;*">



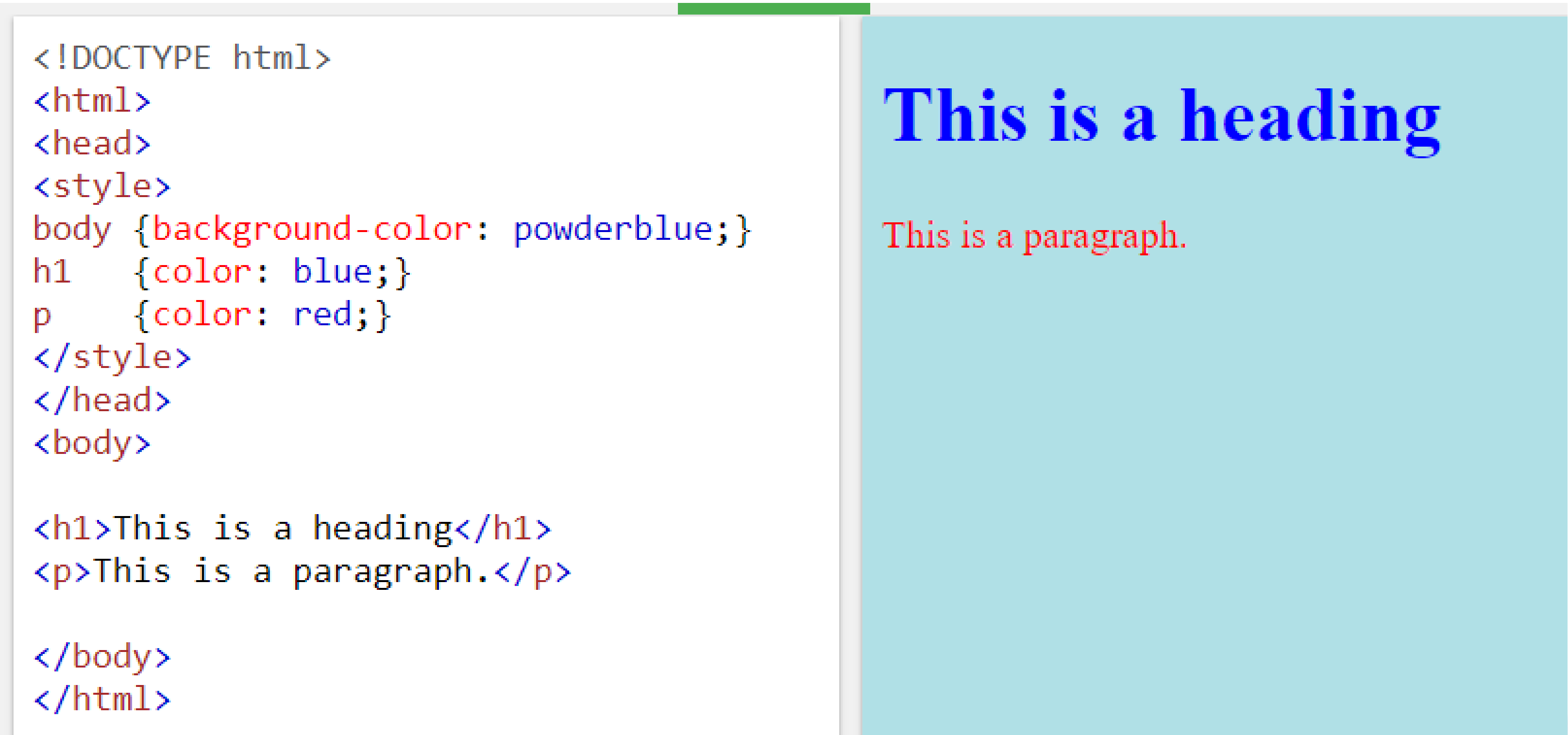
```
<!DOCTYPE html>
<html>
<body style="background-color:powderblue;">

<h1>This is a heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

This is a heading

This is a paragraph.

HTML Styles…

- ❑ Internal style is used to define a style for a single HTML page.
- ❑ An internal style is defined in the <head> section of an HTML page, within a <style> element:



```
<!DOCTYPE html>
<html>
<head>
<style>
body {background-color: powderblue;}
h1   {color: blue;}
p    {color: red;}
</style>
</head>
<body>

<h1>This is a heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

This is a heading

This is a paragraph.

Tables

Styling Tables

```
border: border-width border-style border-color
```

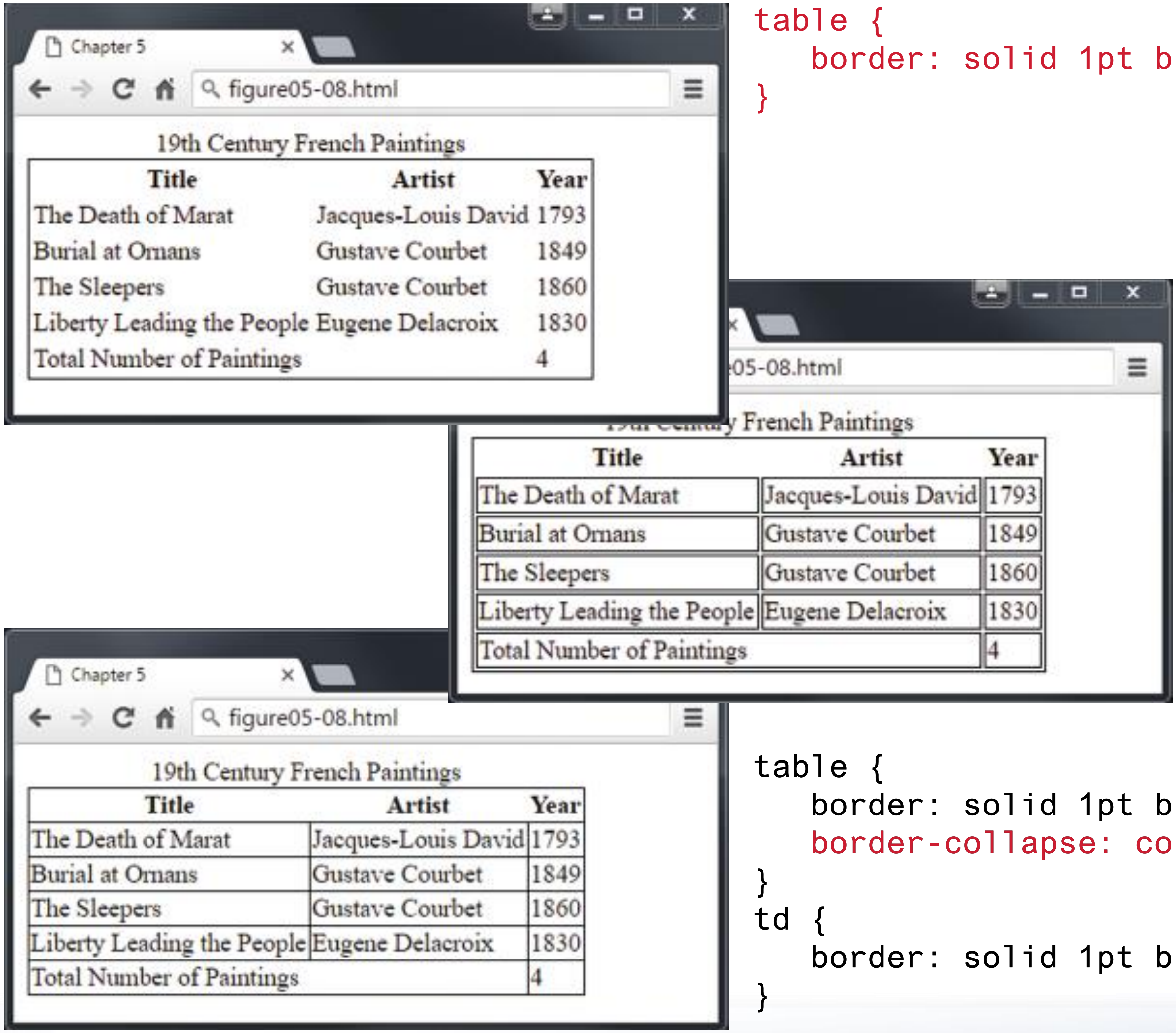
- ❑ border: *controls the border of the tag element*

Value	Description
border-width	Specifies the width of the border. Default value is "medium"
border-style	Specifies the style of the border. It can be “dotted”, “dashed”, “solid”, “double”…etc. Default value is "none"
border-color	Specifies the color of the border. Default value is the color of the text

https://www.w3schools.com/cssref/playit.asp?filename=playcss_border-style&preval=groove

Tables

Styling Tables



19th Century French Paintings

Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Total Number of Paintings		4

```
table {
   border: solid 1pt black;
}
```

y French Paintings

Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Total Number of Paintings		4

```
table {
   border: solid 1pt black;
}
td {
   border: solid 1pt black;
}
```

19th Century French Paintings

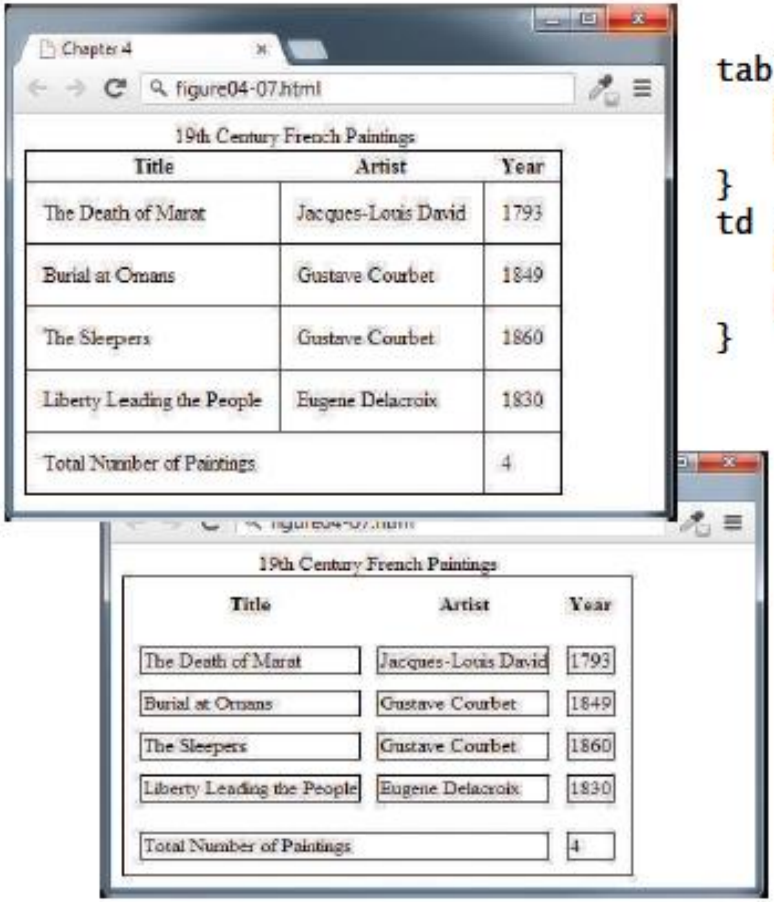
Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Total Number of Paintings		4

```
table {
   border: solid 1pt black;
   border-collapse: collapse;
}
td {
   border: solid 1pt black;
}
```

https://www.w3schools.com/cssref/tryit.asp?filename=trycss_border-collapse

Tables

Styling Tables



19th Century French Paintings

Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Total Number of Paintings		4

```
table {
    border: solid 1pt black;
    border-collapse: collapse;
}
td {
    border: solid 1pt black;
    padding: 10pt;
}
```

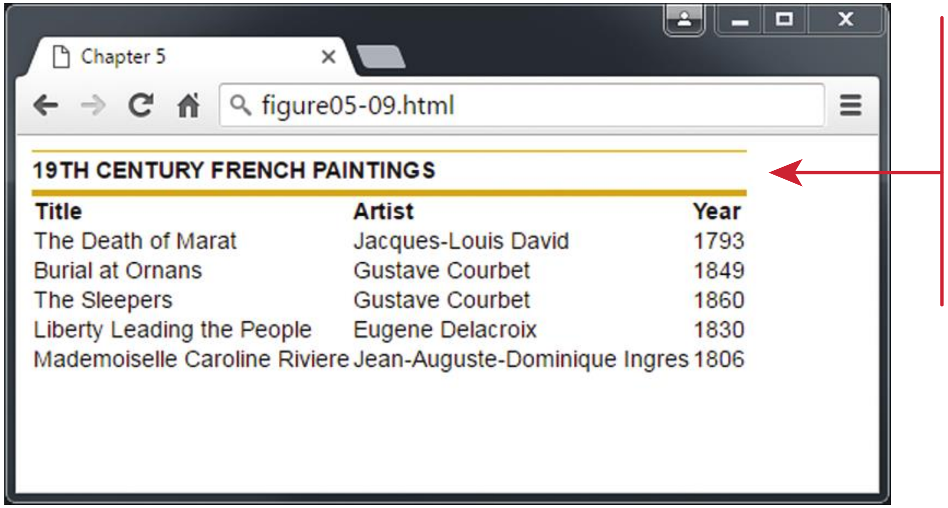
19th Century French Paintings

Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Total Number of Paintings		4

```
table {
    border: solid 1pt black;
    border-spacing: 10pt;
}
td {
    border: solid 1pt black;
}
```

Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.
More about padding: https://www.w3schools.com/css/css_padding.asp

Tables
Styling Tables



19TH CENTURY FRENCH PAINTINGS

Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Mademoiselle Caroline Riviere	Jean-Auguste-Dominique Ingres	1806

```
caption {
   font-weight: bold;
   padding: 0.25em 0 0.25em 0;
   text-align: left;
   text-transform: uppercase;
   border-top: 1px solid #DCA806;
}
table {
   font-size: 0.8em;
   font-family: Arial, sans-serif;
   border-collapse: collapse;
   border-top: 4px solid #DCA806;
   border-bottom: 1px solid white;
   text-align: left;
}
```

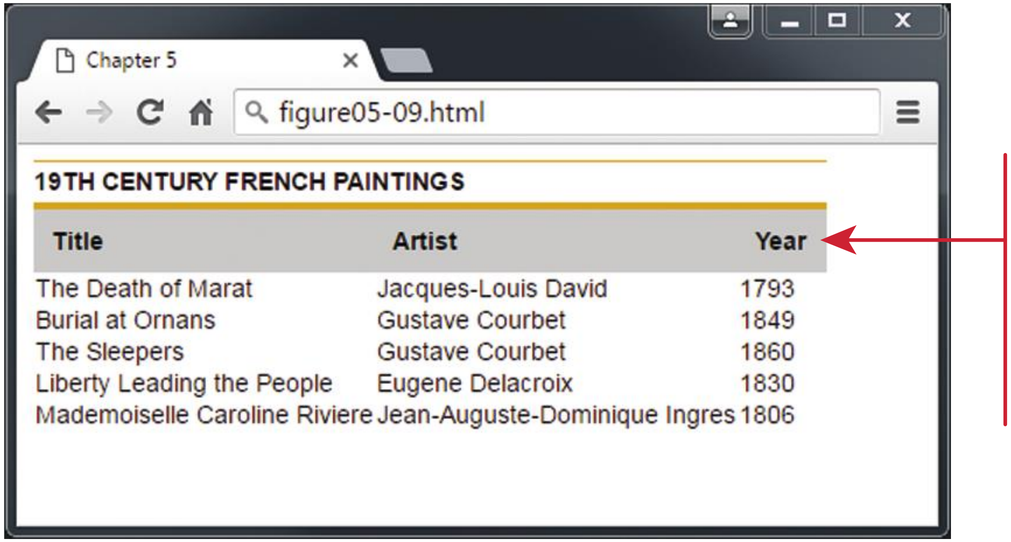
Note:

- By specifying the padding width in em, the width of the padding is relative to the font size of the DIV element.
- An em is equal to the computed font-size of that element’s parent. *For example*, If there is a div element defined with font-size: 16px then for that div and for its children 1em = 16px.

Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

Tables

Styling Tables



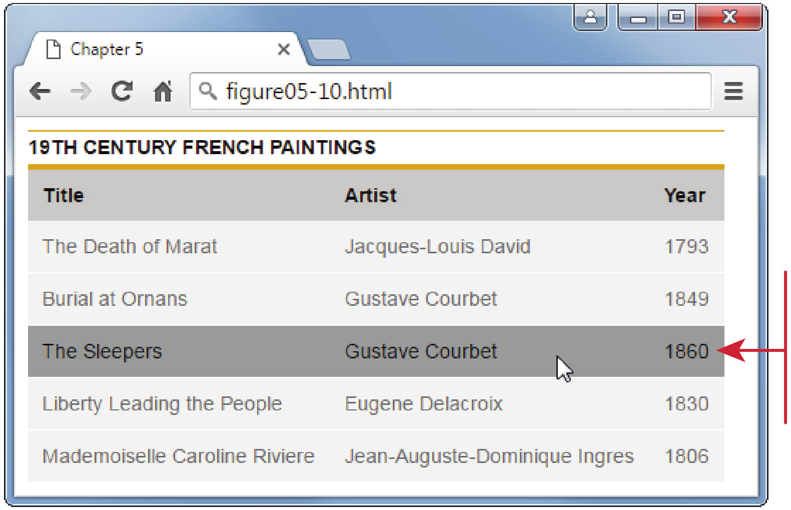
19TH CENTURY FRENCH PAINTINGS

Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Mademoiselle Caroline Riviere	Jean-Auguste-Dominique Ingres	1806

```
thead tr {
    background-color: #CACACA;
}
th {
    padding: 0.75em;
}
```

Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

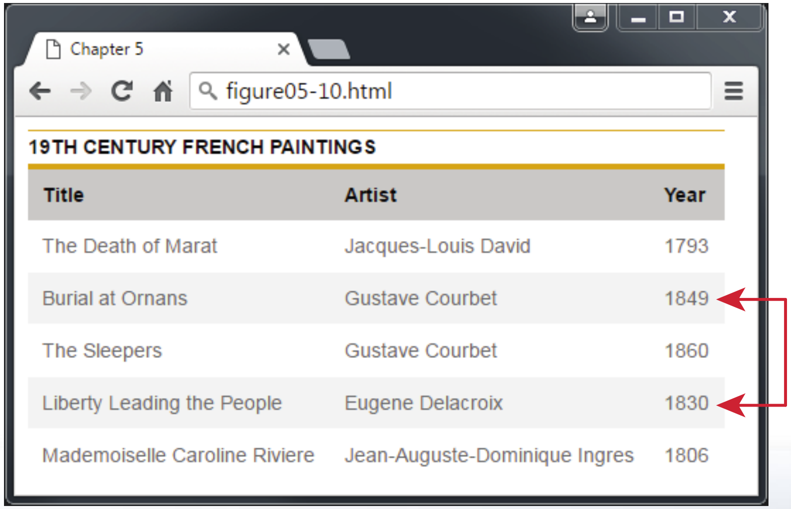
Tables
Hover & Zebras



19TH CENTURY FRENCH PAINTINGS

Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Mademoiselle Caroline Riviere	Jean-Auguste-Dominique Ingres	1806

```
tbody tr:hover {
   background-color: #9e9e9e;
   color: black;
}
```



19TH CENTURY FRENCH PAINTINGS

Title	Artist	Year
The Death of Marat	Jacques-Louis David	1793
Burial at Ornans	Gustave Courbet	1849
The Sleepers	Gustave Courbet	1860
Liberty Leading the People	Eugene Delacroix	1830
Mademoiselle Caroline Riviere	Jean-Auguste-Dominique Ingres	1806

```
tbody tr:nth-child(even) {
   background-color: lightgray;
}
```

Connolly, Randy. *Fundamentals of web development*. Pearson Education, 2015.

Special Characters and Horizontal Rules

- HTML5 provides character entity references (in the form &*code*;) for representing special characters that cannot be rendered otherwise
- Special characters can be represented as
  - Word abbreviations
  - Numeric character references— decimal or hexadecimal (hex) values representing special character

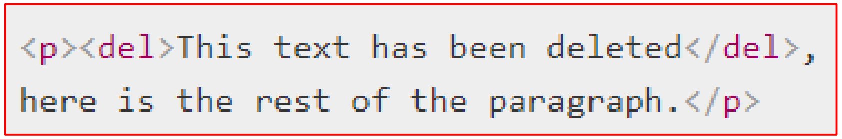
Char	Number	Entity	Description
∀	&#8704;	&forall;	FOR ALL
∃	&#8707;	&exist;	THERE EXISTS
∅	&#8709;	&empty;	EMPTY SETS

  - For an extensive lists of character entities,

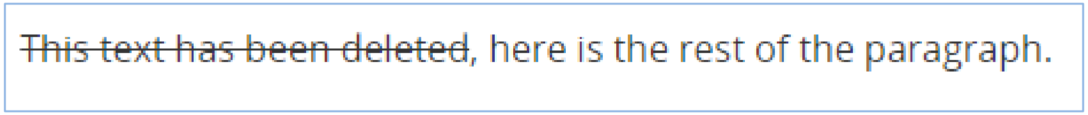
    https://dev.w3.org/html5/html-author/charref
    https://www.freeformatter.com/html-entities.html

Special Characters and Horizontal Rules..

- ❑ The <del> tag defines text that has been deleted from a document.

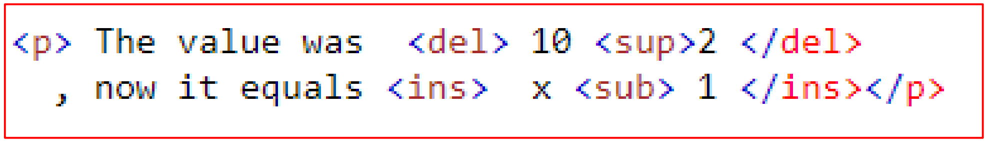


```
<p><del>This text has been deleted</del>,
here is the rest of the paragraph.</p>
```

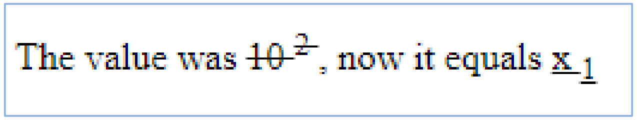


~~This text has been deleted~~, here is the rest of the paragraph.

- ❑ The <ins> tag defines a text that has been inserted into a document.



```
<p> The value was  <del> 10 <sup>2 </del>
  , now it equals <ins>  x <sub> 1 </ins></p>
```

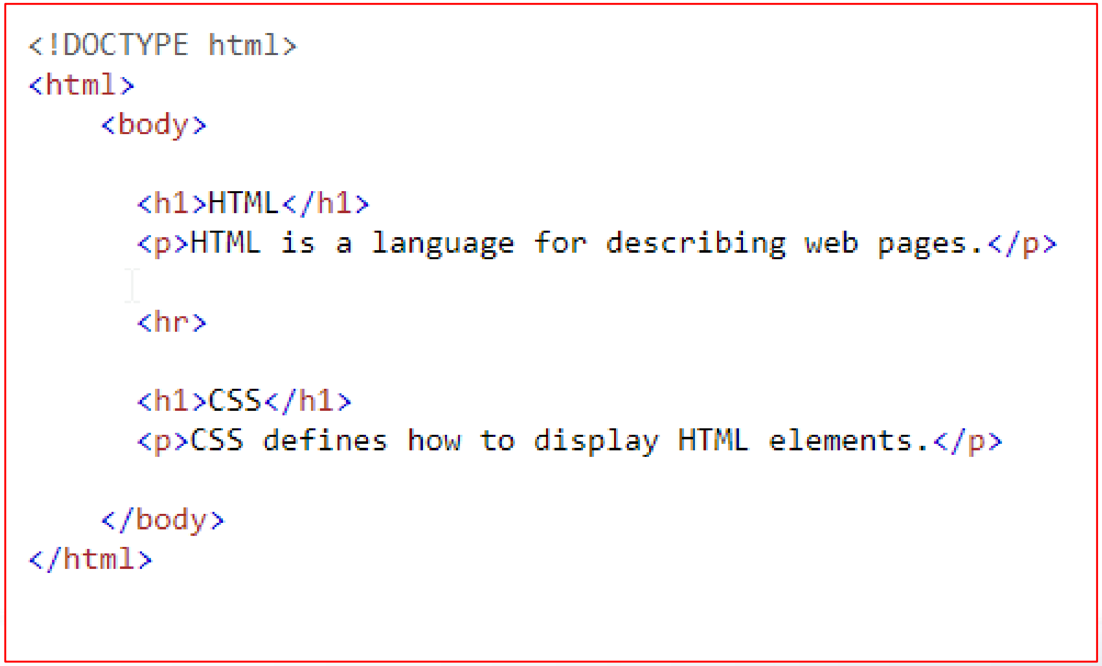


The value was ~~10^{2}~~, now it equals x$_{1}$

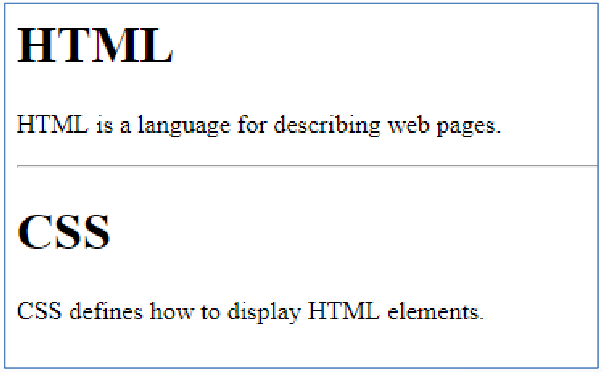
- ❑ Browsers will normally strike a line through deleted text and underline inserted text.

Special Characters and Horizontal Rules..

- ❑ A horizontal rule, indicated by the <hr> tag renders a horizontal line with extra space above and below it in most browsers.
  - The horizontal rule element should be considered a legacy element and you should avoid using it.
  - CSS can be used to add horizontal rules and other formatting to documents.



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

      <h1>HTML</h1>
      <p>HTML is a language for describing web pages.</p>

      <hr>

      <h1>CSS</h1>
      <p>CSS defines how to display HTML elements.</p>

    </body>
</html>
```



HTML

HTML is a language for describing web pages.

CSS

CSS defines how to display HTML elements.