Introduction to XML

XML stands for EXtensible Markup Language.

XML was designed to transport and store data.

In this tutorial you will learn about XML, and the difference between XML and HTML.

XML is important to know, and very easy to learn.

XML was designed to transport and store data.

HTML was designed to display data.

What You Should Already Know

Before you continue you should have a basic understanding of the following:

- HTML
- JavaScript

If you want to study these subjects first, find the tutorials on our Home page.

What is XML?

- XML stands for E**X**tensible **M**arkup **L**anguage
- XML is a **markup language** much like HTML
- XML was designed to **carry data**, not to display data
- XML tags are not predefined. You must **define your own tags**
- XML is designed to be **self-descriptive**
- XML is a **W3C Recommendation**

The Difference Between XML and HTML

XML is not a replacement for HTML.
XML and HTML were designed with different goals:

XML was designed to transport and store data, with focus on what data is.
HTML was designed to display data, with focus on how data looks.

HTML is about displaying information, while XML is about carrying information.

XML Does not DO Anything

Maybe it is a little hard to understand, but XML does not DO anything. XML was created to structure, store, and transport information.

The following example is a note to Tove from Jani, stored as XML:

```
<note>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

The note above is quite self descriptive. It has sender and receiver information, it also has a heading and a message body.

But still, this XML document does not DO anything. It is just pure information wrapped in tags. Someone must write a piece of software to send, receive or display it.

XML is Just Plain Text

XML is nothing special. It is just plain text. Software that can handle plain text can also handle XML.

However, XML-aware applications can handle the XML tags specially. The functional meaning of the tags depends on the nature of the application.

With XML You Invent Your Own Tags

The tags in the example above (like <to> and <from>) are not defined in any XML standard. These tags are "invented" by the author of the XML document.

That is because the XML language has no predefined tags.

The tags used in HTML (and the structure of HTML) are predefined. HTML documents can only use tags defined in the HTML standard (like <p>, <h1>, etc.).

XML allows the author to define his own tags and his own document structure.

XML is Not a Replacement for HTML

XML is a complement to HTML.

It is important to understand that XML is not a replacement for HTML. In most web applications, XML is used to transport data, while HTML is used to format and display the data.

My best description of XML is this:

XML is a software and hardware independent tool for carrying information.

XML is a W3C Recommendation

The Extensible Markup Language (XML) became a W3C Recommendation 10. February 1998.

XML is Everywhere

We have been participating in XML development since its creation. It has been amazing to see how quickly the XML standard has developed and how quickly a large number of software vendors have adopted the standard.

XML is now as important for the Web as HTML was to the foundation of the Web.

XML is everywhere. It is the most common tool for data transmissions between all sorts of applications, and becomes more and more popular in the area of storing and describing information.

How Can XML be Used?

XML is used in many aspects of web development, often to simplify data storage and sharing.

XML Separates Data from HTML

If you need to display dynamic data in your HTML document, it will take a lot of work to edit the HTML each time the data changes.

With XML, data can be stored in separate XML files. This way you can concentrate on using HTML for layout and display, and be sure that changes in the underlying data will not require any changes to the HTML.

With a few lines of JavaScript, you can read an external XML file and update the data content of your HTML.

XML Simplifies Data Sharing

In the real world, computer systems and databases contain data in incompatible formats.

XML data is stored in plain text format. This provides a software- and hardware-independent way of storing data.

This makes it much easier to create data that different applications can share.

XML Simplifies Platform Changes

Upgrading to new systems (hardware or software platforms), is always very time consuming. Large amounts of data must be converted and incompatible data is often lost.

XML data is stored in text format. This makes it easier to expand or upgrade to new operating systems, new applications, or new browsers, without losing data.

XML Makes Your Data More Available

Since XML is independent of hardware, software and application, XML can make your data more available and useful.

Different applications can access your data, not only in HTML pages, but also from XML data sources.

With XML, your data can be available to all kinds of "reading machines" (Handheld computers, voice machines, news feeds, etc), and make it more available for blind people, or people with other disabilities.

XML is Used to Create New Internet Languages

A lot of new Internet languages are created with XML.

Here are some examples:

- XHTML the latest version of HTML
- WSDL(web service description language) for describing available web services
- WAP(wireless application programming language) and WML(wireless markup language) as markup languages for handheld devices
- RSS(Really Simple Syndication) languages for news feeds
- RDF and OWL for describing resources and ontology
- SMIL for describing multimedia for the web

XML Tree

XML documents form a tree structure that starts at "the root" and branches to "the leaves".

An Example XML Document

XML documents use a self-describing and simple syntax:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<note>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

The first line is the XML declaration. It defines the XML version (1.0) and the encoding used (ISO-8859-1 = Latin-1/West European character set).

The next line describes the **root element** of the document (like saying: "this document is a note"):

```
<note>
```

The next 4 lines describe 4 **child elements** of the root (to, from, heading, and body):

```
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
```

And finally the last line defines the end of the root element:

```
</note>
```

You can assume, from this example, that the XML document contains a note to Tove from Jani.

Don't you agree that XML is pretty self-descriptive?

XML Documents Form a Tree Structure

XML documents must contain a **root element**. This element is "the parent" of all other elements.

The elements in an XML document form a document tree. The tree starts at the root and branches to the lowest level of the tree.

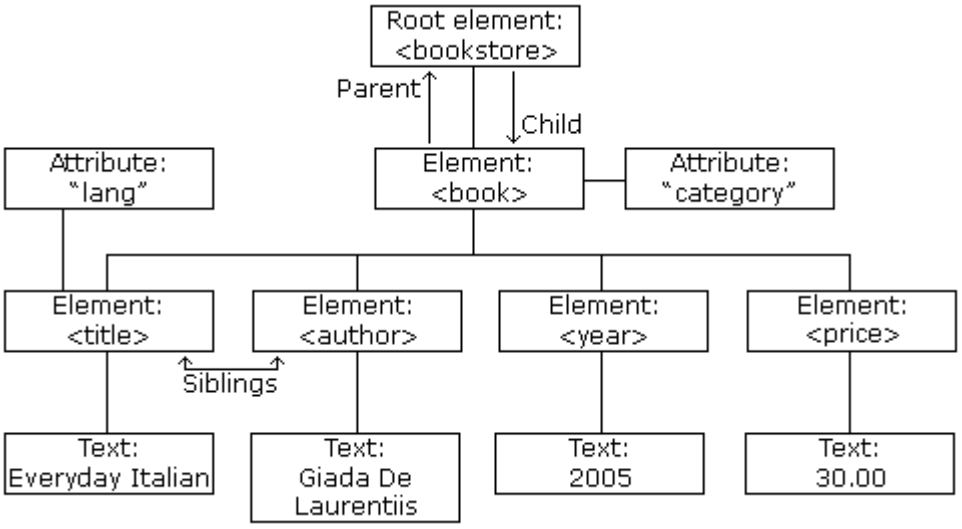
All elements can have sub elements (child elements):

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

The terms parent, child, and sibling are used to describe the relationships between elements. Parent elements have children. Children on the same level are called siblings (brothers or sisters).

All elements can have text content and attributes (just like in HTML).

Example:



The image above represents one book in the XML below:

```
<bookstore>
<book category="COOKING">
  <title lang="en">Everyday Italian</title>
  <author>Giada De Laurentiis</author>
  <year>2005</year>
  <price>30.00</price>
</book>
<book category="CHILDREN">
  <title lang="en">Harry Potter</title>
  <author>J K. Rowling</author>
  <year>2005</year>
  <price>29.99</price>
</book>
<book category="WEB">
  <title lang="en">Learning XML</title>
  <author>Erik T. Ray</author>
  <year>2003</year>
  <price>39.95</price>
</book>
</bookstore>
```

The root element in the example is <bookstore>. All <book> elements in the document are contained within <bookstore>.

The <book> element has 4 children: <title>,< author>, <year>, <price>.

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 <b> element, it must be closed inside the <b> 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:

&lt;	<	less than
&gt;	>	greater than
&amp;	&	ampersand
&apos;	'	apostrophe
&quot;	"	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.

XML Elements

An XML document contains XML Elements.

What is an XML Element?

An **XML element** is everything from (including) the element's start tag to (including) the element's end tag.

An element can contain other elements, simple text or a mixture of both. Elements can also have attributes.

```
<bookstore>
<book category="CHILDREN">
  <title>Harry Potter</title>
  <author>J K. Rowling</author>
  <year>2005</year>
  <price>29.99</price>
</book>
<book category="WEB">
  <title>Learning XML</title>
  <author>Erik T. Ray</author>
  <year>2003</year>
  <price>39.95</price>
</book>
</bookstore>
```

In the example above, <bookstore> and <book> have **element contents**, because they contain other elements. <author> has **text content** because it contains text.

In the example above only <book> has an **attribute** (category="CHILDREN").

XML Naming Rules

XML elements must follow these naming rules:

- Names can contain letters, numbers, and other characters
- Names must not start with a number or punctuation character
- Names must not start with the letters xml (or XML, or Xml, etc)
- Names cannot contain spaces

Any name can be used, no words are reserved.

Best Naming Practices

Make names descriptive. Names with an underscore separator are nice: <first_name>, <last_name>.

Names should be short and simple, like this: <book_title> not like this: <the_title_of_the_book>.

Avoid "-" characters. If you name something "first-name," some software may think you want to subtract name from first.

Avoid "." characters. If you name something "first.name," some software may think that "name" is a property of the object "first."

Avoid ":" characters. Colons are reserved to be used for something called namespaces (more later).

XML documents often have a corresponding database. A good practice is to use the naming rules of your database for the elements in the XML documents.

Non-English letters like éòá are perfectly legal in XML, but watch out for problems if your software vendor doesn't support them.

XML Elements are Extensible

XML elements can be extended to carry more information.

Look at the following XML example:

```
<note>
<to>Tove</to>
<from>Jani</from>
<body>Don't forget me this weekend!</body>
</note>
```

Let's imagine that we created an application that extracted the <to>, <from>, and <body> elements from the XML document to produce this output:

MESSAGE

To: Tove
From: Jani

Don't forget me this weekend!

Imagine that the author of the XML document added some extra information to it:

```
<note>
<date>2008-01-10</date>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

Should the application break or crash?

No. The application should still be able to find the <to>, <from>, and <body> elements in the XML document and produce the same output.

One of the beauties of XML, is that it can often be extended without breaking applications.

XML Attributes

XML elements can have attributes in the start tag, just like HTML.

Attributes provide additional information about elements.

XML Attributes

From HTML you will remember this: <img src="computer.gif">. The "src" attribute provides additional information about the <img> element.

In HTML (and in XML) attributes provide additional information about elements:

```
<img src="computer.gif">
<a href="demo.asp">
```

Attributes often provide information that is not a part of the data. In the example below, the file type is irrelevant to the data, but important to the software that wants to manipulate the element:

```
<file type="gif">computer.gif</file>
```

XML Attributes Must be Quoted

Attribute values must always be enclosed in quotes, but either single or double quotes can be used. For a person's sex, the person tag can be written like this:

```
<person sex="female">
```

or like this:

```
<person sex='female'>
```

If the attribute value itself contains double quotes you can use single quotes, like in this example:

```
<gangster name='George "Shotgun" Ziegler'>
```

or you can use character entities:

```
<gangster name="George &quot;Shotgun&quot; Ziegler">
```

XML Elements vs. Attributes

Take a look at these examples:

```
<person sex="female">
  <firstname>Anna</firstname>
  <lastname>Smith</lastname>
</person>
```

```
<person>
  <sex>female</sex>
  <firstname>Anna</firstname>
  <lastname>Smith</lastname>
</person>
```

In the first example sex is an attribute. In the last, sex is an element. Both examples provide the same information.

There are no rules about when to use attributes and when to use elements. Attributes are handy in HTML. In XML my advice is to avoid them. Use elements instead.

My Favorite Way

The following three XML documents contain exactly the same information:

A date attribute is used in the first example:

```
<note date="10/01/2008">
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

A date element is used in the second example:

```
<note>
<date>10/01/2008</date>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

An expanded date element is used in the third: (THIS IS MY FAVORITE):

```
<note>
<date>
  <day>10</day>
  <month>01</month>
  <year>2008</year>
</date>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

Avoid XML Attributes?

Some of the problems with using attributes are:

- attributes cannot contain multiple values (elements can)
- attributes cannot contain tree structures (elements can)
- attributes are not easily expandable (for future changes)

Attributes are difficult to read and maintain. Use elements for data. Use attributes for information that is not relevant to the data.

Don't end up like this:

```
<note day="10" month="01" year="2008"
to="Tove" from="Jani" heading="Reminder"
body="Don't forget me this weekend!">
</note>
```

XML Attributes for Metadata

Sometimes ID references are assigned to elements. These IDs can be used to identify XML elements in much the same way as the ID attribute in HTML. This example demonstrates this:

```
<messages>
  <note id="501">
    <to>Tove</to>
    <from>Jani</from>
    <heading>Reminder</heading>
    <body>Don't forget me this weekend!</body>
  </note>
  <note id="502">
    <to>Jani</to>
    <from>Tove</from>
    <heading>Re: Reminder</heading>
    <body>I will not</body>
  </note>
</messages>
```

The ID above is just an identifier, to identify the different notes. It is not a part of the note itself.

What I'm trying to say here is that metadata (data about data) should be stored as attributes, and that data itself should be stored as elements.

XML Validation

XML with correct syntax is "Well Formed" XML.

XML validated against a DTD is "Valid" XML.

Well Formed XML Documents

A "Well Formed" XML document has correct XML syntax.

The syntax rules were described in the previous chapters:

- XML documents must have a root element

- XML elements must have a closing tag
- XML tags are case sensitive
- XML elements must be properly nested
- XML attribute values must be quoted

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<note>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

Valid XML Documents

A "Valid" XML document is a "Well Formed" XML document, which also conforms to the rules of a Document Type Definition (DTD):

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE note SYSTEM "Note.dtd">
<note>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

The DOCTYPE declaration in the example above, is a reference to an external DTD file. The content of the file is shown in the paragraph below.

XML DTD

The purpose of a DTD is to define the structure of an XML document. It defines the structure with a list of legal elements:

```
<!DOCTYPE note [
  <!ELEMENT note (to,from,heading,body)>
  <!ELEMENT to      (#PCDATA)>
  <!ELEMENT from    (#PCDATA)>
  <!ELEMENT heading (#PCDATA)>
  <!ELEMENT body    (#PCDATA)>
]>
```

If you want to study DTD, you will find our DTD tutorial on our homepage.

XML Schema

W3C supports an XML based alternative to DTD called XML Schema:

```
<xs:element name="note">
```

```
<xs:complexType>
  <xs:sequence>
    <xs:element name="to"      type="xs:string"/>
    <xs:element name="from"    type="xs:string"/>
    <xs:element name="heading" type="xs:string"/>
    <xs:element name="body"    type="xs:string"/>
  </xs:sequence>
</xs:complexType>

</xs:element>
```

If you want to study XML Schema, you will find our Schema tutorial on our homepage.

A General XML Validator

To help you check the syntax of your XML files, we have created an XML validator to syntax-check your XML.

XML Validator

Use our XML validator to syntax-check your XML.

XML Errors Will Stop You

Errors in XML documents will stop your XML applications.

The W3C XML specification states that a program should stop processing an XML document if it finds an error. The reason is that XML software should be small, fast, and compatible.

HTML browsers will display documents with errors (like missing end tags). HTML browsers are big and incompatible because they have a lot of unnecessary code to deal with (and display) HTML errors.

With XML, errors are not allowed.

Syntax-Check Your XML

To help you syntax-check your XML, we have created an XML validator.

Paste your XML into the text area below, and syntax-check it by clicking the "Validate" button.

```
<?xml version="1.0" ?>
<note>
<to>Tove</to>
<from>Jani</Ffrom>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
</note>
```

Note: This only checks if your XML is "Well formed". If you want to validate your XML against a DTD, see the last paragraph on this page.

Syntax-Check an XML File

You can syntax-check an XML file by typing the URL of the file into the input field below, and then click the "Validate" button:

Filename:

http://www.w3schools.com/xml/note_error.xml

Validate

Note: If you get an "Access denied" error, it's because your browser security does not allow file access across domains.

The file "note_error.xml" demonstrates your browsers error handling. If you want see an error free message, substitute the "note_error.xml" with "cd_catalog.xml".

Validate Your XML Against a DTD

If you know DTD, you can validate your XML in the text area below.

Just add the DOCTYPE declaration to your XML and click the "Validate" button:

```
<?xml version="1.0" ?>
<!DOCTYPE note [
  <!ELEMENT note (to,from,heading,body)>
  <!ELEMENT to      (#PCDATA)>
  <!ELEMENT from    (#PCDATA)>
  <!ELEMENT heading (#PCDATA)>
  <!ELEMENT body    (#PCDATA)>
]>
<note>
<to>Tove</to>
<from>Jani</from>
<heading>Reminder</heading>
<message>Don't forget me this weekend!</message>
</note>
```

Note: Only Internet Explorer will actually check your XML against the DTD. Firefox, Mozilla, Netscape, and Opera will not.

Viewing XML Files

Raw XML files can be viewed in all major browsers.

Don't expect XML files to be displayed as HTML pages.

Viewing XML Files

```
<?xml version="1.0" encoding="ISO-8859-1"?>
- <note>
      <to>Tove<to>
      <from>Jani<from>
      <heading>Reminder<heading>
      <body>Don't forget me this weekend!<body>
  <note>
```

Look at this XML file: note.xml

The XML document will be displayed with color-coded root and child elements. A plus (+) or minus sign (-) to the left of the elements can be clicked to expand or collapse the element structure. To view the raw XML source (without the + and - signs), select "View Page Source" or "View Source" from the browser menu.

Note: In Netscape, Opera, and Safari, only the element text will be displayed. To view the raw XML, you must right click the page and select "View Source"

Viewing an Invalid XML File

If an erroneous XML file is opened, the browser will report the error.

Look at this XML file: note_error.xml

Other XML Examples

Viewing some XML documents will help you get the XML feeling.

An XML CD catalog
This is a CD collection, stored as XML data.

An XML plant catalog
This is a plant catalog from a plant shop, stored as XML data.

A Simple Food Menu
This is a breakfast food menu from a restaurant, stored as XML data.

Why Does XML Display Like This?

XML documents do not carry information about how to display the data.

Since XML tags are "invented" by the author of the XML document, browsers do not know if a tag like <table> describes an HTML table or a dining table.

Without any information about how to display the data, most browsers will just display the XML document as it is.

In the next chapters, we will take a look at different solutions to the display problem, using CSS, XSLT and JavaScript.

XML Namespaces

XML Namespaces provide a method to avoid element name conflicts.

Name Conflicts

In XML, element names are defined by the developer. This often results in a conflict when trying to mix XML documents from different XML applications.

This XML carries HTML table information:

```
<table>
   <tr>
   <td>Apples</td>
   <td>Bananas</td>
   </tr>
</table>
```

This XML carries information about a table (a piece of furniture):

```
<table>
   <name>African Coffee Table</name>
   <width>80</width>
   <length>120</length>
</table>
```

If these XML fragments were added together, there would be a name conflict. Both contain a <table> element, but the elements have different content and meaning.

An XML parser will not know how to handle these differences.

Solving the Name Conflict Using a Prefix

Name conflicts in XML can easily be avoided using a name prefix.

This XML carries information about an HTML table, and a piece of furniture:

```
<h:table>
   <h:tr>
   <h:td>Apples</h:td>
   <h:td>Bananas</h:td>
   </h:tr>
</h:table>
<f:table>
   <f:name>African Coffee Table</f:name>
```

```
   <f:width>80</f:width>
   <f:length>120</f:length>
</f:table>
```

In the example above, there will be no conflict because the two <table> elements have different names.

XML Namespaces - The xmlns Attribute

When using prefixes in XML, a so-called **namespace** for the prefix must be defined.

The namespace is defined by the **xmlns attribute** in the start tag of an element.

The namespace declaration has the following syntax. xmlns:*prefix*="*URI*".

```
<root>
<h:table xmlns:h="http://www.w3.org/TR/html4/">
   <h:tr>
   <h:td>Apples</h:td>
   <h:td>Bananas</h:td>
   </h:tr>
</h:table>
<f:table xmlns:f="http://www.w3schools.com/furniture">
   <f:name>African Coffee Table</f:name>
   <f:width>80</f:width>
   <f:length>120</f:length>
</f:table>
</root>
```

In the example above, the xmlns attribute in the <table> tag give the h: and f: prefixes a qualified namespace.

When a namespace is defined for an element, all child elements with the same prefix are associated with the same namespace.

Namespaces can be declared in the elements where they are used or in the XML root element:

```
<root
xmlns:h="http://www.w3.org/TR/html4/"
xmlns:f="http://www.w3schools.com/furniture">
<h:table>
   <h:tr>
   <h:td>Apples</h:td>
   <h:td>Bananas</h:td>
   </h:tr>
</h:table>
<f:table>
   <f:name>African Coffee Table</f:name>
   <f:width>80</f:width>
   <f:length>120</f:length>
</f:table>
</root>
```

Note: The namespace URI is not used by the parser to look up information.

The purpose is to give the namespace a unique name. However, often companies use the namespace as a pointer to a web page containing namespace information.

Try to go to http://www.w3.org/TR/html4/.

Uniform Resource Identifier (URI)

A **Uniform Resource Identifier** (URI) is a string of characters which identifies an Internet Resource.

The most common URI is the **Uniform Resource Locator** (URL) which identifies an Internet domain address. Another, not so common type of URI is the **Universal Resource Name** (URN).

In our examples we will only use URLs.

Default Namespaces

Defining a default namespace for an element saves us from using prefixes in all the child elements. It has the following syntax:

```
xmlns="namespaceURI"
```

This XML carries HTML table information:

```
<table xmlns="http://www.w3.org/TR/html4/">
   <tr>
   <td>Apples</td>
   <td>Bananas</td>
   </tr>
</table>
```

This XML carries information about a piece of furniture:

```
<table xmlns="http://www.w3schools.com/furniture">
   <name>African Coffee Table</name>
   <width>80</width>
   <length>120</length>
</table>
```

Namespaces in Real Use

XSLT is an XML language that can be used to transform XML documents into other formats, like HTML.

In the XSLT document below, you can see that most of the tags are HTML tags.

The tags that are not HTML tags have the prefix xsl, identified by the namespace xmlns:xsl="http://www.w3.org/1999/XSL/Transform":

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<xsl:stylesheet version="1.0"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
<xsl:template match="/">
<html>
<body>
  <h2>My CD Collection</h2>
  <table border="1">
    <tr>
      <th align="left">Title</th>
      <th align="left">Artist</th>
    </tr>
    <xsl:for-each select="catalog/cd">
    <tr>
      <td><xsl:value-of select="title"/></td>
      <td><xsl:value-of select="artist"/></td>
    </tr>
    </xsl:for-each>
  </table>
</body>
</html>
</xsl:template>
</xsl:stylesheet>
```