

Nov 9, 2011

Web Technologies Assignment 2

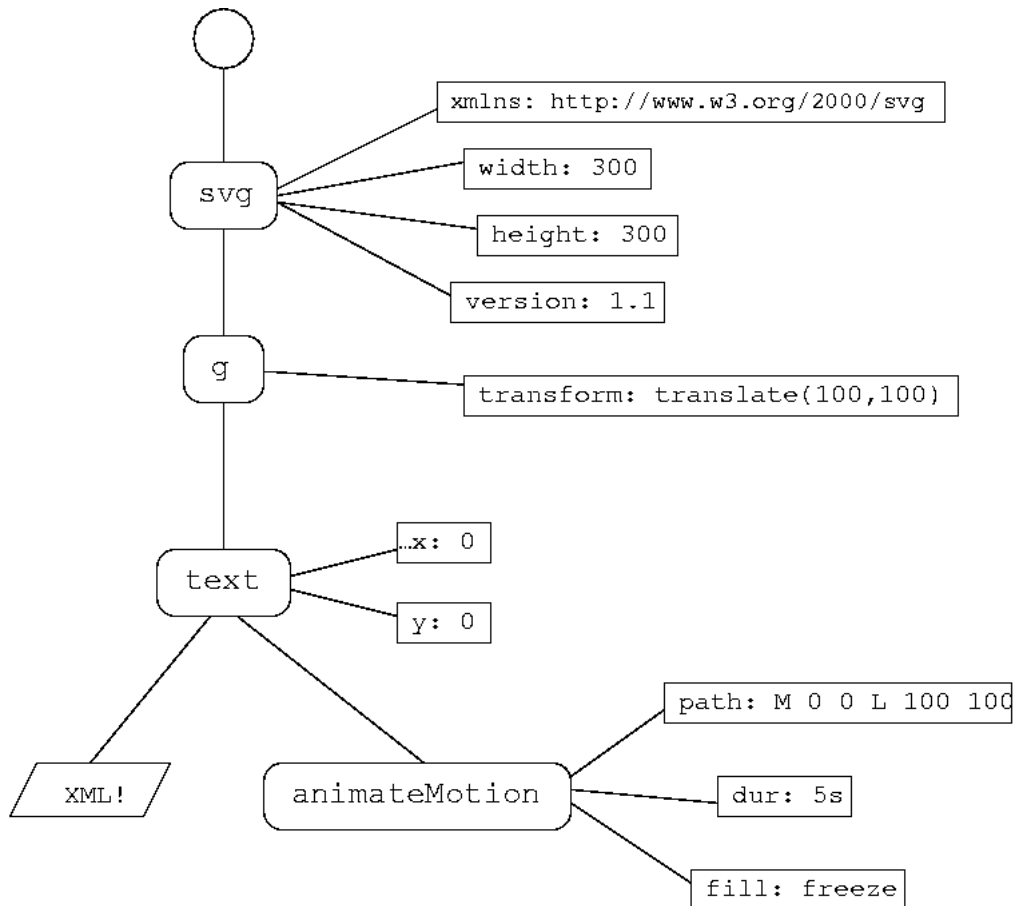
Please hand in your homework by email to pgiarrusso@informatik. The deadline for this assignment is Nov 14.

If at all possible, please bring your laptop to the following exercises.

G2.1 XML Trees

Do exercise 2.3 of IXWT:

1. What is the textual representation of the following XML tree?



2. Draw the tree corresponding to the following XML document.

```
<?xml version="1.0" encoding="iso-8859-1"?>  
<!DOCTYPE rss PUBLIC
```

```

    "-//Netscape Communications//DTD RSS 0.91//EN"
    "http://my.netscape.com/publish/formats/rss-0.91.dtd">
<rss version="0.91">
  <channel>
    <title>XML.com</title>
    <link>http://www.xml.com/</link>
    <description>XML.com features a rich mix [...]</description>
    <language>en-us</language>
    <item>
      <title>Normalizing XML, Part 2</title>
      <link>http://www.xml.com/pub/a/2002/12/04/normalizing.html</link>
      <description>In this second and final look [...]</description>
    </item>
    <item>
      <title>The .NET Schema Object Model</title>
      <link>http://www.xml.com/pub/a/2002/12/04/som.html</link>
      <description>Priya Lakshminarayanan describes in detail [...]</description>
    </item>
  </channel>
</rss>

```

G2.2 XML Well-Formedness

Do exercise 2.5 of IXWT, that is, check each of the following XML documents for well-formedness.

1. `<?xml version="1.0" encoding="UTF-8" ?>`

```

<bookshelf>
  <book>
    <title>Harry Potter & the Half-Blood Prince</title>
    <author>J.K. Rowling</author>
    <comments>
      The long-awaited, eagerly anticipated, arguably [...]
    </comments>
  </book>
  <book>
    <title>Kitchen Garden A to Z: Growing, Harvesting, Buying, Storing</title>
    <author>Mike McGrath</author>
    <author>Gordon Smith</author>
    <comments>
      Do you know which vegetables should never go in the [...]
    </comments>
  </book>
</bookshelf>

```

2. `<!—`

```

    Books on my upper bookshelf.
    J. Doe., April 2005
—>

```

```

<?xml version="1.0" encoding="UTF-8" ?>
<bookshelf>
  <book>
    <title>At the Tomb of the Inflatable Pig: Travels Through Paraguay</title>
    <author>John Gimlette</author>
  </book>
  <book>
    <title>An Embarrassment of Mangoes: A Caribbean Interlude</title>
    <author>Ann Vanderhoof</author>
  </book>

```

```

<book>
  <title>The South Beach Diet Cookbook</title>
  <author>Arthur S. Agatston</author>
</book>
</bookshelf>

```

3. `<?xml version="1.0" encoding="UTF-8"?>`

```

<BOOKSHELF>
  <BOOK>
    <TITLE>The Ultimate Weight Solution Cookbook: Recipes for Weight Loss Freedom</ti
    <AUTHOR>Phil McGraw</author>
    <COMMENTS>
      It took me 3 minutes to thumb thru the book and I
      exchanged it today for the latest Body For Life for Women.
    </comments>
  </book>
</bookshelf>

```

4. `<?xml version="1.0" encoding="UTF-8"?>`

```

<bookshelf>
  <book>
    <title>The New Basics: A-to-Z Baby & Child Care for the Modern Parent</title>
    <author>Michel Cohen</author>
    <comments>
      Some very odd advice , like in the section titled Washing he says [...]
      <p>
        The attempt at clever writing gets old, such as labeling the [...]
      <p>
        While many topics are covered lots of them don't really say [...]
      <p>
        The author's solution for colic is to "leave Lucy to cry in dim [...]
      <p>
        The book is disrespectful to any health professional who does [...]
      <p>
        The fact that the advice for many subjects is that "they will [...]
      <p>
        I'd pass on this one. [...]
    </comments>
  </book>
</bookshelf>

```

G2.3 XML Namespaces

Do exercise 2.8 of IXWT, that is, consider the following XML document.

```

<a:foo qux="A" xmlns:a="B" xmlns:b="C">
  <b:bar a:quux="D" xmlns="E" />
  <xmlns xmlns:a="F" xmlns="G">
    <baz a:corge="H" xmlns:baz="I" xmlns="" />
  </xmlns>
</a:foo>

```

1. Which namespaces do the elements foo, bar, and baz belong to?
2. Which namespaces do the attributes qux, quux, and corge belong to?

G2.4 XPath

XPath expressions are mainly used to select nodes of an XML document. There are various tools for experimenting with XPath expressions available, for instance XPath Explorer

<http://sourceforge.net/projects/xpe/files/xpe/20030304/xpe.jar/download>. Note, however, that some tools implement XPath 1.0 and thus never match elements in the default namespace, unlike XPath Explorer.

1. Consider the XML document from exercise G2.1, and assume the current context node is the first item node occurring. For all XPath axes, what are the corresponding node sequences?
2. Consider the Recipe XML document from the lecture or from IXWT <http://www.brics.dk/ixwt/examples/recipes.xml>, and assume the document's root node is the current context node. State XPath expressions selecting the following nodes:
 - (a) all names of ingredients
 - (b) all recipes using salt
 - (c) all complex ingredients, i.e. ingredients consisting of numerous ingredients themselves
 - (d) all recipes with more than 10 preparation steps
 - (e) all recipes containing milk and sugar
 - (f) the number of eggs being used in recipes that also use milk
3. Consider again the Recipe XML document, and apply to it the XPath expressions `//rcp:ingredient[1]` and `/descendant/rcp:ingredient[1]`. Do they produce the same result? Try explaining why in terms of their desugarings.

H2.1 XML for Library Management

1. Write an XML document consisting of the sample data you collected for exercise H1.2.
2. Extend your data model by adding a column “description” to libraries, which consists of an XHTML description. Add descriptions to your sample libraries, using namespaces to assure no name clashes can occur.
3. Assuming the root node is the current context node, write XPath expressions selecting the following nodes:
 - (a) the names of all libraries
 - (b) all libraries for Java, C or C++
 - (c) the names of all libraries with two or more developers
 - (d) the names of all developers which participated at one or more libraries
 - (e) the language and version of all libraries with exactly one developer
 - (f) the websites of all developers that worked alone on a library

H2.2 XML Database versus Relational Database

What is the relational database counterpart of our XML library collection? Draw the tables and relations necessary to model the XML document of the previous exercise in a relational database. Compare the two models.