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Introduction to World Wide Web

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A Beginner's Guide to HTML

This is a primer for producing documents in HTML, the markup language used by the World Wide Web.

Acronym Expansion

WWW World Wide Web (or Web, for short).

SGML Standard Generalized Markup Language -- this is a standard for describing markup languages.

DTD
Document Type Definition -- this is a specific markup language, written using SGML.

HTML
HyperText Markup Language -- HTML is a SGML DTD. In practical terms, HTML is a collection of styles (indicated by markup tags) that define the various components of a World Wide Web document.

What This Primer Doesn't Cover

This primer assumes that you have:

- at least a passing knowledge of how to use NCSA Mosaic or some other Web browser
- a general understanding of how Web servers and client browsers work
- access to a Web server for which you would like to produce HTML documents, or that you wish to produce HTML documents for personal use

Creating HTML Documents

HTML documents are in plain (also known as ASCII) text format and can be created using any text editor (e.g., Emacs or vi on UNIX machines). A couple of Web browsers (tkWWW for X Window System machines and CERN's Web browser for NeXT computers) include rudimentary HTML editors in a WYSIWYG environment. There are also some WYSIWIG editors available now (e.g. HotMetal for Sun Sparcstations, HTML Edit for Macintoshes). You may wish to try one of them first before delving into the details of HTML.

> *You can preview a document in progress with NCSA Mosaic (and some other Web browsers). Open it with the* **Open Local** *command under the* **File** *menu.*
>
> *After you edit the source HTML file, save the changes. Return to NCSA Mosaic and* **Reload** *the document. The changes are reflected in the on-screen display.*

The Minimal HTML Document

Here is a bare-bones example of HTML:

```
<TITLE>The simplest HTML example</TITLE>
<H1>This is a level-one heading</H1>
Welcome to the world of HTML.
This is one paragraph.<P>
And this is a second.<P>
```

Click here to see the formatted version of the example.

HTML uses markup tags to tell the Web browser how to display the text. The above example uses:

- the `<TITLE>` tag (and corresponding `</TITLE>` tag), which specifies the title of the document
- the `<H1>` header tag (and corresponding `</H1>`)
- the `<P>` paragraph-separator tag

HTML tags consist of a left angle bracket (<), (a ``less than'' symbol to mathematicians), followed by name of the tag and closed by a right angular bracket (>). Tags are usually paired, e.g. `<H1>` and `</H1>`. The ending tag looks just like the starting tag except a slash (/) precedes the text within the brackets. In the example, `<H1>` tells the Web browser to start formatting a level-one heading; `</H1>` tells the browser that the heading is complete.

The primary exception to the pairing rule is the `<P>` tag. There is no such thing as `</P>`.

NOTE: *HTML is not case sensitive.* `<title>` *is equivalent to* `<TITLE>` *or* `<TiTlE>`.

Not all tags are supported by all World Wide Web browsers. If a browser does not support a tag, it just ignores it.

Basic Markup Tags

Title

Every HTML document should have a title. A title is generally displayed separately from the document and is used primarily for document identification in other contexts (e.g., a WAIS search). Choose about half a dozen words that describe the document's purpose.

> *In the X Window System and Microsoft Windows versions of NCSA Mosaic, the*

This is a level one heading

Welcome to the world of HTML. This is one paragraph.

And this is a second.

Document Title *field is at the top of the screen just below the pulldown menus. In NCSA Mosaic for Macintosh, text tagged as* <TITLE> *appears as the window title.*

Headings

HTML has six levels of headings, numbered 1 through 6, with 1 being the most prominent. Headings are displayed in larger and/or bolder fonts than normal body text. The first heading in each document should be tagged <H1>. The syntax of the heading tag is:

<Hy>*Text of heading* </Hy >

where *y* is a number between 1 and 6 specifying the level of the heading.

For example, the coding for the ``Headings" section heading above is

```
<H3>Headings</H3>
```

Title versus first heading

In many documents, the first heading is identical to the title. For multipart documents, the text of the first heading should be suitable for a reader who is already browsing related information (e.g., a chapter title), while the title tag should identify the document in a wider context (e.g., include both the book title and the chapter title, although this can sometimes become overly long).

Paragraphs

Unlike documents in most word processors, carriage returns in HTML files aren't significant. Word wrapping can occur at any point in your source file, and multiple spaces are collapsed into a single space. (There are couple of exceptions; space following a <P> or <Hy> tag, for example, is ignored.) Notice that in the bare-bones example, the first paragraph is coded as

```
Welcome to HTML.
This is the first paragraph. <P>
```

In the source file, there is a line break between the sentences. A Web browser ignores this line break and starts a new paragraph only when it reaches a <P> tag.

Important: You must separate paragraphs with <P>. The browser ignores any indentations or blank lines in the source text. HTML relies almost entirely on the tags for formatting instructions, and without the <P> tags, the document becomes one large paragraph. (The exception is text tagged as ``preformatted," which is explained below.) For instance, the following would produce identical output as the first bare-bones HTML example:

```
<TITLE>The simplest HTML example</TITLE><H1>This is a level
one heading</H1>Welcome to the world of HTML. This is one
paragraph.<P>And this is a second.<P>
```

However, to preserve readability in HTML files, headings should be on separate lines, and paragraphs should be separated by blank lines (in addition to the <P> tags).

NCSA Mosaic handles <P> by ending the current paragraph and inserting a blank line.

In HTML+, a successor to HTML currently in development, <P> becomes a ``container" of text, just as the text of a level-one heading is ``contained" within<H1> ... </H1>:

```
<P>
This is a paragraph in HTML+.
</P>
```

The difference is that the </P> closing tag can always be omitted. (That is, if a browser sees a <P>, it knows that there must be an implied </P> to end the previous paragraph.) In other words, in HTML+, <P>

is a beginning-of-paragraph marker.

The advantage of this change is that you will be able to specify formatting options for a paragraph. For example, in HTML+, you will be able to center a paragraph by coding

```
<P ALIGN=CENTER>
This is a centered paragraph. This is HTML+, so you can't do it yet.
```

This change won't effect any documents you write now, and they will continue to look just the same with HTML+ browsers.

Linking to Other Documents

The chief power of HTML comes from its ability to link regions of text (and also images) to another document. The browser highlights these regions (usually with color and/or underlines) to indicate that they are hypertext links (often shortened to hyperlinks or simply links).

HTML's single hypertext-related tag is `<A>`, which stands for anchor. To include an anchor in your document:

1. Start the anchor with `<A` . (There's a space after the `A`.)
2. Specify the document that's being pointed to by entering the parameter `HREF="`*filename*`"` followed by a closing right angle bracket: >
3. Enter the text that will serve as the hypertext link in the current document.
4. Enter the ending anchor tag: `</A>`.

Here is an sample hypertext reference:

```
<A HREF="MaineStats.html">Maine</A>
```

This entry makes the word ``Maine" the hyperlink to the document `MaineStats.html`, which is in the same directory as the first document. You can link to documents in other directories by specifying the relative path from the current document to the linked document. For example, a link to a file `NJStats.html` located in the subdirectory `AtlanticStates` would be:

```
<A HREF="AtlanticStates/NJStats.html">New Jersey</A>
```

These are called *relative links*. You can also use the absolute pathname of the file if you wish. Pathnames use the standard UNIX syntax.

Relative Links Versus Absolute Pathnames

In general, you should use relative links, because

1. You have less to type.
2. It's easier to move a group of documents to another location, because the relative path names will still be valid.

However, use absolute pathnames when linking to documents that are not directly related. For example, consider a group of documents that comprise a user manual. Links within this group should be relative links. Links to other documents (perhaps a reference to related software) should use full path names. This way, if you move the user manual to a different directory, none of the links would have to be updated.

Uniform Resource Locator

The World Wide Web uses Uniform Resource Locators (URLs) to specify the location of files on other servers. A URL includes the type of resource being accessed (e.g., gopher, WAIS), the address of the server, and the location of the file. The syntax is:

scheme`://`*host.domain*`[`*:port*`]`*/path/filename*

where *scheme* is one of

`file`
: a file on your local system, or a file on an anonymous FTP server

`http`
: a file on a World Wide Web server

`gopher`
: a file on a Gopher server

`WAIS`
: a file on a WAIS server

`news`
: an Usenet newsgroup

`telnet`
: a connection to a Telnet-based service

The *port* number can generally be omitted. (That means unless someone tells you otherwise, leave it out.)

For example, to include a link to this primer in your document, you would use

```
<A HREF = "http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html">
NCSA's Beginner's Guide to HTML</A>
```

This would make the text ``NCSA's Beginner's Guide to HTML'' a hyperlink to this document.

For more information on URLs, look at

- *WWW Names and Addresses, URIs, URLs, URNs*, written by people at CERN
- *A Beginner's Guide to URLs*, located on the NCSA Mosaic **Help** menu

Links to Specific Sections in Other Documents

Anchors can also be used to move to a particular section in a document. Suppose you wish to set a link from document A and a specific section in document B. (Call this file `documentB.html`.) First you need to set up a named anchor in document B. For example, to set up an anchor named ``Jabberwocky'' to document B, enter

```
Here's <A NAME = "Jabberwocky">some text</a>
```

Now when you create the link in document A, include not only the filename, but also the named anchor, separated by a hash mark (#).

```
This is my <A HREF = "documentB.html#Jabberwocky">link</A> to document B.
```

Now clicking on the word ``link'' in document A sends the reader directly to the words ``some text'' in document B.

Links to Specific Sections Within the Current Document

The technique is exactly the same except the filename is omitted.

For example, to link to the Jabberwocky anchor from within the same file (Document B), use

```
This is <A HREF = "#Jabberwocky">Jabberwocky link</A> from within Document B.
```

Additional Markup Tags

The preceding is sufficient to produce simple HTML documents. For more complex documents, HTML has tags for several types of lists, preformatted sections, extended quotations, character formatting, and other items.

Lists

HTML supports unnumbered, numbered, and definition lists.

Unnumbered Lists

To make an unnumbered list,

1. Start with an opening list <UL> tag.
2. Enter the <LI> tag followed by the individual item. (No closing </LI> tag is needed.)
3. End with a closing list </UL> tag.

Below an example two-item list:

```
<UL>
<LI> apples
<LI> bananas
</UL>
```

The output is:

- apples
- bananas

The <LI> items can contain multiple paragraphs. Just separate the paragraphs with the <P> paragraph tags.

Numbered Lists

A numbered list (also called an ordered list, from which the tag name derives) is identical to an unnumbered list, except it uses <OL> instead of <UL>. The items are tagged using the same <LI> tag. The following HTML code

```
<OL>
<LI> oranges
<LI> peaches
<LI> grapes
</OL>
```

produces this formatted output:

1. oranges
2. peaches
3. grapes

Definition Lists

A definition list usually consists of alternating a term (abbreviated as DT) and a definition (abbreviated as DD). Web browsers generally format the definition on a new line.

The following is an example of a definition list:

```
<DL>
<DT> NCSA
<DD> NCSA, the National Center for Supercomputing Applications,
     is located on the campus of the University of Illinois
     at Urbana-Champaign. NCSA is one of the participants in the
     National MetaCenter for Computational Science and Engineering.
<DT> Cornell Theory Center
<DD> CTC is located on the campus of Cornell University in Ithaca,
     New York. CTC is another participant in the National MetaCenter
     for Computational Science and Engineering.
</DL>
```

The output looks like:

NCSA
: NCSA, the National Center for Supercomputing Applications, is located on the campus of the University of Illinois at Urbana-Champaign. NCSA is one of the participants in the National MetaCenter for Computational Science and Engineering.

Cornell Theory Center
: CTC is located on the campus of Cornell University in Ithaca, New York. CTC is another participant in the National MetaCenter for Computational Science and Engineering.

The <DT> and <DD> entries can contain multiple paragraphs (separated by <P> paragraph tags), lists, or other definition information.

Nested Lists

Lists can be arbitrarily nested, although in practice you probably should limit the nesting to three levels. You can also have a number of paragraphs, each containing a nested list, in a single list item.

An example nested list:

```
<UL>
<LI> A few New England states:
    <UL>
    <LI> Vermont
    <LI> New Hampshire
    </UL>
<LI> One Midwestern state:
    <UL>
    <LI> Michigan
    </UL>
</UL>
```

The nested list is displayed as

- A few New England states:
  - Vermont
  - New Hampshire
- One Midwestern state:
  - Michigan

Preformatted Text

Use the <PRE> tag (which stands for ``preformatted'') to generate text in a fixed-width font and cause spaces, new lines, and tabs to be significant. (That is, multiple spaces are displayed as multiple spaces, and lines break in the same locations as in the source HTML file.) This is useful for program listings. For example, the following lines

```
<PRE>
  #!/bin/csh
  cd $SCR
  cfs get mysrc.f:mycfsdir/mysrc.f
  cfs get myinfile:mycfsdir/myinfile
  fc -02 -o mya.out mysrc.f
  mya.out
  cfs save myoutfile:mycfsdir/myoutfile
  rm *
</PRE>
```

display as

```
#!/bin/csh
cd $SCR
cfs get mysrc.f:mycfsdir/mysrc.f
cfs get myinfile:mycfsdir/myinfile
fc -02 -o mya.out mysrc.f
mya.out
cfs save myoutfile:mycfsdir/myoutfile
rm *
```

Hyperlinks can be used within <PRE> sections. You should avoid using other HTML tags within <PRE> sections, however.

Note that because <, >, and & have special meaning in HTML, you have to use their escape sequences (<, >, and &, respectively) to enter these characters. See the section Special Characters for more information.

Extended Quotations

Use the <BLOCKQUOTE> tag to include quotations in a separate block on the screen. Most browsers generally indent to separate it from surrounding text.

An example:

```
<BLOCKQUOTE>
I still have a dream. It is a dream deeply rooted in the
American dream. <P>
I have a dream that one day this nation will rise up and
live out the true meaning of its creed. We hold these truths
to be self-evident that all men are created equal. <P>
</BLOCKQUOTE>
```

The result is:

> I still have a dream. It is a dream deeply rooted in the American dream.
>
> I have a dream that one day this nation will rise up and live out the true meaning of its creed. We hold these truths to be self-evident that all men are created equal.

Addresses

The <ADDRESS> tag is generally used to specify the author of a document and a means of contacting the author (e.g., an email address). This is usually the last item in a file.

For example, the last line of the online version of this guide is

```
<ADDRESS>
A Beginner's Guide to HTML / NCSA / pubs@ncsa.uiuc.edu
</ADDRESS>
```

The result is
A Beginner's Guide to HTML / NCSA / pubs@ncsa.uiuc.edu

NOTE: <ADDRESS> is *not* used for postal addresses. See ``Forced Line Breaks" on page 10 to see how to format postal addresses.

Character Formatting

You can code individual words or sentences with special styles. There are two types of styles: logical and physical. Logical styles tag text according to its meaning, while physical styles specify the specific appearance of a section. For example, in the preceding sentence, the words ``logical styles" was tagged as a ``definition." The same effect (formatting those words in italics), could have been achieved via a different tag that specifies merely ``put these words in italics."

Physical Versus Logical: Use Logical Styles When Possible

If physical and logical styles produce the same result on the screen, why are there both? We devolve, for a couple of paragraphs, into the philosophy of SGML, which can be summed in a Zen-like mantra: ``Trust your browser."

In the ideal SGML universe, content is divorced from presentation. Thus, SGML tags a level-one heading as a level-one heading, but does not specify that the level-one heading should be, for instance, 24-point

bold Times centered on the top of a page. The advantage of this approach (it's similar in concept to style sheets in many word processors) is that if you decide to change level-one headings to be 20-point left-justified Helvetica, all you have to do is change the definition of the level-one heading in the presentation device (i.e., your World Wide Web browser).

The other advantage of logical tags is that they help enforce consistency in your documents. It's easier to tag something as <H1> than to remember that level-one headings are 24-point bold Times or whatever. The same is true for character styles. For example, consider the <STRONG> tag. Most browsers render it in bold text. However, it is possible that a reader would prefer that these sections be displayed in red instead. Logical styles offer this flexibility.

Logical Styles

<DFN> for a word being defined. Typically displayed in italics. (NCSA Mosaic is a World Wide Web browser.)
<EM> for emphasis. Typically displayed in italics. (*Watch out for pickpockets.*)
<CITE> for titles of books, films, etc. Typically displayed in italics. (*A Beginner's Guide to HTML*)
<CODE> for snippets of computer code. Displayed in a fixed-width font. (The `<stdio.h>` header file)
<KBD> for user keyboard entry. Should be displayed in a bold fixed-width font, but many browsers render it in the plain fixed-width font. (Enter `passwd` to change your password.)
<SAMP> for computer status messages. Displayed in a fixed-width font. (`Segmentation fault: Core dumped.`)
<STRONG>
for strong emphasis. Typically displayed in bold. (**Important**)
<VAR> for a ``metasyntactic'' variable, where the user is to replace the variable with a specific instance. Typically displayed in italics. (`rm` *filename* deletes the file.)

Physical Styles

<B> bold text
<I> italic text
<TT> typewriter text, e.g. fixed-width font.

Using Character Tags

To apply a character style,

1. Start with <*tag*>, where *tag* is the desired character formatting tag, to indicate the beginning of the tagged text.
2. Enter the tagged text.
3. End the passage with </*tag*>.

Special Characters

Escape Sequences

Four characters of the ASCII character set -- the left angle bracket (<), the right angle bracket (>), the ampersand (&) and the double quote (") -- have special meaning within HTML and therefore cannot be used ``as is'' in text. (The angle brackets are used to indicate the beginning and end of HTML tags, and the ampersand is used to indicate the beginning of an escape sequence.)

To use one of these characters in an HTML document, you must enter its escape sequence instead:

`<` the escape sequence for <
`>` the escape sequence for >
`&` the escape sequence for &
`&quot;` the escape sequence for "

Additional escape sequences support accented characters. For example:

`&ouml;` the escape sequence for a lowercase o with an umlaut: ö
`&ntilde;`
the escape sequence for a lowercase n with an tilde: ñ

`&Egrave;`
the escape sequence for an uppercase E with a grave accent: È

A full list of supported characters can be found at CERN.

NOTE: Unlike the rest of HTML, the escape sequences are case sensitive. You cannot, for instance, use < instead of <.

Forced Line Breaks

The `<BR>` tag forces a line break with no extra space between lines. (By contrast, most browsers format the `<P>` paragraph tag with an additional blank line to more clearly indicate the beginning the new paragraph.)

One use of `<BR>` is in formatting addresses:

```
National Center for Supercomputing Applications<BR>
605 East Springfield Avenue<BR>
Champaign, Illinois 61820-5518<BR>
```

Horizontal Rules

The `<HR> tag` produces a horizontal line the width of the browser window.

In-line Images

Most Web browsers can display in-line images (that is, images next to text) that are in X Bitmap (XBM) or GIF format. Each image takes time to process and slows down the initial display of the document, so generally you should not include too many or overly large images.

To include an in-line image, use

```
<IMG SRC=image_URL>
```

where *image_URL* is the URL of the image file. The syntax for `IMG SRC` URLs is identical to that used in an anchor `HREF`. If the image file is a GIF file, then the filename part of *image_URL* **must** end with `.gif`. Filenames of X Bitmap images must end with `.xbm`.


By default the bottom of an image is aligned with the text as shown in this paragraph.


Add the `ALIGN=TOP` option if you want the browser to align adjacent text with the top of the image as shown in this paragraph. The full in-line image tag with the top alignment is:

```
<IMG ALIGN=top SRC=image_URL>
```


`ALIGN=MIDDLE` aligns the text with the center of the image.

Alternate Text for Browsers That Can't Display Images

Some World Wide Web browsers, primarily those that run on VT100 terminals, cannot display images.

The ALT option allows you to specify text to be displayed when an image cannot be. For example:

```
<IMG SRC = "UpArrow.gif" ALT = "Up">
```

where UpArrow.gif is the picture of an upward pointing arrow. With NCSA Mosaic and other graphics-capable viewers, the user sees the up arrow graphic. With a VT100 browser, such as lynx, the user sees the word ``Up."

External Images, Sounds, and Animations

You may want to have an image open as a separate document when a user activates a link on either a word or a smaller, in-line version of the image included in your document. This is considered an external image and is useful if you do not wish to slow down the loading of the main document with large in-line images.

To include a reference to an external image, use

```
<A HREF = image_URL>link anchor</A>
```

Use the same syntax is for links to external animations and sounds. The only difference is the file extension of the linked file. For example,

```
<A HREF = "QuickTimeMovie.mov">link anchor</A>
```

specifies a link to a QuickTime movie. Some common file types and their extensions are:

File Type — **Extension**

Plain text — .txt
HTML document — .html
GIF image — .gif
TIFF image — .tiff
XBM bitmap image — .xbm
JPEG image — .jpg or .jpeg
PostScript file — .ps
AIFF sound — .aiff
AU sound — .au
QuickTime movie — .mov
MPEG movie — .mpeg or .mpg

Make sure your intended audience has the necessary viewers. Most UNIX workstations, for instance, cannot view QuickTime movies.

Troubleshooting

Avoid Overlapping Tags

Consider this snippet of HTML:

```
<B>This is an example of <DFN>overlapping</B> HTML tags.</DFN>
```

The word ``overlapping" is contained within both the <B> and <DFN> tags. How does the browser format it? You won't know until you look, and different browsers will likely react differently. In general, avoid overlapping tags.

Embed Anchors and Character Tags, But Nothing Else

It is acceptable to embed anchors within another HTML element:

```
<H1><A HREF = "Destination.html">My heading</A></H1>
```

Do not embed a heading or another HTML element within an anchor:

```
<A HREF = "Destination.html">
<H1>My heading</H1>
</A>
```

Although most browsers currently handle this example, it is forbidden by the official HTML and HTML+ specifications, and will not work with future browsers.

Character tags modify the appearance of other tags:

```
<UL><LI><B>A bold list item</B>
    <UL>
    <LI><I>An italic list item</I>
</UL>
```

However, avoid embedding other types of HTML element tags. For example, it is tempting to embed a heading within a list, in order to make the font size larger:

```
<UL><LI><H1>A large heading</H1>
    <UL>
    <LI><H2>Something slightly smaller</H2>
</UL>
```

Although some browsers, such as NCSA Mosaic for the X Window System, format this construct quite nicely, it is unpredictable (because it is undefined) what other browsers will do. For compatibility with all browsers, avoid these kinds of constructs.

What's the difference between embedding a <B> within a <LI> tag as opposed to embedding a <H1> within a <LI>? This is again a question of SGML. The semantic meaning of <H1> is that it's the main heading of a document and that it should be followed by the content of the document.Thus it doesn't make sense to find a <H1> within a list.

Character formatting tags also are generally not additive. You might expect that

```
<B><I>some text</I></B>
```

would produce bold-italic text. On some browsers it does; other browsers interpret only the innermost tag (here, the italics).

Check Your Links

When an <IMG> tag points at an image that does not exist, a dummy image is substituted. When this happens, make sure that the referenced image does in fact exist, that the hyperlink has the correct information in the URL, and that the file permission is set appropriately (world-readable).

A Longer Example

Here is a longer example of an HTML document:

```
<HEAD>
<TITLE>A Longer Example</TITLE>
</HEAD>
<BODY>
<H1>A Longer Example</H1>
This is a simple HTML document. This is the first
paragraph. <P>
This is the second paragraph, which shows special effects.  This is a
word in <I>italics</I>.  This is a word in <B>bold</B>.
Here is an in-lined GIF image: <IMG SRC = "myimage.gif">.
<P>
This is the third paragraph, which demonstrates links.  Here is
a hypertext link from the word <A HREF = "subdir/myfile.html">foo</A>
to a document called "subdir/myfile.html". (If you
try to follow this link, you will get an error screen.) <P>
<H2>A second-level header</H2>
Here is a section of text that should display as a
fixed-width font: <P>
<PRE>
    On the stiff twig up there
    Hunches a wet black rook
    Arranging and rearranging its feathers in the rain ...
</PRE>
This is a unordered list with two items: <P>
<UL>
<LI> cranberries
<LI> blueberries
</UL>
This is the end of my example document. <P>
<ADDRESS>Me (me@mycomputer.univ.edu)</ADDRESS>
</BODY>
```

Click here to see the formatted version.

In addition to tags already discussed, this example also uses the `<HEAD> ... </HEAD>` and `<BODY> ... </BODY>` tags, which separate the document into introductory information about the document and the main text of the document. These tags don't change the appearance of the formatted document at all, but are useful for several purposes (for example, NCSA Mosaic for Macintosh 2.0, for example, allows you to browse just the header portion of document before deciding whether to download the rest), and it is recommended that you use these tags.

For More Information

This guide is only an introduction to HTML and not a comprehensive reference. Below are additional sources of information.

Fill-out Forms

One major feature not discussed here is fill-out forms, which allows users to return information to the World Wide Web server. For information on fill-out forms, look at this Fill-out Forms Overview

Style Guides

The following offer advice on how to write ``good'' HTML:

- *Composing Good HTML*
- CERN's style guide for online hypert

Other Introductory Documents

These cover similar information as this guide:

- *How to Write HTML Files*
- *Introduction to HTML*

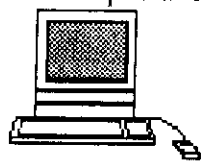
Additional References

- *The HTML Quick Reference Guide*, which provides a comprehensive listing of HTML codes
- The official HTML specification
- A description of SGML, the Standard Generalized Markup Language
- Dan Connolly's *HTML Design Notebook*. Dan Connolly is one of the originators of HTML.

National Center for Supercomputing Applications / pubs@ncsa.uiuc.edu

A Longer Example

This is a simple HTML document. This is the first paragraph.

This is the second paragraph, which shows special effects. This is a word in *italics*. This is a word in **bold**. Here is an inlined GIF image:  .

This is the third paragraph, which demonstrates links. Here is a hypertext link from the word foo to a document called "subdir/myfile.html". (If you try to follow this link, you will get an error screen.)

A second-level header

Here is a section of text that should display as a fixed-width font:

```
On the stiff twig up there
Hunches a wet black rook
Arranging and rearranging its feathers in the rain ...
```

This is a unordered list with two items:

- cranberries
- blueberries

This is the end of my example document.

Me (me@mycomputer.univ.edu)

HTML Quick Reference

The HyperText Markup Language (HTML) is composed of a set of elements that define a document and guide its display. This document presents a concise reference guide to Level 1 of HTML, listing almost all of the Level 1 elements, and giving a brief description of those elements.

Users should be aware that HTML is an evolving language, and different World-Wide Web browsers may recognize slightly different sets of HTML elements. For general information about HTML including plans for new versions, see http://www.w3.org/hypertext/WWW/MarkUp/MarkUp.html

An HTML element may include a name, some attributes and some text or hypertext, and will appear in an HTML document as

```
<tag_name> text </tag_name>
<tag_name attribute_name=argument> text </tag_name>, or just
<tag_name>
```

For example:

```
<title> My Useful Document </title>
```

and

```
<a href="argument"> text </a>
```

An HTML document is composed of a single element:

```
<html>...</html>
```

that is, in turn, composed of head and body elements:

```
<head>...</head>
```

and

```
<body>...</body>
```

To allow older HTML documents to remain readable, `<html>`, `<head>`, and `<body>` are actually optional within HTML documents.

Elements usually placed in the head element

`<isindex>`
: Specifies that the current document describes a database that can be searched using the index search method appropriate for whatever client is being used to read the document. For example, a Lynx user will use the "s" keyboard command.

`<title>...</title>`
: Specify a document title. Note that the title will not appear on the document as is customary on printed documents. It will usually appear in a window bar identifying the contents of the window. HTML header tags perform the functions usually reserved for titles.

`<base href="URL">`
: Specify the name of the file in which the current document is stored. This is useful when link references within the document do not include full pathnames (i.e., are partially qualified).

`<link rev="RELATIONSHIP" rel="RELATIONSHIP" href="URL">`
: The link tag allows you to define relationships between the document containing the link tag and the document specified in the "URL". The `rel` attribute specifies the relationship between the HTML file and the Uniform Resource Locator (URL). The `rev` attribute (for "reverse") specifies the relationship between the URL and the HTML file. For example, `<link rev="made" href="URL">` indicates that the file maker or owner is described in the document identified by the URL. (Note that link tags are not displayed on the screen as part of the document. They define static relationships, not hypertext links.)

Elements usually placed in the body element

The following sections describe elements that can be used in the body of the document.

Text Elements

`<p>` The end of a paragraph that will be formatted before it is displayed on the screen.

`<pre>...</pre>`
Identifies text that has already been formatted (preformatted) by some other system and must be displayed as is. Preformatted text may include embedded tags, but not all tag types are permitted. The `<pre>` tag can be used to include tables in documents.

`<listing>...</listing>`
Example computer listing; embedded tags will be ignored, but embedded tabs will work. This is an archaic tag.

`<xmp>...</xmp>`
Similar to `<pre>` except no embedded tags will be recognized.

`<plaintext>`
Similar to `<pre>` except no embedded tags will be recognized, and since there is no end tag, the remainder of the document will be rendered as plain text. This is an archaic tag. Note that some browsers actually recognize a `</plaintext>` tag, even though it is not defined by the standard.

`<blockquote>...</blockquote>`
Include a section of text quoted from some other source.

Hyperlinks or Anchors

`<a name="anchor_name">...</a>`
Define a target location in a document

`<a href="#anchor_name">...</a>`
Link to a location in the same document

`<a href="URL">...</a>`
Link to another file or resource

`<a href="URL#anchor_name">...</a>`
Link to a target location in another document

`<a href="URL?search_word+search_word">...</a>`
Send a search string to a server. Different servers may interpret the search string differently. In the case of word-oriented search engines, multiple search words might be specified by separating individual words with a plus sign (+).

An anchor must include a `name` or `href` attribute, and may include both. There are several optional attributes, but they are rarely encountered.

The structure of a Uniform Resource Locator (URL) may be expressed as:

resource_type://host.domain:port/pathname

where the possible resource types include: `file`, `http`, `news`, `gopher`, `telnet`, `ftp`, and `wais`, among others, and each resource type interprets the pathname in its own way. (Strictly speaking, the `anchor_name` and `search_word` information included in the `name` and `href` attributes in the examples above are part of the URL. They are presented as separate entities for simplicity.) Note that each resource type relates to a specific server type. The colon followed by an integer TCP port number is optional, and is used when a server is listening on a non-standard port.

A more complete description of URLs is presented in
http://www.w3.org/hypertext/WWW/Addressing/Addressing.html

Headers

`<h1>...</h1>` Most prominent header
`<h2>...</h2>`
`<h3>...</h3>`
`<h4>...</h4>`
`<h5>...</h5>`

<h6> . . . </h6> Least prominent header

Logical Styles

 . . .
Emphasis
 . . .
Stronger emphasis
<code> . . . </code>
Display an HTML directive
<samp> . . . </samp>
Include sample output
<kbd> . . . </kbd>
Display a keyboard key
<var> . . . </var>
Define a variable
<dfn> . . . </dfn>
Display a definition (not widely supported)
<cite> . . . </cite>
Display a citation

Physical Styles

 . . .
Boldface
 . . .
Italics
<u> . . . </u>
Underline
<tt> . . . </tt>
`Typewriter font`

Definition list/glossary: <dl>

<dl>
<dt> First term to be defined
<dd> Definition of first term
<dt> Next term to be defined
<dd> Next definition
</dl>

The <dl> attribute `compact` can be used to generate a definition list requiring less space.

Present an unordered list:

 First item in the list
 Next item in the list

Present an ordered list:

 First item in the list
 Next item in the list

Present an interactive menu: <menu>

<menu>
 First item in the menu

 Next item
</menu>

Present a directory list of items: <dir>

<dir>
 First item in the list
 Second item in the list
 Next item in the list
</dir>

Items should be less than 20 characters long.

Entities

&keyword;
: Display a particular character identified by a special keyword. For example the entity & specifies the ampersand (&), and the entity < specifies the less than (<) character. Note that the semicolon following the keyword is required, and the keyword must be one from the list presented in:
http://www.w3.org/hypertext/WWW/MarkUp/Entities.html
-or-
The ISO LATIN I character set

&#ascii_equivalent;
: Use a character literally. Again note that the semicolon following the ASCII numeric value is required.

HTML Forms Interface

The HTML forms interface allows document creators to define HTML documents containing forms to be filled out by users. When a user fills out the form and presses a button indicating the form should be "submitted," the information on the form is sent to a server for processing. The server will usually prepare an HTML document using the information supplied by the user and return it to the client for display.

The following tags implement the forms interface:

- <form>...</form>
- <input>
- <select>...</select>
- <option>
- <textarea>...</textarea>

The last four tags can only be used within a <form>...</form> element.

Define a form

<form>...</form>

Define a form within an HTML document. A document may contain multiple <form> elements, but <form> elements may not be nested. Note that non-form tags can be used within a <form> element. Attributes and their arguments:

action:
: The URL location of the program that will process the form.

method: One of get or post
: The method chosen to exchange data between the client and the program started to process the form. post is preferred for most applications.

Example:

```
<form action="http://kuhttp.cc.ukans.edu/cgi-bin/register" method=post>...
</form>
```

Define an input field

<input> (there is no ending tag)

Defines an input field where the user may enter information on the form. Each input field assigns a value to a variable which has a specified name and a specified data type. Attributes and their arguments:

type
: Specifies the data type for the variable.
  - type="text" and type="password" accept character data
  - type="checkbox" is either selected or not
  - type="radio" allows selection of only one of several radio fields, if they all have the same variable name
  - type="submit" is an action button that sends the completed form to the query server
  - type="reset" is a button that resets the form variables to their default values

name
: "textstring" where textstring is a symbolic name (not displayed) identifying the input variable as in:
<input type="checkbox" name="box1">

value
: "textstring" where the function of textstring depends on the argument for type.
  - For type="text" or type="password", textstring is the default value for the input variable.
  - If type="checkbox" or type="radio", textstring is the value of the input variable when it is "checked".
  - For type="reset" or type="submit", textstring is a label that will appear on the submit or reset button in place of the words "submit" and "reset".

checked
: No arguments. For type="checkbox" or type="radio", if checked is present the input field is "checked" by default.

size
: width where width is an integer value representing the number of characters allowed for the type="text" or type="password" input fields.

maxlength
: length where length is the number of characters accepted for type="text" or type="password". This attribute is only valid for single line "text" or "password" fields.

Define a select field

<select>...</select>

defines and displays a set of optional list items from which the user can select one or more items. This element requires an <option> element for each item in the list. Attributes and their arguments:

name
: "textstring" where textstring is the symbolic identifier for the select field variable.

size
: The argument for size is an integer value representing the number of <option> items that will be displayed at one time.

multiple
: No arguments. If present, the multiple attribute allows selection of more than one <option> value.

Define a select field option

<option>

Within the <select> element the <option> tags are used to define the possible values for the select field. If the attribute selected is present then the option value is selected by default. In the following example all three options may be chosen but bananas are selected by default.

```
<select multiple>
<option>Apples
<option selected>Bananas
<option>Cherries
</select>
```

Define a text area

`<textarea>` . . . default text . . . `</textarea>`

Defines a rectangular field where the user may enter text data. If "default text" is present it will be displayed when the field appears. Otherwise the field will be blank. Attributes and their values:

`name`
: "`textstring`" where `textstring` is a symbolic name that identifies the `<textarea>` variable.

`rows` and `cols`
: Both attributes take an integer value which represents the lines and number of characters per line in the `<textarea>` to be displayed.

Miscellaneous

`<!-- text -->`
: Place a comment in the HTML source

`<address> . . . </address>`
: Present address information

`<img src="URL" alt="Alternate Text">`
: Embed a graphic image in the document. Attributes:

  `src`
  : Specifies the location of the image.

  `alt`
  : Allows a text string to be put in place of the image in clients that cannot display images.

  `align`
  : Specify a relationship to surrounding text. The argument for `align` can be one of `top`, `middle`, or `bottom`.

  `ismap`
  : If `ismap` is present and the image tag is within an anchor, the image will become a "clickable image". The pixel coordinates of the cursor will be appended to the URL specified in the anchor if the user clicks within the ismap image. The resulting URL will take the form "URL?m,n" where m and n are integer coordinates.

`<br>`
: Forces a line break immediately and retains the same style.

`<hr>`
: Places a horizontal rule or separator between sections of text.

Additional Information

For a tutorial introduction to HTML see: http://www.ncsa.uiuc.edu/demoweb/html-primer.html.

For an introduction to forms within HTML see: An Instantaneous Introduction to HTML Forms.

For general information about HTML, see http://www.w3.org/hypertext/WWW/MarkUp/MarkUp.html

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