

## Chapter 4: Marking Up With HTML: A Hypertext Markup Language Primer

Fluency with Information Technology  
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by  
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## Marking Up with HTML

- *Tags* describe how a web page should look
- Formatting with Tags:
  - Words or abbreviations enclosed in angle brackets < >
  - Come in pairs (beginning and end):
    - <title>           </title>
  - Tags are not case-sensitive, but the actual text between the tags is

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## Tags for Bold, Italic, and underline

- **Bold:**       <b>    </b>
- *Italic:*       <i>    </i>
- Underline: <u>   </u>
  - Tag pair surrounds the text to be formatted
- You can apply more than one kind of formatting at a time
  - `<b><i>Veni, Vidi, Vici!</i></b>` produces: ***Veni, Vidi, Vici!***
  - Tags can be in any order, but have to be *nested* correctly
- Some tags do not surround anything, so they don't have an ending form. Closing angle bracket is replaced by />
  - <hr /> inserts a horizontal rule (line)
  - <br /> inserts a line break

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## An HTML Web Page File

Begins with <html> and ends with </html>

```
<html>
  <head>
    Preliminary material goes here, including
    <title> ... </title>
  </head>
  <body>
    Main content of the page goes here
  </body>
</html>
```

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## Structuring Documents

- Markup language describes how a document's parts fit together
  - Headings:
    - Choice of eight levels of heading tags to produce headings, subheadings, etc.
    - Headings display material in large font on a new line
- ```
<h1>Pope</h1> <h2>Cardinal</h2> <h3>Archbishop</h3>
```
- produces:
- Pope**  
**Cardinal**  
**Archbishop**

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Table 4.1 Basic HTML tags

Start Tag	End Tag	Meaning	Required
<html>	</html>	HTML document; first and last tags in an HTML file	✓
<title>	</title>	Title bar text; describes page	✓
<head>	</head>	Preliminary material, e.g., title at start of page	✓
<body>	</body>	The main part of the page	✓
<p>	</p>	Paragraph; can use align attribute	
<hr />		Line (horizontal rule); can use width and size attributes	
<h1>...<h8>	</h1>...</h8>	Headings, eight levels; use in order; can use align attribute	
<b>	</b>	Bold	
<i>	</i>	Italic	
<a href="fn">	</a>	Anchor reference; fn must be a pathname to an HTML file	
		Image source reference; fn must be a pathname to .jpg or .gif file	
 		Break; continue text on a new line	

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## HTML Format vs. Display Format

- HTML text was run together on one line, but displayed formatted on separate lines
- HTML source tells the browser how to produce the formatted image based on the meaning of the tags, not on how the source instructions look
- But HTML is usually written in a structured (indented) form to make it easier for people to understand

```
<h1>Pope</h1>
<h2>Cardinal</h2>
<h3>Archbishop</h3>
```

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## White Space

- White space that has been inserted for readability
  - Spaces
  - Tabs
  - New lines
- Browser turns any sequence of white space characters into a single space before processing HTML
  - Exception: Preformatted information between `<pre>` and `</pre>` tags is displayed as it appears

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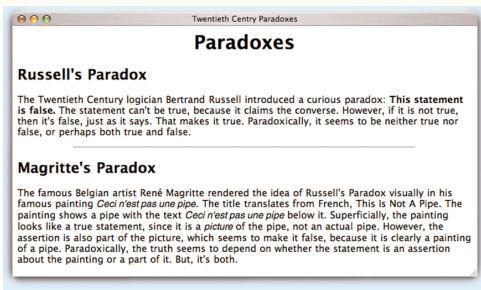


Figure 4.1 HTML source of paradoxes.html and the corresponding Web page resulting from its interpretation by a browser.

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```
<html>
<head> <title> Twentieth Century Paradoxes </title>
</head>
<body>
<h1 align="center">Paradoxes</h1>
<h2>Russell's Paradox</h2>
<p> The Twentieth Century logician Bertrand Russell introduced a curious paradox: <b>This statement is false.</b> The statement can't be true, because it claims the converse. However, if it is not true, then it's false, just as it says. That makes it true. Paradoxically, it seems to be neither true nor false, or perhaps both true and false.</p>
<hr width="75%" />
<h2> Magritte's Paradox</h2>
<p> The famous Belgian artist Rene Magritte rendered the idea of Russell's Paradox visually in his famous painting Ceci n'est pas une pipe. The title translates from French, This Is Not A Pipe. The painting shows a pipe with the text Ceci n'est pas une pipe</b> below it. Superficially, the painting looks like a true statement, since it is a picture of the pipe, not an actual pipe. However, the assertion is also part of the picture, which seems to make it false, because it is clearly a painting of a pipe. Paradoxically, the truth seems to depend on whether the statement is an assertion about the painting or a part of it. But, it's both.</p>
</body>
</html>
```

Figure 4.1 HTML source of paradoxes.html and the corresponding Web page resulting from its interpretation by a browser.

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## Brackets in HTML: The Escape Symbol

- What if our web page needed to show a math relationship like  $0 < p > r$
- The browser would interpret `< p >` as a paragraph tag, and would not display it
- To show angle brackets, use escape symbol — ampersand (&) — then an abbreviation, then a semicolon (;)
  - &lt; displays as <
  - &gt; displays as >
  - &amp; displays as &

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## Special Characters

- &lt; <
- &gt; >
- &amp; &
- &nbsp; (non-breaking space)
- &mdash – (em dash)

- Full list at

<http://www.w3.org/TR/REC-html40/sgml/entities.html>

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## Accent Marks in HTML

- Letters with accent marks use the escape symbol
- Ampersand, then letter, then the name of the accent mark, then semicolon
  - `&eacute;`; displays as é
  - `&ntilde;`; displays as ñ
- Full list at  
<http://www.w3.org/TR/REC-html40/sgml/entities.html>

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Table 4.2. Special Symbols for Western European Language Accent Marks

Symbol	HTML	Symbol	HTML	Symbol	HTML	Symbol	HTML
à	<code>&amp;agrave;</code>	á	<code>&amp;acute;</code>	â	<code>&amp;acirc;</code>	ã	<code>&amp;atilde;</code>
ä	<code>&amp;auml;</code>	å	<code>&amp;aring;</code>	ç	<code>&amp;ccedil;</code>	è	<code>&amp;egrave;</code>
é	<code>&amp;eacute;</code>	ê	<code>&amp;ecirc;</code>	ë	<code>&amp;euml;</code>	ì	<code>&amp;igrave;</code>
í	<code>&amp;iacute;</code>	î	<code>&amp;icirc;</code>	ï	<code>&amp;iuml;</code>	ñ	<code>&amp;ntilde;</code>
ó	<code>&amp;ograve;</code>	ô	<code>&amp;ocirc;</code>	õ	<code>&amp;ocirc;</code>	ö	<code>&amp;otilde;</code>
ö	<code>&amp;ouml;</code>	ø	<code>&amp;oslash;</code>	ù	<code>&amp;ugrave;</code>	ú	<code>&amp;uacute;</code>
û	<code>&amp;ucirc;</code>	ü	<code>&amp;uuml;</code>				

Note: For an accent mark on an uppercase letter, make the letter following the &amp; uppercase.

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## Attributes in HTML

- Properties such as text alignment require more information
- For justification, we need to specify left, right, or center
  - `<p align = "center">`  
(default justification is left)
- Horizontal rule attributes: width and size (thickness) can be specified or left to default  
`<hr width="50%" size="3" />`

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## Marking Links With Anchor Tags

- There are two sides of a hyperlink:
  - Anchor text* (the text in the current document that is highlighted)
  - Hyperlink reference* (the address of a Web page / target of the link)
- Begin with `<a` followed by a space
- Give the link reference using `href="filename"`
- Close the start anchor tag with `>`
- Text to be displayed for this link
- End anchor tag with `</a>`  
`<a href="target_of_the_hyperlink">Anchor Text Seen</a>`  
[Anchor Text Seen](#)

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## Anchor Tags (cont'd)

- Absolute pathnames:** Reference pages at other web sites using complete URLs  
`http://server/directory_path/filename`  
`<a href="http://www.aw.com/snyder/index.html">FIT</a>`

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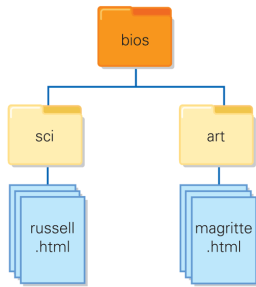
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## Anchor Tags (cont'd)

- Relative pathnames:** Reference pages stored to the same directory (give only the name of the file)
  - Read `<a href="./filename">this file</a>`.
  - Relative pathnames are more flexible — we can move web files around as a group
  - Relative pathnames can also specify a path deeper or higher in the directory structure  
`./directory/filename`      `../directory/filename`
    - Current directory
    - Parent directory (one level up)

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## Including Pictures With Image Tags

- Image Tag Format:
 

```

```

  - src short for source
  - Absolute and relative pathname rules apply
- Pictures can be used as links using anchor tag
 

```
<a href="fullsize.jpg"></a>
```

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## Including Pictures With Image Tags

- GIF and JPEG Images
  - GIF: Graphic Interchange Format
    - 8 bits (256 colors or levels of gray)
  - JPEG: Joint Photographic Experts Group
    - 24 bits (millions of colors – full color; levels of compression)
  - Tell browser which format image is in using filename extension (.gif, .jpg or .jpeg)

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## Positioning the Image in the Document

- By default, images are inserted in the page at the point where the tag is specified in the HTML, and the text lines up with the bottom of the image
- *Align* attribute can line up image with *top* of line of text, *middle*, or *bottom*
- *Align left*, *center*, or *right* attribute puts the image on the side of the browser window — text flows around it
- To put image on separate line, enclose within paragraph tags
- Can specify how large the image should be displayed (in pixels) with *height* and *width* attributes

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## Handling Color

- Color is used for both background and text
- *bgcolor* attribute of body tag gives solid background color
  - Use hexadecimal color numbers (0-9 A-F)
 

```
<body bgcolor="#FF00FF">
```

 (magenta)
  - Or use predefined color terms
 

```
<body bgcolor="magenta">
```
- *color* attribute can be used with body text, link, or font tags
 

```
<font color="red">text</font>
```

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Table 4.3. Predefined HTML Colors

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

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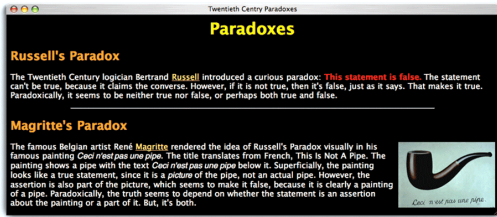


Figure 4.2 Completed Web page and the HTML source.

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```

<html>
<head>
<title> Twentieth Century Paradoxes </title>
</head>
<body bgcolor="#f0f0f0" text="#000000" link="#FFCC66">
<h1 align="center">Paradoxes</h1>
<h2>Russell's Paradox</h2>
<p>The Twentieth Century logician Bertrand
<a href="Russellbio.html">Russell</a>
introduced a curious paradox: <b>This
statement is false.</b> The statement can't be
true, because it claims the converse. However, if it is
not true, then it's false, just as it says. That makes it
true. Paradoxically, it seems to be neither true nor false,
or perhaps both true and false.</p>
<hr width="75%" />
<h2>Magritte's Paradox</h2>
<p>The famous Belgian artist
<a href="Magrittebio.html">Magritte</a>
rendered the idea of Russell's Paradox visually in his famous painting
<i>Ceci n'est pas une pipe</i>. The title translates from
French, This is Not A Pipe. The painting shows a pipe with
the text <i>Ceci n'est pas une pipe</i> below it.
Superficially, the painting looks like a true statement,
since it is a <i>picture</i> of the pipe, not an actual
pipe. However, the assertion is also part of the picture,
which seems to make it false, because it is clearly a
painting of a pipe. Paradoxically, the truth seems to
depend on whether the statement is an assertion about
the painting or a part of it. But, it's both. </p>
</body>
</html>

```

Figure 4.2 Completed Web page and the HTML source.

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## Handling Lists

- Unnumbered (bulleted) list:
  - <ul> and </ul> tags begin and end the list
  - <li> and </li> tags begin and end the items within the list
- Ordered (numbered) list:
  - <ol> and </ol> tags begin and end the list
  - Uses the same <li> tags
- Sublists: Insert lists within lists (between <li> </li> tags)
- Definitional list:
  - <dl> and </dl> tags begin and end the list
  - <dt> and </dt> surround the terms to be defined
  - <dd> and </dd> surround the definitions (indented)

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## Handling Tables

- Tables begin and end with <table> and </table> tags
- Rows are enclosed in table row tags, <tr> and </tr>
- Cells of each row are surrounded by table data tags, <td> and </td>
- Create a caption centered at the top of the table with <caption> and </caption> tags
- Column headings are created as first row of table by using <th> and </th> tags instead of table data tags
- See examples in textbook

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## Controlling Text with Tables

- Tables can control arrangement of information on a page
- e.g., a series of links listed across the top of the page could be placed in a one-row table to keep them together
  - If the window is too small to display all the links, table keeps them in a row and a scroll bar is added
  - If the tags are not in a table, the links will wrap to the next line instead

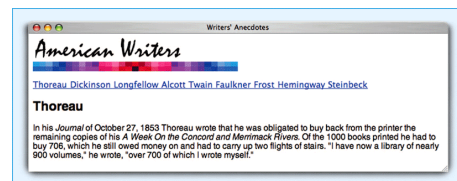


Figure 4.3 A page and its HTML for a simple listing of links (continues next page).

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```

<html>
<head> <title>Writers' Anecdotes</title>
</head>
<body bgcolor="white" text="black">

<p>
<a href="hd.html"> Thoreau </a>
<a href="ed.html"> Dickinson </a>
<a href="hw.html"> Longfellow </a>
<a href="lm.html"> Alcott </a>
<a href="sc.html"> Twain </a>
<a href="wf.html"> Faulkner </a>
<a href="rf.html"> Frost </a>
<a href="sh.html"> Hemingway </a>
<a href="js.html"> Steinbeck </a>
</p>
<h2><font face="helvetica">Thoreau</h2>
<p><font face="helvetica">
In his <i>Journal</i> of October 27, 1853 Thoreau
wrote that he was obligated to buy back from the
printer the remaining copies of his <i>A Week On the
Concord and Merrimack Rivers</i>. Of the 1000 books
printed he had to buy 706, which he still owed money
on and had to carry up two flights of stairs. "I
have now a library of nearly 900 volumes," he wrote,
"over 700 of which I wrote myself."</font></p>
</body>
</html>
    
```

Figure 4.3 (continued) A page and its HTML for a simple listing of links.

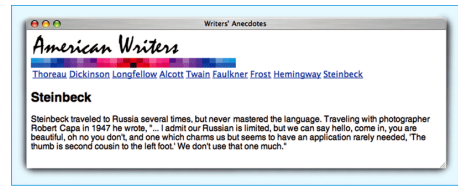


Figure 4.4 A page and its HTML for listing links in a table (continues next page).

```

<html>
<head><title>Writers' Anecdotes</title></head>
<body bgcolor="white" text="black">

<table>
<tr>
<td> <a href="hd.html">Thoreau</a> </td>
<td> <a href="ed.html">Dickinson</a> </td>
<td> <a href="hw.html">Longfellow</a> </td>
<td> <a href="lm.html">Alcott</a> </td>
<td> <a href="sc.html">Twain</a> </td>
<td> <a href="wf.html">Faulkner</a> </td>
<td> <a href="rf.html">Frost</a> </td>
<td> <a href="sh.html">Hemingway</a> </td>
<td> <a href="js.html">Steinbeck</a> </td>
</tr>
</table>
<h2><font face="helvetica">Steinbeck</font></h2>
<p><font face="helvetica">
Steinbeck traveled to Russia several times, but never
mastered the language. Traveling with photographer Robert
Capa in 1947 he wrote, "... I admit our Russian is
limited, but we can say hello, come in, you are beautiful, oh
no you don't, and one which charms us but seems to have an
application rarely needed, "The thumb is second cousin to
the left foot." We don't use that one much."</font></p>
</body>
</html>
    
```

Figure 4.4 (continued) A page and its HTML for listing links in a table.

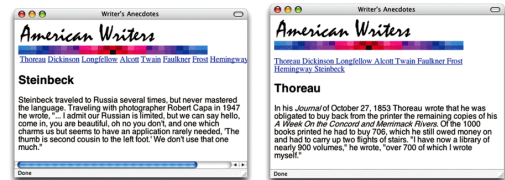


Figure 4.5 The display of the two pages from Figures 4.3 and 4.4 in a small window showing that the table keeps the links in a single row (left) rather than wrapping them (right).

Table 4.4. Hexadecimal Digit Equivalents

Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
B	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: Find the decimal number in the table and then combine the entries in the left column and the top row symbols to form the hexadecimal equivalent. Thus decimal 180 is hexadecimal B4.