

XML Syntax Rules

The syntax rules of XML are very simple and logical. The rules are easy to learn, and easy to use.

All XML Elements Must Have a Closing Tag

In HTML, you will often see elements that don't have a closing tag:

```
<p>This is a paragraph  
<p>This is another paragraph
```

In XML, it is illegal to omit the closing tag. All elements **must** have a closing tag:

```
<p>This is a paragraph</p>  
<p>This is another paragraph</p>
```

Note: You might have noticed from the previous example that the XML declaration did not have a closing tag. This is not an error. The declaration is not a part of the XML document itself, and it has no closing tag.

XML Tags are Case Sensitive

XML elements are defined using XML tags.

XML tags are case sensitive. With XML, the tag <Letter> is different from the tag <letter>.

Opening and closing tags must be written with the same case:

```
<Message>This is incorrect</message>  
<message>This is correct</message>
```

Note: "Opening and closing tags" are often referred to as "Start and end tags". Use whatever you prefer. It is exactly the same thing.

XML Elements Must be Properly Nested

In HTML, you will often see improperly nested elements:

```
<b><i>This text is bold and italic</b></i>
```

In XML, all elements **must** be properly nested within each other:

```
<b><i>This text is bold and italic</i></b>
```

In the example above, "Properly nested" simply means that since the `<i>` element is opened inside the `` element, it must be closed inside the `` element.

XML Documents Must Have a Root Element

XML documents must contain one element that is the **parent** of all other elements. This element is called the **root** element.

```
<root>
  <child>
    <subchild>.....</subchild>
  </child>
</root>
```

XML Attribute Values Must be Quoted

XML elements can have attributes in name/value pairs just like in HTML.

In XML the attribute value must always be quoted. Study the two XML documents below. The first one is incorrect, the second is correct:

```
<note date=12/11/2007>
<to>Tove</to>
<from>Jani</from>
</note>
```

```
<note date="12/11/2007">
<to>Tove</to>
<from>Jani</from>
</note>
```

The error in the first document is that the date attribute in the note element is not quoted.

Entity References

Some characters have a special meaning in XML.

If you place a character like "<" inside an XML element, it will generate an error because the parser interprets it as the start of a new element.

This will generate an XML error:

```
<message>if salary < 1000 then</message>
```

To avoid this error, replace the "<" character with an **entity reference**:

```
<message>if salary &lt; 1000 then</message>
```

There are 5 predefined entity references in XML:

<	<	less than
>	>	greater than
&	&	ampersand
'	'	Apostrophe
"	"	quotation mark

Note: Only the characters "<" and "&" are strictly illegal in XML. The greater than character is legal, but it is a good habit to replace it.

Comments in XML

The syntax for writing comments in XML is similar to that of HTML.

```
<!-- This is a comment -->
```

With XML, White Space is Preserved

HTML reduces multiple white space characters to a single white space:

HTML:	Hello my name is Tove
Output:	Hello my name is Tove.

With XML, the white space in your document is not truncated.

XML Stores New Line as LF

In Windows applications, a new line is normally stored as a pair of characters: carriage return (CR) and line feed (LF). The character pair bears some resemblance to the typewriter actions of setting a new line. In Unix applications, a new line is normally stored as a LF character. Macintosh applications use only a CR character to store a new line.

Displaying XML with CSS

With CSS (Cascading Style Sheets) you can add display information to an XML document.

Displaying your XML Files with CSS?

It is possible to use CSS to format an XML document.

Below is an example of how to use a CSS style sheet to format an XML document:

Take a look at this XML file: [The CD catalog](#)

Then look at this style sheet: [The CSS file](#)

Finally, view: [The CD catalog formatted with the CSS file](#)

Below is a fraction of the XML file. The second line links the XML file to the CSS file:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<?xml-stylesheet type="text/css" href="cd_catalog.css"?>
<CATALOG>
  <CD>
    <TITLE>Empire Burlesque</TITLE>
    <ARTIST>Bob Dylan</ARTIST>
    <COUNTRY>USA</COUNTRY>
    <COMPANY>Columbia</COMPANY>
    <PRICE>10.90</PRICE>
    <YEAR>1985</YEAR>
  </CD>
  <CD>
    <TITLE>Hide your heart</TITLE>
    <ARTIST>Bonnie Tyler</ARTIST>
    <COUNTRY>UK</COUNTRY>
    <COMPANY>CBS Records</COMPANY>
    <PRICE>9.90</PRICE>
```

```
<YEAR>1988</YEAR>
</CD>
.
.
.
.
</CATALOG>
```

Formatting XML with CSS is not the most common method.

W3C recommend using XSLT instead.

cd_catalog.xml

```
<CATALOG>
```

```
<CD>
```

```
<TITLE>Empire Burlesque</TITLE>
```

```
<ARTIST>Bob Dylan</ARTIST>
```

```
<COUNTRY>USA</COUNTRY>
```

```
<COMPANY>Columbia</COMPANY>
```

```
<PRICE>10.90</PRICE>
```

```
<YEAR>1985</YEAR>
```

```
</CD>
```

```
<CD>
```

```
<TITLE>Hide your heart</TITLE>
```

```
<ARTIST>Bonnie Tyler</ARTIST>
```

```
<COUNTRY>UK</COUNTRY>
```

```
<COMPANY>CBS Records</COMPANY>
```

```
<PRICE>9.90</PRICE>
```

```
<YEAR>1988</YEAR>
```

```
</CD>
```

```
<CD>
```

```
<TITLE>Greatest Hits</TITLE>
```

<ARTIST>Dolly Parton</ARTIST>

<COUNTRY>USA</COUNTRY>

<COMPANY>RCA</COMPANY>

<PRICE>9.90</PRICE>

<YEAR>1982</YEAR>

</CD>

<CD>

<TITLE>Still got the blues</TITLE>

<ARTIST>Gary Moore</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>Virgin records</COMPANY>

<PRICE>10.20</PRICE>

<YEAR>1990</YEAR>

</CD>

<CD>

<TITLE>Eros</TITLE>

<ARTIST>Eros Ramazzotti</ARTIST>

<COUNTRY>EU</COUNTRY>

<COMPANY>BMG</COMPANY>

<PRICE>9.90</PRICE>

<YEAR>1997</YEAR>

</CD>

<CD>

<TITLE>One night only</TITLE>

<ARTIST>Bee Gees</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>Polydor</COMPANY>

<PRICE>10.90</PRICE>

<YEAR>1998</YEAR>

</CD>

<CD>

<TITLE>Sylvias Mother</TITLE>

<ARTIST>Dr.Hook</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>CBS</COMPANY>

<PRICE>8.10</PRICE>

<YEAR>1973</YEAR>

</CD>

<CD>

<TITLE>Maggie May</TITLE>

<ARTIST>Rod Stewart</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>Pickwick</COMPANY>

<PRICE>8.50</PRICE>

<YEAR>1990</YEAR>

</CD>

<CD>

<TITLE>Romanza</TITLE>

<ARTIST>Andrea Bocelli</ARTIST>

<COUNTRY>EU</COUNTRY>

<COMPANY>Polydor</COMPANY>

<PRICE>10.80</PRICE>

<YEAR>1996</YEAR>

</CD>

<CD>

<TITLE>When a man loves a woman</TITLE>

<ARTIST>Percy Sledge</ARTIST>

<COUNTRY>USA</COUNTRY>

<COMPANY>Atlantic</COMPANY>

<PRICE>8.70</PRICE>

<YEAR>1987</YEAR>

</CD>

<CD>

<TITLE>Black angel</TITLE>

<ARTIST>Savage Rose</ARTIST>

<COUNTRY>EU</COUNTRY>

<COMPANY>Mega</COMPANY>

<PRICE>10.90</PRICE>

<YEAR>1995</YEAR>

</CD>

<CD>

<TITLE>1999 Grammy Nominees</TITLE>

<ARTIST>Many</ARTIST>

<COUNTRY>USA</COUNTRY>

<COMPANY>Grammy</COMPANY>

<PRICE>10.20</PRICE>

<YEAR>1999</YEAR>

</CD>

<CD>

<TITLE>For the good times</TITLE>

<ARTIST>Kenny Rogers</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>Mucik Master</COMPANY>

<PRICE>8.70</PRICE>

<YEAR>1995</YEAR>

</CD>

<CD>

<TITLE>Big Willie style</TITLE>

<ARTIST>Will Smith</ARTIST>

<COUNTRY>USA</COUNTRY>

<COMPANY>Columbia</COMPANY>

<PRICE>9.90</PRICE>

<YEAR>1997</YEAR>

</CD>

<CD>

<TITLE>Tupelo Honey</TITLE>

<ARTIST>Van Morrison</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>Polydor</COMPANY>

<PRICE>8.20</PRICE>

<YEAR>1971</YEAR>

</CD>

<CD>

<TITLE>Soulsville</TITLE>

<ARTIST>Jorn Hoel</ARTIST>
<COUNTRY>Norway</COUNTRY>
<COMPANY>WEA</COMPANY>
<PRICE>7.90</PRICE>
<YEAR>1996</YEAR>
</CD>

<CD>
<TITLE>The very best of</TITLE>
<ARTIST>Cat Stevens</ARTIST>
<COUNTRY>UK</COUNTRY>
<COMPANY>Island</COMPANY>
<PRICE>8.90</PRICE>
<YEAR>1990</YEAR>
</CD>

<CD>
<TITLE>Stop</TITLE>
<ARTIST>Sam Brown</ARTIST>
<COUNTRY>UK</COUNTRY>
<COMPANY>A and M</COMPANY>
<PRICE>8.90</PRICE>
<YEAR>1988</YEAR>
</CD>

<CD>
<TITLE>Bridge of Spies</TITLE>
<ARTIST>T'Pau</ARTIST>
<COUNTRY>UK</COUNTRY>

<COMPANY>Siren</COMPANY>

<PRICE>7.90</PRICE>

<YEAR>1987</YEAR>

</CD>

<CD>

<TITLE>Private Dancer</TITLE>

<ARTIST>Tina Turner</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>Capitol</COMPANY>

<PRICE>8.90</PRICE>

<YEAR>1983</YEAR>

</CD>

<CD>

<TITLE>Midt om natten</TITLE>

<ARTIST>Kim Larsen</ARTIST>

<COUNTRY>EU</COUNTRY>

<COMPANY>Medley</COMPANY>

<PRICE>7.80</PRICE>

<YEAR>1983</YEAR>

</CD>

<CD>

<TITLE>Pavarotti Gala Concert</TITLE>

<ARTIST>Luciano Pavarotti</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>DECCA</COMPANY>

<PRICE>9.90</PRICE>

<YEAR>1991</YEAR>

</CD>

<CD>

<TITLE>The dock of the bay</TITLE>

<ARTIST>Otis Redding</ARTIST>

<COUNTRY>USA</COUNTRY>

<COMPANY>Atlantic</COMPANY>

<PRICE>7.90</PRICE>

<YEAR>1987</YEAR>

</CD>

<CD>

<TITLE>Picture book</TITLE>

<ARTIST>Simply Red</ARTIST>

<COUNTRY>EU</COUNTRY>

<COMPANY>Elektra</COMPANY>

<PRICE>7.20</PRICE>

<YEAR>1985</YEAR>

</CD>

<CD>

<TITLE>Red</TITLE>

<ARTIST>The Communards</ARTIST>

<COUNTRY>UK</COUNTRY>

<COMPANY>London</COMPANY>

<PRICE>7.80</PRICE>

<YEAR>1987</YEAR>

</CD>

<CD>

<TITLE>Unchain my heart</TITLE>

<ARTIST>Joe Cocker</ARTIST>

<COUNTRY>USA</COUNTRY>

<COMPANY>EMI</COMPANY>

<PRICE>8.20</PRICE>

<YEAR>1987</YEAR>

</CD>

</CATALOG>

cd_catalog.txt

CATALOG

{

background-color: #ffffff;

width: 100%;

}

CD

{

display: block;

margin-bottom: 30pt;

margin-left: 0;

}

TITLE

{

color: #FF0000;

font-size: 20pt;

}

ARTIST

```
{  
color: #0000FF;  
font-size: 20pt;  
}
```

COUNTRY,PRICE,YEAR,COMPANY

```
{  
display: block;  
color: #000000;  
margin-left: 20pt;  
}
```

cd_catalog_with_css.xml

```
<?xml version="1.0" encoding="ISO-8859-1"?>  
  
<?xml-stylesheet type="text/css" href="cd_catalog.css"?>  
  
<CATALOG>  
  
  <CD>  
  
    <TITLE>Empire Burlesque</TITLE>  
  
    <ARTIST>Bob Dylan</ARTIST>  
  
    <COUNTRY>USA</COUNTRY>  
  
    <COMPANY>Columbia</COMPANY>  
  
    <PRICE>10.90</PRICE>  
  
    <YEAR>1985</YEAR>  
  
  </CD>  
  
  <CD>  
  
    <TITLE>Hide your heart</TITLE>
```

```
<ARTIST>Bonnie Tyler</ARTIST>
<COUNTRY>UK</COUNTRY>
<COMPANY>CBS Records</COMPANY>
<PRICE>9.90</PRICE>
<YEAR>1988</YEAR>
</CD>
.
.
.
.
</CATALOG>
```

Displaying XML with XSLT

Displaying XML with XSLT

XSLT is the recommended style sheet language of XML.

XSLT (eXtensible Stylesheet Language Transformations) is far more sophisticated than CSS.

One way to use XSLT is to transform XML into HTML before it is displayed by the browser as demonstrated in these examples:

[View the XML file](#), [the XSLT style sheet](#), and [View the result](#).

Below is a fraction of the XML file. The second line links the XML file to the XSLT file:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<?xml-stylesheet type="text/xsl" href="simple.xsl"?>
<breakfast_menu>
  <food>
    <name>Belgian Waffles</name>
    <price>$5.95</price>
    <description>
      two of our famous Belgian Waffles
    </description>
    <calories>650</calories>
```

```
</food>  
</breakfast_menu>
```

If you want to learn more about XSLT, find our XSLT tutorial on our [homepage](#).

Transforming XML with XSLT on the Server

In the example above, the XSLT transformation is done by the browser, when the browser reads the XML file.

Different browsers may produce different result when transforming XML with XSLT. To reduce this problem the XSLT transformation can be done on the server.

[View the result](#).

Note that the result of the output is exactly the same, either the transformation is done by the web server or by the web browser.