Web Programming

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What is a Web Site?

- a *Web site is a collection of related Web pages, images, videos or other digital assets that are addressed relative to a common Uniform Resource Locator (URL), often consisting of only the domain name, or the IP address, and the root path ('/') in an Internet Protocol-based network.* A Web site is hosted on at least one Web server, accessible via a network such as the Internet or a private local area network.

Web site categories

- Personal Web sites
- Commercial Web sites
- Organizational including government and non-profit organization Web sites, and
- Entertainment Web sites

Static pages.
Content is served from the server's file-system.
Pages built using Server Side Includes or Common Gateway Interface (CGI).
Frames and Tables used to position and align the elements on a pag

Web 2.0

- Web 2.0, also known as Library 2.0, is user-centred Web, where blogs, wikis, social networks, multimedia applications, dynamic programming scripts are being used for collection, contribution and collaboration on the Web.

The web browser technologies are used in Web 2.0 development and it includes AJAX and JavaScript frameworks. Recently, AJAX and JavaScript frameworks have become a very popular means of creating web 2.0 sites.these 8 tools mentioned below:

Podcasting
Blogging
Tagging
Curating with RSS

Social bookmarking

Social networking

Web 3.0

- Web 3.0, also known as semantic Web, is smarter and can understand what you want. The searcher no longer needs to wade through a plethora of information or filter out search results but gets the target information straight by working on a combination of information based on his requirement as he understands and preferences he wants i.e. one needs to be less specific and more natural with his queries. This technology should aid the users obtain answers faster and accurately.

This is particularly true from the perspective of machine conception as opposed to human understanding. The Semantic Web necessitates the use of a declarative ontological language like OWL to produce domain-specific ontologies that machines can use to reason about information and make new conclusions, not simply match keywords.
can use to reason about information and make new conclusions, not simply match keywords.
Artificial Intelligence
3D Graphics

Types of Web sites

static Web site

- In static Web site the information is displayed in the same format as they are stored in the server. Such information is primarily coded in HTML (and the address ends in .htm). Most of the Web sites are static as they present pre-defined, static information, in the sense the pages retrieved by different users at different times remain the same. To make a change to the content, the files need to be manually opened, data changed and the new version should be uploading to the Web.

Dynamic Web site

- Dynamic Web site pages are ones that retrieves fresh information each time you view (like the latest news you see or various games you play on the Web).
- example familiar to all is the _seat availability‘ facility in the Indian Railways Web site. The information on seat availability is likely to change every second on fresh reservation or cancellation of reservations. Here, the data in the railway reservation database are updated in real time and the site /browser retrieves the latest status as a response to your search.

Protocols

- http
- https
- Fttp
- SSL

Web **Server**

- The Web **Server** is a computer that holds and serves a Web site. The Web server includes the hardware, operating system, Web server software, TCP/IP protocols and site content (Web pages, images and other files). Using the HTTP protocol, the Web server delivers Web pages to browsers. If the Web server is used internally within an organization and is not exposed to the public, it is an intranet server and if it serves to external machines (outside the organization) it will be called an Internet (Web) server.

Projects

What is HTML?

- HTML, otherwise known as HyperText Markup Language, is the language used to create Web pages
- Using HTML, you can create a Web page with text, graphics, sound, and video

Tags

- The essence of HTML programming is tags
- A tag is a keyword enclosed by angle brackets (Example: <I>)
- There are opening and closing tags for many but not all tags; The affected text is between the two tags

More Tags…

- The opening and closing tags use the same command except the closing tag contains and additional forward slash /
- For example, the expression `<B> Warning </B>` would cause the word ‘Warning’ to appear in bold face on a Web page

Nested Tags

- Whenever you have HTML tags within other HTML tags, you must close the nearest tag first
- Example:

    <H1> <I> The Nation </I> </H1>

Structure of a Web Page

- All Web pages share a common structure
- All Web pages should contain a pair of <HTML>, <HEAD>, <TITLE>, and <BODY> tags

```
<HTML>
<HEAD>
<TITLE> Example </TITLE>
</HEAD>
<BODY>
    This is where you would include the text and images on your Web page.
</BODY>
</HTML>
```

The <TITLE> Tag

- Choose the title of your Web page carefully; The title of a Web page determines its ranking in certain search engines
- The title will also appear on Favorite lists, History lists, and Bookmark lists to identify your page

Creating a Basic Starting Document

- The HEAD of your document point to above window part. The TITLE of your document appears in the very top line of the user's browser. If the user chooses to "Bookmark" your page or save as a "Favorite"; it is the TITLE that is added to the list.
- The text in your TITLE should be as descriptive as possible because this is what many search engines, on the internet, use for indexing your site.

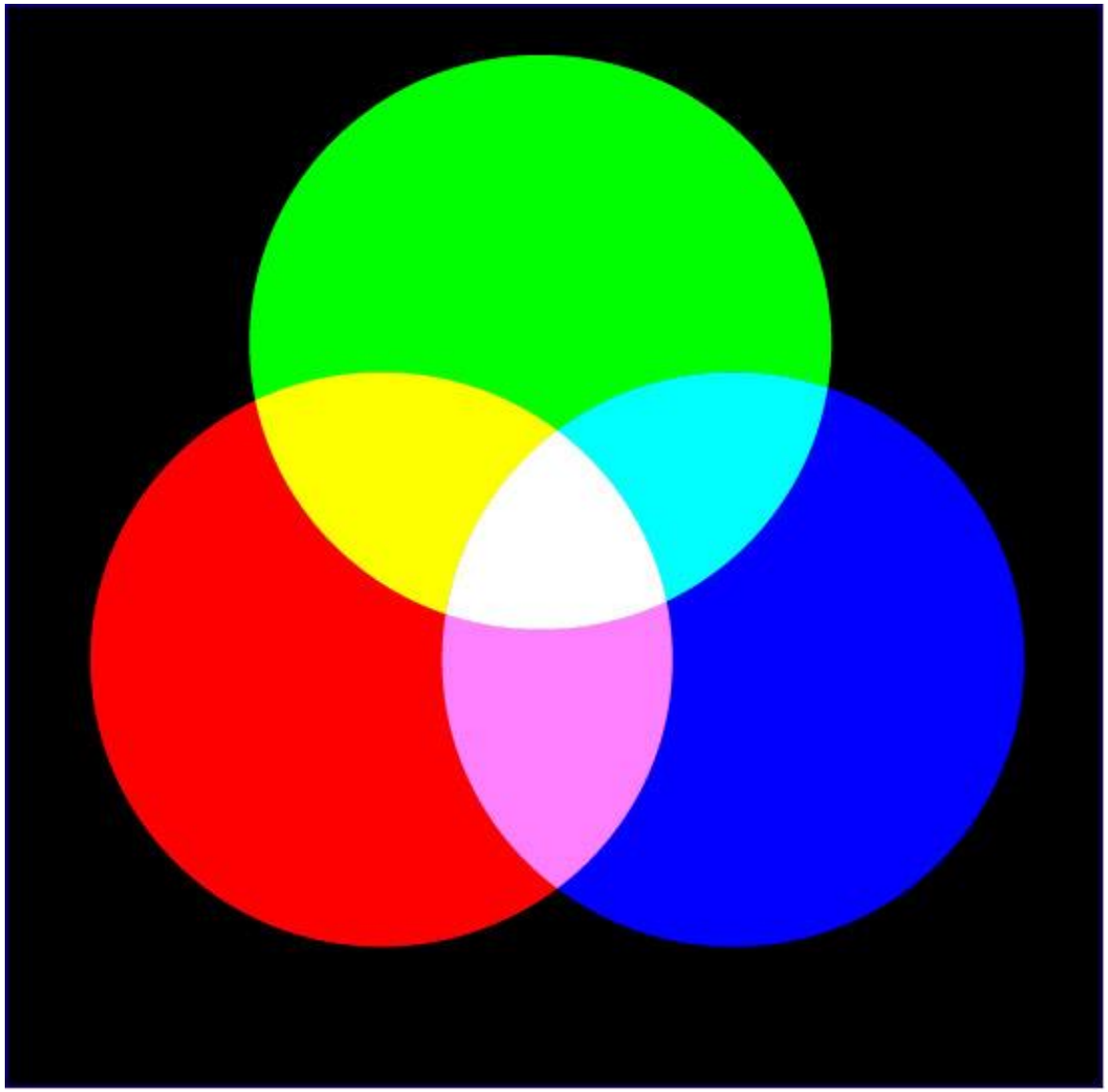
Setting Document Properties

- Document properties are controlled by attributes of the BODY element. For example, there are color settings for the background color of the page, the document's text and different states of links.

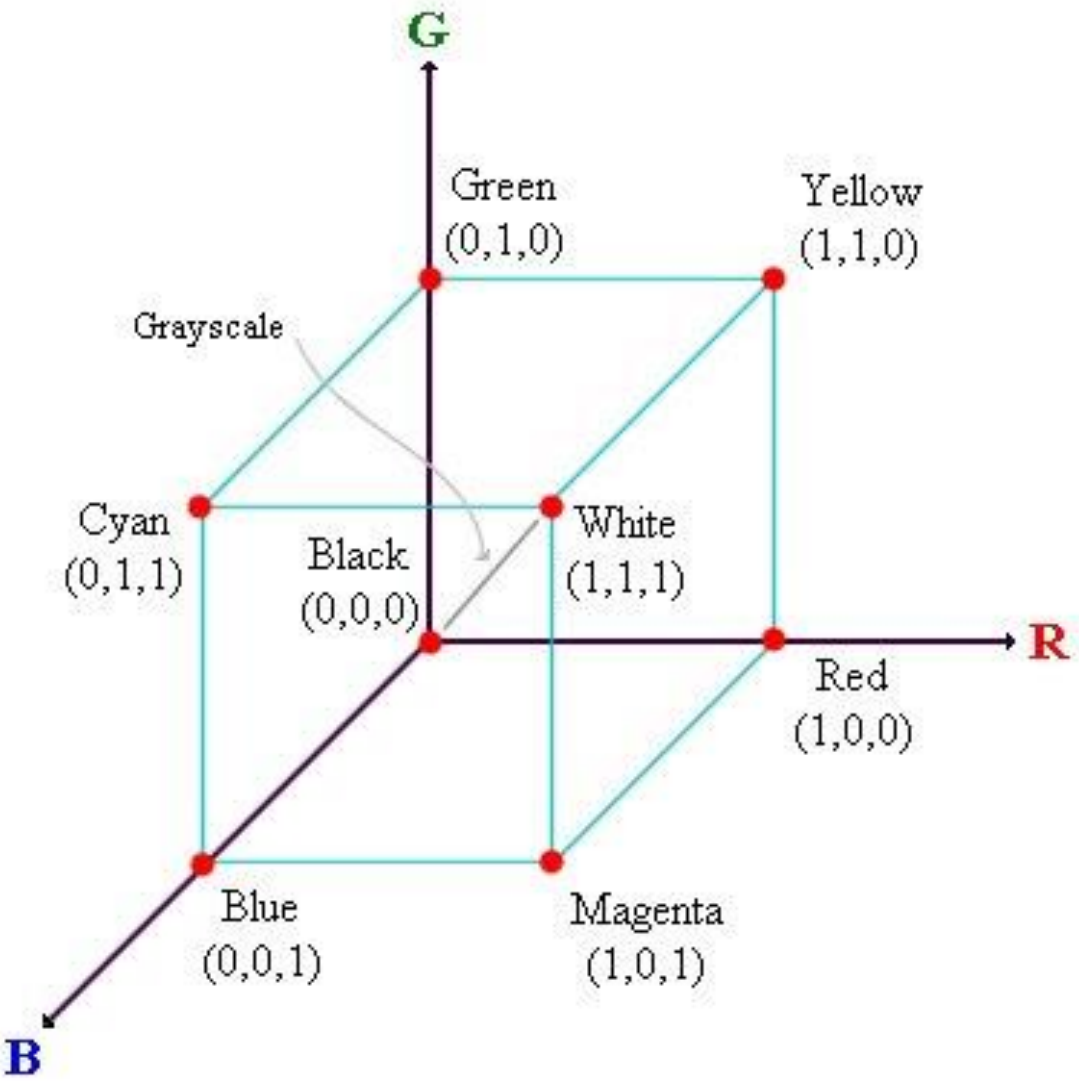
Color Codes

- Colors are set using “RGB” color codes, which are, represented as hexadecimal values. Each 2-digit section of the code represents the amount, in sequence, of red, green or blue that forms the color. For example, a RGB value with 00 as the first two digits has no red in the color.

Main Colours



RGB Colour Model



16 Basic Colors

Color Name	RGB Triplet	Hexadecimal	Color Name	RGB Triplet	Hexadecimal
Aqua	(0,255,255)	00FFFF	Navy	(0,0,128)	000080
Black	(0,0,0)	000000	Olive	(128,128,0)	808000
Blue	(0,0,255)	0000FF	Purple	(128,0,128)	800080
Fuchsia	(255,0,255)	FF00FF	Red	(255,0,0)	FF0000
Gray	(128,128,128)	808080	Silver	(192,192,192)	C0C0C0
Green	(0,128,0)	008000	Teal	(0,128,128)	008080
Lime	(0,255,0)	00FF00	White	(255,255,255)	FFFFFF
Maroon	(128,0,0)	800000	Yellow	(255,255,0)	FFFF00

Color Codes

1. WHITE	1. #FFFFFF
2. BLACK	2. #000000
3. RED	3. #FF0000
4. GREEN	4. #00FF00
5. BLUE	5. #0000FF
6. MAGENTA	6. #FF00FF
7. CYAN	7. #00FFFF
8. YELLOW	8. #FFFF00
9. AQUAMARINE	9. #70DB93
10. BAKER'S CHOCOLATE	10. #5C3317
11. VIOLET	11. #9F5F9F
12. BRASS	12. #B5A642
13. COPPER	13. #B87333
14. PINK	14. #FF6EC7
15. ORANGE	15. #FF7F00

Color Codes

- If you require more information about color values, there is an excellent site entitled “VGDesign’s Interactive Color Cube” that displays the background color code when you put your cursor over a small color sample. The Web address is :

  http://www.vgdesign.com/color.html

The Body Element

- The BODY element of a web page is an important element in regards to the page's appearance. Here are the attributes of the **BODY** tag to control all the levels:

  TEXT="#RRGGBB" to change the color of **all the text** on the page (**full page text color.**)

- This element contains information about the page's background color, the background image, as well as the text and link colors.

Background Color

- It is very common to see web pages with their background color set to white or some other colors.
- To set your document's background color, you need to edit the <BODY> element by adding the BGCOLOR attribute. The following example will display a document with a white background color:

<BODY BGCOLOR="#FFFFFF"></BODY>

TEXT Color

- The TEXT attribute is used to control the color of all the normal text in the document. The default color for text is black. The TEXT attribute would be added as follows:

  <BODY BGCOLOR="#FFFFFF" TEXT="#FF0000"></BODY>

In this example the document's page color is white and the text would be red.

LINK, VLINK, and ALINK

These attributes control the colors of the different link states:

1. LINK – initial appearance – default = Blue.
2. VLINK – visited link – default = Purple.
3. ALINK –active link being clicked–default= Yellow.

The Format for setting these attributes is:

<BODY BGCOLOR="#FFFFFF" TEXT="#FF0000"
LINK="#0000FF"
VLINK="#FF00FF"
ALINK="FFFF00"> </BODY>

Using Image Background

- The BODY element also gives you ability of setting an image as the document's background.
- An example of a background image's HTML code is as follows:

```
<BODY BACKGROUND="hi.gif"
  BGCOLOR="#FFFFFF"></BODY>
```

Text Formatting

- Manipulating text in HTML can be tricky; Oftentimes, what you see is NOT what you get
- For instance, special HTML tags are needed to create paragraphs, move to the next line, and create headings

Text Formatting Tags

<B> **Bold Face** </B>

<I> *Italics* </I>

<U> Underline </U>

<P> New Paragraph </P>

 Next Line

Changing the Font

- The expression <FONT FACE = “fontname”> … </FONT> can be used to change the font of the enclosed text
- To change the size of text use the expression <FONT SIZE=n> …. </FONT> where n is a number between 1 and 7

Changing the Font

- To change the color, use <FONT COLOR="red">…. </FONT>; The color can also be defined using hexadecimal representation (Example: #ffffff)
- These attributes can be combined to change the font, size, and color of the text all at once; For example, <FONT SIZE=4 FACE="Courier" COLOR="red"> …. </FONT>

Headings

- Web pages are typically organized into sections with headings; To create a heading use the expression <Hn>…</Hn> where n is a number between 1 and 7
- In this case, the 1 corresponds to the largest size heading while the 7 corresponds to the smallest size

Headings, <Hx> </Hx>

- Inside the **BODY** element, heading elements **H1** through **H6** are generally used for major divisions of the document. Headings are permitted to appear in any order, but you will obtain the best results when your documents are displayed in a browser if you follow these guidelines:

1. **H1**: should be used as the highest level of heading, **H2** as the next highest, and so forth.
2. You should not skip heading levels: e.g., an **H3** should not appear after an **H1**, unless there is an **H2** between them.

Headings, <Hx> </Hx>

```
<HTML>
<HEAD>
<TITLE> Example Page</TITLE>
</HEAD>
<BODY>
<H1> Heading 1 </H1>
<H2> Heading 2 </H2>
<H3> Heading 3 </H3>
<H4> Heading 4 </H4>
<H5> Heading 5 </H5>
<H6> Heading 6 </H6>
</BODY>
</HTML>
```

Heading 1

Heading 2

Heading 3

Heading 4

Heading 5

Heading 6

Paragraphs, <P> </P>

- Paragraphs allow you to add text to a document in such a way that it will automatically adjust the end of line to suite the window size of the browser in which it is being displayed. Each line of text will stretch the entire length of the window.

Paragraphs, <P> </P>

```
<HTML><HEAD>
<TITLE> Example Page</TITLE>
</HEAD>
<BODY></H1> Heading 1 </H1>
<P> Paragraph 1, ….</P>
<H2> Heading 2 </H2>
<P> Paragraph 2, ….</P>
<H3> Heading 3 </H3>
<P> Paragraph 3, ….</P>
<H4> Heading 4 </H4>
<P> Paragraph 4, ….</P>
<H5> Heading 5 </H5>
<P> Paragraph 5, ….</P>
<H6> Heading 6</H6>
<P> Paragraph 6, ….</P>
</BODY></HTML>
```

Heading 1

Paragraph 1,….

Heading 2

Paragraph 2,….

Heading 3

Paragraph 3,….

Heading 4

Paragraph 4,….

Heading 5

Paragraph 5,….

Heading 6

Paragraph 6,….

Break,

- Line breaks allow you to decide where the text will break on a line or continue to the end of the window.
- A
 is an empty Element, meaning that it may contain attributes but it does not contain content.
- The
 element does not have a closing tag.

Break,

```
<HTML>
<HEAD>
<TITLE> Example Page</TITLE>
</HEAD>
<BODY>
<H1> Heading 1 </H1>
<P>Paragraph 1, <BR>
Line 2 <BR> Line 3 <BR>….
</P>
</BODY>
</HTML>
```

Heading 1

Paragraph 1,….

Line 2

Line 3

….

Horizontal Rule, <HR>

- The <HR> element causes the browser to display a horizontal line (rule) in your document.
- <HR> does not use a closing tag, </HR>.

Horizontal Rule, <HR>

Attribute	Description	Default Value
SIZE	Height of the rule in pixels	2 pixels
WIDTH	Width of the rule in pixels or percentage of screen width	100%
NOSHADE	Draw the rule with a flat look instead of a 3D look	Not set (3D look)
ALIGN	Aligns the line (Left, Center, Right)	Center
COLOR	Sets a color for the rule (IE 3.0 or later)	Not set

Horizontal Rule, <HR>

```
<HTML>
<HEAD>
<TITLE> Example Page</TITLE>
</HEAD>
<BODY>
<H1> Heading 1 </H1>
<P>Paragraph 1, <BR>
Line 2 <BR>
<HR>Line 3 <BR>
</P>
</BODY>
</HTML>
```

Heading 1

Paragraph 1,….

Line 2

Line 3

Character Formatting

In this chapter you will learn how to enhance your page with Bold, Italics, and other character formatting options.

Objectives

Upon completing this section, you should be able to

1. Change the color and size of your text.
2. Use Common Character Formatting Elements.
3. Align your text.
4. Add special characters.
5. Use other character formatting elements.

Bold, Italic and other Character Formatting Elements

- **<FONT SIZE="+2">** Two sizes bigger**</FONT>**
- The size attribute can be set as an absolute value from 1 to 7 or as a relative value using the "+" or "-" sign. Normal text size is 3 (from -2 to +4).
- **<B> Bold </B>**
- **<I>** ***Italic*** **</I>**
- **<U> Underline </U>**
- Color = "#RRGGBB" The COLOR attribute of the FONT element. E.g., **<FONT COLOR="#RRGGBB">this text has color</FONT>**
- **<PRE> Preformatted </PRE>** Text enclosed by PRE tags is displayed in a mono-spaced font. Spaces and line breaks are supported without additional elements or special characters.

Bold, Italic and other Character Formatting Elements

- **<EM>** ***Emphasis*** **</EM>** Browsers usually display this as italics.
- **<STRONG> STRONG </STRONG>** Browsers display this as bold.
- **<TT> TELETYPE </TT>** Text is displayed in a mono-spaced font. A typewriter text, e.g. fixed-width font.
- **<CITE> Citation </CITE>** represents a document citation (**italics**). **For titles of books, films, etc. Typically displayed in italics. (*A Beginner's Guide to HTML*)**

Bold, Italic and other Character Formatting Elements

```
<P> <FONT SIZE="+1"> One
    Size Larger </FONT> - Normal
    –
<FONT SIZE="-1"> One Size
    Smaller </FONT> <BR>
<B> Bold</B> - <I> italics</I> -
    <U> Underlined </U> -
<FONT COLOR="#FF0000">
    Colored </FONT> <BR>
<EM> Emphasized</EM> -
    <STRONG> Strong
    </STRONG> - <TT> Tele Type
    </TT> <BR>
```

One Size Larger - Normal – One Size Smaller
Bold - *italics* - Underlined - Colored
Emphasized - **Strong** - Tele Type

Aligning Text

- The ALIGN attribute can be inserted in the <P> and <Hn> tags to right justify, center, or left justify the text
- For example, <H1 ALIGN=CENTER> The New York Times </H1> would create a centered heading of the largest size

Comment Statements

- Comment statements are notes in the HTML code that explain the important features of the code
- The comments do not appear on the Web page itself but are a useful reference to the author of the page and other programmers
- To create a comment statement use the <!-- …. --> tags

The Infamous Blink Tag

- It is possible to make text blink using the <BLINK> … </BLINK> tag
- However, it is best to use this feature at most sparingly or not at all; What seems like a good idea to a Web designer can become very annoying to a Web user
- The <BLINK> tag is not supported by Internet Explorer

Page Formatting

- To define the background color, use the BGCOLOR attribute in the <BODY> tag
- To define the text color, use the TEXT attribute in the <BODY> tag
- To define the size of the text, type <BASEFONT SIZE=n>

Example

```
<HTML>
<HEAD>
<TITLE> Example </TITLE>
</HEAD>
<BODY BGCOLOR="black"  TEXT="white">
<BASEFONT SIZE=7>
    This is where you would include the text and
    images on your Web page.
</BODY>
</HTML>
```

Inserting Images

- Type <IMG SRC = “image.ext”>, where image.ext indicates the location of the image file
- The WIDTH=n and HEIGHT=n attributes can be used to adjust the size of an image
- The attribute BORDER=n can be used to add a border n pixels thick around the image

Alternate Text

- Some browsers don't support images. In this case, the ALT attribute can be used to create text that appears instead of the image.
- Example:

  <IMG SRC="satellite.jpg" ALT = "Picture of satellite">

Links

- A link lets you move from one page to another, play movies and sound, send email, download files, and more….
- A link has three parts: a **destination**, a **label**, and a **target**
- To create a link type

  <A HREF="page.html"> label </A>

Anatomy of a Link

<A HREF="page.html"> label </A>

- In the above link, "page.html" is the destination. The destination specifies the address of the Web page or file the user will access when he/she clicks on the link.
- The label is the text that will appear underlined or highlighted on the page

Example: Links

- To create a link to CNN, I would type:

  <A HREF="http://www.cnn.com">CNN</A>

- To create a link to MIT, I would type:

  <A HREF="http://www.mit.edu">MIT</A>

Changing the Color of Links

- The LINK, VLINK, and ALINK attributes can be inserted in the <BODY> tag to define the color of a link
  - LINK defines the color of links that have not been visited
  - VLINK defines the color of links that have already been visited
  - ALINK defines the color of a link when a user clicks on it

Using Links to Send Email

- To create a link to an email address, type <A HREF="mailto:email_address"> Label</A>
- For example, to create a link to send email to myself, I would type: <A HREF="mailto: ktdunn@mit.edu">email Katie Dunn</A>

Anchors

- Anchors enable a user to jump to a specific place on a Web site
- Two steps are necessary to create an anchor. First you must create the anchor itself. Then you must create a link to the anchor from another point in the document.

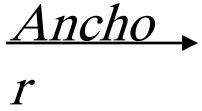
Anchors

- To create the anchor itself, type <A NAME="anchor name">label</A> at the point in the Web page where you want the user to jump to
- To create the link, type <A HREF="#anchor name">label</A> at the point in the text where you want the link to appear

Example: Anchor

```
<A HREF="#chap2">Chapter Two</A><BR>
```


```
<A NAME="chap2">Chapter 2 </A>
```



Ordered Lists

- Ordered lists are a list of numbered items.
- To create an ordered list, type:

```
<OL>
    <LI> This is step one.
    <LI> This is step two.
    <LI> This is step three.
</OL>
```

Here's how it would look on the Web:

1. **This is step one.**
2. **This is step two.**
3. **This is step three.**

More Ordered Lists….

- The TYPE=x attribute allows you to change the the kind of symbol that appears in the list.
  - A is for capital letters
  - a is for lowercase letters
  - I is for capital roman numerals
  - i is for lowercase roman numerals

Unordered Lists

- An unordered list is a list of bulleted items
- To create an unordered list, type:

```
<UL>
    <LI> First item in list
    <LI> Second item in list
    <LI> Third item in list
</UL>
```

Here's how it would look on the Web:

- First item in list
- Second item in list
- Third item in list

More Unordered Lists…

- The TYPE=shape attribute allows you to change the type of bullet that appears
  - *circle* corresponds to an empty round bullet
  - *square* corresponds to a square bullet
  - *disc* corresponds to a solid round bullet; this is the default value

Lists

In this chapter you will learn how to create a variety of lists.

Objectives

Upon completing this section, you should be able to

1. Create an unordered list.
2. Create an ordered list.
3. Create a defined list.
4. Nest Lists.

List Elements

- HTML supplies several list elements. Most list elements are composed of one or more <LI> (List Item) elements.
- UL : Unordered List. Items in this list start with a list mark such as a bullet. Browsers will usually change the list mark in nested lists.

<UL>

<LI> List item **…</LI>**

<LI> List item **…</LI>**

</UL>

- List item …
- List item …

List Elements

- You have the choice of three bullet types: **disc(default), circle, square.**
- These are controlled in Netscape Navigator by the “TYPE” attribute for the <UL> element.

<UL TYPE=“square”>

<LI> List item …</LI>

<LI> List item …</LI>

<LI> List item …</LI>

</UL>

- List item …
- List item …
- List item …

List Elements

- OL: Ordered List. Items in this list are numbered automatically by the browser.

<OL>

<LI> List item …</LI>

<LI> List item …</LI>

<LI> List item …</LI>

</OL>

1. **List item …**
2. **List item …**
3. **List item**

- You have the choice of setting the TYPE Attribute to one of five numbering styles.

List Elements

TYPE	Numbering Styles	
1	**Arabic numbers**	**1,2,3, ……**
a	**Lower alpha**	**a, b, c, ……**
A	**Upper alpha**	**A, B, C, ……**
i	**Lower roman**	**i, ii, iii, ……**
I	**Upper roman**	**I, II, III, ……**

List Elements

- You can specify a starting number for an ordered list.

<OL TYPE =“i”>

<LI> List item …</LI>

<LI> List item …</LI>

</OL>

<P> text ….</P>

<OL TYPE=“i” START=“3”>

<LI> List item …</LI>

</OL>

List Elements

i. List item …
ii. List item …

Text ….

iii. List item …

List Elements

- **DL: Definition List**. This kind of list is different from the others. Each item in a DL consists of one or more **Definition Terms (DT elements),** followed by one or more **Definition Description (DD elements).**

<DL>
<DT> HTML </DT>
<DD> Hyper Text Markup Language </DD>
<DT> DOG </DT>
<DD> A human’s best friend!</DD>
</DL>

HTML

Hyper Text Markup Language

DOG

A human’s best friend!

Nesting Lists

- You can nest lists by inserting a UL, OL, etc., inside a list item (LI).

EXample

```
<UL TYPE = “square”>
<LI> List item …</LI>
<LI> List item …
<OL TYPE=“i” START=“3”>
<LI> List item …</LI>
<LI> List item …</LI>
<LI> List item …</LI>
<LI> List item …</LI>
<LI> List item …</LI>
</OL>
</LI>
<LI> List item …</LI>
</UL>
```

- List item …
- List item …
  iii. List item …
  iv. List item …
  v. List item …
  vi. List item …
  vii. List item …
- List item …

What will be the output?

```
<H1 ALIGN="CENTER">SAFETY TIPS FOR CANOEISTS</H1>
<OL TYPE=“a” START=“2”>
<LI>Be able to swim </LI>
<LI>Wear a life jacket at all times </LI>
<LI>Don't stand up or move around. If canoe tips,
    <UL>
    <LI>Hang on to the canoe </LI>
    <LI>Use the canoe for support and </LI>
     <LI>Swim to shore
    </UL> </LI>
<LI>Don't overexert yourself </LI>
<LI>Use a bow light at night </LI>
</OL>
```

The output….

SAFETY TIPS FOR CANOEISTS

b. Be able to swim

c. Wear a life jacket at all times

d. Don't stand up or move around. If canoe tips,

   - Hang on to the canoe
   - Use the canoe for support and
   - Swim to shore

e. Don't overexert yourself

f. Use a bow light at night

```
<H1 ALIGN="CENTER">SAFETY TIPS FOR
CANOEISTS</H1>
<OL TYPE="a" START="2">
<LI>Be able to swim </LI>
<LI>Wear a life jacket at all times </LI>
<LI>Don't stand up or move around. If canoe tips,
<UL>
<LI>Hang on to the canoe </LI>
<LI>Use the canoe for support
<OL type="I" start="4">
<LI> Be careful </LI>
<LI> Do not look around</LI>
</LI> </OL>
 <LI>Swim to shore
</UL> </LI>
<LI>Don't overexert yourself </LI>
<LI>Use a bow light at night </LI>
</OL>
```

What will be the output?

The output….

SAFETY TIPS FOR CANOEISTS

b. Be able to swim
c. Wear a life jacket at all times
d. Don't stand up or move around. If canoe tips,
    - Hang on to the canoe
    - Use the canoe for support
        IV. Be careful
        V. Do not look around
    - Swim to shore
e. Don't overexert yourself
f. Use a bow light at night