

XML is essential for huge corporate systems and for us

Using the Power of XML Personally

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Review ...

- Recall that XML is the land of tags so we can structure input separate from any processing application
- Three types of tags
 - Identity
 - Affinity
 - Collection

Our Plan For Today

- We'll explain how you can create personal XML software for a simple task of interest to you ... we'll use a travelogue as an example
- Begin by thinking through the design
- Second Work A Simple Example
- Then Consider the Diary Problem

A Record Of Our Travels

- An example is a travel record
- Kinds of info:
 - State name
 - What we did
 - A flag adds some interest
- Also need a title

Places I've Traveled

Washington State



The State of Washington is a fun place to visit. We toured Spokane, Grand Coulee Dam, Seattle's Space Needle and Mt. Rainier, which wasn't rainy at all, but beautiful in the sun!

Oregon



South of Washington is Oregon. It is at the end of the old Oregon Trail. It is an unusual place. First, the University of Oregon's team is called the Ducks. Also, Mt. Bachelor is near the Sisters; with so many women around, why is it still a bachelor?

California



California seems to be a republic, but not a banana republic. More like an orange republic. We visited San Francisco, San Quentin, the Monterey Bay Aquarium, LA and Hollywood. We didn't see any stars, but we were not there in the dark either.

The XML File Has This Content

- Tagging the information by what it is

```
<travels>
  <visit>
    <sight>Washington State</sight>
    <action flag="wash.gif">
      The State of Washington is a fun place to visit. We toured Spokane, Grand Coulee Dam,
      Seattle's Space Needle and Mt. Rainier, which wasn't rainy at all, but beautiful in the sun!
    </action>
  </visit>

  <visit>
    <sight>Oregon</sight>
    <action flag="oregon.jpg">
      South of Washington is Oregon. It is at the end of the old Oregon Trail. It is an unusual place.
      First, the University of Oregon's team is called the Ducks. Also, Mt. Bachelor is near the Sisters;
      with so many women around, why is it still a bachelor?
    </action>
  </visit>

  <visit>
    <sight>California</sight>
    <action flag="california.png">
      California seems to be a republic, but not a banana republic. More like an orange republic.
      We visited San Francisco, San Quentin, the Monterey Bay Aquarium, LA and Hollywood. We
      didn't see any stars, but we were not there in the dark either.</action>
  </visit>
</travels>
```

The XML File Has This Content

- Tagging the information by what it is

```
<travels>
  <visit>
    <sight>Washington State</sight>
    <action flag="wash.gif">
      The State of Washington is a beautiful state with Western features. Grand Coulee Dam,
      Seattle's Space Needle, and the sun!
    </action>
  </visit>

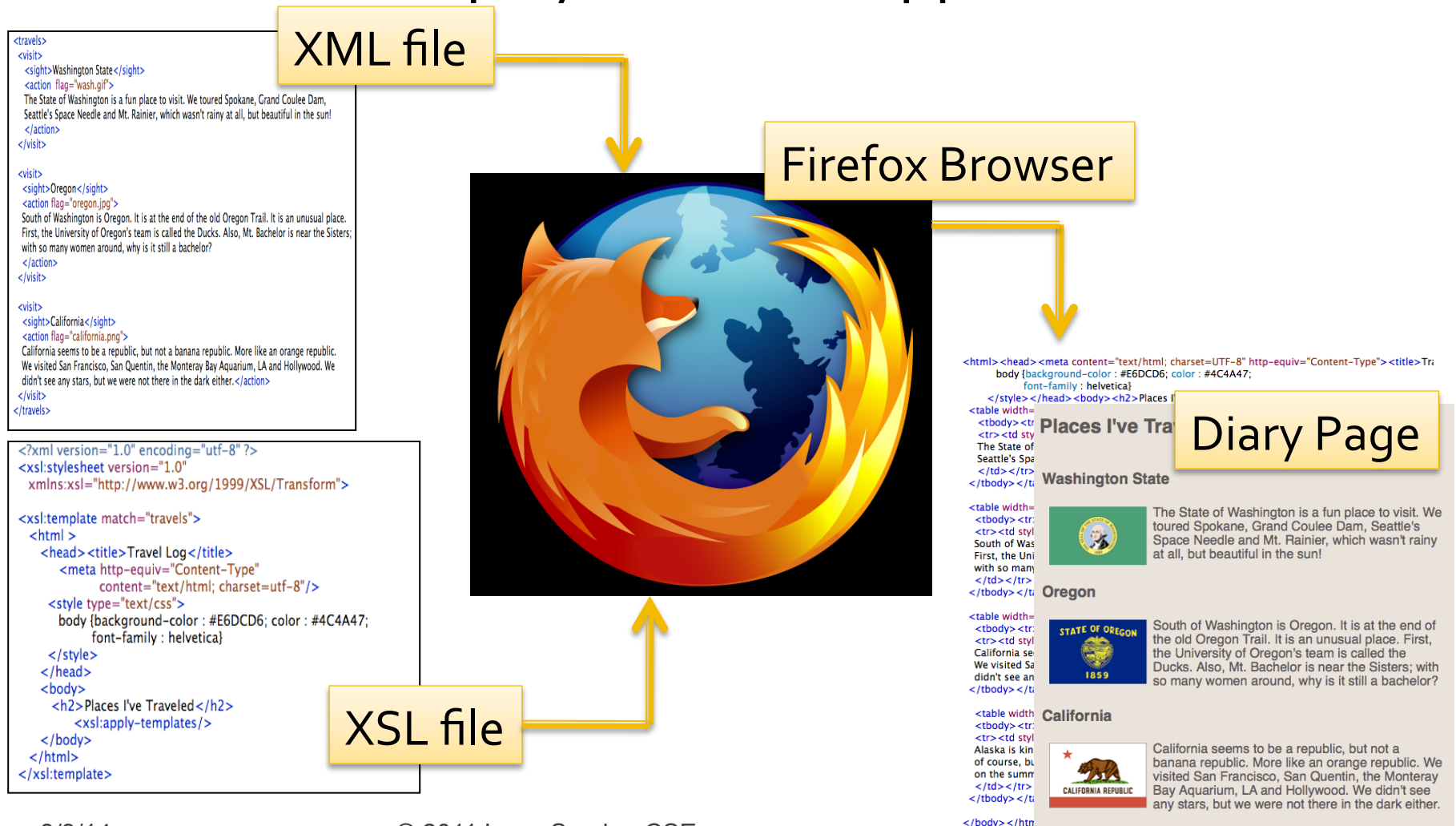
  <visit>
    <sight>Oregon</sight>
    <action flag="oregon.gif">
      South of Washington is Oregon, a beautiful state with unusual place.
      First, the University of Oregon's team is called the Ducks. Also, the Bachelor is near the Sisters;
      with so many women around, why is it still a bachelor?
    </action>
  </visit>

  <visit>
    <sight>California</sight>
    <action flag="california.png">
      California seems to be a republic, but not a banana republic. More like an orange republic.
      We visited San Francisco, San Quentin, the Monterey Bay Aquarium, LA and Hollywood. We
      didn't see any stars, but we were not there in the dark either.</action>
  </visit>
</travels>
```

The task is to convert this XML
into the Web page shown earlier

Big Picture of How This Will Work

- Here are the players in this application



Firefox Combines XML+XSL → HTML

```
<html>
  <head><meta content="text/html; charset=UTF-8" http-equiv="Content-Type">
  <title>Travel Log</title>
  <style type="text/css">
    body {background-color : #E6DCD6; color : #4C4A47; font-family : helvetica}
  </style>
</head>
<body>
  <h2>Places I've Traveled</h2>
```

Final HTML

```
<table width="500">
  <tbody><tr><td><h3>Washington State</h3></td></tr>
  <tr><td style="text-size:xsmall; padding-left:10px">
    
    The State of Washington is a fun place to visit. We toured Spokane, Grand Coulee Dam,
    Seattle's Space Needle and Mt. Rainier, which wasn't rainy at all, but beautiful in the sun!
  </td></tr>
</tbody></table>
```

```
<table width="500">
```


Firefox Combines XML+XSL → HTML

```
<html>  
  <head><meta content="text/html; charset=UTF-8" http-equiv="Content-Type">
```

```
  <visit>  
    <sight>Washington State</sight>  
    <action flag="wash.gif">  
      The State of Washington is a fun place to visit. We toured Spokane, Grand Coulee Dam,  
      Seattle's Space Needle and Mt. Rainier, which wasn't rainy at all, but beautiful in the sun!  
    </action>  
  </visit>
```

XML Input

```
<table width="500">  
  <tbody><tr><td><h3>Washington State</h3></td></tr>  
  <tr><td style="text-size:xsmall; padding-left:10px">  
      
    The State of Washington is a fun place to visit. We toured Spokane, Grand Coulee Dam,  
    Seattle's Space Needle and Mt. Rainier, which wasn't rainy at all, but beautiful in the sun!  
  </td></tr>  
</tbody></table>
```

Final HTML

```
<table width="500">
```

Firefox Combines XML+XSL → HTML

```
<html>
  <head><meta content="text/html; charset=UTF-8" http-equiv="Content-Type">
  <title>Travel Log</title>
  <style type="text/css">
    body {background-color : #E6DCD6; color : #4C4A47; font-family : helvetica}
  </style>
</head>
<body>
  <h2>Places I've Traveled</h2>
```

Final HTML

```
<table>
  <tbody>
    <tr>
      <td>
        <img alt="The Seattle skyline" data-bbox="95 670 145 725"/>
        The Seattle skyline
      </td>
    </tr>
  </tbody>
</table>
<table>
```

```
<xsl:template match="travels">
  <html >
    <head><title>Travel Log</title>
    <meta http-equiv="Content-Type" content="text/html; charset=utf-8"/>
    <style type="text/css">
      body {background-color : #E6DCD6; color : #4C4A47; font-family : helvetica}
    </style>
  </head>
  <body>
    <h2>Places I've Traveled</h2>
    <xsl:apply-templates/>
  </body>
</html>
</xsl:template>
```

XSL Input

Processing The Files

- For this application, “processing” the files means creating HTML from XML guided by XSL
 - Here’s how ---
 - For each tag, we say what HTML we want, using “XSL”
 - Put those definitions into a file (they’re called **templates**)
 - Put directions at the top of the XML definition telling it where to find the definitions file
 - “Run” the XML in Firefox (you use Firefox, right?) ... it does all the rest!

Just Do It!

XSL: Extensible StyleSheet Language

- XSL is a markup language for XML ... and (of course) its written in XML
- Let's take a look

```
<?xml version="1.0" encoding="utf-8" ?>
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

<xsl:template match="travels">
  <html >
    <head> <title>Travel Log</title>
      <meta http-equiv="Content-Type"
        content="text/html; charset=utf-8"/>
      <style type="text/css">
        body {background-color : #E6DCD6; color : #4C4A47;
          font-family : helvetica}
      </style>
    </head>
    <body>
      <h2>Places I've Traveled</h2>
      <xsl:apply-templates/>
    </body>
  </html>
</xsl:template>
```

The Rest of XSL Definition

- This is the remainder of the Travel Log XSL

```
<xsl:template match="visit">  
  <table width="500">  
    <xsl:apply-templates/>  
  </table>  
</xsl:template>
```

```
<xsl:template match="sight">  
  <tr><td><h3>  
    <xsl:apply-templates/></h3>  
  </td></tr>  
</xsl:template>
```

```
<xsl:template match="action">  
  <tr><td style="text-size:xsmall; padding-left:10px">  
      
    <xsl:apply-templates/>  
  </td></tr>  
</xsl:template>
```

```
</xsl:stylesheet>
```

XSL is all tags because it has its own tags like `<xsl:template ... >` plus all of the HTML tags it will output, like `<h3>`. But if it's an XSL tag, it says so

XSL: Extensible StyleS Language

- Look closely at the XSL mixing its own tags with HTML tags

```
<?xml version="1.0" encoding="utf-8" ?>  
<xsl:stylesheet version="1.0"  
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
```

Standard header text ... must be first in XSL file

```
<xsl:template match="travels">  
  <html >  
    <head> <title>Travel Log</title>  
      <meta http-equiv="Content-Type"  
        content="text/html; charset=utf-8"/>  
      <style type="text/css">  
        body {background-color : #E6DCD6; color : #4C4A47;  
          font-family : helvetica}  
      </style>  
    </head>  
    <body>  
      <h2>Places I've Traveled</h2>  
      <xsl:apply-templates/>  
    </body>  
  </html>  
</xsl:template>
```

Here's how to say what XML tag this definition is for

HTML in here

Important tag, to be explained next

Now, Let's Just Do It

- So, we build the skeleton of the XSL with our text editor

standard header - copy

```
travellLog55.xsl (no symbol selected)
<?xml version="1.0" encoding="utf-8" ?>
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

  <xsl:template match="travels">
    <xsl:apply-templates/>
  </xsl:template>

  <xsl:template match="visit">
    <xsl:apply-templates/>
  </xsl:template>

  <xsl:template match="sight">
    <xsl:apply-templates/>
  </xsl:template>

  <xsl:template match="action">
    <xsl:apply-templates/>
  </xsl:template>

</xsl:stylesheet>
```

“apply-templates” tag says “style inner stuff”

Say how to style each XML tag

All that's left is HTML

Top-level Tag: <travels>

- The “root tag” needs to style the main page

```
<xsl:template match="travels">  
  <xsl:apply-templates/>  
</xsl:template>
```

```
<xsl:template match="travels">  
  <html >  
    <head><title>Travel Log</title>  
      <meta http-equiv="Content-Type"  
        content="text/html; charset=utf-8"/>  
      <style type="text/css">  
        body {background-color : #E6DCD6; color : #4C4A47;  
          font-family : helvetica}  
      </style>  
    </head>  
    <body>  
      <h2>Places I've Traveled</h2>  
      <xsl:apply-templates/>  
    </body>  
  </html>  
</xsl:template>
```

“style inner stuff”

```
<travels>  
<visit>  
  <sight>Washing  
  <action flag="wa  
  The State of Washi  
  Seattle's Space Need  
</action>
```


Continue For Other Tags

```
<xsl:template match="visit">  
  <xsl:apply-templates/>  
</xsl:template>
```

```
<xsl:template match="visit">  
  <table width="500">  
    <xsl:apply-templates/>  
  </table>  
</xsl:template>
```

```
<xsl:template match="sight">  
  <xsl:apply-templates/></h3>  
</xsl:template>
```

```
<xsl:template match="sight">  
  <tr><td><h3>  
    <xsl:apply-templates/></h3>  
  </td></tr>  
</xsl:template>
```

Grab the Attribute Value


- When we have an attribute like
`<action flag="wash.gif">`
we grab the value using a very odd syntax
`
 <tr><td style="text-size:xsmall; padding-left:10px">

 <xsl:apply-templates/>
</td></tr>
</xsl:template>
```

# Linking to XSL

- To make this all happen, we go to the XML and link it to the XSL file
  - Add two “boiler plate” encoding lines (just copy)
  - Make href point to the XSL file

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="travelLogSS.xsl"?>
```



```
<travels>
 <visit>
 <sight>Washington State</sight>
 <action flag="wash.gif">
 The State of Washington is a fun place to visit. We toured Spokane, Grand Coulee Dam,
 Seattle's Space Needle and Mt. Rainier, which wasn't rainy at all, but beautiful in the sun!
 </action>
 </visit>

 <visit>
 <siaht>Oreaon</siaht>
```

# Ta Dah!

We have a page!  
... open XML file  
with Firefox

## Places I've Traveled

### Washington State



The State of Washington is a fun place to visit. We toured Spokane, Grand Coulee Dam, Seattle's Space Needle and Mt. Rainier, which wasn't rainy at all, but beautiful in the sun!

### Oregon



South of Washington is Oregon. It is at the end of the old Oregon Trail. It is an unusual place. First, the University of Oregon's team is called the Ducks. Also, Mt. Bachelor is near the Sisters; with so many women around, why is it still a bachelor?

### California



California seems to be a republic, but not a banana republic. More like an orange republic. We visited San Francisco, San Quentin, the Monterey Bay Aquarium, LA and Hollywood. We didn't see any stars, but we were not there in the dark either.

# Now, Add to Data As Needed

- The Travel Log page is done; we don't expect to write more XSL, except to restyle something
- Just add to XML file

```
<visit>
<sight>Alaska</sight>
<action flag="ak.png">
```

Alaska is kind of hard to describe -- it is enormous. We visited Anchorage, of course, but we also saw Denali (Mt. McKinley), where we saw grizzly bears. In Fairbanks on the summer solstice, we saw the Midnight Sun Baseball game -- no lights, just sunshine!

```
</action>
</visit>
```

## Oregon

STATE OF OREGON

South of Washington is Oregon. It is at the end of the old Oregon Trail. It is an unusual place. First

## Alaska



-- no lights, just sunshine!

Alaska is kind of hard to describe -- it is enormous. We visited Anchorage, of course, but we also saw Denali (Mt. McKinley), where we saw grizzly bears. In Fairbanks on the summer solstice, we saw the Midnight Sun Baseball game

# Adding More KINDS of Data

- What about the pictures???
- Add an XML picture tag ... like HTML, it will be self-terminating; needs styling XSL, too
- `<pic name="im/mtrainier.jpg" />` goes in XML
- `<xsl:template match="pic">` goes in XSL
  - ``
- `</xsl:template>`
- Place `<pic>` tags inside of `<action>` tags

# Adding More XML

- Suppose our travels take us to Chicago ... we have two options:
  - Treat Chicago like any state sight – it has a flag, for example
  - Add a new kind of visit, maybe a `<tour>` that is similar to `<action>` but is used for cities; it can have different attributes, like `sports_team="Cubs"`
- Additional XML means more XSL is needed at the start



# Assignment 16 ... Coming Wed.



Lynx

[NPR Hourly News](#)

[U Dub](#)

[CS Principles](#)

[Astronomy Picture of the Day](#)

**MOD**

## My Online Diary

*This is my diary of the cool stuff that happens each day*

**Monday, March 3, 2014**

Last night was the Academy Awards ceremony. Although, my favorite movie won seven Oscars, it didn't win Best Picture, which is scandalous. It basically proves that the people voting are old guys with pacemakers who can't handle a little excitement.

