XSLT programming examples

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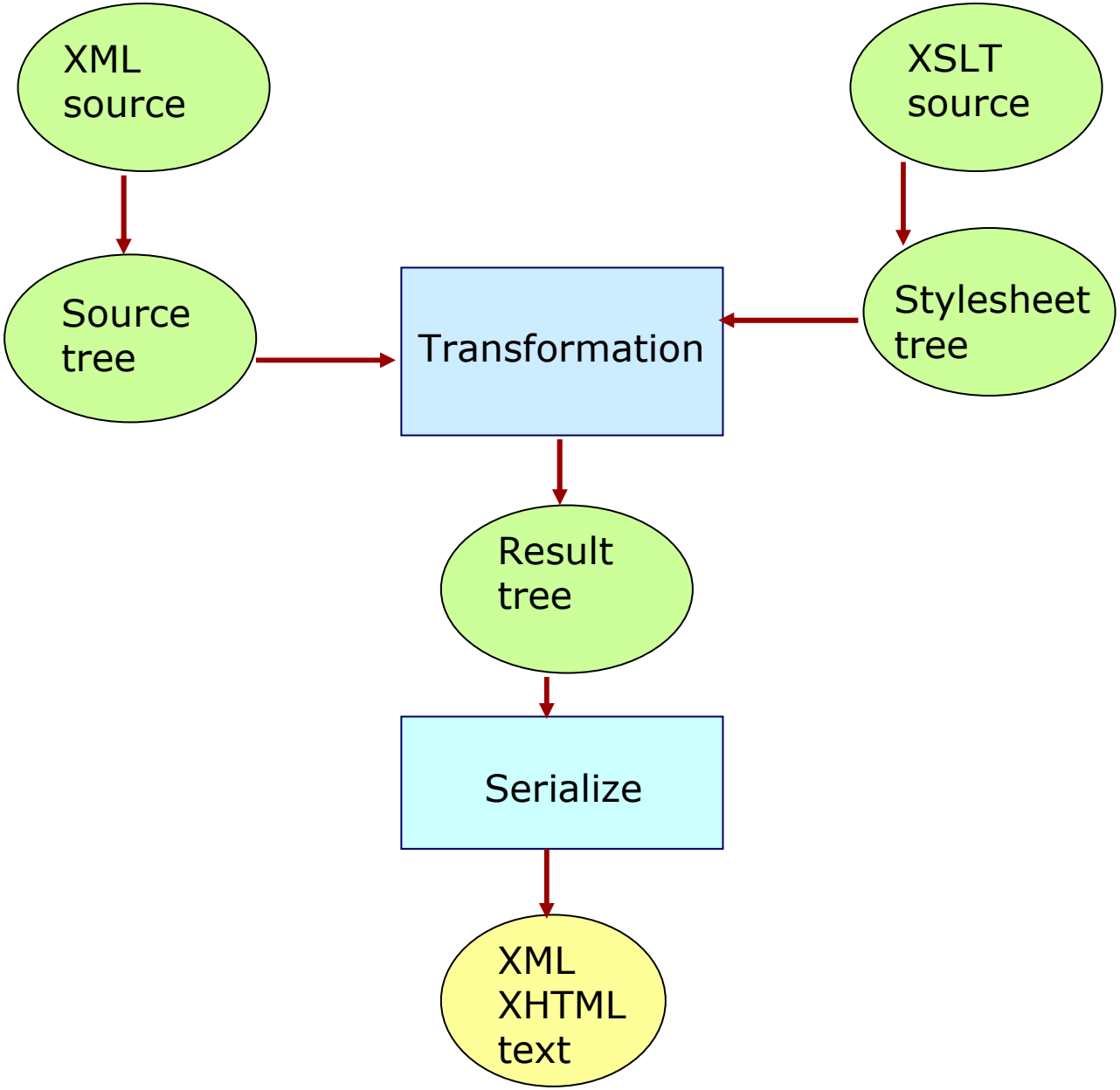

XML source
XSLT source
Source tree
Transformation
Stylesheet tree
Result tree
Serialize
XML XHTML text

J. Holvikivi

Recursion: xml file

```
<?xml version='1.0'?>
<?xml-stylesheet type="text/xsl" href="books.xsl"?>
<library>
   <book>
        <title>Pennies from heaven</title>
        <author>Mae West</author>
   </book>
   <book>
        <title>Memories</title>
        <author>Bertrand Russel</author>
   </book>
   <book>
        <title>Investigations</title>
        <author>Ludwig Wittgenstein</author>
   </book>
</library>
```

Recursion: books.xsl

```
<?xml version="1.0"?>
<xsl:stylesheet
   xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
   version="1.0">
<xsl:template match="/">
<html><body>
    <xsl:element name="table">
     <xsl:apply-templates select="//book"/>
     </xsl:element>
</body></html>
</xsl:template>
```

- ...continues

Recursion (continues)

```
<xsl:template match="*">
<xsl:if test="count(ancestor::*) =1">
    <xsl:element name="tr">
    <xsl:apply-templates select="child::*"/>
    </xsl:element>
</xsl:if>
<xsl:if test="count(ancestor::*) !=1">
    <xsl:element name="td">
    <xsl:value-of select="."/>
    </xsl:element>
</xsl:if>
</xsl:template>
</xsl:stylesheet>
```

Sorting, second example

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/xsl" href="mooming.xsl"?>
<crew>
  <member name="Mamma" gear="handbag" cloth="apron"/>
  <member name ="Pappa" gear="pipe" cloth="hat"/>
  <member name ="Mymlan" gear="mirror" cloth="dress"/>
</crew>
```

xsl:sort

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

<xsl:template match="/">
<html>
<head><title>Moomin belongings sorted</title></head>
<body>
      <xsl:for-each select="//member">
      <xsl:sort select="@name" />
      <p><xsl:value-of select="@name"/>
      <ul>
      <li><xsl:value-of select="@gear"/></li>
      <li><xsl:value-of select="@cloth"/></li>
      </ul></p>
      </xsl:for-each>
</body></html>
</xsl:template>
</xsl:stylesheet>
```

Generic process for copying

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

<xsl:template match=" * | @* | processing-instruction() ">
    <xsl:copy>
    <xsl:apply-templates select=" * | @* | text | processing-instruction() "/>
    </xsl:copy>

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

Variables and parameters: the alphabet one by one

```
<xsl:template name="alphabetTemplate">
    <xsl:param name="alphabet" select="
    'ABCDEFGHIJKLMNOPQRSTUVWXYZ' " />
    <xsl:variable name="letter" select="substring($alphabet, 1, 1)" />
    <xsl:variable name="remainder" select="substring($alphabet, 2)" />
….
    <xsl:if test="$remainder">
        <xsl:call-template name="alphabetTemplate"/>
        <xsl:with-param name="alphabet" select=" remainder " />
        </xsl:call-template>
    </xsl:if>
</xsl:template>
```

Another HTML example:

An XML document representing the results of a soccer tournament

```
<results group="A">
  <match>
    <date>10-Jun-1998</date>
    <team score="2">Brazil</team>
    <team score="1">Scotland</team>
  </match>
  <match>
    <date>10-Jun-1998</date>
    <team score="2">Morocco</team>
    <team score="2">Norway</team>
  </match>
  <match>
    <date>16-Jun-1998</date>
    <team score="1">Scotland</team>
    <team score="1">Norway</team>
  </match>
```

Another HTML example, page 2:

An XML document representing the results of a soccer tournament

```
<match>
     <date>16-Jun-1998</date>
     <team score="3">Brazil</team>
     <team score="0">Morocco</team>
  </match>
  <match>
     <date>23-Jun-1998</date>
     <team score="1">Brazil</team>
     <team score="2">Norway</team>
  </match>
  <match>
     <date>23-Jun-1998</date>
     <team score="0">Scotland</team>
     <team score="3">Morocco</team>
  </match>
  </results>
```

A basic style sheet for the soccer results

```
<xsl:transform
     xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <xsl:template match="results">
     <html>
     <head><title>
        Results of Group <xsl:value-of select="@group"/>
     </title></head>
     <body><h1>
        Results of Group <xsl:value-of select="@group"/>
     </h1>
     <xsl:apply-templates/>
     </body></html>
  </xsl:template>
  <xsl:template match="match">
     <h2>
        <xsl:value-of select="team[1]"/> versus <xsl:value-of select="team[2]"/>
     </h2>
     <p>Played on <xsl:value-of select="date"/></p>
     <p>Result:
           <xsl:value-of select="team[1] "/>
           <xsl:value-of select="team[1]/@score"/>,
           <xsl:value-of select="team[2] "/>
           <xsl:value-of select="team[2]/@score"/>
     </p>
  </xsl:template>
  </xsl:transform>
```

A style sheet that computes team standings (part 1)

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

<xsl:variable name="teams" select="//team[not(.=preceding::team)]"/>
<xsl:variable name="matches" select="//match"/>

<xsl:template match="results">

<html><body>
  <h1>Results of Group <xsl:value-of select="@group"/></h1>

  <table cellpadding="5">
    <tr>
      <td>Team</td>
      <td>Played</td>
      <td>Won</td>
      <td>Drawn</td>
      <td>Lost</td>
      <td>For</td>
      <td>Against</td>
    </tr>
```

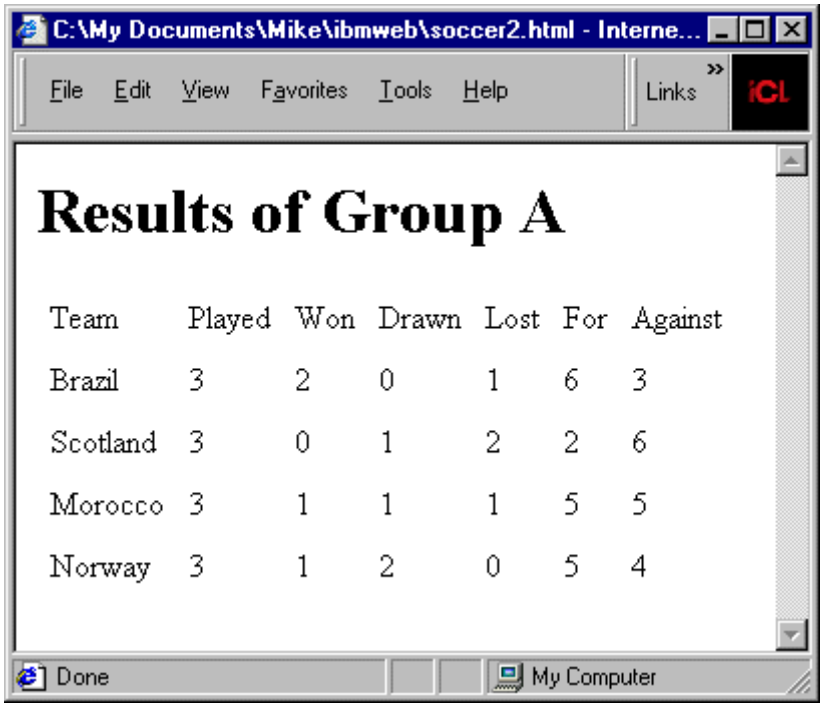
A style sheet that computes team standings (part 2)

```
  <xsl:for-each select="$teams">
        <xsl:variable name="this" select="."/>
        <xsl:variable name="played" select="count($matches[team=$this])"/>

        <xsl:variable name="won"
           select="count($matches[team[.=$this]/@score &gt; team[.!=$this]/@score])"/>
        <xsl:variable name="lost"
           select="count($matches[team[.=$this]/@score &lt; team[.!=$this]/@score])"/>
        <xsl:variable name="drawn"
           select="count($matches[team[.=$this]/@score = team[.!=$this]/@score])"/>
        <xsl:variable name="for"
           select="sum($matches/team[.=current()]/@score)"/>
        <xsl:variable name="against"
           select="sum($matches[team=current()]/team/@score) - $for"/>
        <tr>
        <td><xsl:value-of select="."/></td>
        <td><xsl:value-of select="$played"/></td>
        <td><xsl:value-of select="$won"/></td>
        <td><xsl:value-of select="$drawn"/></td>
        <td><xsl:value-of select="$lost"/></td>
        <td><xsl:value-of select="$for"/></td>
        <td><xsl:value-of select="$against"/></td>
        </tr>
    </xsl:for-each>
    </table>
  </body></html>
  </xsl:template>
  </xsl:transform>
```

A style sheet that computes team standings: result

- The data are rearranged and processed:



Explanations

<xsl:variable name="teams" select="//team[not(.=preceding::team)]"/>

create a global variable *teams* (node-set which has all team elements, the same element cannot be selected twice)

this node set is processed in the loop on the next page

<xsl:for-each select="$teams"> the dollar sign refers to variable teams

<xsl:variable name="this" select="."/> declare a local variable *this,* that gets the value of the current node

count($matches[team=$this])

counts the number of those matches for which it is true that the name of this team is in the element value

/@score > team[.!=$this]/@score

compare values of score attributes: has this team more (> >) scores than the other; != means NOT

XSL as a functional programming language: the factorial

```
<?xml version="1.0"?>
    <xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
<!-- Defining and Calling the Factorial Function in XSLT -->
    <!-- A separate file factorial-main.xml provides specific arguments -->
    <!-- call factorial on selected integer argument n -->
<xsl:template match="/arguments/a1">
<html>
    <head>
    <title>factorial(<xsl:value-of select="."/>)</title>
    </head>
    <body>
<xsl:call-template name="factorial">
    <xsl:with-param name="n" select="."/>
    </xsl:call-template>
    </body>
</html>
    </xsl:template>
```

XSL as a functional programming language: the factorial, cont.

```
<xsl:template name="factorial">
<xsl:param name="n"/>
<xsl:choose>
<xsl:when test="$n = 0">1</xsl:when>
<!-- factorial(0) = 1 -->
<xsl:when test="$n > 0"> <!-- factorial(n) = -->
<xsl:variable name="factor">
<xsl:call-template name="factorial">
<xsl:with-param name="n" select="$n - 1"/>
</xsl:call-template>
</xsl:variable>
<xsl:value-of select="$n * $factor"/> <!-- n*factorial(n-1) -->
</xsl:when>
</xsl:choose>
</xsl:template>
```