

Front End Development Workshop

Module 3 - Introduction to XML

NSBE Lehman College - Review 3/25/2015

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- ▶ Review HTML5, CSS3
- ▶ Introduction - What does XML stands for?
- ▶ XML Environment - How XML is used?
- ▶ Structure and Syntax - How does XML work?
- ▶ Combining XML - CSS, JavaScript, XSL

Review

- ▶ HTML5: designed to display data
- ▶ CSS3: build layout to display data
- ▶ What about XML?

Introduction XML

- ▶ XML - EXtensible Markup Language
- ▶ Independent tool for carrying data
- ▶ Markup language as HTML

XML x HTML

	HTML	XML
Function	Display data	Describe data
Language	Predefined tags	Developer defined tags
Errors	Allowed	Never allowed

Why XML?

- ▶ Data organization
- ▶ Data provider (more than one page may need the same data)
- ▶ Example: RSS
 - ▶ Reddit
 - ▶ Newspapers

XML Examples

- Mostly are self descriptive

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

http://www.w3schools.com/xml/xml_whatIs.asp

XML issue

- XML needs an interpreter
- Solution can be either
 - A language to display data
 - A language to process data

XML Use Case

- HTML displaying dynamic data:
 - Store XML data
 - JavaScript reads XML and updates HTML page

XML Structure - Example 1

```
<?xml version="1.0" encoding="UTF-8"?>
<note>
  <to>Tove</to>
  <from>Jani</from>
  <heading>Reminder</heading>
  <body>Don't forget me this weekend!</body>
</note>
```

Annotations:

- `<?xml version="1.0" encoding="UTF-8"?>` → XML declaration
- `<note>` → Root element
- `<from>Jani</from>` → Child element

http://www.w3schools.com/xml/xml_tree.asp

XML Structure - Example 2

```
<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>Mark T. Ray</author>
    <year>2003</year>
    <price>39.95</price>
  </book>
</bookstore>
```

Annotations:

- `<bookstore>` → Root element
- `<title lang="en">Everyday Italian</title>` → Text/Value
- `<book category="CHILDREN">` → Child element
- `<title lang="en">Learning XML</title>` → Subchild element
- `category="WEB"` → Attribute

http://www.w3schools.com/xml/xml_tree.asp

XML Syntax

- ▶ All tags have to be closed
 - ▶ Exception: XML declaration
- ▶ Tags case sensitive
- ▶ Attribute values must be quoted
- ▶ `<!--` Comments like HTML `-->`
- ▶ White spaces preserved

XML Entity References

- Special characters generate error
- 5 pre-defined entity in XML

Entity References	Character
<	< (less than)
>	> (greater than)
&	& (ampersand)
'	' (apostrophe)
"	" (quotation mark)

XML Tag

- Also called elements
- Names must start with letter/underscore
- Only "XML" is reserved
- Empty elements:
 - No text/value
 - May have attribute(s)
 - Self-closing tags

Tips for XML development

- Elements
 - Avoid special characters
 - Example: ":", ".", ":", "á"
- Be consistent in naming style
 - Example: camelCase, PascalCase
- Use elements rather than attributes
 - Use attributes for metadata

Combining XML

- ▶ Many ways to display data
 - ▶ CSS
 - ▶ JavaScript
 - ▶ XSLT (Web Standard)

Display XML - CSS Example

- ▶ Method is not common
- ▶ Requires a reference:

```
<?xml version="1.0" encoding="UTF-8"?>
<?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>10.98</PRICE>
    <YEAR>1985</YEAR>
  </CD>
  <CD>
    <TITLE>Hide your heart</TITLE>
    <ARTIST>Bonnie Tyler</ARTIST>
    <COUNTRY>UK</COUNTRY>
    <COMPANY>CBS Records</COMPANY>
    <PRICE>9.98</PRICE>
    <YEAR>1988</YEAR>
  </CD>
  .
  .
  .
</CATALOG>
```

http://www.w3schools.com/xml/xml_display.asp

XML+CSS Activity

- ▶ Create an XML file (quotation.xml)
- ▶ Write some quotations
- ▶ Create a stylesheet to display (quotation.css)
- ▶ Link CSS file with XML
- ▶ Be creative and have fun!

DTD and Schema

- Standardization for XML entities
- Describe document content
- DTD: identified by `<!DOCTYPE >` tag
- Schema: identified by `<xs:element > </xs:element>`
- Not usual

Display XML - JavaScript Example

- Uses DOM (Document Object Model)

```

if (window.XMLHttpRequest)
    // code for IE7+, Firefox, Chrome, Opera, Safari
    xmlhttp=new XMLHttpRequest();
}
else
    // code for IE6, IES
    xmlhttp=new ActiveXObject("Microsoft.XMLHTTP");
}
xmlhttp.open("GET","note.xml",false);
xmlhttp.send();
xmlDoc=xmlhttp.responseXML;

document.getElementById("to").innerHTML=
xmlDoc.getElementsByTagName("to")[0].childNodes[0].nodeValue;
document.getElementById("from").innerHTML=
xmlDoc.getElementsByTagName("from")[0].childNodes[0].nodeValue;
document.getElementById("message").innerHTML=
xmlDoc.getElementsByTagName("body")[0].childNodes[0].nodeValue;

```

http://www.w3schools.com/xml/xml_to_html.asp

Resources

- note.xml

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <note>
3   <to>Tove</to>
4   <from>Jani</from>
5   <heading>Reminder</heading>
6   <body>Don't forget me this weekend!</body>
7 </note>

```

http://www.w3schools.com/xml/xml_to_html.asp

- note.html

```

<html>
<head>
  <script type="text/javascript" src="note.js"></script>
</head>
<body>
  <div>W3Schools Internal Note</div>
  <div>
    <to></div> <span id="to"></span><br />
    <from></div> <span id="from"></span><br />
    <div>Message:</div> <span id="message"></span>
  </div>
</body>
</html>

```

XML+JavaScript Activity

- Download "cdCatalog.html"
- Create a <CATALOG> tag
 - Include some <CD>s you like
 - Each <CD> must have, at least:
 - An <ID>: 1, 2, 3,...
 - An <ARTIST> name
 - The <NAME> of the CD

XSLT Language

- eXtensible Stylesheet Language Transformation (.xsl)
- Better than CSS
 - Edit output elements
 - Sort them
- Root element:

```
<xsl:stylesheet version="1.0"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

  <xsl:transform version="1.0"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
```

http://www.w3schools.com/xsl/xsl_transformation.asp

XSLT Structure

```
<?xml version="1.0" encoding="UTF-8"?>
<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 bgcolor="#9acd32">
          <th>Title</th>
          <th>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>
```

Annotations in the original image:

- Heading points to `<h2>My CD Collection</h2>`
- ? points to `<xsl:template match="/">`
- ? points to `<xsl:for-each select="catalog/cd">`
- ? points to `<td><xsl:value-of select="title"></td>`
- ? points to `<td><xsl:value-of select="artist"></td>`

http://www.w3schools.com/xsl/xsl_transformation.asp

XML+XSL Activity

- ▶ Use CD catalog created before (cdCatalog.xml)
- ▶ Create a stylesheet for it (cdCatalog.xsl)
- ▶ Link XSL with XML

```
<?xml-stylesheet type="text/xsl" href="cdcatalog.xsl"?>
```
- ▶ Open XML file

Conclusion

- ▶ XML:
 - ▶ Does not substitute HTML
 - ▶ Stores and organizes data
 - ▶ Can be used in many ways

Questions

- ▶ NSBE Lehman College

Student Life Building, Room 205A
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Regular meetings

- ▶ Tuesdays, 3-4pm
- ▶ Thursdays, 5-5:50pm
