REC-html32

HTML 3.2 Reference Specification

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Status of this document

This document has been reviewed by W3C members and other interested parties and has been endorsed by the Director as a W3C Recommendation. It is a stable document and may be used as reference material or cited as a normative reference from another document. W3C's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and interoperability of the Web.

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Abstract

The HyperText Markup Language (HTML) is a simple markup language used to create hypertext documents that are portable from one platform to another. HTML documents are SGML documents with generic semantics that are appropriate for representing information from a wide range of applications. This specification defines HTML version 3.2. HTML 3.2 aims to capture recommended practice as of early '96 and as such to be used as a replacement for HTML 2.0 (RFC 1866).

Contents

Introduction to HTML 3.2

HTML 3.2 is W3C's specification for HTML, developed in early `96 together with vendors including IBM, Microsoft, Netscape Communications Corporation, Novell, SoftQuad, Spyglass, and Sun Microsystems. HTML 3.2 adds widely deployed features such as tables, applets and text flow around images, while providing full backwards compatibility with the existing standard HTML 2.0.

W3C is continuing to work with vendors on extensions for accessibility features, multimedia objects, scripting, style sheets, layout, forms, math and internationalization. W3C plans on incorporating this work in further versions of HTML.

HTML as an SGML Application

HTML 3.2 is an SGML application conforming to International Standard ISO 8879 -- Standard Generalized Markup Language. As an SGML application, the syntax of conforming HTML 3.2 documents is defined by the combination of the SGML declaration and the document type definition (DTD). This specification defines the intended interpretation of HTML 3.2 elements, and places further constraints on the permitted syntax which are otherwise inexpressible in the DTD.

The SGML rules for record boundaries are tricky. In particular, a record end immediately following a start tag should be discarded. For example:

```
<P>
Text
```

is equivalent to:

```
<P>Text
```

Similarly, a record end immediately preceding an end tag should be discarded. For example:

```
Text
</P>
```

is equivalent to:

```
Text</P>
```

Except within literal text (e.g. the `PRE` element), HTML treats contiguous sequences of white space characters as being equivalent to a single space character (ASCII decimal 32). These rules allow authors considerable flexibility when editing the marked-up text directly. Note that future revisions to HTML may allow for the interpretation of the horizontal tab character (ASCII decimal 9) with respect to a tab rule defined by an associated style sheet.

SGML entities in PCDATA content or in CDATA attributes are expanded by the parser, e.g. `&#233;` is expanded to the ISO Latin-1 character decimal 233 (a lower case letter e with an acute accent). This could also have been written as a named character entity, e.g. `&eacute;`. The & character can be included in its own right using the named character entity `&`.

HTML allows CDATA attributes to be unquoted provided the attribute value contains only letters (a to z and A to Z), digits (0 to 9), hyphens (ASCII decimal 45) or, periods (ASCII decimal 46). Attribute

values can be quoted using double or single quote marks (ASCII decimal 34 and 39 respectively). Single quote marks can be included within the attribute value when the value is delimited by double quote marks, and vice versa.

Note that some user agents require attribute minimisation for the following attributes: COMPACT, ISMAP, CHECKED, NOWRAP, NOSHADE and NOHREF. These user agents don't accept syntax such as COMPACT=COMPACT or ISMAP=ISMAP although this is legitimate according to the HTML 3.2 DTD.

The SGML declaration and the DTD for use with HTML 3.2 are given in appendices. Further guidelines for parsing HTML are given in WD-html-lex.

The Structure of HTML documents

HTML 3.2 Documents start with a <!DOCTYPE> declaration followed by an HTML element containing a HEAD and then a BODY element:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<HTML>
<HEAD>
<TITLE>A study of population dynamics</TITLE>
... other head elements
</HEAD>
<BODY>
... document body
</BODY>
</HTML>
```

In practice, the HTML, HEAD and BODY start and end tags can be omitted from the markup as these can be inferred in all cases by parsers conforming to the HTML 3.2 DTD.

Every conforming HTML 3.2 document **must** start with the <!DOCTYPE> declaration that is needed to distinguish HTML 3.2 documents from other versions of HTML. The HTML specification is not concerned with storage entities. As a result, it is not required that the document type declaration reside in the same storage entity (i.e. file). A Web site may choose to dynamically prepend HTML files with the document type declaration if it is known that all such HTML files conform to the HTML 3.2 specification.

Every HTML 3.2 document must also include the descriptive title element. A minimal HTML 3.2 document thus looks like:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<TITLE>A study of population dynamics</TITLE>
```

Note: the word "Final" replaces "Draft" now that the HTML 3.2 specification has been ratified by the W3C member organizations.

The HEAD element

This contains the document head, but you can always omit both the start and end tags for HEAD. The contents of the document head is an unordered collection of the following elements:

```
<!ENTITY % head.content "TITLE & ISINDEX? & BASE?">
<!ENTITY % head.misc "SCRIPT|STYLE|META|LINK">

<!ELEMENT HEAD O O  (%head.content) +(%head.misc)>
```

The %head.misc entity is used to allow the associated elements to occur multiple times at arbitrary positions within the HEAD. The following elements can be part of the document head:

TITLE defines the document title, and is always needed.
ISINDEX for simple keyword searches, see PROMPT attribute.
BASE defines base URL for resolving relative URLs.
SCRIPT reserved for future use with scripting languages.
STYLE reserved for future use with style sheets.
META used to supply meta info as name/value pairs.
LINK used to define relationships with other documents.

TITLE, SCRIPT and STYLE are containers and require both start and end tags. The other elements are not containers so that end tags are forbidden. Note that conforming browsers won't render the contents of SCRIPT and STYLE elements.

TITLE

```
<!ELEMENT TITLE - -  (#PCDATA)* -(%head.misc)>
```

Every HTML 3.2 document **must** have exactly one TITLE element in the document's HEAD. It provides an advisory title which can be displayed in a user agent's window caption etc. The content model is PCDATA. As a result, character entities can be used for accented characters and to escape special characters such as & and <. Markup is not permitted in the content of a TITLE element.

Example TITLE element:

```
    <TITLE>A study of population dynamics</TITLE>
```

STYLE and SCRIPT

```
<!ELEMENT STYLE  - - CDATA -- placeholder for style info -->
<!ELEMENT SCRIPT - - CDATA -- placeholder for script statements -->
```

These are place holders for the introduction of style sheets and client-side scripts in future versions of HTML. User agents should hide the contents of these elements.

These elements are defined with CDATA as the content type. As a result they may contain only SGML characters. All markup characters or delimiters are ignored and passed as data to the application, except

for ETAGO ("</") delimiters followed immediately by a name character [a-zA-Z]. This means that the element's end-tag (or that of an element in which it is nested) is recognized, while an error occurs if the ETAGO is invalid.

ISINDEX

```
<!ELEMENT ISINDEX - O EMPTY>
<!ATTLIST ISINDEX
    prompt CDATA #IMPLIED -- prompt message -->
```

The ISINDEX element indicates that the user agent should provide a single line text input field for entering a query string. There are no restrictions on the number of characters that can be entered. The PROMPT attribute can be used to specify a prompt string for the input field, e.g.

```
<ISINDEX PROMPT="Search Phrase">
```

The semantics for ISINDEX are currently well defined only when the base URL for the enclosing document is an HTTP URL. Typically, when the user presses the enter (return) key, the query string is sent to the server identified by the base URL for this document. For example, if the query string entered is "ten green apples" and the base URL is:

```
http://www.acme.com/
```

then the query generated is:

```
http://www.acme.com/?ten+green+apples"
```

Note that space characters are mapped to "+" characters and that normal URL character escaping mechanisms apply. For further details see the HTTP specification.

***Note** in practice, the query string is resticted to Latin-1 as there is no current mechanism for the URL to specify a character set for the query.*

BASE

```
<!ELEMENT BASE - O EMPTY>
<!ATTLIST BASE
    href %URL  #REQUIRED
    >
```

The BASE element gives the base URL for dereferencing relative URLs, using the rules given by the URL specification, e.g.

```
<BASE href="http://www.acme.com/intro.html">
 ...
<IMG SRC="icons/logo.gif">
```

The image is deferenced to

```
http://www.acme.com/icons/logo.gif
```

In the absence of a BASE element the document URL should be used. Note that this is not necessarily the same as the URL used to request the document, as the base URL may be overridden by an HTTP header

accompanying the document.

META

```
<!ELEMENT META - O EMPTY    -- Generic Metainformation -->
<!ATTLIST META
        http-equiv  NAME    #IMPLIED  -- HTTP response header name  --
        name        NAME    #IMPLIED  -- metainformation name       --
        content     CDATA   #REQUIRED -- associated information     --
        >
```

The META element can be used to include name/value pairs describing properties of the document, such as author, expiry date, a list of key words etc. The NAME attribute specifies the property name while the CONTENT attribute specifies the property value, e.g.

```
<META NAME="Author" CONTENT="Dave Raggett">
```

The HTTP-EQUIV attribute can be used in place of the NAME attribute and has a special significance when documents are retrieved via the Hypertext Transfer Protocol (HTTP). HTTP servers may use the property name specified by the HTTP-EQUIV attribute to create an RFC 822 style header in the HTTP response. This can't be used to set certain HTTP headers though, see the HTTP specification for details.

```
<META HTTP-EQUIV="Expires" CONTENT="Tue, 20 Aug 1996 14:25:27 GMT">
```

will result in the HTTP header:

```
Expires: Tue, 20 Aug 1996 14:25:27 GMT
```

This can be used by caches to determine when to fetch a fresh copy of the associated document.

LINK

LINK provides a media independent method for defining relationships with other documents and resources. LINK has been part of HTML since the very early days, although few browsers as yet take advantage of it (most still ignore LINK elements).

LINK elements can be used *in principle*:

a. for document specific navigation toolbars or menus
b. to control how collections of HTML files are rendered into printed documents
c. for linking associated resources such as style sheets and scripts
d. to provide alternative forms of the current document

```
<!ELEMENT LINK - O EMPTY>
<!ATTLIST LINK
    href    %URL    #IMPLIED    -- URL for linked resource --
    rel     CDATA   #IMPLIED    -- forward link types --
    rev     CDATA   #IMPLIED    -- reverse link types --
    title   CDATA   #IMPLIED    -- advisory title string --
    >
```

href

Specifies a URL designating the linked resource.

rel
: The forward relationship also known as the "link type". It specifies a named relationship from the enclosing document to the resource specified by the HREF attribute. HTML link relationships are as yet unstandardized, although some conventions have been established.

rev
: This defines a reverse relationship. A link from document A to document B with REV=*relation* expresses the same relationship as a link from B to A with REL=*relation*. REV=made is sometimes used to identify the document author, either the author's email address with a mailto URL, or a link to the author's home page.

title
: An advisory title for the linked resource.

Here are some proposed relationship values:

rel=top
: The link references the top of a hierarchy, e.g. the first or cover page in a collection.

rel=contents
: The link references a document serving as a table of contents.

rel=index
: The link references a document providing an index for the current document.

rel=glossary
: The link references a document providing a glossary of terms that are relevant to the current document.

rel=copyright
: The link references a copyright statement for the current document.

rel=next
: The link references the next document to visit in a guided tour. It can be used, for example, to preload the next page.

rel=previous
: The link references the previous document in a guided tour.

rel=help
: The link references a document offering help, e.g. describing the wider context and offering further links to relevant documents. This is aimed at reorienting users who have lost their way.

rel=search
: The link references a page for searching material related to a collection of pages

Example LINK elements:

```
<LINK REL=Contents HREF=toc.html>
<LINK REL=Previous HREF=doc31.html>
<LINK REL=Next HREF=doc33.html>

<LINK REL=Chapter REV=Contents HREF=chapter2.html>
```

The BODY element

This contains the document body. Both start and end tags for BODY may be omitted. The body can contain a wide range of elements:

- Headings (H1 - H6)
- The ADDRESS element
- Block level Elements
- Text level elements

The key attributes are: BACKGROUND, BGCOLOR, TEXT, LINK, VLINK and ALINK. These can be used to set a repeating background image, plus background and foreground colors for normal text and hypertext links.

```
<!ENTITY % body.content "(%heading | %text | %block | ADDRESS)*">

<!ENTITY % color "CDATA" -- a color specification: #HHHHHH @@ details? -->

<!ENTITY % body-color-attrs "
        bgcolor %color #IMPLIED
        text %color #IMPLIED
        link %color #IMPLIED
        vlink %color #IMPLIED
        alink %color #IMPLIED
        ">

<!ELEMENT BODY O O  %body.content>
<!ATTLIST BODY
        background %URL #IMPLIED  -- texture tile for document background --
        %body-color-attrs;  -- bgcolor, text, link, vlink, alink --
        >
```

Example:

```
 <body bgcolor=white text=black link=red vlink=maroon alink=fuchsia>
```

bgcolor
: Specifies the background color for the document body. See below for the syntax of color values.

text
: Specifies the color used to stroke the document's text. This is generally used when you have changed the background color with the BGCOLOR or BACKGROUND attributes.

link
: Specifies the color used to stroke the text for unvisited hypertext links.

vlink
: Specifies the color used to stroke the text for visited hypertext links.

alink
: Specifies the highlight color used to stroke the text for hypertext links at the moment the user clicks on the link.

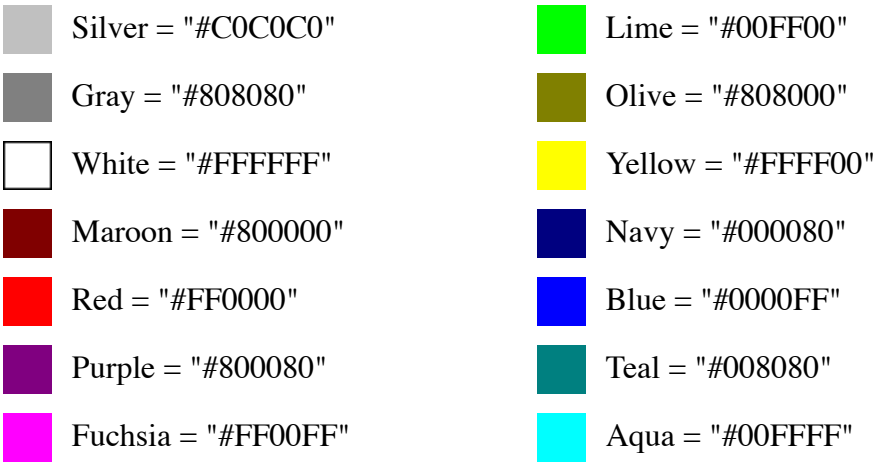
background
: Specifies a URL for an image that will be used to tile the document background.

Colors are given in the sRGB color space as hexadecimal numbers (e.g. COLOR="#C0FFC0"), or as one of 16 widely understood color names. These colors were originally picked as being the standard 16 colors supported with the Windows VGA palette.

Color names and sRGB values

 Black = "#000000"

 Green = "#008000"



Block and Text level elements

Most elements that can appear in the document body fall into one of two groups: block level elements which cause paragraph breaks, and text level elements which don't. Common block level elements include H1 to H6 (headers), P (paragraphs) LI (list items), and HR (horizontal rules). Common text level elements include EM, I, B and FONT (character emphasis), A (hypertext links), IMG and APPLET (embedded objects) and BR (line breaks). Note that block elements generally act as containers for text level and other block level elements (excluding headings and address elements), while text level elements can only contain other text level elements. The exact model depends on the element.

Headings

```
<!--
  There are six levels of headers from H1 (the most important)
  to H6 (the least important).
-->

<!ELEMENT ( %heading )  - -  (%text;)*>
<!ATTLIST ( %heading )
        align  (left|center|right) #IMPLIED
        >
```

H1, H2, H3, H4, H5 and H6 are used for document headings. You always need the start and end tags. H1 elements are more important than H2 elements and so on, so that H6 elements define the least important level of headings. More important headings are generally rendered in a larger font than less important ones. Use the optional ALIGN attribute to set the text alignment within a heading, e.g.

```
  <H1 ALIGN=CENTER> ... centered heading ... </H1>
```

The default is left alignment, but this can be overridden by an enclosing DIV or CENTER element.

ADDRESS

```
    <!ENTITY % address.content "((%text;) | P)*">

    <!ELEMENT ADDRESS - - %address.content>
```

The ADDRESS element requires start and end tags, and specifies information such as authorship and

contact details for the current document. User agents should render the content with paragraph-breaks before and after. Note that the content is restricted to paragraphs, plain text and text-like elements as defined by the %text entity.

Example:

```
<ADDRESS>
Newsletter editor<BR>
J.R. Brown<BR>
8723 Buena Vista, Smallville, CT 01234<BR>
Tel: +1 (123) 456 7890
</ADDRESS>
```

Block elements

P *paragraphs*

The paragraph element requires a start tag, but the end tag can always be omitted. Use the ALIGN attribute to set the text alignment within a paragraph, e.g. <P ALIGN=RIGHT>

UL *unordered lists*

These require start and end tags, and contain one or more LI elements representing individual list items.

OL *ordered (i.e. numbered) lists*

These require start and end tags, and contain one or more LI elements representing individual list items.

DL *definition lists*

These require start and end tags and contain DT elements that give the terms, and DD elements that give corresponding definitions.

PRE *preformatted text*

Requires start and end tags. These elements are rendered with a monospaced font and preserve layout defined by whitespace and line break characters.

DIV *document divisions*

Requires start and end tags. It is used with the ALIGN attribute to set the text alignment of the block elements it contains. ALIGN can be one of LEFT, CENTER or RIGHT.

CENTER *text alignment*

Requires start and end tags. It is used to center text lines enclosed by the CENTER element. See DIV for a more general solution.

BLOCKQUOTE *quoted passage*

Requires start and end tags. It is used to enclose extended quotations and is typically rendered with indented margins.

FORM *fill-out forms*

Requires start and end tags. This element is used to define a fill-out form for processing by HTTP servers. The attributes are ACTION, METHOD and ENCTYPE. Form elements can't be nested.

ISINDEX *primitive HTML forms*

Not a container, so the end tag is forbidden. This predates FORM and is used for simple kinds of forms which have a single text input field, implied by this element. A single ISINDEX can appear in the document head or body.

HR *horizontal rules*

Not a container, so the end tag is forbidden. attributes are ALIGN, NOSHADE, SIZE and WIDTH.

TABLE *can be nested*

Requires start and end tags. Each table starts with an optional CAPTION followed by one or more

TR elements defining table rows. Each row has one or more cells defined by TH or TD elements. attributes for TABLE elements are WIDTH, BORDER, CELLSPACING and CELLPADDING.

Paragraphs

```
<!ELEMENT P     - O (%text)*>
<!ATTLIST P
    align  (left|center|right) #IMPLIED
    >
```

The P element is used to markup paragraphs. It is a container and requires a start tag. The end tag is optional as it can always be inferred by the parser. User agents should place paragraph breaks before and after P elements. The rendering is user agent dependent, but text is generally wrapped to fit the space available.

Example:

```
<P>This is the first paragraph.
<P>This is the second paragraph.
```

Paragraphs are usually rendered flush left with a ragged right margin. The ALIGN attribute can be used to explicitly specify the horizontal alignment:

`align=left`
: The paragraph is rendered flush left.

`align=center`
: The paragraph is centered.

`align=right`
: The paragraph is rendered flush right.

For example:

```
<p align=center>This is a centered paragraph.
<p align=right>and this is a flush right paragraph.
```

The default is left alignment, but this can be overridden by an enclosing DIV or CENTER element.

Lists

List items can contain block and text level items, including nested lists, although headings and address elements are excluded. This limitation is defined via the %flow entity.

Unordered Lists

```
<!ELEMENT UL - -  (LI)+>
<!ENTITY % ULStyle "disc|square|circle">

<!ATTLIST UL -- unordered lists --
    type    (%ULStyle)   #IMPLIED   -- bullet style --
    compact (compact)    #IMPLIED   -- reduced interitem spacing --
    >
```

```
<!ELEMENT LI - O %flow -- list item -->
<!ATTLIST LI
    type   (%LIStyle)    #IMPLIED   -- list item style --
    >
```

Unordered lists take the form:

```
<UL>
  <LI> ... first list item
  <LI> ... second list item
  ...
</UL>
```

The UL element is used for unordered lists. Both start and end tags are always needed. The LI element is used for individual list items. The end tag for LI elements can always be omitted. Note that LI elements can contain nested lists. The COMPACT attribute can be used as a hint to the user agent to render lists in a more compact style.

The TYPE attribute can be used to set the bullet style on UL and LI elements. The permitted values are "disc", "square" or "circle". The default generally depends on the level of nesting for lists.

- with `<li type=disc>`
- with `<li type=square>`
- with `<li type=circle>`

This list was chosen to cater for the original bullet shapes used by Mosaic in 1993.

Ordered (i.e. numbered) Lists

```
<!ELEMENT OL - -  (LI)+>
<!ATTLIST OL -- ordered lists --
    type      CDATA      #IMPLIED   -- numbering style --
    start     NUMBER     #IMPLIED   -- starting sequence number --
    compact  (compact)   #IMPLIED   -- reduced interitem spacing --
    >

<!ELEMENT LI - O %flow -- list item -->
<!ATTLIST LI
    type      CDATA      #IMPLIED   -- list item style --
    value     NUMBER     #IMPLIED   -- set sequence number --
    >
```

Ordered (i.e. numbered) lists take the form:

```
<OL>
  <LI> ... first list item
  <LI> ... second list item
  ...
</OL>
```

The OL START attribute can be used to initialize the sequence number (by default it is initialized to 1). You can set it later on with the VALUE attribute on LI elements. Both of these attributes expect integer values. You can't indicate that numbering should be continued from a previous list, or to skip missing values without giving an explicit number.

The COMPACT attribute can be used as a hint to the user agent to render lists in a more compact style. The OL TYPE attribute allows you to set the numbering style for list items:

Type	Numbering style	
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, ...

Definition Lists

```
<!-- definition lists - DT for term, DD for its definition -->

<!ELEMENT DL    - -  (DT|DD)+>
<!ATTLIST DL
        compact (compact) #IMPLIED -- more compact style --
        >

<!ELEMENT DT - O  (%text)*>
<!ELEMENT DD - O  %flow;>
```

Definition lists take the form:

```
  <DL>
    <DT> term name
    <DD> term definition
    ...
  </DL>
```

DT elements can only act as containers for text level elements, while DD elements can hold block level elements as well, excluding headings and address elements.

For example:

```
<DL>
<DT>Term 1<dd>This is the definition of the first term.
<DT>Term 2<dd>This is the definition of the second term.
</DL>
```

which could be rendered as:

Term 1
: This is the definition of the first term.

Term 2
: This is the definition of the second term.

The COMPACT attribute can be used with the DL element as a hint to the user agent to render lists in a more compact style.

DIR and MENU

```
<!ELEMENT (DIR|MENU) - -  (LI)+ -(%block)>
<!ATTLIST (DIR|MENU)
        compact (compact) #IMPLIED
        >
```

These elements have been part of HTML from the early days. They are intended for unordered lists similar to UL elements. User agents are recommended to render DIR elements as multicolumn directory lists, and MENU elements as single column menu lists. In practice, Mosaic and most other user agents have ignored this advice and instead render DIR and MENU in an identical way to UL elements.

Preformatted Text

```
<!ELEMENT PRE - - (%text)* -(%pre.exclusion)>
<!ATTLIST PRE
        width NUMBER #implied
        >
```

The PRE element can be used to include preformatted text. User agents render this in a fixed pitch font, preserving spacing associated with white space characters such as space and newline characters. Automatic word-wrap should be disabled within PRE elements.

Note that the SGML standard requires that the parser remove a newline immediately following the start tag or immediately preceding the end tag.

PRE has the same content model as paragraphs, excluding images and elements that produce changes in font size, e.g. IMG, BIG, SMALL, SUB, SUP and FONT.

A few user agents support the WIDTH attribute. It provides a hint to the user agent of the required width in characters. The user agent can use this to select an appropriate font size or to indent the content appropriately.

Here is an example of a PRE element; a verse from Shelley (To a Skylark):

```
<PRE>
       Higher still and higher
         From the earth thou springest
       Like a cloud of fire;
         The blue deep thou wingest,
And singing still dost soar, and soaring ever singest.
</PRE>
```

which is rendered as:

```
       Higher still and higher
         From the earth thou springest
       Like a cloud of fire;
         The blue deep thou wingest,
And singing still dost soar, and soaring ever singest.
```

The horizontal tab character (encoded in Unicode, US ASCII and ISO 8859-1 as decimal 9) should be interpreted as the smallest non-zero number of spaces which will leave the number of characters so far on the line as a multiple of 8. Its use is strongly discouraged since it is common practice when editing to set the tab-spacing to other values, leading to misaligned documents.

XMP, LISTING and PLAINTEXT

```
<![ %HTML.Deprecated [

<!ENTITY % literal "CDATA"
        -- historical, non-conforming parsing mode where
           the only markup signal is the end tag
           in full
        -->

<!ELEMENT (XMP|LISTING) - -  %literal>
<!ELEMENT PLAINTEXT - O %literal>

]]>
```

These are obsolete tags for preformatted text that predate the introduction of PRE. User agents may support these for backwards compatibility. Authors should avoid using them in new documents!

DIV and CENTER

```
<!ELEMENT DIV - - %body.content>
<!ATTLIST DIV
        align   (left|center|right) #IMPLIED -- alignment of following text --
        >

<!-- CENTER is a shorthand for DIV with ALIGN=CENTER -->
<!ELEMENT center - - %body.content>
```

DIV elements can be used to structure HTML documents as a hierarchy of divisions. The ALIGN attribute can be used to set the default horizontal alignment for elements within the content of the DIV element. Its value is restricted to LEFT, CENTER or RIGHT, and is defined in the same way as for the paragraph element <P>.

Note that because DIV is a block-like element it will terminate an open P element. Other than this, user agents are **not** expected to render paragraph breaks before and after DIV elements. CENTER is directly equivalent to DIV with ALIGN=CENTER. Both DIV and CENTER require start and end tags.

CENTER was introduced by Netscape before they added support for the HTML 3.0 DIV element. It is retained in HTML 3.2 on account of its widespread deployment.

BLOCKQUOTE

```
<!ELEMENT BLOCKQUOTE - - %body.content>
```

This is used to enclose block quotations from other works. Both the start and end tags are required. It is often rendered indented, e.g.

> They went in single file, running like hounds on a strong scent, and an eager light was in their eyes. Nearly due west the broad swath of the marching Orcs tramped its ugly slot; the sweet grass of Rohan had been bruised and blackened as they passed.
>
> *from "The Two Towers" by J.R.R. Tolkien.*

FORM

```
<!ENTITY % HTTP-Method "GET | POST"
        -- as per HTTP specification
        -->

<!ELEMENT FORM - - %body.content -(FORM)>
<!ATTLIST FORM
        action %URL #IMPLIED  -- server-side form handler --
        method (%HTTP-Method) GET -- see HTTP specification --
        enctype %Content-Type; "application/x-www-form-urlencoded"
        >
```

This is used to define an HTML form, and you can have more than one form in the same document. Both the start and end tags are required. For very simple forms, you can also use the ISINDEX element. Forms can contain a wide range of HTML markup including several kinds of form fields such as single and multi-line text fields, radio button groups, checkboxes, and menus.

action
: This specifies a URL which is either used to post forms via email, e.g. `action="mailto:foo@bar.com"`, or used to invoke a server-side forms handler via HTTP, e.g. `action="http://www.acme.com/cgi-bin/register.pl"`

method
: When the action attribute specifies an HTTP server, the method attribute determines which HTTP method will be used to send the form's contents to the server. It can be either `GET` or `POST`, and defaults to `GET`.

enctype
: This determines the mechanism used to encode the form's contents. It defaults to *application/x-www-form-urlencoded*.

Further details on handling forms are given in RFC 1867.

HR - *horizontal rules*

Horizontal rules may be used to indicate a change in topic. In a speech based user agent, the rule could be rendered as a pause.

```
<!ELEMENT HR    - O EMPTY>
<!ATTLIST HR
        align (left|right|center) #IMPLIED
        noshade (noshade) #IMPLIED
        size  %Pixels #IMPLIED
        width %Length #IMPLIED
        >
```

`HR` elements are not containers so the end tag is forbidden. The attributes are: `ALIGN`, `NOSHADE`, `SIZE` and `WIDTH`.

align
: This determines whether the rule is placed at the left, center or right of the space between the current left and right margins for `align=left`, `align=center` or `align=right` respectively. By default, the rule is centered.

noshade
: This attribute requests the user agent to render the rule in a solid color rather than as the traditional two colour "groove".

size
: This can be used to set the height of the rule in pixels.

width
: This can be used to set the width of the rule in pixels (e.g. `width=100`) or as the percentage between the current left and right margins (e.g. `width="50%"`). The default is 100%.

Tables

HTML 3.2 includes a widely deployed subset of the specification given in RFC 1942 and can be used to markup tabular material or for layout purposes. Note that the latter role typically causes problems when rending to speech or to text only user agents.

```
<!-- horizontal placement of table relative to window -->
<!ENTITY % Where "(left|center|right)">

<!-- horizontal alignment attributes for cell contents -->
<!ENTITY % cell.halign
        "align  (left|center|right) #IMPLIED"
        >

<!-- vertical alignment attributes for cell contents -->
<!ENTITY % cell.valign
        "valign  (top|middle|bottom)  #IMPLIED"
        >

<!ELEMENT table - - (caption?, tr+)>
<!ELEMENT tr - O (th|td)*>
<!ELEMENT (th|td) - O %body.content>

<!ATTLIST table                         -- table element --
        align     %Where;   #IMPLIED    -- table position relative to window --
        width     %Length   #IMPLIED    -- table width relative to window --
        border    %Pixels   #IMPLIED    -- controls frame width around table --
        cellspacing %Pixels #IMPLIED    -- spacing between cells --
        cellpadding %Pixels #IMPLIED    -- spacing within cells --
        >

<!ELEMENT CAPTION - - (%text;)* -- table or figure caption -->
<!ATTLIST CAPTION
        align (top|bottom) #IMPLIED
        >

<!ATTLIST tr                        -- table row --
        %cell.halign;               -- horizontal alignment in cells --
        %cell.valign;               -- vertical alignment in cells --
        >

<!ATTLIST (th|td)                   -- header or data cell --
        nowrap (nowrap)  #IMPLIED   -- suppress word wrap --
        rowspan NUMBER   1          -- number of rows spanned by cell --
        colspan NUMBER   1          -- number of cols spanned by cell --
        %cell.halign;               -- horizontal alignment in cells --
        %cell.valign;               -- vertical alignment in cells --
        width   %Pixels  #IMPLIED   -- suggested width for cell --
        height  %Pixels  #IMPLIED   -- suggested height for cell --
        >
```

Tables take the general form:

```
<TABLE BORDER=3 CELLSPACING=2 CELLPADDING=2 WIDTH="80%">
<CAPTION> ... table caption ... </CAPTION>
<TR><TD> first cell <TD> second cell
<TR> ...
...
</TABLE>
```

The attributes on TABLE are all optional. By default, the table is rendered without a surrounding border. The table is generally sized automatically to fit the contents, but you can also set the table width using the WIDTH attribute. BORDER, CELLSPACING and CELLPADDING provide further control over the table's appearence. Captions are rendered at the top or bottom of the table depending on the ALIGN attribute.

Each table row is contained in a TR element, although the end tag can always be omitted. Table cells are defined by TD elements for data and TH elements for headers. Like TR, these are containers and can be given without trailing end tags. TH and TD support several attributes: ALIGN and VALIGN for aligning cell content, ROWSPAN and COLSPAN for cells which span more than one row or column. A cell can contain a wide variety of other block and text level elements including form fields and other tables.

The TABLE element always requires both start and end tags. It supports the following attributes:

align
: This takes one of the case insensitive values: LEFT, CENTER or RIGHT. It specifies the horizontal placement of the table relative to the current left and right margins. It defaults to left alignment, but this can be overridden by an enclosing DIV or CENTER element.

width
: In the absence of this attribute the table width is automatically determined from the table contents. You can use the WIDTH attribute to set the table width to a fixed value in pixels (e.g. WIDTH=212) or as a percentage of the space between the current left and right margins (e.g. WIDTH="80%").

border
: This attribute can be used to specify the width of the outer border around the table to a given number of pixels (e.g. BORDER=4). The value can be set to zero to suppress the border altogether. In the absence of this attribute the border should be suppressed. Note that some browsers also accept <TABLE BORDER> with the same semantics as BORDER=1.

cellspacing
: In traditional desktop publishing software, adjacent table cells share a common border. This is not the case in HTML. Each cell is given its own border which is separated from the borders around neighboring cells. This separation can be set in pixels using the CELLSPACING attribute, (e.g. CELLSPACING=10). The same value also determines the separation between the table border and the borders of the outermost cells.

cellpadding
: This sets the padding in pixels between the border around each cell and the cell's contents.

The CAPTION element has one attribute ALIGN which can be either ALIGN=TOP or ALIGN=BOTTOM. This can be used to force the caption to be placed above the top or below the bottom of the table respectively. Most user agents default to placing the caption above the table. CAPTION always requires both start and end tags. Captions are limited to plain text and text-level elements as defined by the %text entity. Block level elements are not permitted.

The TR or table row element requires a start tag, but the end tag can always be left out. TR acts as a container for table cells. It has two attributes:

align
: Sets the default horizontal alignment of cell contents. It takes one of the case insensitive values: LEFT, CENTER or RIGHT and plays the same role as the ALIGN attribute on paragraph elements.

valign
: This can be used to set the default vertical alignment of cell contents within each cell. It takes one of the case insensitive values: TOP, MIDDLE or BOTTOM to position the cell contents at the top, middle or bottom of the cell respectively.

There are two elements for defining table cells. TH is used for header cells and TD for data cells. This distinction allows user agents to render header and data cells in different fonts, and enables speech based browsers to do a better job. The start tags for TH and TD are always needed but the end tags can be left out. Table cells can have the following attributes:

nowrap
: The presence of this attribute disables automatic word wrap within the contents of this cell (e.g. <TD NOWRAP>). This is equivalent to using the   entity for non-breaking spaces within the content of the cell.

rowspan
: This takes a positive integer value specifying the number of rows spanned by this cell. It defaults to one.

colspan
: This takes a positive integer value specifying the number of columns spanned by this cell. It defaults to one.

align
: Specifies the default horizontal alignment of cell contents, and overrides the ALIGN attribute on the table row. It takes the same values: LEFT, CENTER and RIGHT. If you don't specify an ALIGN attribute value on the cell, the default is left alignment for <td> and center alignment for <th> although you can override this with an ALIGN attribute on the TR element.

valign
: Specifies the default vertical alignment of cell contents, overriding the VALIGN attribute on the table row. It takes the same values: TOP, MIDDLE and BOTTOM. If you don't specify a VALIGN attribute value on the cell, the default is middle although you can override this with a VALIGN attribute on the TR element.

width
: Specifies the suggested width for a cell content in pixels excluding the cell padding. This value will normally be used except when it conflicts with the width requirements for other cells in the same column.

height
: Specifies the suggested height for a cell content in pixels excluding the cell padding. This value will normally be used except when it conflicts with the height requirements for other cells in the same row.

Tables are commonly rendered in bas-relief, raised up with the outer border as a bevel, and individual cells inset into this raised surface. Borders around individual cells are only drawn if the cell has explicit content. White space doesn't count for this purpose with the exception of .

The algorithms used to automatically size tables should take into account the minimum and maximum width requirements for each cell. This is used to determine the minimum and maximum width

requirements for each column and hence for the table itself.

Cells spanning more than one column contribute to the widths of each of the columns spanned. One approach is to evenly apportion the cell's minimum and maximum width between these columns, another is to weight the apportioning according to the contributions from cells that don't span multiple columns.

For some user agents it may be necessary or desirable to break text lines within words. In such cases a visual indication that this has occurred is advised.

The minimum and maximum width of nested tables contribute to the minimum and maximum width of the cell in which they occur. Once the width requirements are known for the top level table, the column widths for that table can be assigned. This allows the widths of nested tables to be assigned and hence in turn the column widths of such tables. If practical, all columns should be assigned at least their minimum widths. It is suggested that any surplus space is then shared out proportional to the difference between the minimum and maximum width requirements of each column.

Note that pixel values for width and height refer to screen pixels, and should be multiplied by an appropriate factor when rendering to very high resolution devices such as laser printers. For instance if a user agent has a display with 75 pixels per inch and is rendering to a laser printer with 600 dots per inch, then the pixel values given in HTML attributes should be multiplied by a factor of 8.

Text level elements

These don't cause paragraph breaks. Text level elements that define character styles can generally be nested. They can contain other text level elements but not block level elements.

Font style elements

These all require start and end tags, e.g.

```
This has some <B>bold text</B>.
```

Text level elements must be properly nested - the following is in error:

```
This has some <B>bold and <I></B>italic text</I>.
```

User agents should do their best to respect nested emphasis, e.g.

```
This has some <B>bold and <I>italic text</I></B>.
```

Where the available fonts are restricted or for speech output, alternative means should be used for rendering differences in emphasis.

TT teletype or monospaced text
I italic text style
B bold text style
U underlined text style
STRIKE strike-through text style
BIG places text in a large font
SMALL places text in a small font
SUB places text in subscript style
SUP places text in superscript style

Note: future revisions to HTML may be phase out STRIKE in favor of the more concise "S" tag from HTML 3.0.

Phrase Elements

These all require start and end tags, e.g.

```
This has some <EM>emphasized text</EM>.
```

EM basic emphasis typically rendered in an italic font
STRONG strong emphasis typically rendered in a bold font
DFN defining instance of the enclosed term
CODE used for extracts from program code
SAMP used for sample output from programs, and scripts etc.
KBD used for text to be typed by the user
VAR used for variables or arguments to commands
CITE used for citations or references to other sources

Form fields

INPUT, SELECT and TEXTAREA are only allowed within FORM elements. INPUT can be used for a variety of form fields including single line text fields, password fields, checkboxes, radio buttons, submit and reset buttons, hidden fields, file upload, and image buttons. SELECT elements are used for single or multiple choice menus. TEXTAREA elements are used to define multi-line text fields. The content of the element is used to initialize the field.

INPUT *text fields, radio buttons, check boxes, ...*

INPUT elements are not containers and so the end tag is forbidden.

```
<!ENTITY % IAlign "(top|middle|bottom|left|right)">

<!ENTITY % InputType
        "(TEXT | PASSWORD | CHECKBOX | RADIO | SUBMIT
            | RESET | FILE | HIDDEN | IMAGE)">
```

```
<!ELEMENT INPUT - O EMPTY>
<!ATTLIST INPUT
        type %InputType TEXT     -- what kind of widget is needed --
        name  CDATA #IMPLIED     -- required for all but submit and reset --
        value CDATA #IMPLIED     -- required for radio and checkboxes --
        checked (checked) #IMPLIED -- for radio buttons and check boxes --
        size CDATA  #IMPLIED     -- specific to each type of field --
        maxlength NUMBER #IMPLIED
        src   %URL  #IMPLIED     -- for fields with background images --
        align %IAlign #IMPLIED   -- vertical or horizontal alignment --
        >
```

type

Used to set the type of input field:

`type=text` *(the default)*

A single line text field whose visible size can be set using the `size` attribute, e.g. `size=40` for a 40 character wide field. Users should be able to type more than this limit though with the text scrolling through the field to keep the input cursor in view. You can enforce an upper limit on the number of characters that can be entered with the `maxlength` attribute. The `name` attribute is used to name the field, while the `value` attribute can be used to initialize the text string shown in the field when the document is first loaded.

```
<input type=text size=40 name=user value="your name">
```

`type=password`

This is like type=text, but echoes characters using a character like * to hide the text from prying eyes when entering passwords. You can use `size` and `maxlength` attributes to control the visible and maximum length exactly as per regular text fields.

```
<input type=password size=12 name=pw>
```

`type=checkbox`

Used for simple Boolean attributes, or for attributes that can take multiple values at the same time. The latter is represented by several checkbox fields with the same `name` and a different `value` attribute. Each checked checkbox generates a separate name/value pair in the submitted data, even if this results in duplicate names. Use the `checked` attribute to initialize the checkbox to its checked state.

```
<input type=checkbox checked name=uscitizen value=yes>
```

`type=radio`

Used for attributes which can take a single value from a set of alternatives. Each radio button field in the group should be given the same `name`. Radio buttons require an explicit `value` attribute. Only the checked radio button in the group generates a name/value pair in the submitted data. One radio button in each group should be initially checked using the `checked` attribute.

```
<input type=radio name=age value="0-12">
<input type=radio name=age value="13-17">
<input type=radio name=age value="18-25">
<input type=radio name=age value="26-35" checked>
<input type=radio name=age value="36-">
```

`type=submit`

This defines a button that users can click to submit the form's contents to the server. The button's label is set from the value attribute. If the name attribute is given then the submit button's name/value pair will be included in the submitted data. You can include several submit buttons in the form. See type=image for graphical submit buttons.

```
<input type=submit value="Party on ...">
```

type=image
: This is used for graphical submit buttons rendered by an image rather than a text string. The URL for the image is specified with the src attribute. The image alignment can be specified with the align attribute. In this respect, graphical submit buttons are treated identically to IMG elements, so you can set align to left, right, top, middle or bottom. The x and y values of the location clicked are passed to the server: In the submitted data, image fields are included as two name/value pairs. The names are derived by taking the name of the field and appending ".x" for the x value, and ".y" for the y value.

```
<p>Now choose a point on the map:

<input type=image name=point src="map.gif">
```

***Note**: image fields typically cause problems for text-only and speech-based user agents!*

type=reset
: This defines a button that users can click to reset form fields to their initial state when the document was first loaded. You can set the label by providing a value attribute. Reset buttons are never sent as part of the form's contents.

```
<input type=reset value="Start over ...">
```

type=file
: This provides a means for users to attach a file to the form's contents. It is generally rendered by text field and an associated button which when clicked invokes a file browser to select a file name. The file name can also be entered directly in the text field. Just like type=text you can use the size attribute to set the visible width of this field in average character widths. You can set an upper limit to the length of file names using the maxlength attribute. Some user agents support the ability to restrict the kinds of files to those matching a comma separated list of MIME content types given with the ACCEPT attribute e.g. accept="image/*" restricts files to images. Further information can be found in RFC 1867.

```
<input type=file name=photo size=20 accept="image/*">
```

type=hidden
: These fields should not be rendered and provide a means for servers to store state information with a form. This will be passed back to the server when the form is submitted, using the name/value pair defined by the corresponding attributes. This is a work around for the statelessness of HTTP. Another approach is to use HTTP "Cookies".

```
<input type=hidden name=customerid value="c2415-345-8563">
```

name
: Used to define the property name that will be used to identify this field's content when it is submitted to the server.

value

Used to initialize the field, or to provide a textual label for submit and reset buttons.

checked
The presence of this attribute is used to initialize checkboxes and radio buttons to their checked state.

size
Used to set the visible size of text fields to a given number of average character widths, e.g. `size=20`

maxlength
Sets the maximum number of characters permitted in a text field.

src
Specifies a URL for the image to use with a graphical submit button.

align
Used to specify image alignment for graphical submit buttons. It is defined just like the IMG align attribute and takes one of the values: `top`, `middle`, `bottom`, `left` or `right`, defaulting to `bottom`.

SELECT *menus*

```
<!ELEMENT SELECT - - (OPTION+)>
<!ATTLIST SELECT
        name CDATA #REQUIRED
        size NUMBER #IMPLIED
        multiple (multiple) #IMPLIED
        >

<!ELEMENT OPTION - O (#PCDATA)*>
<!ATTLIST OPTION
        selected (selected) #IMPLIED
        value  CDATA  #IMPLIED -- defaults to element content --
        >
```

SELECT is used to define select one from many or many from many menus. SELECT elements require start and end tags and contain one or more OPTION elements that define menu items. One from many menus are generally rendered as drop-down menus while many from many menus are generally shown as list boxes.

Example:

```
<SELECT NAME="flavor">
<OPTION VALUE=a>Vanilla
<OPTION VALUE=b>Strawberry
<OPTION VALUE=c>Rum and Raisin
<OPTION VALUE=d>Peach and Orange
</SELECT>
```

SELECT attributes:

name
This specifies a property name that is used to identify the menu choice when the form is submitted to the server. Each selected option results in a property name/value pair being included as part of the form's contents.

size
This sets the number of visible choices for many from many menus.

multiple

The presence of this attribute signifies that the users can make multiple selections. By default only one selection is allowed.

`OPTION` attributes:

selected
When this attribute is present, the option is selected when the document is initially loaded. It is an error for more than one option to be so selected for one from many menus.

value
Specifies the property value to be used when submitting the form's content. This is combined with the property name as given by the name attribute of the parent `SELECT` element.

TEXTAREA *multi-line text fields*

```
<!-- Multi-line text input field. -->

<!ELEMENT TEXTAREA - - (#PCDATA)*>
<!ATTLIST TEXTAREA
        name CDATA #REQUIRED
        rows NUMBER #REQUIRED
        cols NUMBER #REQUIRED
        >
```

`TEXTAREA` elements require start and end tags. The content of the element is restricted to text and character entities. It is used to initialize the text that is shown when the document is first loaded.

Example:

```
<TEXTAREA NAME=address ROWS=4 COLS=40>
Your address here ...
</TEXTAREA>
```

It is recommended that user agents canonicalize line endings to CR, LF (ASCII decimal 13, 10) when submitting the field's contents. The character set for submitted data should be ISO Latin-1, unless the server has previously indicated that it can support alternative character sets.

name
This specifies a property name that is used to identify the textarea field when the form is submitted to the server.

rows
Specifies the number of visible text lines. Users should be able to enter more lines that this, so user agents should provide some means to scroll through the contents of the textarea field when the contents extend beyond the visible area.

cols
Specifies the visible width in average character widths. Users should be able to enter longer lines that this, so user agents should provide some means to scroll through the contents of the textarea field when the contents extend beyond the visible area. User agents may wrap visible text lines to keep long lines visible without the need for scrolling.

Special Text level Elements

A (Anchor), IMG, APPLET, FONT, BASEFONT, BR and MAP.

The A (anchor) element

```
<!ELEMENT A - - (%text)* -(A)>
<!ATTLIST A
        name    CDATA   #IMPLIED    -- named link end --
        href    %URL    #IMPLIED    -- URL for linked resource --
        rel     CDATA   #IMPLIED    -- forward link types --
        rev     CDATA   #IMPLIED    -- reverse link types --
        title   CDATA   #IMPLIED    -- advisory title string --
        >
```

Anchors can't be nested and always require start and end tags. They are used to define hypertext links and also to define named locations for use as targets for hypertext links, e.g.

```
   The way to <a href="hands-on.html">happiness</a>.
```

and also to define named locations for use as targets for hypertext links, e.g.

```
   <h2><a name=mit>545 Tech Square - Hacker's Paradise</a></h2>
```

name
: This should be a string defining unique name for the scope of the current HTML document. `NAME` is used to associate a name with this part of a document for use with URLs that target a named section of a document.

href
: Specifies a URL acting as a network address for the linked resource. This could be another HTML document, a PDF file or an image etc.

rel
: The forward relationship also known as the "link type". It can be used to determine to how to deal with the linked resource when printing out a collection of linked resources.

rev
: This defines a reverse relationship. A link from document A to document B with `REV=relation` expresses the same relationship as a link from B to A with `REL=relation`. `REV=made` is sometimes used to identify the document author, either the author's email address with a mailto URL, or a link to the author's home page.

title
: An advisory title for the linked resource.

IMG *- inline images*

```
<!ENTITY % IAlign "(top|middle|bottom|left|right)">

<!ELEMENT IMG    - O EMPTY --  Embedded image -->
<!ATTLIST IMG
        src     %URL     #REQUIRED  -- URL of image to embed --
        alt     CDATA    #IMPLIED   -- for display in place of image --
        align   %IAlign  #IMPLIED   -- vertical or horizontal alignment --
        height  %Pixels  #IMPLIED   -- suggested height in pixels --
        width   %Pixels  #IMPLIED   -- suggested width in pixels --
        border  %Pixels  #IMPLIED   -- suggested link border width --
        hspace  %Pixels  #IMPLIED   -- suggested horizontal gutter --
        vspace  %Pixels  #IMPLIED   -- suggested vertical gutter --
        usemap  %URL     #IMPLIED   -- use client-side image map --
        ismap   (ismap)  #IMPLIED   -- use server image map --
```

```
>
```

Used to insert images. IMG is an empty element and so the end tag is forbidden. Images can be positioned vertically relative to the current textline or floated to the left or right. See BR with the CLEAR attribute for control over textflow.

e.g. `<IMG SRC="canyon.gif" ALT="Grand Canyon">`

IMG elements support the following attributes:

src
: This attribute is required for every IMG element. It specifies a URL for the image resource, for instance a GIF, JPEG or PNG image file.

alt
: This is used to provide a text description of the image and is vital for interoperability with speech-based and text only user agents.

align
: This specifies how the image is positioned relative to the current textline in which it occurs:

`align=top`
: positions the top of the image with the top of the current text line. User agents vary in how they interpret this. Some only take into account what has occurred on the text line prior to the IMG element and ignore what happens after it.

`align=middle`
: aligns the middle of the image with the baseline for the current textline.

`align=bottom`
: is the default and aligns the bottom of the image with the baseline.

`align=left`
: floats the image to the current left margin, temporarily changing this margin, so that subsequent text is flowed along the image's righthand side. The rendering depends on whether there is any left aligned text or images that appear earlier than the current image in the markup. Such text (but not images) generally forces left aligned images to wrap to a new line, with the subsequent text continuing on the former line.

`align=right`
: floats the image to the current right margin, temporarily changing this margin, so that subsequent text is flowed along the image's lefthand side. The rendering depends on whether there is any right aligned text or images that appear earlier than the current image in the markup. Such text (but not images) generally forces right aligned images to wrap to a new line, with the subsequent text continuing on the former line.

Note that some browsers introduce spurious spacing with multiple left or right aligned images. As a result authors can't depend on this being the same for browsers from different vendors. See BR for ways to control text flow.

width
: Specifies the intended width of the image in pixels. When given together with the height, this allows user agents to reserve screen space for the image before the image data has arrived over the network.

height

Specifies the intended height of the image in pixels. When given together with the width, this allows user agents to reserve screen space for the image before the image data has arrived over the network.

border

When the IMG element appears as part of a hypertext link, the user agent will generally indicate this by drawing a colored border (typically blue) around the image. This attribute can be used to set the width of this border in pixels. Use `border=0` to suppress the border altogether. User agents are recommended to provide additional cues that the image is clickable, e.g. by changing the mouse pointer.

hspace

This can be used to provide white space to the immediate left and right of the image. The HSPACE attribute sets the width of this white space in pixels. By default HSPACE is a small non-zero number.

vspace

This can be used to provide white space above and below the image The VSPACE attribute sets the height of this white space in pixels. By default VSPACE is a small non-zero number.

usemap

This can be used to give a URL fragment identifier for a client-side image map defined with the MAP element.

ismap

When the IMG element is part of a hypertext link, and the user clicks on the image, the ISMAP attribute causes the location to be passed to the server. This mechanism causes problems for text-only and speech-based user agents. Whenever its possible to do so use the MAP element instead.

Here is an example of how you use ISMAP:

```
<a href="/cgibin/navbar.map"><img src=navbar.gif ismap border=0></a>
```

The location clicked is passed to the server as follows. The user agent derives a new URL from the URL specified by the HREF attribute by appending `?' the x coordinate `,' and the y coordinate of the location in pixels. The link is then followed using the new URL. For instance, if the user clicked at at the location x=10, y=27 then the derived URL will be: "*/cgibin/navbar.map?10,27*". It is generally a good idea to suppress the border and use graphical idioms to indicate that the image is clickable.

Note that pixel values refer to screen pixels, and should be multiplied by an appropriate factor when rendering to very high resolution devices such as laser printers. For instance if a user agent has a display with 75 pixels per inch and is rendering to a laser printer with 600 dots per inch, then the pixel values given in HTML attributes should be multiplied by a factor of 8.

APPLET *(Java Applets)*

```
<!ELEMENT APPLET - - (PARAM | %text)*>
<!ATTLIST APPLET
        codebase %URL     #IMPLIED   -- code base --
        code     CDATA    #REQUIRED  -- class file --
        alt      CDATA    #IMPLIED   -- for display in place of applet --
        name     CDATA    #IMPLIED   -- applet name --
        width    %Pixels  #REQUIRED  -- suggested width in pixels --
        height   %Pixels  #REQUIRED  -- suggested height in pixels --
        align    %IAlign  #IMPLIED   -- vertical or horizontal alignment --
        hspace   %Pixels  #IMPLIED   -- suggested horizontal gutter --
```

```
        vspace   %Pixels  #IMPLIED   -- suggested vertical gutter --
        >

<!ELEMENT PARAM - O EMPTY>
<!ATTLIST PARAM
    name    NMTOKEN   #REQUIRED  -- The name of the parameter --
    value   CDATA     #IMPLIED   -- The value of the parameter --
    >
```

Requires start and end tags. This element is supported by all Java enabled browsers. It allows you to embed a Java applet into HTML documents. APPLET uses associated PARAM elements to pass parameters to the applet. Following the PARAM elements, the content of APPLET elements should be used to provide an alternative to the applet for user agents that don't support Java. It is restricted to text-level markup as defined by the *%text* entity in the DTD. Java-compatible browsers ignore this extra HTML code. You can use it to show a snapshot of the applet running, with text explaining what the applet does. Other possibilities for this area are a link to a page that is more useful for the Java-ignorant browser, or text that taunts the user for not having a Java-compatible browser.

Here is a simple example of a Java applet:

```
<applet code="Bubbles.class" width=500 height=500>
Java applet that draws animated bubbles.
</applet>
```

Here is another one using a PARAM element:

```
<applet code="AudioItem" width=15 height=15>
<param name=snd value="Hello.au|Welcome.au">
Java applet that plays a welcoming sound.
</applet>
```

codebase = *codebaseURL*
: This optional attribute specifies the base URL of the applet -- the directory or folder that contains the applet's code. If this attribute is not specified, then the document's URL is used.

code = *appletFile*
: This required attribute gives the name of the file that contains the applet's compiled Applet subclass. This file is relative to the base URL of the applet. It cannot be absolute.

alt = *alternateText*
: This optional attribute specifies any text that should be displayed if the browser understands the APPLET tag but can't run Java applets.

name = *appletInstanceName*
: This optional attribute specifies a name for the applet instance, which makes it possible for applets on the same page to find (and communicate with) each other.

width = *pixels*
height = *pixels*
: These required attributes give the initial width and height (in pixels) of the applet display area, not counting any windows or dialogs that the applet brings up.

align = *alignment*

This attribute specifies the alignment of the applet. This attribute is defined in exactly the same way as the IMG element. The permitted values are: `top`, `middle`, `bottom`, `left` and `right`. The default is `bottom`.

vspace = *pixels*
hspace = *pixels*
These optional attributes specify the number of pixels above and below the applet (`VSPACE`) and on each side of the applet (`HSPACE`). They're treated the same way as the `IMG` element's `VSPACE` and `HSPACE` attributes.

The `PARAM` element is used to pass named parameters to applet:

```
<PARAM NAME = appletParameter VALUE = value>
```

`PARAM` elements are the only way to specify applet-specific parameters. Applets read user-specified values for parameters with the `getParameter()` method.

name = *applet parameter name*
value = *parameter value*

SGML character entities such as *`&eacute;`* and *`&#185;`* are expanded before the parameter value is passed to the applet. To include an & character use `&`.

Note: PARAM elements should be placed at the start of the content for the APPLET element. This is not specified as part of the DTD due to technicalities with SGML mixed content models.

FONT

```
<!ELEMENT FONT - - (%text)*      -- local change to font -->
<!ATTLIST FONT
    size    CDATA   #IMPLIED    -- [+]nn e.g. size="+1", size=4 --
    color   CDATA   #IMPLIED    -- #RRGGBB in hex, e.g. red: color="#FF0000" --
    >
```

Requires start and end tags. This allows you to change the font size and/or color for the enclosed text. The attributes are: `SIZE` and `COLOR`. Font sizes are given in terms of a scalar range defined by the user agent with no direct mapping to point sizes etc. The `FONT` element may be phased out in future revisions to HTML.

size
This sets the font size for the contents of the font element. You can set size to an integer ranging from 1 to 7 for an absolute font size, or specify a relative font size with a signed integer value, e.g. `size="+1"` or `size="-2"`. This is mapped to an absolute font size by adding the current base font size as set by the `BASEFONT` element (see below).
color
Used to set the color to stroke the text. Colors are given as RGB in hexadecimal notation or as one of 16 widely understood color names defined as per the BGCOLOR attribute on the `BODY` element.

Some user agents also support a `FACE` attribute which accepts a comma separated list of font names in order of preference. This is used to search for an installed font with the corresponding name. `FACE` is not part of HTML 3.2.

The following shows the effects of setting font to absolute sizes:

size=1 size=2 size=3 size=4 size=5 size=6 size=7

The following shows the effect of relative font sizes using a base font size of 3:

size=-4 size=-3 size=-2 size=-1 size=+1 size=+2 size=+3 size=+4

The same thing with a base font size of 6:

size=-4 size=-3 size=-2 size=-1 size=+1 size=+2 size=+3 size=+4

BASEFONT

```
<!ELEMENT BASEFONT - O EMPTY    -- base font size (1 to 7) -->
<!ATTLIST BASEFONT
    size    CDATA   #IMPLIED    -- e.g. size=4, defaults to 3 --
    >
```

Used to set the base font size. BASEFONT is an empty element so the end tag is forbidden. The SIZE attribute is an integer value ranging from 1 to 7. The base font size applies to the normal and preformatted text but not to headings, except where these are modified using the FONT element with a relative font size.

BR

Used to force a line break. This is an empty element so the end tag is forbidden. The CLEAR attribute can be used to move down past floating images on either margin. <BR CLEAR=LEFT> moves down past floating images on the left margin, <BR CLEAR=RIGHT> does the same for floating images on the right margin, while <BR CLEAR=ALL> does the same for such images on both left and right margins.

MAP

The MAP element provides a mechanism for client-side image maps. These can be placed in the same document or grouped in a separate document although this isn't yet widely supported. The MAP element requires start and end tags. It contains one or more AREA elements that specify hotzones on the associated image and bind these hotzones to URLs.

```
<!ENTITY % SHAPE "(rect|circle|poly)">
<!ENTITY % COORDS "CDATA" -- comma separated list of numbers -->

<!ELEMENT MAP - - (AREA)+>
<!ATTLIST MAP
    name    CDATA   #REQUIRED
    >
```

```
<!ELEMENT AREA - O EMPTY>
<!ATTLIST AREA
    shape   %SHAPE  rect
    coords  %COORDS #IMPLIED  -- defines coordinates for shape --
    href    %URL    #IMPLIED  -- this region acts as hypertext link --
    nohref (nohref) #IMPLIED  -- this region has no action --
    alt     CDATA   #REQUIRED -- needed for non-graphical user agents --
    >
```

Here is a simple example for a graphical navigational toolbar:

```
<img src="navbar.gif" border=0 usemap="#map1">

<map name="map1">
 <area href=guide.html alt="Access Guide" shape=rect coords="0,0,118,28">
 <area href=search.html alt="Search" shape=rect coords="184,0,276,28">
 <area href=shortcut.html alt="Go" shape=rect coords="118,0,184,28">
 <area href=top10.html alt="Top Ten" shape=rect coords="276,0,373,28">
</map>
```

The MAP element has one attribute NAME which is used to associate a name with a map. This is then used by the USEMAP attribute on the IMG element to reference the map via a URL fragment identifier. Note that the value of the NAME attribute is case sensitive.

The AREA element is an empty element and so the end tag is forbidden. It takes the following attributes: SHAPE, COORDS, HREF, NOHREF and ALT. The SHAPE and COORDS attributes define a region on the image. If the SHAPE attribute is omitted, SHAPE="RECT" is assumed.

shape=rect coords="*left-x, top-y, right-x, bottom-y***"**

shape=circle coords="*center-x, center-y, radius***"**

shape=poly coords="*x_1,y_1, x_2,y_2, x_3,y_3, ...***"**

Where **x** and **y** are measured in pixels from the left/top of the associated image. If **x** and **y** values are given with a percent sign as a suffix, the values should be interpreted as percentages of the image's width and height, respectively. For example:

```
SHAPE=RECT COORDS="0, 0, 50%, 100%"
```

The HREF attribute gives a URL for the target of the hypertext link. The NOHREF attribute is used when you want to define a region that doesn't act as a hotzone. This is useful when you want to cut a hole in an underlying region acting as a hotzone.

If two or more regions overlap, the region defined first in the map definition takes precedence over subsequent regions. This means that AREA elements with NOHREF should generally be placed before ones with the HREF attribute.

The ALT attribute is used to provide text labels which can be displayed in the status line as the mouse or other pointing device is moved over hotzones, or for constructing a textual menu for non-graphical user agents. Authors are **strongly recommended** to provide meaningful ALT attributes to support interoperability with speech-based or text-only user agents.

Sample SGML Open Catalog for HTML 3.2

This can be used with an SGML parser like nsgmls to verify that files conform to the HTML 3.2 DTD. It assumes that the DTD has been saved as the file "HTML32.dtd" and that the Latin-1 entities are in the file "ISOlat1.ent".

```
-- html32.soc: catalog for parsing HTML 3.2 documents --
SGMLDECL "HTML32.dcl"
PUBLIC "-//W3C//DTD HTML 3.2 Final//EN" HTML32.dtd
PUBLIC "-//W3C//DTD HTML 3.2 Draft//EN" HTML32.dtd
PUBLIC "-//W3C//DTD HTML 3.2//EN" HTML32.dtd
PUBLIC "ISO 8879-1986//ENTITIES Added Latin 1//EN//HTML" ISOlat1.ent
```

SGML Declaration for HTML 3.2

This uses the 8 bit ISO Latin-1 character set. The size limits on properties like literals and tag names have been considerably increased from their HTML 2.0 values, but it is recommended that user agents avoid imposing arbitrary length limits.

```
<!SGML  "ISO 8879:1986"
   --
        SGML Declaration for HyperText Markup Language version 3.2

        With support for ISO Latin-1 and increased limits
        for tag and literal lengths etc.
   --

   CHARSET
         BASESET  "ISO 646:1983//CHARSET
                   International Reference Version
                   (IRV)//ESC 2/5 4/0"
         DESCSET  0   9   UNUSED
                  9   2   9
                  11  2   UNUSED
                  13  1   13
                  14  18  UNUSED
                  32  95  32
                  127 1   UNUSED
         BASESET  "ISO Registration Number 100//CHARSET
                   ECMA-94 Right Part of
                   Latin Alphabet Nr. 1//ESC 2/13 4/1"
         DESCSET  128  32   UNUSED
                  160  96    32

   CAPACITY   SGMLREF
              TOTALCAP        200000
              GRPCAP          150000
              ENTCAP          150000

   SCOPE    DOCUMENT
   SYNTAX
      SHUNCHAR CONTROLS 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
               17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 127
      BASESET  "ISO 646:1983//CHARSET
                International Reference Version
                (IRV)//ESC 2/5 4/0"
      DESCSET  0 128 0
```

```
      FUNCTION
              RE            13
              RS            10
              SPACE         32
              TAB SEPCHAR    9

      NAMING   LCNMSTRT ""
               UCNMSTRT ""
               LCNMCHAR ".-"
               UCNMCHAR ".-"
               NAMECASE GENERAL YES
                        ENTITY  NO
      DELIM    GENERAL  SGMLREF
               SHORTREF SGMLREF
      NAMES    SGMLREF
      QUANTITY SGMLREF
               ATTSPLEN 65536
               LITLEN   65536
               NAMELEN  65536
               PILEN    65536
               TAGLVL   100
               TAGLEN   65536
               GRPGTCNT 150
               GRPCNT   64

   FEATURES
     MINIMIZE
       DATATAG  NO
       OMITTAG  YES
       RANK     NO
       SHORTTAG YES
     LINK
       SIMPLE   NO
       IMPLICIT NO
       EXPLICIT NO
     OTHER
       CONCUR   NO
       SUBDOC   NO
       FORMAL   YES
   APPINFO      NONE
>
```

HTML 3.2 Document Type Definition

```
<!--
        W3C Document Type Definition for the HyperText Markup Language
        version 3.2 as ratified by a vote of W3C member companies.
        For more information on W3C look at  URL http://www.w3.org/

        Date: Tuesday January 14th 1997

        Author: Dave Raggett <dsr@w3.org>

        HTML 3.2 aims to capture recommended practice as of early '96
        and as such to be used as a replacement for HTML 2.0 (RFC 1866).
        Widely deployed rendering attributes are included where they
        have been shown to be interoperable. SCRIPT and STYLE are
        included to smooth the introduction of client-side scripts
        and style sheets. Browsers must avoid showing the contents
```

```
        of these element Otherwise support for them is not required.
        ID, CLASS and STYLE attributes are not included in this version
        of HTML.
-->

<!ENTITY % HTML.Version
        "-//W3C//DTD HTML 3.2 Final//EN"

        -- Typical usage:

            <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
            <html>
            ...
            </html>
        --
        >

<!--================== Deprecated Features Switch ============================-->

<!ENTITY % HTML.Deprecated "INCLUDE">

<!--================== Imported Names ========================================-->

<!ENTITY % Content-Type "CDATA"
        -- meaning a MIME content type, as per RFC1521
        -->

<!ENTITY % HTTP-Method "GET | POST"
        -- as per HTTP specification
        -->

<!ENTITY % URL "CDATA"
        -- The term URL means a CDATA attribute
           whose value is a Uniform Resource Locator,
           See RFC1808 (June 95) and RFC1738 (Dec 94).
        -->

<!-- Parameter Entities -->

<!ENTITY % head.misc "SCRIPT|STYLE|META|LINK" -- repeatable head elements -->

<!ENTITY % heading "H1|H2|H3|H4|H5|H6">

<!ENTITY % list "UL | OL |  DIR | MENU">

<![ %HTML.Deprecated [
    <!ENTITY % preformatted "PRE | XMP | LISTING">
]]>

<!ENTITY % preformatted "PRE">

<!--================ Character mnemonic entities =============================-->

<!ENTITY % ISOlat1 PUBLIC
       "ISO 8879-1986//ENTITIES Added Latin 1//EN//HTML">
%ISOlat1;

<!--================ Entities for special symbols ============================-->
<!-- &trade and &cbsp are not widely deployed and so not included here -->

<!ENTITY amp    CDATA "&#38;"   -- ampersand          -->
<!ENTITY gt     CDATA "&#62;"   -- greater than       -->
<!ENTITY lt     CDATA "&#60;"   -- less than          -->
```

```
<!--==================== Text Markup =========================================-->

<!ENTITY % font "TT | I | B  | U | STRIKE | BIG | SMALL | SUB | SUP">

<!ENTITY % phrase "EM | STRONG | DFN | CODE | SAMP | KBD | VAR | CITE">

<!ENTITY % special "A | IMG | APPLET | FONT | BASEFONT | BR | SCRIPT | MAP">

<!ENTITY % form "INPUT | SELECT | TEXTAREA">

<!ENTITY % text "#PCDATA | %font | %phrase | %special | %form">

<!ELEMENT (%font|%phrase) - - (%text)*>

<!-- there are also 16 widely known color names although
  the resulting colors are implementation dependent:

   aqua, black, blue, fuchsia, gray, green, lime, maroon,
   navy, olive, purple, red, silver, teal, white, and yellow

 These colors were originally picked as being the standard
 16 colors supported with the Windows VGA palette.
 -->

<!ELEMENT FONT - - (%text)*     -- local change to font -->
<!ATTLIST FONT
    size    CDATA   #IMPLIED    -- [+]nn e.g. size="+1", size=4 --
    color   CDATA   #IMPLIED    -- #RRGGBB in hex, e.g. red: color="#FF0000" --
    >

<!ELEMENT BASEFONT - O EMPTY    -- base font size (1 to 7)-->
<!ATTLIST BASEFONT
    size    CDATA   #IMPLIED    -- e.g. size=3 --
    >

<!ELEMENT BR    - O EMPTY    -- forced line break -->
<!ATTLIST BR
        clear (left|all|right|none) none -- control of text flow --
        >

<!--================== HTML content models ================================-->
<!--
    HTML has three basic content models:

        %text       character level elements and text strings
        %flow       block-like elements e.g. paragraphs and lists
        %bodytext   as %flow plus headers H1-H6 and ADDRESS
-->

<!ENTITY % block
     "P | %list | %preformatted | DL | DIV | CENTER |
      BLOCKQUOTE | FORM | ISINDEX | HR | TABLE">

<!-- %flow is used for DD and LI -->

<!ENTITY % flow "(%text | %block)*">

<!--================== Document Body ======================================-->

<!ENTITY % body.content "(%heading | %text | %block | ADDRESS)*">

<!ENTITY % color "CDATA" -- a color specification: #HHHHHH @@ details? -->
```

```
<!ENTITY % body-color-attrs "
        bgcolor %color #IMPLIED
        text %color #IMPLIED
        link %color #IMPLIED
        vlink %color #IMPLIED
        alink %color #IMPLIED
        ">

<!ELEMENT BODY O O  %body.content>
<!ATTLIST BODY
        background %URL #IMPLIED  -- texture tile for document background --
        %body-color-attrs;  -- bgcolor, text, link, vlink, alink --
        >

<!ENTITY % address.content "((%text;) | P)*">

<!ELEMENT ADDRESS - - %address.content>

<!ELEMENT DIV - - %body.content>
<!ATTLIST DIV
        align   (left|center|right) #IMPLIED -- alignment of following text --
        >

<!-- CENTER is a shorthand for DIV with ALIGN=CENTER -->
<!ELEMENT center - - %body.content>

<!--================== The Anchor Element ================================-->

<!ELEMENT A - - (%text)* -(A)>
<!ATTLIST A
        name    CDATA   #IMPLIED    -- named link end --
        href    %URL    #IMPLIED    -- URL for linked resource --
        rel     CDATA   #IMPLIED    -- forward link types --
        rev     CDATA   #IMPLIED    -- reverse link types --
        title   CDATA   #IMPLIED    -- advisory title string --
        >

<!--================== Client-side image maps ============================-->

<!-- These can be placed in the same document or grouped in a
     separate document although this isn't yet widely supported -->

<!ENTITY % SHAPE "(rect|circle|poly)">
<!ENTITY % COORDS "CDATA" -- comma separated list of numbers -->

<!ELEMENT MAP - - (AREA)*>
<!ATTLIST MAP
    name    CDATA   #IMPLIED
    >

<!ELEMENT AREA - O EMPTY>
<!ATTLIST AREA
    shape   %SHAPE  rect
    coords  %COORDS #IMPLIED  -- defines coordinates for shape --
    href    %URL    #IMPLIED  -- this region acts as hypertext link --
    nohref (nohref) #IMPLIED  -- this region has no action --
    alt     CDATA   #REQUIRED -- needed for non-graphical user agents --
    >

<!--================== The LINK Element ==================================-->

<!ENTITY % Types "CDATA"
```

```
        -- See Internet Draft: draft-ietf-html-relrev-00.txt
           LINK has been part of HTML since the early days
           although few browsers as yet take advantage of it.

           Relationship values can be used in principle:

                a) for document specific toolbars/menus when used
                   with the LINK element in the document head:
                b) to link to a separate style sheet
                c) to make a link to a script
                d) by stylesheets to control how collections of
                   html nodes are rendered into printed documents
                e) to make a link to a printable version of this document
                   e.g. a postscript or pdf version
-->

<!ELEMENT LINK - O EMPTY>
<!ATTLIST LINK
        href    %URL    #IMPLIED    -- URL for linked resource --
        rel     %Types  #IMPLIED    -- forward link types --
        rev     %Types  #IMPLIED    -- reverse link types --
        title   CDATA   #IMPLIED    -- advisory title string --
        >

<!--==================== Images ===============================================-->

<!ENTITY % Length "CDATA"   -- nn for pixels or nn% for percentage length -->
<!ENTITY % Pixels "NUMBER"  -- integer representing length in pixels -->

<!-- Suggested widths are used for negotiating image size
     with the module responsible for painting the image.
     align=left or right cause image to float to margin
     and for subsequent text to wrap around image -->

<!ENTITY % IAlign "(top|middle|bottom|left|right)">

<!ELEMENT IMG    - O EMPTY --  Embedded image -->
<!ATTLIST IMG
        src     %URL     #REQUIRED  -- URL of image to embed --
        alt     CDATA    #IMPLIED   -- for display in place of image --
        align   %IAlign  #IMPLIED   -- vertical or horizontal alignment --
        height  %Pixels  #IMPLIED   -- suggested height in pixels --
        width   %Pixels  #IMPLIED   -- suggested width in pixels --
        border  %Pixels  #IMPLIED   -- suggested link border width --
        hspace  %Pixels  #IMPLIED   -- suggested horizontal gutter --
        vspace  %Pixels  #IMPLIED   -- suggested vertical gutter --
        usemap  %URL     #IMPLIED   -- use client-side image map --
        ismap   (ismap)  #IMPLIED   -- use server image map --
        >

<!-- USEMAP points to a MAP element which may be in this document
  or an external document, although the latter is not widely supported -->

<!--==================== Java APPLET tag ======================================-->
<!--
  This tag is supported by all Java enabled browsers. Applet resources
  (including their classes) are normally loaded relative to the document
  URL (or <BASE> element if it is defined). The CODEBASE attribute is used
  to change this default behavior. If the CODEBASE attribute is defined then
  it specifies a different location to find applet resources. The value
  can be an absolute URL or a relative URL. The absolute URL is used as is
  without modification and is not effected by the documents <BASE> element.
  When the codebase attribute is relative, then it is relative to the
```

```
  document URL (or <BASE> tag if defined).
-->
<!ELEMENT APPLET - - (PARAM | %text)*>
<!ATTLIST APPLET
        codebase %URL     #IMPLIED   -- code base --
        code     CDATA    #REQUIRED  -- class file --
        alt      CDATA    #IMPLIED   -- for display in place of applet --
        name     CDATA    #IMPLIED   -- applet name --
        width    %Pixels  #REQUIRED  -- suggested width in pixels --
        height   %Pixels  #REQUIRED  -- suggested height in pixels --
        align    %IAlign  #IMPLIED   -- vertical or horizontal alignment --
        hspace   %Pixels  #IMPLIED   -- suggested horizontal gutter --
        vspace   %Pixels  #IMPLIED   -- suggested vertical gutter --
        >

<!ELEMENT PARAM - O EMPTY>
<!ATTLIST PARAM
        name    NMTOKEN   #REQUIRED  -- The name of the parameter --
        value   CDATA     #IMPLIED   -- The value of the parameter --
        >

<!--
Here is an example:

    <applet codebase="applets/NervousText"
        code=NervousText.class
        width=300
        height=50>
    <param name=text value="Java is Cool!">
    <img src=sorry.gif alt="This looks better with Java support">
    </applet>
-->

<!--==================== Horizontal Rule ================================-->

<!ELEMENT HR    - O EMPTY>
<!ATTLIST HR
        align (left|right|center) #IMPLIED
        noshade (noshade) #IMPLIED
        size  %Pixels #IMPLIED
        width %Length #IMPLIED
        >
<!--==================== Paragraphs=====================================-->

<!ELEMENT P     - O (%text)*>
<!ATTLIST P
        align  (left|center|right) #IMPLIED
        >

<!--==================== Headings ======================================-->

<!--
  There are six levels of headers from H1 (the most important)
  to H6 (the least important).
-->

<!ELEMENT ( %heading )  - -  (%text;)*>
<!ATTLIST ( %heading )
        align  (left|center|right) #IMPLIED
        >

<!--==================== Preformatted Text ==============================-->
```

```
<!-- excludes images and changes in font size -->

<!ENTITY % pre.exclusion "IMG|BIG|SMALL|SUB|SUP|FONT">

<!ELEMENT PRE - - (%text)* -(%pre.exclusion)>
<!ATTLIST PRE
        width NUMBER #implied -- is this widely supported? --
        >

<![ %HTML.Deprecated [

<!ENTITY % literal "CDATA"
        -- historical, non-conforming parsing mode where
           the only markup signal is the end tag
           in full
        -->

<!ELEMENT (XMP|LISTING) - -  %literal>
<!ELEMENT PLAINTEXT - O %literal>

]]>

<!--==================== Block-like Quotes ================================-->

<!ELEMENT BLOCKQUOTE - - %body.content>

<!--==================== Lists ============================================-->

<!--
    HTML 3.2 allows you to control the sequence number for ordered lists.
    You can set the sequence number with the START and VALUE attributes.
    The TYPE attribute may be used to specify the rendering of ordered
    and unordered lists.
-->

<!-- definition lists - DT for term, DD for its definition -->

<!ELEMENT DL    - -  (DT|DD)+>
<!ATTLIST DL
        compact (compact) #IMPLIED -- more compact style --
        >

<!ELEMENT DT - O  (%text)*>
<!ELEMENT DD - O  %flow;>

<!-- Ordered lists OL, and unordered lists UL -->
<!ELEMENT (OL|UL) - -  (LI)+>

<!--
       Numbering style
    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, ...

    The style is applied to the sequence number which by default
    is reset to 1 for the first list item in an ordered list.

    This can't be expressed directly in SGML due to case folding.
-->

<!ENTITY % OLStyle "CDATA" -- constrained to: [1|a|A|i|I] -->
```

```
<!ATTLIST OL -- ordered lists --
        type      %OLStyle   #IMPLIED   -- numbering style --
        start     NUMBER     #IMPLIED   -- starting sequence number --
        compact  (compact)   #IMPLIED   -- reduced interitem spacing --
        >

<!-- bullet styles -->

<!ENTITY % ULStyle "disc|square|circle">

<!ATTLIST UL -- unordered lists --
        type    (%ULStyle)   #IMPLIED   -- bullet style --
        compact (compact)    #IMPLIED   -- reduced interitem spacing --
        >

<!ELEMENT (DIR|MENU) - -  (LI)+ -(%block)>
<!ATTLIST DIR
        compact (compact) #IMPLIED
        >
<!ATTLIST MENU
        compact (compact) #IMPLIED
        >

<!-- <DIR>              Directory list                 -->
<!-- <DIR COMPACT>      Compact list style             -->
<!-- <MENU>             Menu list                      -->
<!-- <MENU COMPACT>     Compact list style             -->

<!-- The type attribute can be used to change the bullet style
     in unordered lists and the numbering style in ordered lists -->

<!ENTITY % LIStyle "CDATA" -- constrained to: "(%ULStyle|%OLStyle)" -->

<!ELEMENT LI - O %flow -- list item -->
<!ATTLIST LI
        type    %LIStyle     #IMPLIED   -- list item style --
        value    NUMBER      #IMPLIED   -- reset sequence number --
        >

<!--================ Forms ===============================================-->

<!ELEMENT FORM - - %body.content -(FORM)>
<!ATTLIST FORM
        action %URL #IMPLIED  -- server-side form handler --
        method (%HTTP-Method) GET -- see HTTP specification --
        enctype %Content-Type; "application/x-www-form-urlencoded"
        >

<!ENTITY % InputType
        "(TEXT | PASSWORD | CHECKBOX | RADIO | SUBMIT
            | RESET | FILE | HIDDEN | IMAGE)">

<!ELEMENT INPUT - O EMPTY>
<!ATTLIST INPUT
        type %InputType TEXT     -- what kind of widget is needed --
        name  CDATA   #IMPLIED   -- required for all but submit and reset --
        value CDATA   #IMPLIED   -- required for radio and checkboxes --
        checked (checked) #IMPLIED -- for radio buttons and check boxes --
        size CDATA    #IMPLIED   -- specific to each type of field --
        maxlength NUMBER #IMPLIED -- max chars allowed in text fields --
        src   %URL    #IMPLIED   -- for fields with background images --
        align %IAlign #IMPLIED   -- vertical or horizontal alignment --
```

```
        >

<!ELEMENT SELECT - - (OPTION+)>
<!ATTLIST SELECT
        name CDATA #REQUIRED
        size NUMBER #IMPLIED
        multiple (multiple) #IMPLIED
        >

<!ELEMENT OPTION - O (#PCDATA)*>
<!ATTLIST OPTION
        selected (selected) #IMPLIED
        value  CDATA  #IMPLIED -- defaults to element content --
        >

<!-- Multi-line text input field. -->

<!ELEMENT TEXTAREA - - (#PCDATA)*>
<!ATTLIST TEXTAREA
        name CDATA #REQUIRED
        rows NUMBER #REQUIRED
        cols NUMBER #REQUIRED
        >

<!--======================== Tables ===========================================-->

<!-- Widely deployed subset of the full table standard, see RFC 1942
     e.g. at http://www.ics.uci.edu/pub/ietf/html/rfc1942.txt -->

<!-- horizontal placement of table relative to window -->
<!ENTITY % Where "(left|center|right)">

<!-- horizontal alignment attributes for cell contents -->
<!ENTITY % cell.halign
        "align  (left|center|right) #IMPLIED"
        >

<!-- vertical alignment attributes for cell contents -->
<!ENTITY % cell.valign
        "valign  (top|middle|bottom)  #IMPLIED"
        >

<!ELEMENT table - - (caption?, tr+)>
<!ELEMENT tr - O (th|td)*>
<!ELEMENT (th|td) - O %body.content>

<!ATTLIST table                         -- table element --
        align     %Where;   #IMPLIED  -- table position relative to window --
        width     %Length   #IMPLIED  -- table width relative to window --
        border    %Pixels   #IMPLIED  -- controls frame width around table --
        cellspacing %Pixels #IMPLIED  -- spacing between cells --
        cellpadding %Pixels #IMPLIED  -- spacing within cells --
        >

<!ELEMENT CAPTION - - (%text;)* -- table or figure caption -->
<!ATTLIST CAPTION
        align (top|bottom) #IMPLIED
        >

<!ATTLIST tr                        -- table row --
        %cell.halign;               -- horizontal alignment in cells --
        %cell.valign;               -- vertical alignment in cells --
        >
```

```
<!ATTLIST (th|td)                   -- header or data cell --
        nowrap (nowrap)  #IMPLIED   -- suppress word wrap --
        rowspan NUMBER   1          -- number of rows spanned by cell --
        colspan NUMBER   1          -- number of cols spanned by cell --
        %cell.halign;               -- horizontal alignment in cell --
        %cell.valign;               -- vertical alignment in cell --
        width   %Pixels  #IMPLIED   -- suggested width for cell --
        height  %Pixels  #IMPLIED   -- suggested height for cell --
        >

<!--================ Document Head ======================================-->

<!-- %head.misc defined earlier on as "SCRIPT|STYLE|META|LINK" -->

<!ENTITY % head.content "TITLE & ISINDEX? & BASE?">

<!ELEMENT HEAD O O  (%head.content) +(%head.misc)>

<!ELEMENT TITLE - -  (#PCDATA)* -(%head.misc)
          -- The TITLE element is not considered part of the flow of text.
             It should be displayed, for example as the page header or
             window title.
          -->

<!ELEMENT ISINDEX - O EMPTY>
<!ATTLIST ISINDEX
        prompt CDATA #IMPLIED -- prompt message -->

<!--
    The BASE element gives an absolute URL for dereferencing relative
    URLs, e.g.

         <BASE href="http://foo.com/index.html">
         ...
         <IMG SRC="images/bar.gif">

    The image is deferenced to

         http://foo.com/images/bar.gif

   In the absence of a BASE element the document URL should be used.
   Note that this is not necessarily the same as the URL used to
   request the document, as the base URL may be overridden by an HTTP
   header accompanying the document.
-->

<!ELEMENT BASE - O EMPTY>
<!ATTLIST BASE
        href %URL  #REQUIRED
        >

<!ELEMENT META - O EMPTY -- Generic Metainformation -->
<!ATTLIST META
        http-equiv  NAME    #IMPLIED  -- HTTP response header name  --
        name        NAME    #IMPLIED  -- metainformation name       --
        content     CDATA   #REQUIRED -- associated information     --
        >

<!-- SCRIPT/STYLE are place holders for transition to next version of HTML -->

<!ELEMENT STYLE  - - CDATA -- placeholder for style info -->
<!ELEMENT SCRIPT - - CDATA -- placeholder for script statements -->
```

```
<!--================ Document Structure ===================================-->

<!ENTITY % version.attr "VERSION CDATA #FIXED '%HTML.Version;'">

<![ %HTML.Deprecated [
    <!ENTITY % html.content "HEAD, BODY, PLAINTEXT?">
]]>

<!ENTITY % html.content "HEAD, BODY">

<!ELEMENT HTML O O  (%html.content)>
<!ATTLIST HTML
        %version.attr;
        >
```

Character Entities for ISO Latin-1

```
<!-- (C) International Organization for Standardization 1986
     Permission to copy in any form is granted for use with
     conforming SGML systems and applications as defined in
     ISO 8879, provided this notice is included in all copies.
     This has been extended for use with HTML to cover the full
     set of codes in the range 160-255 decimal.
-->
<!-- Character entity set. Typical invocation:
     <!ENTITY % ISOlat1 PUBLIC
       "ISO 8879-1986//ENTITIES Added Latin 1//EN//HTML">
     %ISOlat1;
-->
    <!ENTITY nbsp   CDATA " " -- no-break space -->
    <!ENTITY iexcl  CDATA "&#161;" -- inverted exclamation mark -->
    <!ENTITY cent   CDATA "&#162;" -- cent sign -->
    <!ENTITY pound  CDATA "&#163;" -- pound sterling sign -->
    <!ENTITY curren CDATA "&#164;" -- general currency sign -->
    <!ENTITY yen    CDATA "&#165;" -- yen sign -->
    <!ENTITY brvbar CDATA "&#166;" -- broken (vertical) bar -->
    <!ENTITY sect   CDATA "&#167;" -- section sign -->
    <!ENTITY uml    CDATA "&#168;" -- umlaut (dieresis) -->
    <!ENTITY copy   CDATA "&#169;" -- copyright sign -->
    <!ENTITY ordf   CDATA "&#170;" -- ordinal indicator, feminine -->
    <!ENTITY laquo  CDATA "&#171;" -- angle quotation mark, left -->
    <!ENTITY not    CDATA "&#172;" -- not sign -->
    <!ENTITY shy    CDATA "&#173;" -- soft hyphen -->
    <!ENTITY reg    CDATA "&#174;" -- registered sign -->
    <!ENTITY macr   CDATA "&#175;" -- macron -->
    <!ENTITY deg    CDATA "&#176;" -- degree sign -->
    <!ENTITY plusmn CDATA "&#177;" -- plus-or-minus sign -->
    <!ENTITY sup2   CDATA "&#178;" -- superscript two -->
    <!ENTITY sup3   CDATA "&#179;" -- superscript three -->
    <!ENTITY acute  CDATA "&#180;" -- acute accent -->
    <!ENTITY micro  CDATA "&#181;" -- micro sign -->
    <!ENTITY para   CDATA "&#182;" -- pilcrow (paragraph sign) -->
    <!ENTITY middot CDATA "&#183;" -- middle dot -->
    <!ENTITY cedil  CDATA "&#184;" -- cedilla -->
    <!ENTITY sup1   CDATA "&#185;" -- superscript one -->
    <!ENTITY ordm   CDATA "&#186;" -- ordinal indicator, masculine -->
    <!ENTITY raquo  CDATA "&#187;" -- angle quotation mark, right -->
    <!ENTITY frac14 CDATA "&#188;" -- fraction one-quarter -->
```

```
<!ENTITY frac12 CDATA "&#189;" -- fraction one-half -->
<!ENTITY frac34 CDATA "&#190;" -- fraction three-quarters -->
<!ENTITY iquest CDATA "&#191;" -- inverted question mark -->
<!ENTITY Agrave CDATA "&#192;" -- capital A, grave accent -->
<!ENTITY Aacute CDATA "&#193;" -- capital A, acute accent -->
<!ENTITY Acirc  CDATA "&#194;" -- capital A, circumflex accent -->
<!ENTITY Atilde CDATA "&#195;" -- capital A, tilde -->
<!ENTITY Auml   CDATA "&#196;" -- capital A, dieresis or umlaut mark -->
<!ENTITY Aring  CDATA "&#197;" -- capital A, ring -->
<!ENTITY AElig  CDATA "&#198;" -- capital AE diphthong (ligature) -->
<!ENTITY Ccedil CDATA "&#199;" -- capital C, cedilla -->
<!ENTITY Egrave CDATA "&#200;" -- capital E, grave accent -->
<!ENTITY Eacute CDATA "&#201;" -- capital E, acute accent -->
<!ENTITY Ecirc  CDATA "&#202;" -- capital E, circumflex accent -->
<!ENTITY Euml   CDATA "&#203;" -- capital E, dieresis or umlaut mark -->
<!ENTITY Igrave CDATA "&#204;" -- capital I, grave accent -->
<!ENTITY Iacute CDATA "&#205;" -- capital I, acute accent -->
<!ENTITY Icirc  CDATA "&#206;" -- capital I, circumflex accent -->
<!ENTITY Iuml   CDATA "&#207;" -- capital I, dieresis or umlaut mark -->
<!ENTITY ETH    CDATA "&#208;" -- capital Eth, Icelandic -->
<!ENTITY Ntilde CDATA "&#209;" -- capital N, tilde -->
<!ENTITY Ograve CDATA "&#210;" -- capital O, grave accent -->
<!ENTITY Oacute CDATA "&#211;" -- capital O, acute accent -->
<!ENTITY Ocirc  CDATA "&#212;" -- capital O, circumflex accent -->
<!ENTITY Otilde CDATA "&#213;" -- capital O, tilde -->
<!ENTITY Ouml   CDATA "&#214;" -- capital O, dieresis or umlaut mark -->
<!ENTITY times  CDATA "&#215;" -- multiply sign -->
<!ENTITY Oslash CDATA "&#216;" -- capital O, slash -->
<!ENTITY Ugrave CDATA "&#217;" -- capital U, grave accent -->
<!ENTITY Uacute CDATA "&#218;" -- capital U, acute accent -->
<!ENTITY Ucirc  CDATA "&#219;" -- capital U, circumflex accent -->
<!ENTITY Uuml   CDATA "&#220;" -- capital U, dieresis or umlaut mark -->
<!ENTITY Yacute CDATA "&#221;" -- capital Y, acute accent -->
<!ENTITY THORN  CDATA "&#222;" -- capital THORN, Icelandic -->
<!ENTITY szlig  CDATA "&#223;" -- small sharp s, German (sz ligature) -->
<!ENTITY agrave CDATA "&#224;" -- small a, grave accent -->
<!ENTITY aacute CDATA "&#225;" -- small a, acute accent -->
<!ENTITY acirc  CDATA "&#226;" -- small a, circumflex accent -->
<!ENTITY atilde CDATA "&#227;" -- small a, tilde -->
<!ENTITY auml   CDATA "&#228;" -- small a, dieresis or umlaut mark -->
<!ENTITY aring  CDATA "&#229;" -- small a, ring -->
<!ENTITY aelig  CDATA "&#230;" -- small ae diphthong (ligature) -->
<!ENTITY ccedil CDATA "&#231;" -- small c, cedilla -->
<!ENTITY egrave CDATA "&#232;" -- small e, grave accent -->
<!ENTITY eacute CDATA "&#233;" -- small e, acute accent -->
<!ENTITY ecirc  CDATA "&#234;" -- small e, circumflex accent -->
<!ENTITY euml   CDATA "&#235;" -- small e, dieresis or umlaut mark -->
<!ENTITY igrave CDATA "&#236;" -- small i, grave accent -->
<!ENTITY iacute CDATA "&#237;" -- small i, acute accent -->
<!ENTITY icirc  CDATA "&#238;" -- small i, circumflex accent -->
<!ENTITY iuml   CDATA "&#239;" -- small i, dieresis or umlaut mark -->
<!ENTITY eth    CDATA "&#240;" -- small eth, Icelandic -->
<!ENTITY ntilde CDATA "&#241;" -- small n, tilde -->
<!ENTITY ograve CDATA "&#242;" -- small o, grave accent -->
<!ENTITY oacute CDATA "&#243;" -- small o, acute accent -->
<!ENTITY ocirc  CDATA "&#244;" -- small o, circumflex accent -->
<!ENTITY otilde CDATA "&#245;" -- small o, tilde -->
<!ENTITY ouml   CDATA "&#246;" -- small o, dieresis or umlaut mark -->
<!ENTITY divide CDATA "&#247;" -- divide sign -->
<!ENTITY oslash CDATA "&#248;" -- small o, slash -->
<!ENTITY ugrave CDATA "&#249;" -- small u, grave accent -->
<!ENTITY uacute CDATA "&#250;" -- small u, acute accent -->
<!ENTITY ucirc  CDATA "&#251;" -- small u, circumflex accent -->
```

```
<!ENTITY uuml   CDATA "&#252;" -- small u, dieresis or umlaut mark -->
<!ENTITY yacute CDATA "&#253;" -- small y, acute accent -->
<!ENTITY thorn  CDATA "&#254;" -- small thorn, Icelandic -->
<!ENTITY yuml   CDATA "&#255;" -- small y, dieresis or umlaut mark -->
```

Table of printable Latin-1 Character codes

0	32		64	@	96	‘	128	160		192	À	224	à
1	33	!	65	A	97	a	129	161	¡	193	Á	225	á
2	34	"	66	B	98	b	130	162	¢	194	Â	226	â
3	35	#	67	C	99	c	131	163	£	195	Ã	227	ã
4	36	$	68	D	100	d	132	164	¤	196	Ä	228	ä
5	37	%	69	E	101	e	133	165	¥	197	Å	229	å
6	38	&	70	F	102	f	134	166	¦	198	Æ	230	æ
7	39	’	71	G	103	g	135	167	§	199	Ç	231	ç
8	40	(	72	H	104	h	136	168	¨	200	È	232	è
9	41	)	73	I	105	i	137	169	©	201	É	233	é
10	42	*	74	J	106	j	138	170	ª	202	Ê	234	ê
11	43	+	75	K	107	k	139	171	«	203	Ë	235	ë
12	44	,	76	L	108	l	140	172	¬	204	Ì	236	ì
13	45	−	77	M	109	m	141	173	-	205	Í	237	í
14	46	.	78	N	110	n	142	174	®	206	Î	238	î
15	47	/	79	O	111	o	143	175	¯	207	Ï	239	ï
16	48	0	80	P	112	p	144	176	°	208	Đ	240	ð
17	49	1	81	Q	113	q	145	177	±	209	Ñ	241	ñ
18	50	2	82	R	114	r	146	178	²	210	Ò	242	ò
19	51	3	83	S	115	s	147	179	³	211	Ó	243	ó
20	52	4	84	T	116	t	148	180	´	212	Ô	244	ô
21	53	5	85	U	117	u	149	181	µ	213	Õ	245	õ
22	54	6	86	V	118	v	150	182	¶	214	Ö	246	ö
23	55	7	87	W	119	w	151	183	·	215	×	247	÷
24	56	8	88	X	120	x	152	184	¸	216	Ø	248	ø
25	57	9	89	Y	121	y	153	185	¹	217	Ù	249	ù
26	58	:	90	Z	122	z	154	186	º	218	Ú	250	ú
27	59	;	91	[	123	{	155	187	»	219	Û	251	û
28	60	<	92	\	124	|	156	188	¼	220	Ü	252	ü
29	61	=	93	]	125	}	157	189	½	221	Ý	253	ý
30	62	>	94	^	126	~	158	190	¾	222	Þ	254	þ
31	63	?	95	_	127		159	191	¿	223	ß	255	ÿ

Acknowledgements

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Further Reading

The World Wide Web Consortium
Further information on W3C activities and pointers to the status of work on HTML and HTTP etc. can be found at http://www.w3.org/. Further information on HTML in particular can be found at http://www.w3.org/pub/WWW/MarkUp/.

HTML 2.0 (RFC1866)
By Tim Berners-Lee and Dan Connolly, November 1995. Defines the Hypertext Markup Language Specification Version 2.0. Available from ftp://ds.internic.net/rfc/rfc1866.txt.

Form-based File Upload in HTML (RFC1867)
By E. Nebel and L. Masinter, November 1995. Describes extensions to HTML 2.0 (RFC1866) to support file upload from HTML forms. Available from ftp://ds.internic.net/rfc/rfc1867.txt.

HTML Tables (RFC1942)
By Dave Raggett, May 1996. This defines the HTML table model. It is a superset of the table model defined by HTML 3.2. Available from ftp://ds.internic.net/rfc/rfc1942.txt, or as a W3C working draft at http://www.w3.org/pub/WWW/TR/WD-tables.

A Lexical Analyzer for HTML and Basic SGML
By Dan Connolly, June 1996. Describes lexical considerations for parsing HTML documents. Available from http://www.w3.org/pub/WWW/TR/WD-html-lex

The Hypertext Transfer Protocol (HTTP)
Further information of HTTP can be found at: http://www.w3.org/pub/WWW/Protocols.

A Standard Default Color Space for the Internet - sRGB
By Michael Stokes, Mathew Anderson, Srinivasan Chandrasekar and Ricardo Motta, November 1996. Available from: http://www.w3.org/pub/WWW/Graphics/Color/sRGB.html This provides a precise definition for RGB that allows sRGB images to be reproduced accurately on different platforms and media under varying ambient lighting conditions.