Webpage Markup with HTML5

(C) Pravin Pawar - SUNY Korea, Paul Wang - Kent State University, Ohio

USEFUL RESOURCES

- https://www.w3schools.com/html/html5_intro.asp
- https://developer.mozilla.org/en-US/docs/Web/HTML
- http://codepen.io/pen/

HTML5 PAGE STRUCTURE

```
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml"
      lang="en" xml:lang="en">
<head>
<meta charset="utf-8"/>
<title>Great Company: homepage</title>
<!-- other head elements as appropriate -->
</head>
<body>  <!-- page content begin -->
    . . .
    . . .
<!-- page content end -->  </body>
</html>
```

XML namespaces help contextualize elements an attributes, among other things. It also offers a precise identification for a particular element or attribute.

For instance, the <html> element can be defined by anyone and have any meaning. However, the <html> element within the http://www.w3.org/1999/xhtml namespace is unique and refers to the XHTML.

PAGE TITLE

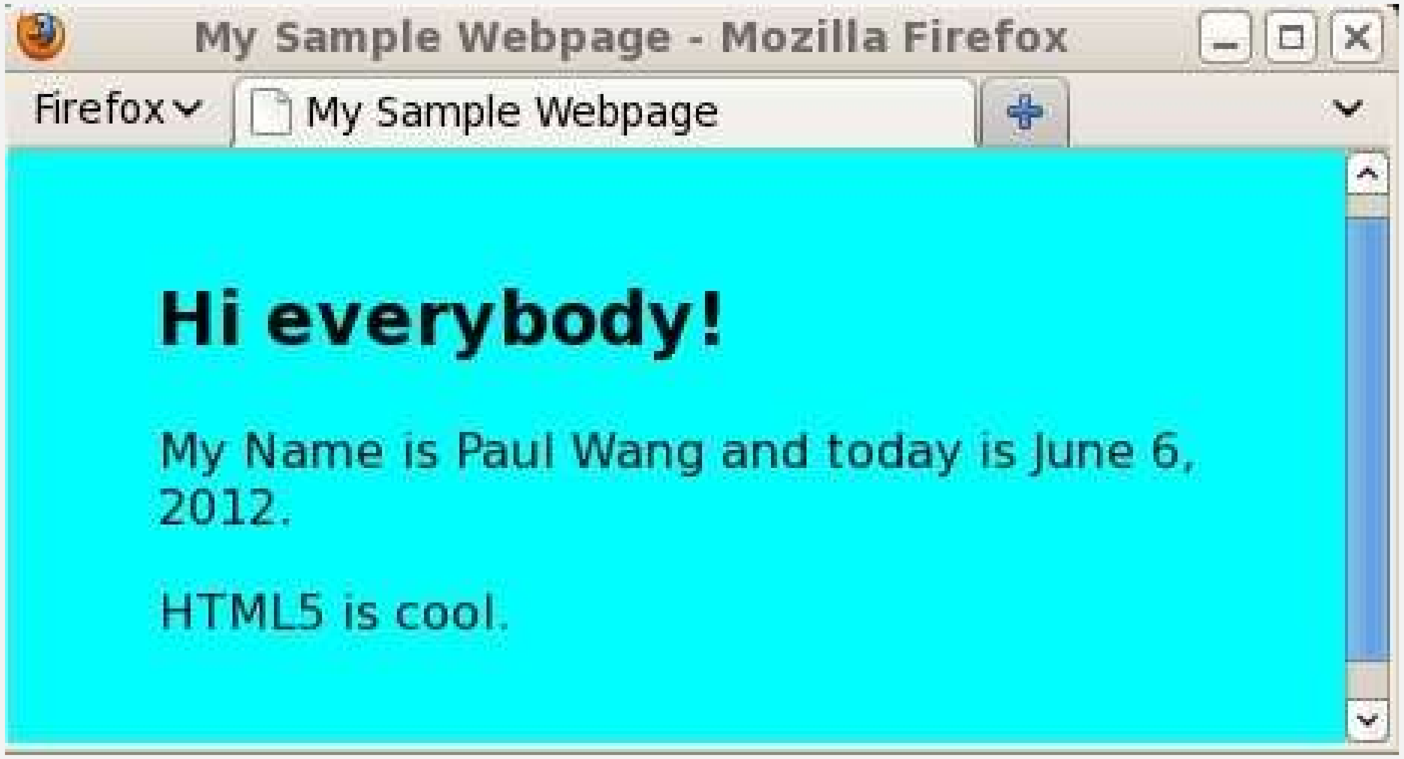
1. Displayed in the *title bar* of the browser window
2. Used in making a bookmark for the page

CREATING A WEBPAGE

```
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml" lang="en"
      xml:lang="en">
<head>
<meta charset="utf-8"/>
<title>My Sample Webpage</title>
</head>
<body style="background-color: cyan; margin: 50px">
<h2>Hi everybody!</h2>
<p>My Name is (put your name here) and today is
<time>(put in the date yyyy-mm-dd)</time>.</p>
<p>HTML5 is cool.</p></body></html>
```

Demo: **Ex:** `FirstPage`

SAMPLE WEBPAGE



Hi everybody!

My Name is Paul Wang and today is June 6, 2012.

HTML5 is cool.

HTML5 ELEMENTS

- Therer are more than 100 different elements in HTML5.
- Elements for meta information are placed in the `head` element.
- Elements for page content are placed in the `<body>` element.
- HTML5 distinguishes between two broad types of content elements:
  1. *flow elements* that occupy their own vertical space in a page and *phrasing elements* that act like words and phrases.
  2. Flow elements act like paragraphs, lists, and tables and can contain other flow elements, phrasing elements, and texts.
  3. Phrasing elements can contain other phrasing elements and texts.

HTML5 ELEMENTS CLASSIFIED

- *Top-level elements:* `html`, `head`, and `body`.
- *Head elements:* elements placed inside `head`, including `title` (page title), `style` (rendering style), `link` (related documents), `meta` (data about the document), `base` (URL of the document), and `script` (client-side scripting). These elements are not part of the page display.
- *Block-level elements:*
  - Flow elements behaving like paragraphs, including `article`, `h1`–`h6` (headings), `header`, `footer`, `section`, `p` (paragraph), `figure`, `canvas` (dynamic drawing area), `pre` (preformatted text), `div` (designated block), `ul`, `ol`, `dl` (lists), `table` (tabulation), `form` (user-input forms), and `video` (video).
  - A block element occupies 100% of the available width to it and will be *stacked vertically* with preceding and subsequent block elements.
  - A block-level (or simply block) element always starts on a new line, and any element immediately after the block element also begins on a new line.

- *Inline elements:*
  - Phrasing elements behaving like words, characters, or phrases that flow horizontally to fill the available width before starting new lines.
  - Usually, inline elements are placed within block elements.
  - Inline elements include `a` (anchor or link), `audio` (sound), `br` (line break), `code` (computer code), `img` (picture or graphics), `em` (emphasis), `nav` (navigation), `samp` (sample output), `span` (designated inline scope), `strong` (strong emphasis), `sub` (subscript), `sup` (superscript), `time` (time/date), and `var` (variable name).

HTML5 ENTITIES

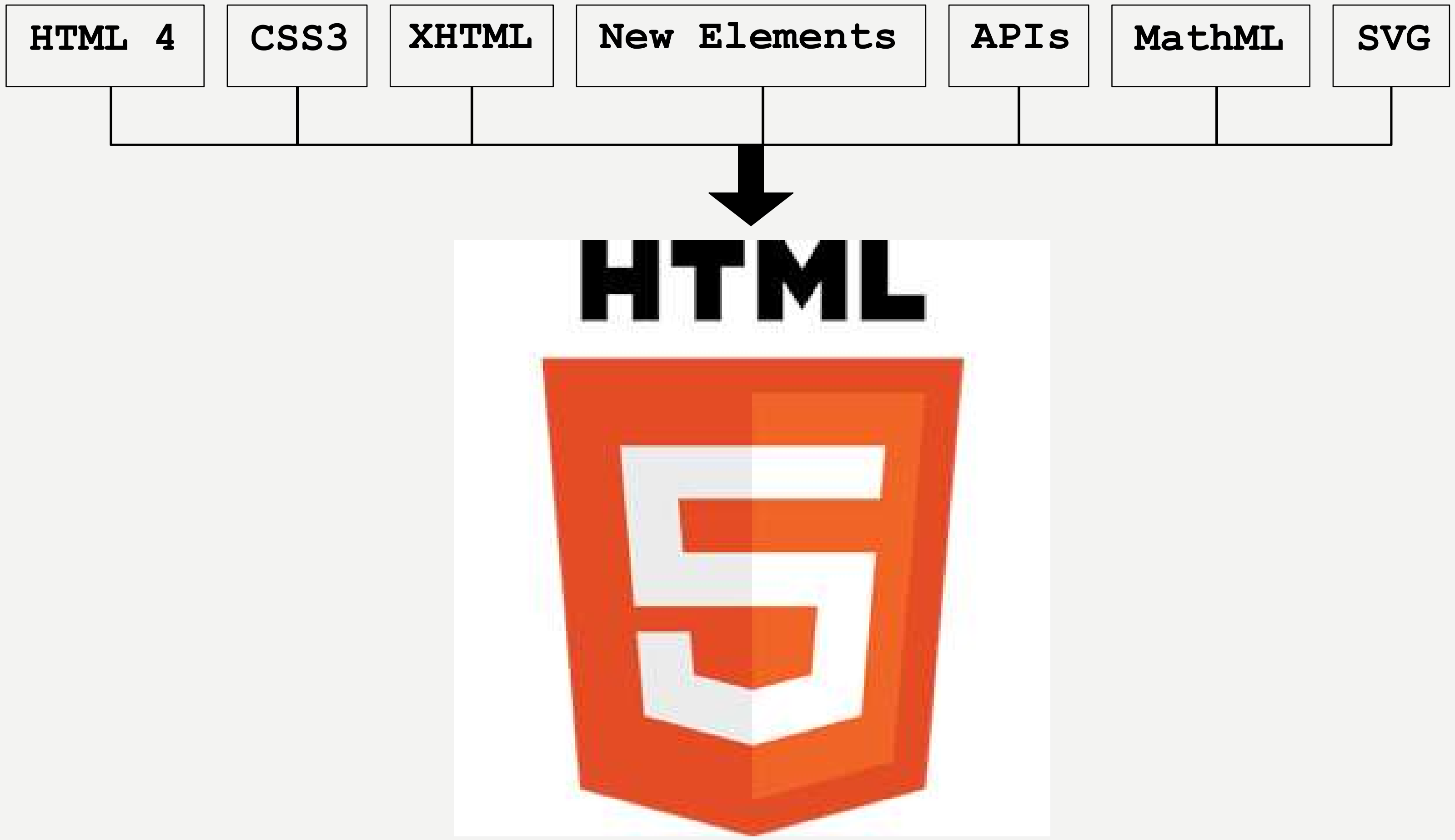
- In an HTML5 document, certain characters, such as < and `&`, are used for markup and must be *escaped* to appear literally. HTML provides *entities* (*escape sequences*) to introduce such characters into a webpage. For example, the entity `&lt;` gives < and `&amp;` gives `&`.
- Characters not on the regular keyboard can also be included directly or using HTML5-defined character references.
- Use <html> <head> <meta charset="utf-8">
- E.g. displaying Korean characters:
- https://ofcourse.kr/html-course/%EC%9D%B8%EC%BD%94%EB%94%A9

EVOLUTION OF HTML

- In 1989, Tim Berners-Lee defined a very simple version of HTML based on SGML. The first common standard for HTML was HTML 3.2 (1997).
- HTML 4.01 became a W3C (the World-Wide Web Consortium) recommendation in December 1999.
- HTML 4.01 begins to clearly separate the document structure and document presentation and specifies a clear relationship between HTML and client-side scripting (JavaScript).
- In January 2000, W3C released XHTML 1.0 as an XML reformulation of HTML 4.01.
- XHTML pages can be processed easily by any XML tool.

- HTML5 combines the XHTML, HTML 4, and CSS3 standards, introduces new elements and APIs, as well as incorporates MathML (Mathematical Markup Language) and SVG (Scalable Vector Graphics) into HTML.
- HTML5 can also easily be written in an XML compliant way. The release of the HTML5 standard promises to bring significant advantages to Web developers and benefits to end users.
  - SVG example: https://www.w3schools.com/graphics/svg_examples.asp
  - MathML example: https://www.w3.org/Math/XSL/csmall2.xml (works with firefox)

HTML5 INTEGRATION



WEBPAGE SYNTAX

- All tags begin with < and end with >. The *tag name* is given immediately following the leading <. Make sure the tag is spelled correctly. Unrecognized tags are ignored by browsers. Any *attributes* are given following the tag name in the form:

  <*tag attribute*$_1$ ="*value*" *attribute*$_2$ ="*value*" . . . >

  You may use single quotes (′), instead of double quotes ("), for the value part of any attribute. Be careful; forgetting to close a quote can result in a blank page display.
  e.g. <a href="https://www.w3schools.com">This is a link</a>

- Tag names and attributes are lowercase. Attributes are always given in either of the two forms:

  attribute_name="*value*"
  attribute_name=′*value*′

For *Boolean attributes*, those that are either on or off, use either of these forms for “on”:

attribute_name ="*attribute_name*"
attribute_name=""

and omit the attribute for “off”.

- Unrecognized tags and attributes are ignored by browsers.
- Most elements involve start and end tags. Other elements, such as `<br/>` (line break) and `<img .../>` (image), do not have closing tags and are known as *void elements*.
- Elements must be *well-formed*. This means no missing opening or closing tags and no improper element nesting. For example,
  `<p>Learning <strong>HTML5</p></strong>`
  overlaps the tags and is not properly nested. The correct nesting is
  `<p>Learning <strong>HTML5</strong></p>`

- Attributes can be required or optional and can be given in any order. If an attribute is not given, its initial (default) value, if any, is used.
- Extra white space and line breaks are allowed between the tag name and attributes and around the = sign inside an attribute. Line breaks and white space within attribute values are also allowed but should be avoided because they may be treated inconsistently by browsers.

HTML5 CORE ATTRIBUTES

- `id`—Uniquely identifies the element in a page. All `id`s in a document must be distinct. Among other uses, a URL ending in `#`*some_id* can lead directly to an element inside a document.
- `style`—Gives presentation styles for the individual element. For example, the code

  ```
  <body style="background-color: cyan">
  ```

  gives the color value `cyan` to the style property `background-color` for this element. Several style properties separated by semicolons can be given. The `style` attribute is a direct but inflexible way to specify presentation style. (css is used for improved styling)

- `class`— Specifies a *style class* or a space separated list of style classes for the element. For example, `class="fineprint"` or `class="footnote fineprint"`. Thus, you may place HTML elements in different classes and associate presentation styles to all elements belonging to the same class.
- `title`—Provides a title for the element. This may be used for tool-tip displays by browsers.
- `hidden`—Prevents the element from being displayed by a browser when set to `true`.

WEBPAGE ARCHITECTURE

- A typical webpage is organized into the following parts inside the root element `html`.
- The `head` element contains child elements: the page title (`title`), the page character encoding with a `meta` tag

  ```
  <meta charset="UTF-8"/>
  ```

  both are required by HTML5. Usually `head` contains additional elements for styling, scripting, and other meta info.
- The `body` element provides the page content, often organized into a `header` part for the top banner and a horizontal navigation bar at the top of the page.
- After the header, the page may also have a vertical navigation bar on the left side. The flow (block) element `nav` is used for navbars that organize links.

NAV EXAMPLE

```
<nav class="crumbs">
    <ol>
        <li class="crumb"><a href="bikes">Bikes</a></li>
        <li class="crumb"><a href="bikes/bmx">BMX</a></li>
        <li class="crumb">Jump Bike 3000</li>
    </ol>
</nav>

<h1>Jump Bike 3000</h1>
<p>This BMX bike is a solid step into the pro world. It looks as legit as it rides
and is built to polish your skills.</p>
```

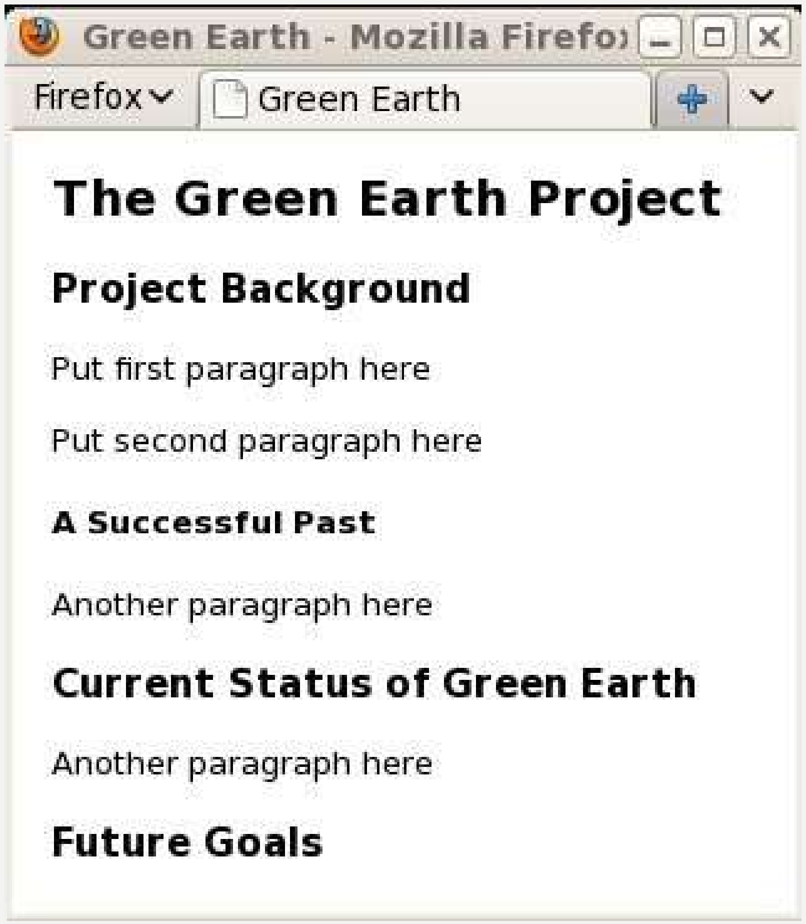
- Then, there are one or more articles (`article`) for the main content, followed by a `footer` at the end of the webpage.
- An article may contain one or more sections (`section`) that consist of headings (`h1` through `h6`), paragraphs (`p`), tables, figures, audio, and video.
- A paragraph man contain text, pictures (`img`), audio, and video.
- The footer often provides information on copyright, author, and links to terms of use, privacy policy, customer service, and so on.
- An `aside` flow (block) element can set aside related information, such as links to references, outside resources, and advertisements, that are not the primary content of the page.

ARTICLE EXAMPLE

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

<article class="film_review">
  <header>
    <h2>Jurassic Park</h2>
  </header>
  <section class="main_review">
    <p>Dinos were great!</p>
  </section>
  <section class="user_reviews">
    <article class="user_review">
      <p>Way too scary for me.</p>
      <footer>
        <p>
          Posted on
          <time datetime="2015-05-16 19:00">May 16</time>
          by Lisa.
        </p>
      </footer>
    </article>
</body>
</html>
```

SECTIONS AND PARAGRAPHS



The Green Earth Project

Project Background

Put first paragraph here

Put second paragraph here

A Successful Past

Another paragraph here

Current Status of Green Earth

Another paragraph here

Future Goals

```
<article>
<h1>The Green Earth Project</h1>
<section>
<h3>Project Background</h3> <!-- section 1-->
   <p>Put first paragraph here</p>
   <p>Put second paragraph here</p>
<h4>A Successful Past</h4><!-- subsection -->
   <p>Another paragraph here</p>
</section><section>
<h3>Current Status of Green Earth</h3><!-- section 2-->
   <p>Another paragraph here</p>
</section><section>
<h3>Future Goals</h3><!-- section 3-->
</section></article>
```

Demo: **Ex:** `GreenEarth`

FLOWING CONTENT

- The `p` (a paragraph) is a flow (block) element which may contain texts and phrasing elements.
- A flow element is typically displayed with a leading and a trailing blank line.

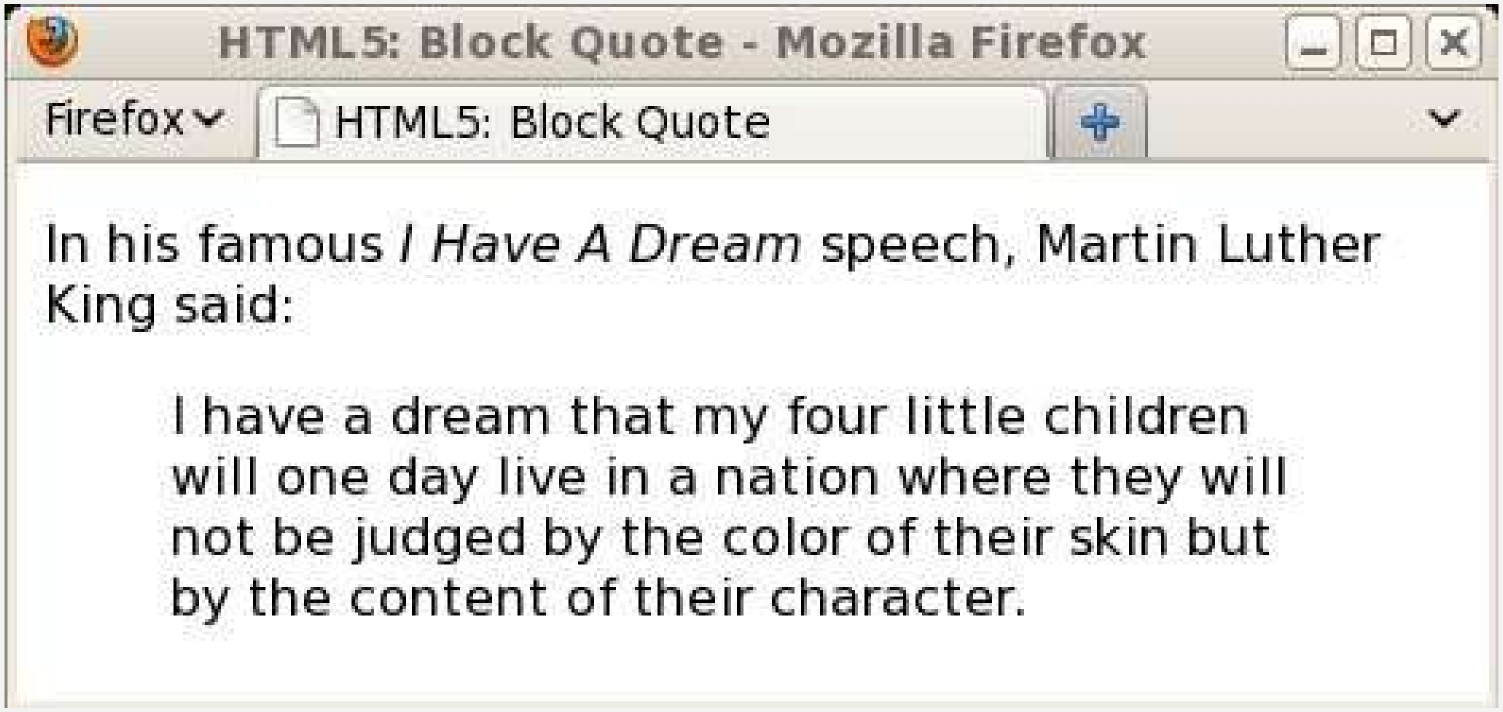
  The element content will be formatted to fit the available width. Line breaks are inserted automatically (*line wrapping*) where needed to render the contents. Extraneous white spaces between words and lines within the source text of the content are normally ignored (*white-space collapsing*).
- If you need a line break at a specific point in the content, you can use the `<br />` tag to call for a line break. For a long-running text without spaces, such as an email or Web address, you can insert the void element `<wbr />` to indicate a

line break opportunity. The browser will do a line break indicated by `wbr` only if necessary. For example,

```
<p>Please visit
www.somelong.<wbr />andcomplicated.com.</p>
```

- Inside a flow element, you can place other phrasing (inline) elements such as `q`, `em`, `mark`, `strong`, `img`, `video`, and `audio`.

BLOCK QUOTE



In his famous *I Have A Dream* speech, Martin Luther King said:

> I have a dream that my four little children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character.

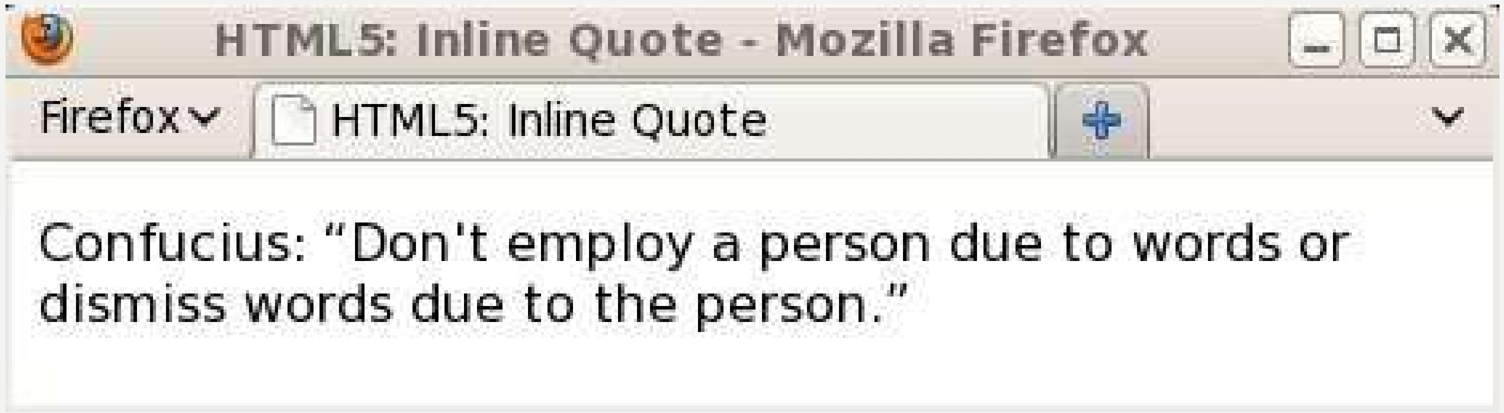
```
<p>In his famous <em>I Have A Dream</em> speech,
Martin Luther King said:</p>
<blockquote cite="http://www.mlkonline.net">
I have a dream that my four little children will one
day live in a nation where they will not be judged
by the color of their skin but by the content of
their character.
</blockquote>
```

Demo: **Ex:** Quote

```
<p>Confucius: <q>Don't employ a person due to words or
dismiss words due to the person.</q></p>
```

Demo: **Ex:** InlineQuote

INLINE QUOTE



Confucius: “Don't employ a person due to words or dismiss words due to the person.”

```
<hr style="height: 4px; width: 50%;
    margin-left: auto; margin-right: auto" />
```

Demo: **Ex:** `Hrule`

WHITE SPACE AND LINE WRAPPING

- HTML uses *white space* separates text into words.
- Words can be separated by one or more white-space characters but will only result in at most one rendered interword space.
- Tags do not break words. For example,

```
<p>The HTML<strong>5</strong> standard.</p>
```

PREFORMATTED TEXT

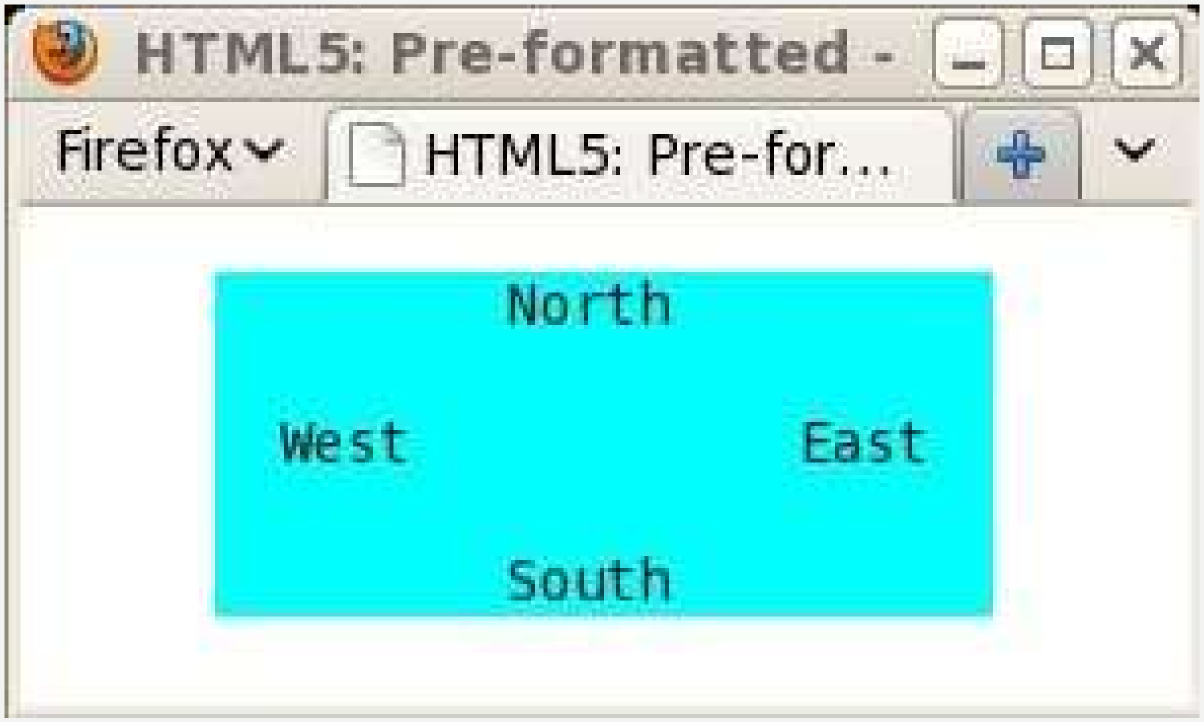
- Text in a pre element is displayed in a fixed-width font, and it preserves both spaces and line breaks.

```
<figure style="width: 12em; background-color: cyan">
<pre>
         North

  West              East

         South
</pre></figure>
```

Preformatted Text



```
         North

West              East

         South
```

Demo: **Ex:** `Pre`

PHRASING ELEMENTS

- `a`: a link
- `br`: an explicit line break
- `cite`: a citation
- `em`: emphasis, usually displayed in italics
- `strong`: strong emphasis, usually displayed in boldface
- `mark`: stronger emphasis with highlighting
- `code`: computer code, usually displayed in a monospaced font
- `del`: deleted words displayed with a line through them
- `sub`: subscript (e.g., `x<sub>0</sub>`)
- `sup`: superscript (e.g., `x<sup>2</sub>`)
- `samp`: sample computer output

- `span`: a general phrasing element that can contain other phrasing (inline) elements, providing a simple way to attach presentation styles to enclosed elements; for example,

  ```
  <span style="font-weight: bold; color: blue">
  Important point</span>
  ```

- `var`: a variable
- `kbd`: keyboard text

FORMATTED TIME

```
<time datetime="date_time">text</time>

<p>Fireworks start at <time datetime="2011-07-04T19:00">
7pm on Independence Day</time></p>

<p>The final NASA space shuttle Atlantis
launched on
<time datetime="2011-07-08T11:29-04:00">the
morning of Friday, 08 July 2011</time>
in Cape Canaveral, Florida USA.</p>
```

PUBLICATION DATE

- Put a `time` element as child of `body` or child of the desired `article`.
- Give `datetime` a date string with optional time string.
- Add the attribute `pubdate="pubdate"`
- Note: The time element does not render as anything special in any of the major browsers.

```
<body>
<time timedate="2012-07-07" pubdate="pubdate"></time>
...
</body>
```

WEBPAGE PRESENTATION STYLES

Define the `style` attribute for an individual element.

```
<h1 style="color: darkgreen">The Green Earth Project</h1>
```

`STYLE` ATTRIBUTE

General form:

`style="`*property*$_1$ `:`*value*$_1$ `;` *property*$_2$ `:`*value*$_2$ `; . . . "`

Foreground and Background Colors:

`color:` *some_color*

`background-color:` *some_color*

TEXT ALIGNMENT

- `text-align:`
- `text-align:`
- `text-align:`
- `text-align:`

`left`—lines are left justified `right`—lines are right justified `center`—lines are centered `justify`—lines are justified left and right

FONT SIZES

```
<footer style="font-size: x-small">
<p> ... </p>
...
<p> ... </p>
</footer>
```

Demo: **Ex:** `FontSize`

INDENTING CONTENT

To indent first line

```
<p style="text-indent: 3em"> ... </p>
```

To indent entire flow (block) element

`margin-left:` *length*

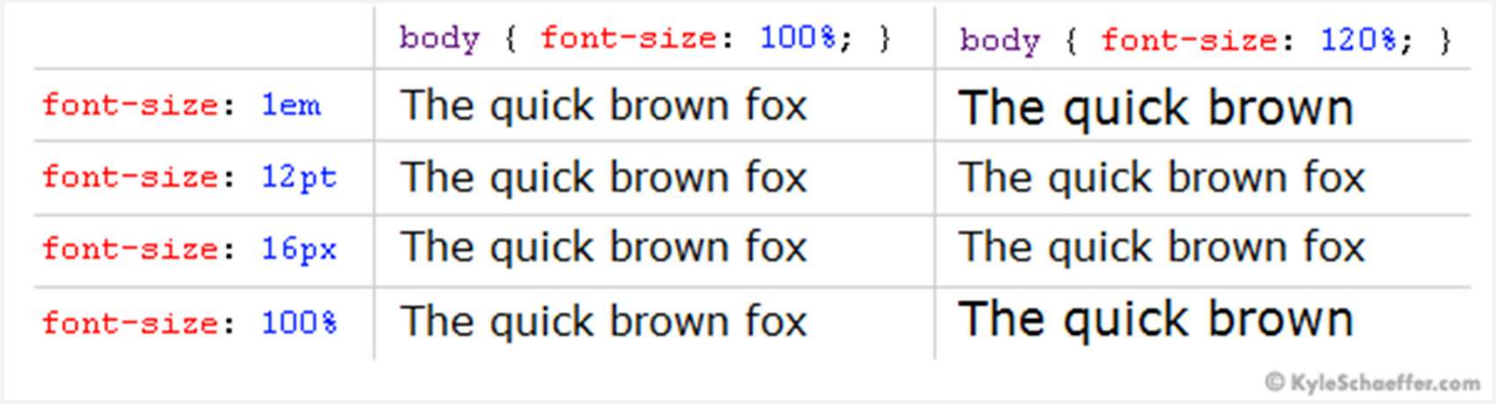
`margin-right:` *length*

```
<div style="margin-left: 5em; margin-right: 5em">
<p> ... </p>
</div>
```

STYLE LENGTH UNITS

- `em`—the *font-size* of the current font
- `ex`—the *x-height* of the current font
- `ch`—the size of `0` (zero) of the current font

"Ems" (em): The "em" is a scalable unit that is used in web document media. An em is equal to the current font-size, for instance, if the font-size of the document is 12pt, 1em is equal to 12pt.



	`body { font-size: 100%; }`	`body { font-size: 120%; }`
`font-size: 1em`	The quick brown fox	The quick brown
`font-size: 12pt`	The quick brown fox	The quick brown fox
`font-size: 16px`	The quick brown fox	The quick brown fox
`font-size: 100%`	The quick brown fox	The quick brown

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COLORS

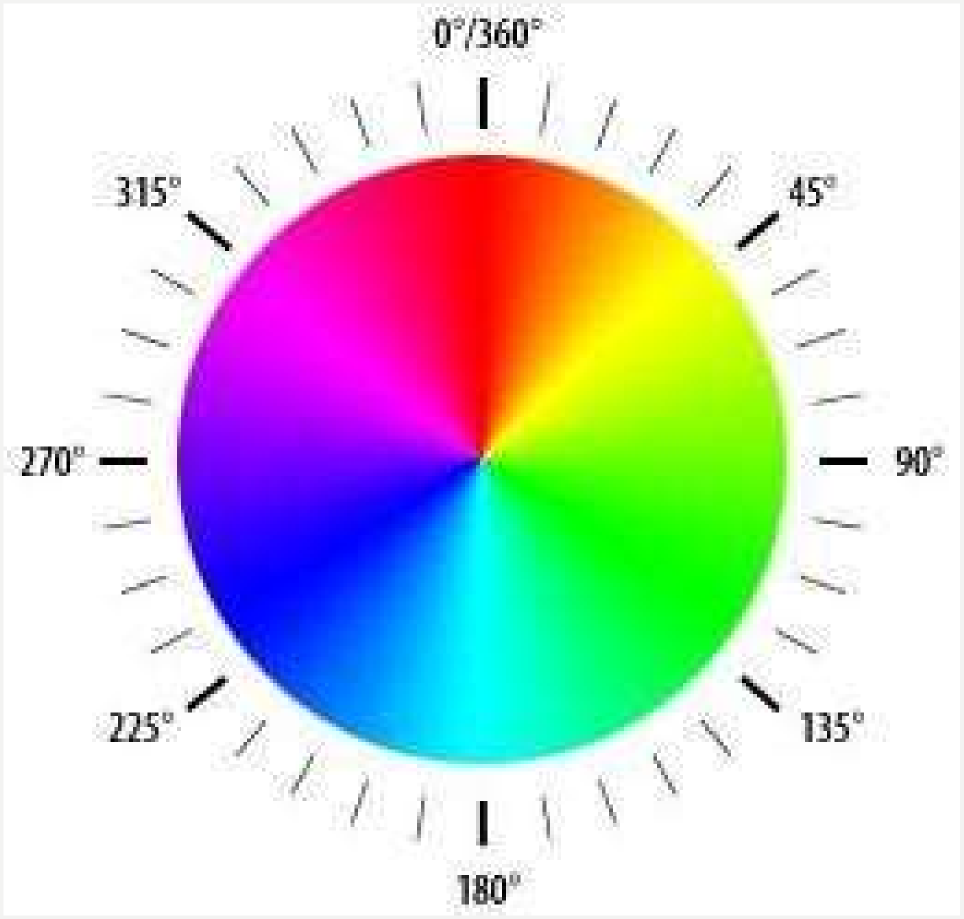
Color values in style properties can be a color name such as `magenta` or `darkblue`. Currently there are about 150 color names defined in CSS. Color values can also be given in a number of standard notations, including RGB (red-green-blue) and HSL (hue-saturation-lightness):

1. #*rrggbb*—where the first two, middle two, and last two of the six hexadecimal digits specify red, green, and blue values, respectively (e.g., `#0ace9f`). This is 24-bit color.

2. #*rgb*—shorthand for the above notation when the first two, middle two, and last two digits are the same (e.g., `#03c` stands for `#0033cc`).

3. `rgb(`*r* `,` *g* `,` *b* `)`—where base-10 integers between 0 and 255 inclusive are used (e.g., `rgb(0,204,108)`). This is the decimal equivalent of notation 1.
4. `hsl(`*h* `,` *s*`%,` *l*`%)`—where *h* (in 0–360 degrees) indicates the hue on the color wheel.
5. https://www.w3schools.com/colors/colors_rgb.asp
6. https://www.w3schools.com/colors/colors_hsl.asp

THE COLOR WHEEL



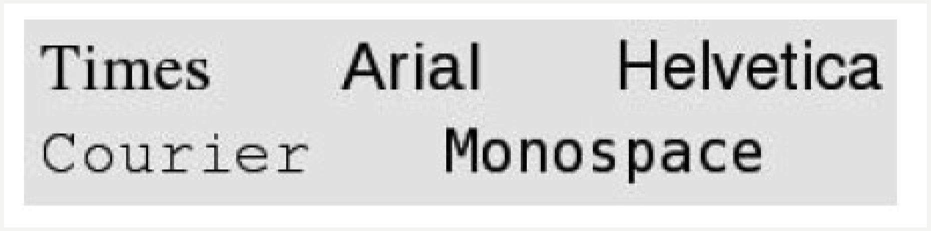
FONT STYLES

```
font-family
font-style
font-variant
font-weight
font-size
```

```
font-family: Times
font-family: Arial, Helvetica, sans-serif
```

Demo: **Ex:** `FontFamily`

SOME FONTS


Times Arial Helvetica
Courier Monospace

GENERIC FONT FAMILIES

- `serif`—for example, `Times`
- `sans-serif`—for example, `Arial` or `Helvetica`
- `cursive`—for example, `Zapf-Chancery`
- `fantasy`—for example, `Western`
- `monospace`—for example, `Courier`

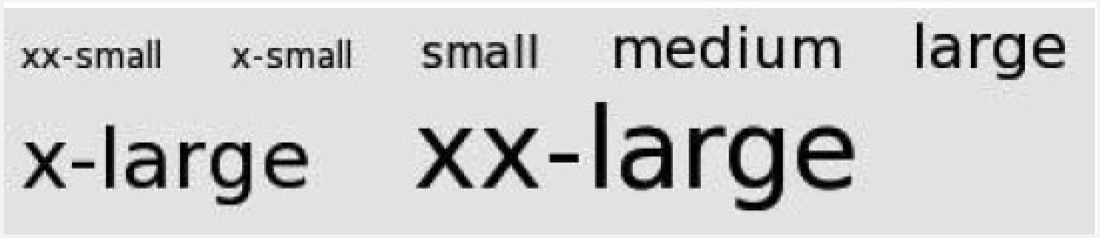
http://wavian.com/font-list.html

https://websitesetup.org/web-safe-fonts-html-css/

FONT WEIGHT

```
font-weight: normal
font-weight: bold
font-weight: bolder
font-weight: lighter
```

RELATIVE FONT SIZES



xx-small x-small small

medium large x-large xx-large

Absolute Font Sizes

- pt (points; 1 pt = 1/72 in.)
- pc (picas; 1 pc = 12 pt)

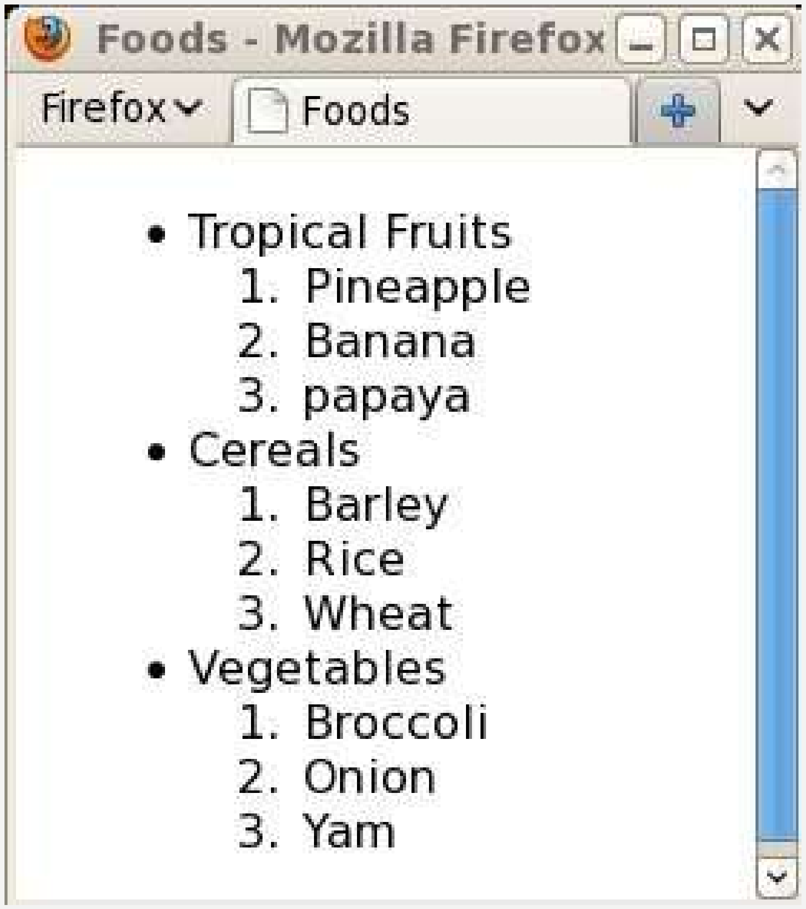
ITEMIZED LISTS

- Bullet list: The `ul` element provides an *unordered list* where the ordering of the items is unimportant. A `ul` is usually presented as a set of bulleted items.
- Ordered list: The `ol` element offers a *numbered list* where the ordering of the items is important. An `ol` is typically displayed as a sequence of enumerated items.
- Definition list: The `dl` element is handy for a *definition list* where each term (`<dt>`) is given a definition or description (`<dd>`).

```
<ul>
<li>Tropical Fruits
   <ol><li>Pineapple</li><li>Banana</li>
       <li>papaya</li></ol>
</li>
<li>Cereals
   <ol><li>Barley</li> <li>Rice</li> <li>Wheat</li></ol>
</li>
<li>Vegetables
   <ol><li>Broccoli</li> <li>Onion</li> <li>Yam</li></ol>
</li></ul>
```

Demo: **Ex:** `List`

LISTS

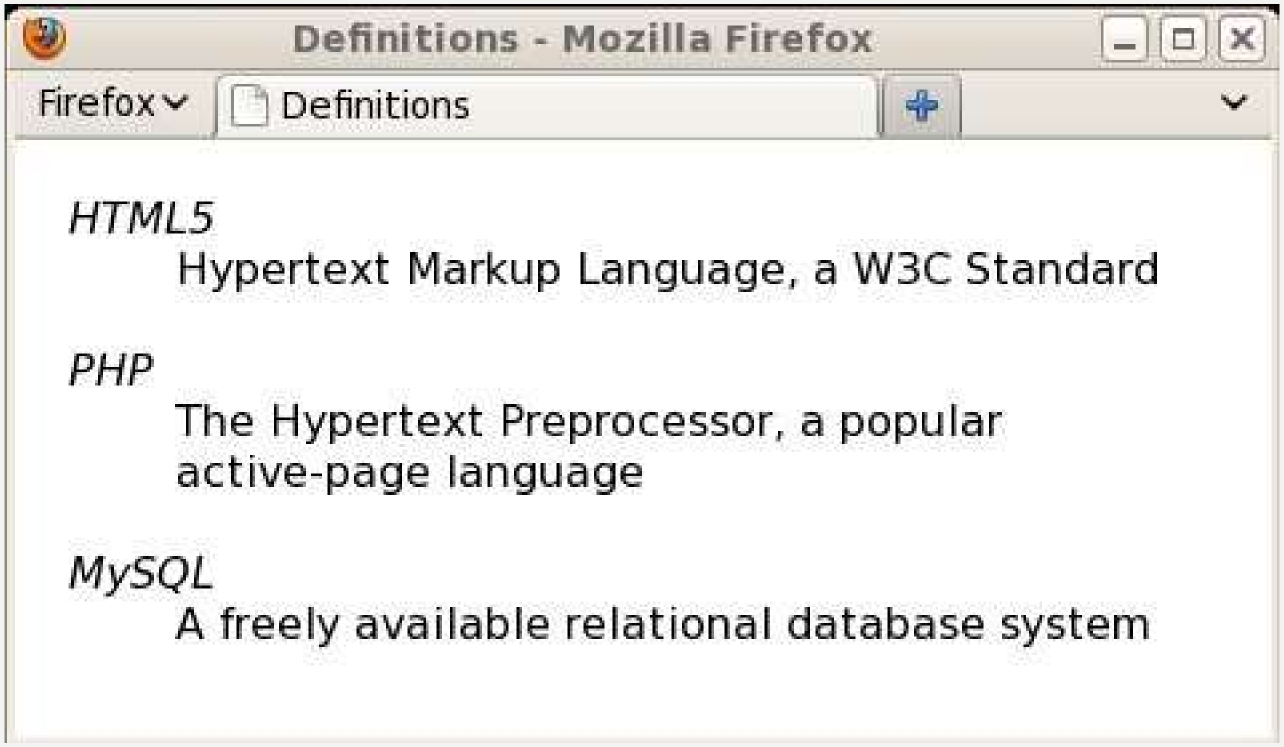


- Tropical Fruits
    1. Pineapple
    2. Banana
    3. papaya
- Cereals
    1. Barley
    2. Rice
    3. Wheat
- Vegetables
    1. Broccoli
    2. Onion
    3. Yam

```
<dl>
  <dt style="font-style: italic">HTML5</dt>
  <dd>Hypertext Markup Language, a W3C Standard<br />
      <br /></dd>
  <dt style="font-style: italic">PHP</dt>
  <dd>The Hypertext Preprocessor, a popular
      active-page language <br /><br /></dd>
  <dt style="font-style: italic">MySQL</dt>
  <dd>A freely available relational database system</dd>
</dl>
```

Demo: **Ex:** `Defs`

A DEFINITION LIST



HTML5
: Hypertext Markup Language, a W3C Standard

PHP
: The Hypertext Preprocessor, a popular active-page language

MySQL
: A freely available relational database system

LIST STYLES

```
<ul style="list-style-type: circle"> ...  </ul>
<ol style="list-style-type: upper-alpha"> ...  </ol>


<p>The following list has inside positioning</p>
<ul style="list-style-position:inside">
  <li style="list-style-type: square; color: green">
     <span style="color: black">First item in the list
       with a green square marker.</span></li>
  <li style="list-style-type: square;  color: red">
     <span style="color: black">Second item in the list
     with a red square marker.</span></li>
  <li style="list-style-type: square; color: blue">
    <span style="color: black">Third item in the list
    with a blue square marker.</span></li>
</ul>
```

`list-style: circle inside`

Demo: **Ex:** `MarkerStyle`

LINKS IN WEBPAGES

`<a href="`*URL*`">`

The URL of the link.

Possible values:

- An absolute URL - points to another web site (like href="http://www.example.com/default.htm")
- A relative URL - points to a file within a web site (like href="default.htm")
- Link to an element with a specified id within the page (like href="#top")
- Other protocols (like https://, ftp://, mailto:, file:, etc..)
- A script (like href="javascript:alert('Hello');")

LINKS IN WEBPAGES

```
<a href="URL">anchor</a>

<a href="bio.html">Brief Bio</a>
<a href="http://www.w3.org/"> The W3C
Consortium</a>
<a href="../pic/dragonfly.jpg" type="image/jpeg"
   title="dragonfly.jpg">Picture of Dragonfly</a>
<a href="sound/cthd.mp3" type="audio/mpeg">
   Tan Dun, Yo Yo Ma - Crouching Tiger,
   Hidden Dragon - Theme</a>
```

IN-PAGE LINKS

```
<h3 id="products">Our Quality Products</h3>

<a href="URL#products"> ... </a>

<article>
<nav><ul>
<li><a href="#product">Products</a></li>
<li><a href="#service">Services</a></li>
<li><a href="#testimonial">Testimonials</a></li>
</ul></nav>

<section>
<h3 id="product">Our Quality Products</h3>
...
</section><section>
<h3 id="service">Responsive Services</h3>
...
</article>
```

SITE INTERNAL AND EXTERNAL LINKS

- Is clearly indicated as going off site.
- Is displayed in a new browser window or tab so the visitor can come back by closing that new window or tab. A simple way is to use the attribute `target="_blank"` to cause the referenced page to display in a new window/tab:

```
<a href="http://www.w3.org/" target="_blank">
The W3C Consortium</a>
```

SITE ORGANIZATION AND NAVIGATION

- Organize the pages for a site into a hierarchy of files and directories (folders) stored on the hard disk of the server host. Avoid nonalphanumeric characters in file and directory names. Otherwise, the file name must be URL encoded before becoming part of a URL.
- Place the site entry page (usually, `index.html`) in the *server root* directory.
- Use subdirectories such as `images/`, `videos/`, `css/` (for style sheets), `js/` (for JavaScript code), `products/`, `services/`, `contractors/`, `members/`, and `affiliates/` to organize the site. The `index.html` page within each subdirectory is usually the lead page for that part of the site.
- Keep the organization simple and avoid using more than three

levels of subdirectory nesting.

- Design a navigation system that is clear, easy to use, and effective in getting visitors where they want to go in your site.
- Use relative URLs exclusively for linking within the site and make sure the link is in one of these forms:
    1. Relative to the *host page* itself (`href="`*file*`"` or `href="`*dir/file*`"`)
    2. Relative to the server root (`href="/`*path-to-file*`"`)

CONTENT-ONLY PAGES

In creating the content-only site, consider establishing pages with these parts:

1. *Major navigation*—Links to the main page, and first-level pages. If the top banner of a page includes a logo of the business or site, link the logo image to the site entry (main page).
2. *Minor navigation*—Links to subpages of this page and links to directly related sibling pages.
3. *In-page navigation* —Links to parts of this page when appropriate.
4. *Draft page content*—Includes text, pictures, and other media types.

LINKING TO SERVICES

- Email links—A link in the form

  `<a href="mailto:`*email-address*`?SUBJECT=`*line*`">`

  tells the browser to launch a program to send email to the given address using the indicated subject line. The subject line (from `?` on) is optional. For example,

  ```
  <a href= "mailto:ppawar@sunykorea.ac.kr?SUBJECT= CSE102
     course">contact Prof</a>
  ```

  Note spaces (`%20`) and other nonalphanumeric characters should be URL encoded. Generally, the `mailto` URL may have zero or more `&` separated *header*=*value* pairs. Useful headers include `to` (additional recipient address), `cc`, and `body` (message body).

  HTML URL encoding reference:

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

For example,

```
<a href="mailto:wdpgroup-request@cs.kent.edu?
    SUBJECT=join&BODY=subscribe">Joint web design
and programming email listserv group</a>
```

provides an easy way to join a listserv.

- Download links—A link in the form

  `<a href="ftp:`*host*:*port*`/`*path-to-file*`">`

  tells the browser to launch an FTP program to connect to the given *host* and to download the specified *file* by anonymous FTP. This is useful for downloading large files such as programs and compressed (ZIP or GZIP) files. If *port* is not given, then the standard port 21 for FTP is assumed. For example,

```
Download <a href="ftp://speedtest.tele2.net/1MB.zip">
         <code>1MB.zip</code></a>
```

An FTP URL can also supply username, password, and file location information for file retrieval.

- Telephone/SMS/Fax links—Links in these forms

  `<a href="tel:`*phone_number*`">`

  `<a href="sms:`*phone_number*`">`

  `<a href="fax:`*phone_number*`">`

  are useful for mobile phone and tablet devices.
- VOIP call links—A link in the form

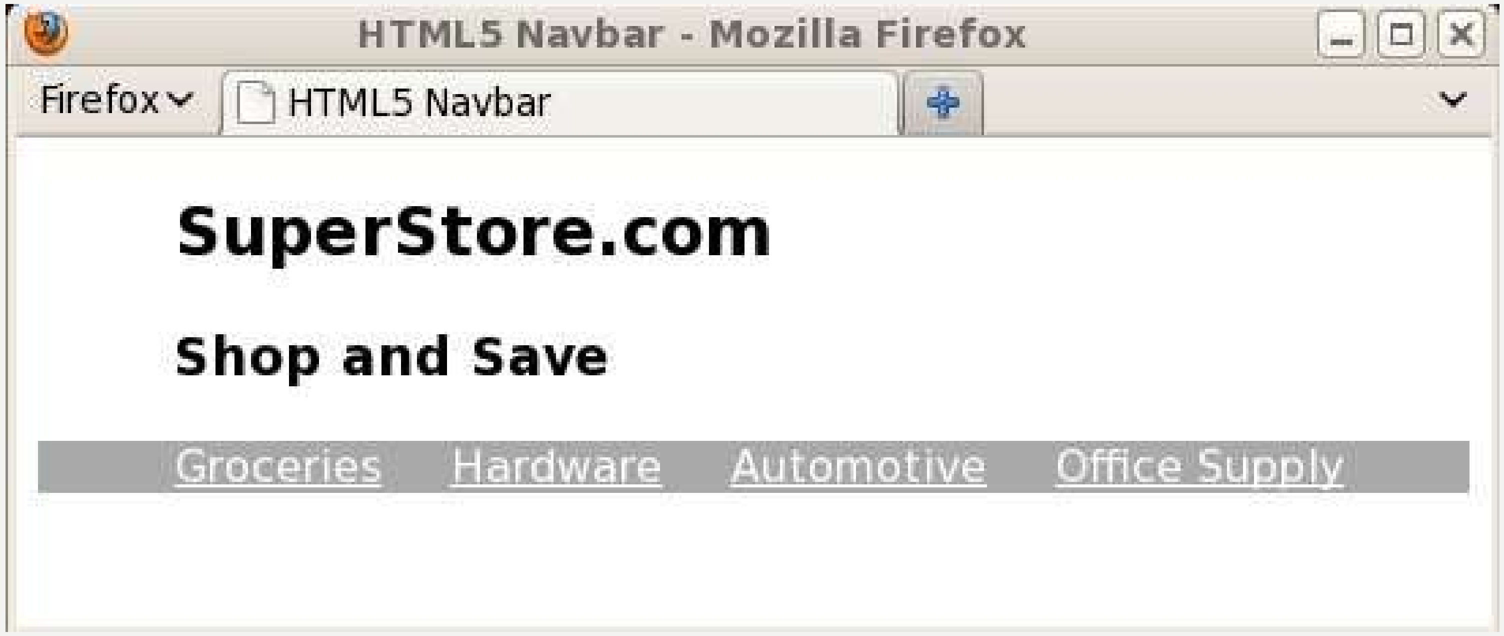
  `<a href="callto:`*screen_name* or *phone_number*`">`

  asks the browser to launch Skype™ or a similar program to make voice-over-IP calls or to conduct voice/video conference.

DISPLAY STYLE FOR LINKS

- Visual browsers pay special attention to the presentation of links. Usually, different display styles are used to indicate whether a textual link is not visited yet, under the mouse (`hover`), being clicked (`active`), or visited already (`visited`).
- Browsers settings define default colors for links.
- An image anchoring a link may by default be displayed with a distinct border.
- The appearance of links can be controlled by style settings.
- Web users are accustomed to seeing links underlined. Therefore, avoid underlining regular text because it can cause confusion. Image links, on the other hand, are almost always presented without any border. Web users understand that clicking an image often leads to another page.

A SAMPLE NAVBAR



HTML5 Navbar - Mozilla Firefox

Firefox

HTML5 Navbar

SuperStore.com

Shop and Save

Groceries Hardware Automotive Office Supply

```
<header>
<section style="margin-left: 50px">
<h1>SuperStore.com</h1>
<h3>Shop and Save</h3></section>
<nav style="background-color: darkgrey;
            padding-left: 40px">
<a style="color:#fff; margin:10px" href="gr/">
Groceries</a>
<a style="color:#fff; margin:10px" href="hw/">
Hardware</a>
<a style="color:#fff; margin:10px" href="au/">
Automotive</a>
<a style="color:#fff; margin:10px" href="of/">
Office Supply</a></nav></header>
```

Demo: **Ex:** Navbar

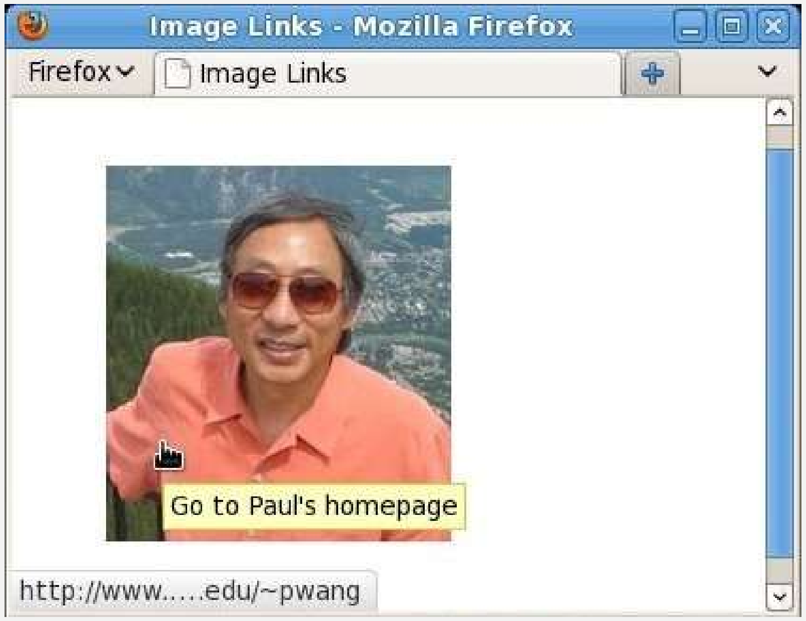
PICTURES AND IMAGES IN WEBPAGES

```
<img src="hat.jpg" alt="A nice hat"
     style="width:160px; height:200px" />
```

A Clickable Image

```
<a title="Go to Paul's homepage"
   href="http://www.cs.kent.edu/~pwang">
<img src="http://www.cs.kent.edu/~pwang/paul.jpg"
     alt="photo of the author Paul S. Wang"/>
</a>
```

Demo: **Ex:** ImgLink

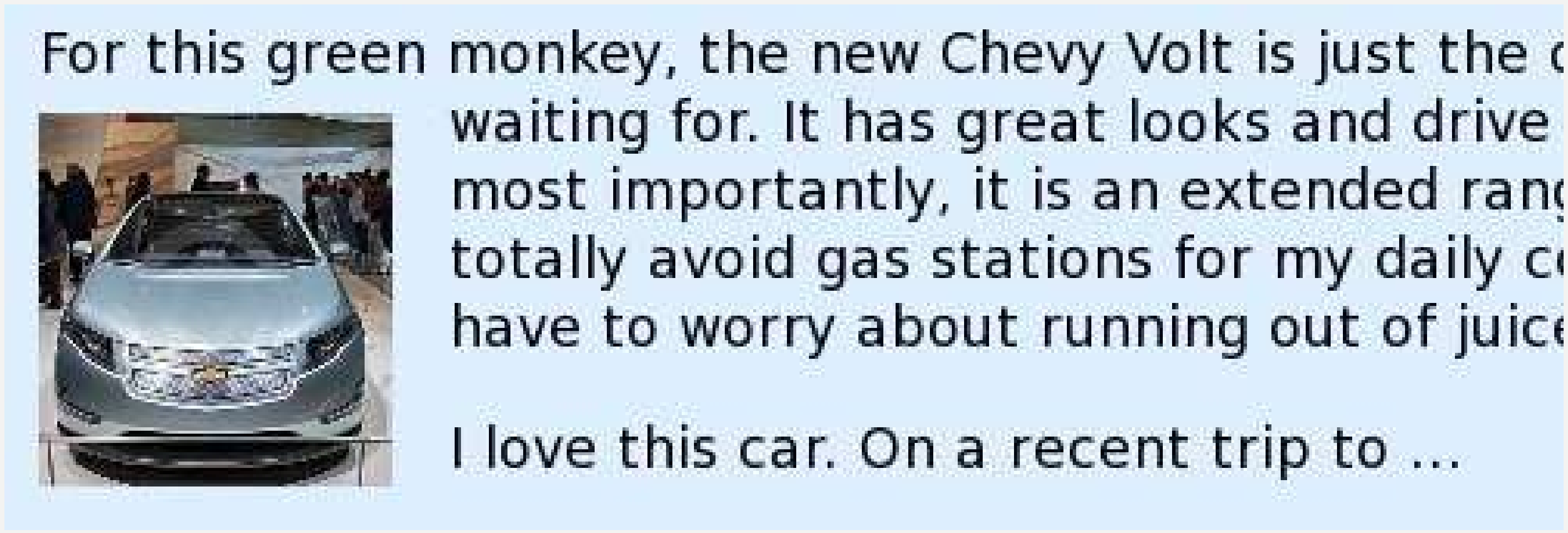


TEXT AROUND IMAGES

```
<p>For this green monkey, the new Chevy Volt is just
<img src="2012volt.jpg" alt="My dream 2012 Chevy Volt"
   height="110" style="float: left;
   margin-right: 1em; margin-bottom: 8px;
   margin-top: 8px" />
the car I have been waiting for.   ...  </p>
<p>I love this car. On a recent trip to ... </p>
```

Demo: **Ex:** `Float`

TEXT AROUND AN IMAGE



For this green monkey, the new Chevy Volt is just the c
waiting for. It has great looks and drive
most importantly, it is an extended rang
totally avoid gas stations for my daily c
have to worry about running out of juic

I love this car. On a recent trip to ...

IMAGE ALIGNMENT WITHIN A LINE

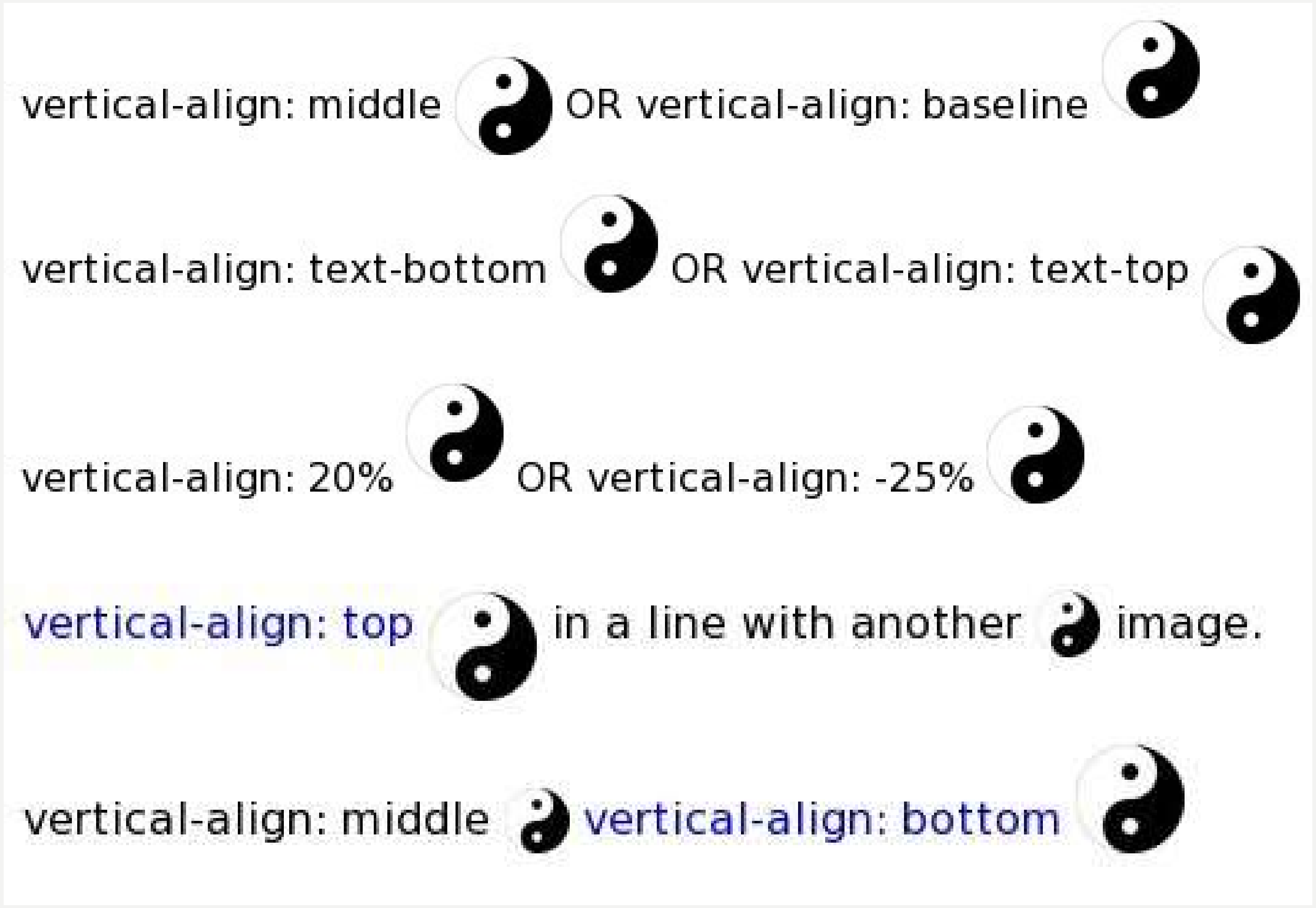
```
Here is some text and an
image <img src="URL" style="vertical-align: baseline" />
```

- `vertical-align: baseline`—Aligns baselines of image and text.
- `vertical-align: middle`—Aligns middle of image with middle of `x` character in preceding text.
- `vertical-align: text-top`—Aligns top of image with font top of preceding text.
- `vertical-align: text-bottom`—Aligns bottom of image with font bottom of preceding text.
- `vertical-align:` *xx* `%`—Raises the bottom of image *xx* percent of the text *line height*.

- `vertical-align: top`—Aligns top of image to tallest element on the line, which could be another image or some other tall element in the same line.
- `vertical-align: bottom`—Aligns bottom of image to lowest element on the line, which could be another image or some other element in the same line.

Demo: **Ex:** `ImgAlign`

INLINE ALIGNMENTS WITH PRECEDING TEXT



vertical-align: middle OR vertical-align: baseline

vertical-align: text-bottom OR vertical-align: text-top

vertical-align: 20% OR vertical-align: -25%

vertical-align: top in a line with another image.

vertical-align: middle vertical-align: bottom

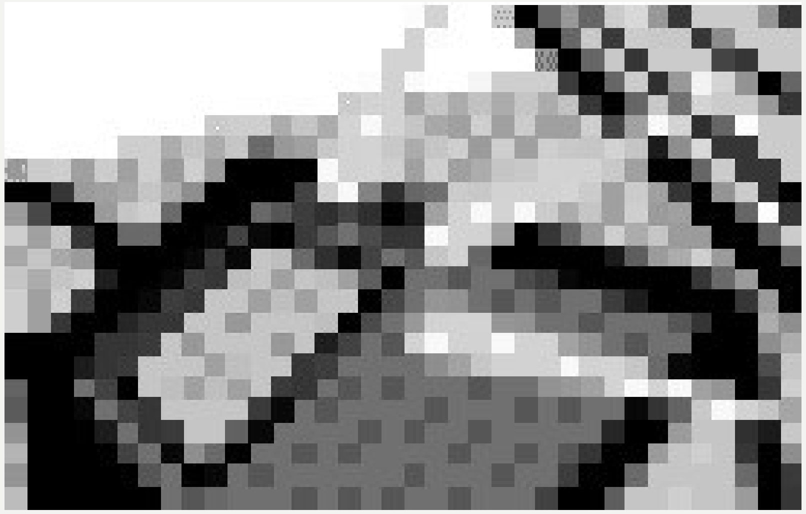
A FIGURE WITH CAPTION

Fig. 7: *Dragonfly, an insect belonging to the order Odonata, the suborder Epiprocta or, in the strict sense, the infraorder Anisoptera. (Wikipedia)*

```
<figure style="text-align: center; font-style: italic">
<img src="dragonfly.jpg" alt="a blue-winged dragonfly" />
<figcaption>
<strong>Fig. 7:</strong> Dragonfly, an insect belonging
to the order Odonata, the suborder Epiprocta or, in the
strict sense, the infraorder Anisoptera. (Wikipedia)
</figcaption>
</figure>
```

Demo: **Ex:** `FigCap`

RASTER IMAGE



- Raster images refer to a dot matrix data structure that represents a generally rectangular grid of pixels.
- Raster images are stored in image files with varying formats.

IMAGE ENCODING FORMATS

- Graphics Interchange Format (GIF)—A raster format suitable for icons, logos, cartoons, and line drawings. GIF images can have up to 256 colors (8-bit).
- Joint Photographic Experts Group (JPEG) format—A raster format usable for color and black-and-white pictures with continuously changing color tones for display. JPEG images can store up to 16.8M colors (24-bit).
- Portable Network Graphics (PNG) format—A format designed to replace GIF.

COLORS IN RASTER IMAGES

- Monochrome—black and white
- Gray scale—different levels of gray (up to 256 shades)
- Indexed—Each pixel color is indicated by an index into a color palette. The palette may contain a set of up to 256 colors. The smaller the palette, the fewer bits needed for each index.
- High color—thousands of colors, 15 to 16 bits per pixel
- True color—16.8 million colors, 24 bits per pixel

Image Coordinates

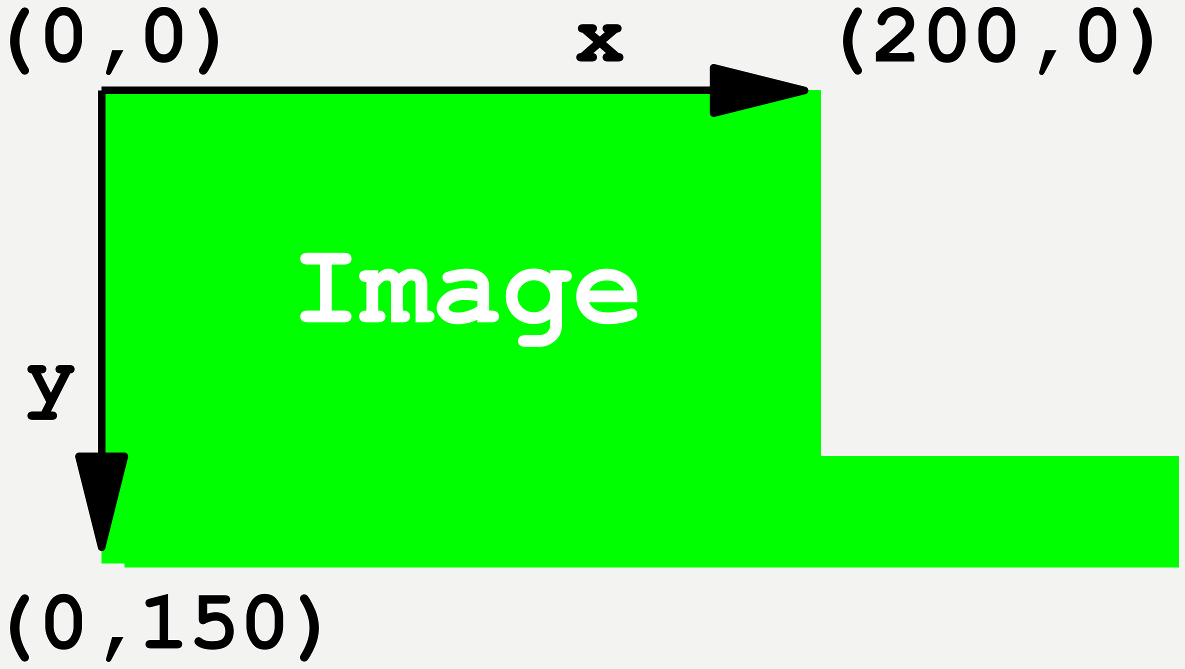


IMAGE MAPS

```
<map name="samplemap">
 <area shape="rect" coords="0,0,100,150"
      href="some-url" alt="item 1" />
 <area shape="poly" coords="0,0,10,32,98,200"
      href="some-url" alt="item 2" />
 <area shape="circle" coords="0,0,100"
      href="some-url" alt="item 3" />
 <area shape="default"
      href="some-url" alt="item otherwise" />
</map>
```

<img src="*img-url*" usemap="#*map-name*" />

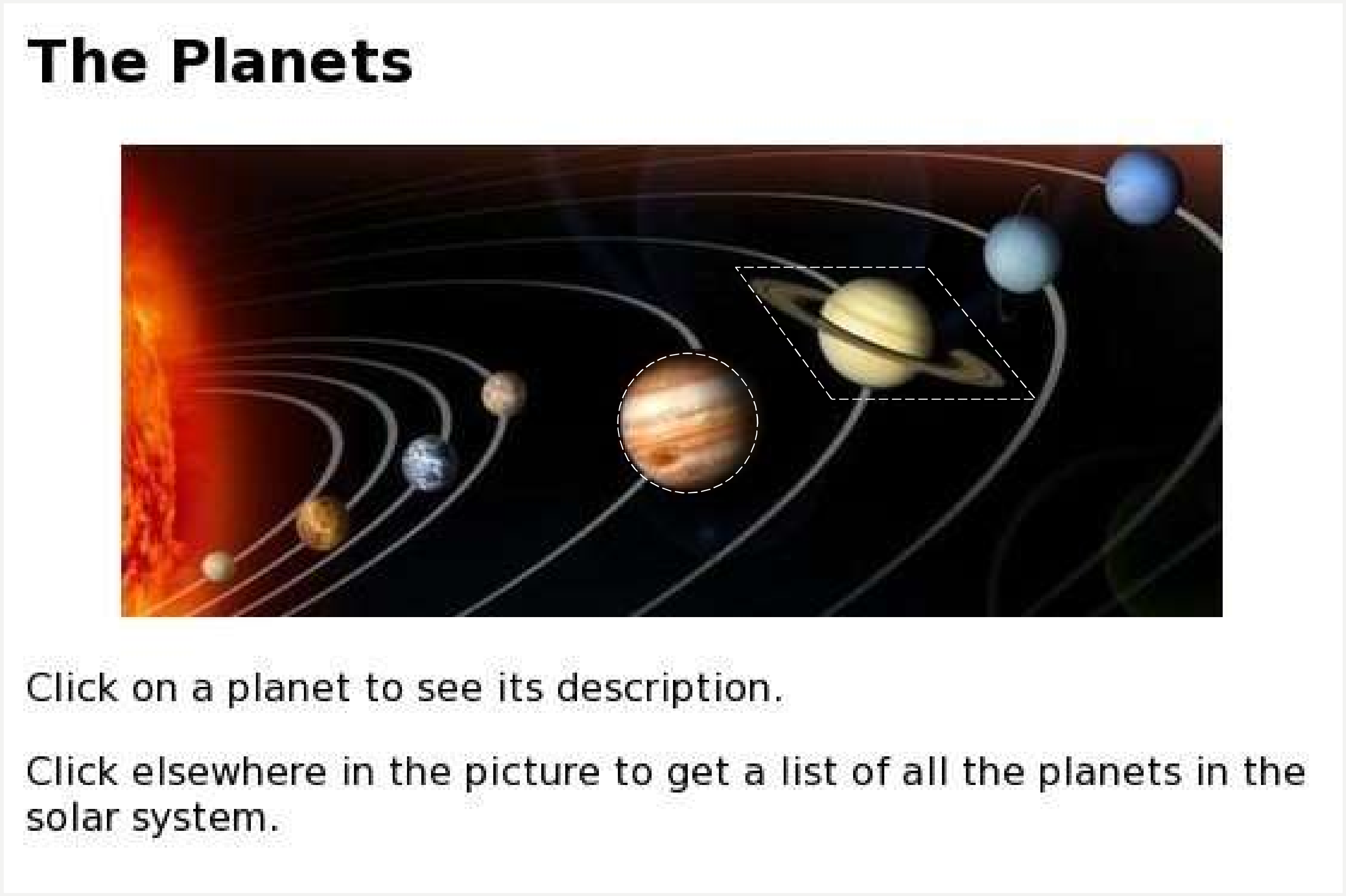
IMAGE MAP EXAMPLE

```
<figure>
<img src="planets.jpg" usemap="#planets"
     alt="Planets image map" />
<map name="planets" id="planets">
  <area shape="circle"
     coords="40,176,7"
     href="mercury.html" alt="Mercury" title="Mercury"/>
  <area shape="circle"
     coords="82,158,10"
     href="venus.html" alt="Venus" title="Venus"/>
  <area shape="circle"
     coords="127,132,11"
     href="earth.html" alt="Earth" title="Earth"/>
  <area shape="circle"
```

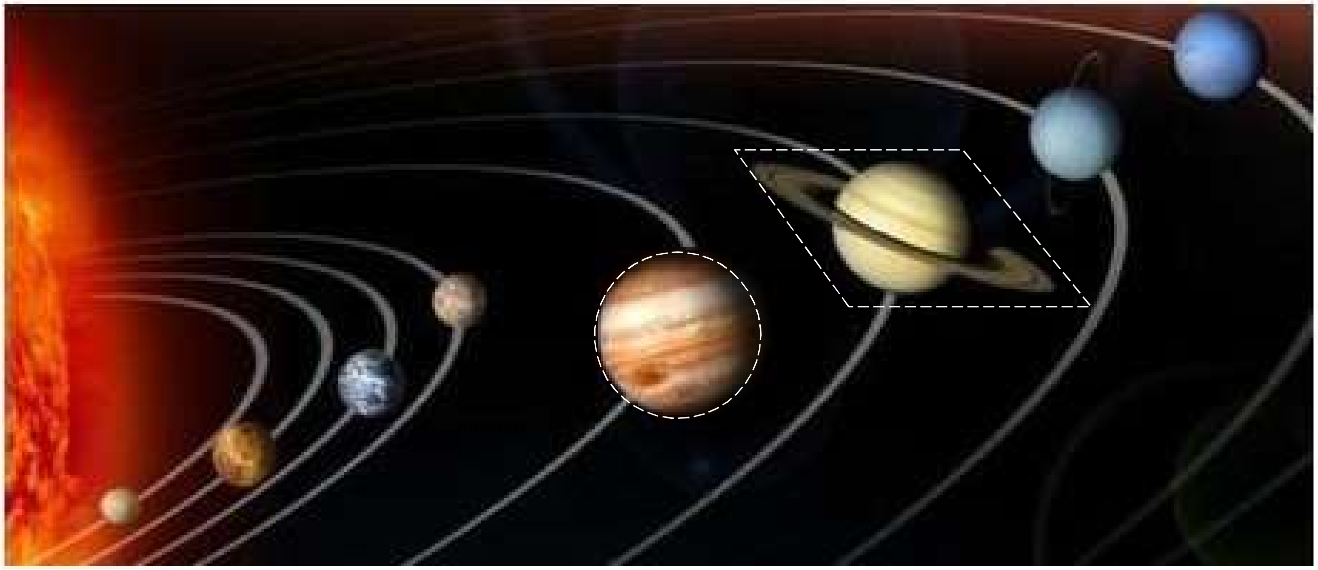
```
    coords="157,103,10"
    href="mars.html" alt="Mars" title="Mars"/>
  <area shape="circle"
    coords="234,116,27"
    href="jupiter.html" alt="Jupiter" title="Jupiter"/>
  <area shape="poly"
    coords="254,53,327,54,373,102,300,107"
    href="saturn.html" alt="Saturn" title="Saturn"/>
  <area shape="default"
    href="solar.html"
    alt="List of solar system planets" />
</map>
</figure>
```

Demo: **Ex:** `Planets`

PLANETS IMAGE MAP



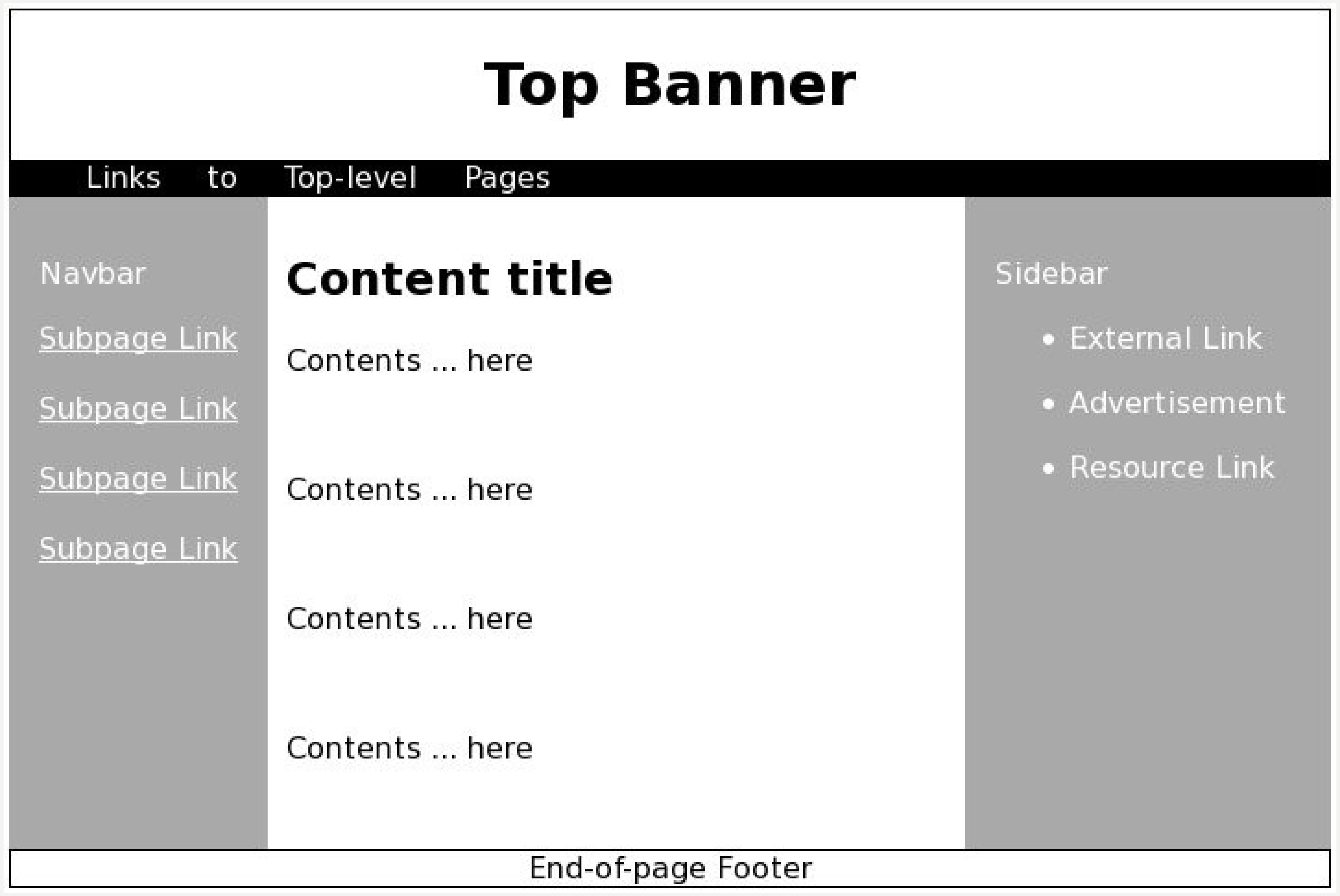
The Planets



Click on a planet to see its description.

Click elsewhere in the picture to get a list of all the planets in the solar system.

A SAMPLE PAGE LAYOUT



WEBPAGE LAYOUT

```
<header>
<h1 style="text-align: center">Top Banner</h1>
<nav style="background-color: black; color: white;
     padding-left: 40px">Links to Top-level Pages
</nav></header>

<div style="background-color: darkgrey">
<!-- three columns here -->
<section style="clear: both"></section>
</div>
<!-- page footer here -->
<nav style="float: left; padding: 1em; color: white">
<p>Navbar</p>
<a href="#">Subpage Link</a><br /><br />
```

```
</ul>
</nav>
<section style="float: left; padding: 10px; width:50%;
         background-color: white">
<h2>Content title</h2>
<article class="sectionArticle">
<p>Contents ... here</p><br />
</article>
</section>
<aside style="float: left; color: white;
              padding: 1em">
<p>Sidebar</p>
<ul><li><p>External Link</p></li>
<li><p>Advertisement</p></li>
<li><p>Resource Link</p></li></ul>
</aside>
<footer style="border: thin solid black;
    text-align: center">End-of-page Footer</footer>
```

Demo: Ex: Layout

DEBUGGING AND VALIDATION

- A spell checker can help you find typos and spelling errors. Careful proofreading can catch grammar and other writing errors.
- Test your webpage with different browsers under different operating systems. Even when a page looks OK, it may still contain coding errors. That is because Web browsers will ignore elements and attributes not recognized, as well as other problems in your HTML code.
- Use Developer Tools for debugging the page.

http:
SO MUCH PUN.COM