

COMP7306, Hong Kong University
Lab Assignment: XML technologies

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Preliminary note

The assignment is voluntarily open-ended and may require you to check additional documentation. Be creative, take decisions as you think best. You do not need to complete all questions to have a passing grade. The assignment is graded out of 20 points.

Handing out the assignment

The assignment must be uploaded on the Moodle Web site as a `.zip` archive containing all source code files, in a way that facilitates as much as possible their assessment. Further instructions might be given by the teaching assistants.

Resources

The assignment requires the use of an XPath 1.0 processor, an XSLT 1.0 processor, an XQuery 1.0 processor, an XSLT 2.0 processor, and a server-side Web programming environment. We recommend, but do not restrict to, the use of the following tools:

- Saxon-HE¹ as an XPath, XSLT (1.0/2.0), XQuery processor.
 - To use Saxon-HE as an XPath processor, one possible way is to transform an XPath expression (say, `//A`) into the string `doc("document.xml")//A` and evaluate this string as an XQuery expression
 - To use Saxon-HE as an XQuery processor, the following command line can be used:

```
java -cp saxon9he.jar net.sf.saxon.Query query.xq
```

where `query.xq` is a file containing the XQuery query.
 - To use Saxon-HE as an XSLT processor, the following command line can be used:

```
java -cp saxon9he.jar net.sf.saxon.Transform -xsl:stylesheet.xml  
-s:document.xml
```

where `stylesheet.xml` is a file containing the XSLT stylesheet and `document.xml` is the XML document. (If `stylesheet.xml` is an XSLT 1.0 stylesheet, Saxon will display a warning message since it is an XSLT 2.0 processor, but this message can be safely ignored.)
- Apache + PHP5 (with its integrated XSLT module) as a Web programming environment.

¹<http://saxon.sourceforge.net/#F9.4HE>

European Royal Genealogy

Download from the course Web site the file containing genealogy data about European royal families. Carefully study this file to understand its structure.

1. Build and execute XPath queries that answer the following questions:
 - a) (0.5 point) How many individuals does the file describe?
 - b) (0.5 point) How many female individuals does the file describe?
 - c) (0.5 point) When did Louis XIV marry for the first time?
 - d) (0.5 point) Who is the mother of Louis XIV?
2. (3 points) Construct an XSLT 1.0 stylesheet that displays the list of all individuals' names, ordered in lexicographic order, as a text file with one name per line.
3. (5 points) Construct an XSLT 1.0 stylesheet that displays all information about a given individual (provided as a parameter of the stylesheet), as an HTML or XHTML page.
4. (2 points) Write an XQuery query that, given an individual, returns the list (as an XML file) of all his or her ancestors' names. *Hint*: one can use a recursive XQuery function.
5. (3 points) Construct an XSLT 1.0 stylesheet that displays as an HTML page the list of all individuals grouped by their *titles* (e.g., *Queen of England*, *Prince of Sweden*...).
6. (2 points) Construct an XSLT 2.0 stylesheet that displays as an HTML page the list of all individuals grouped by their *titles* (e.g., *Queen of England*, *Prince of Sweden*...).
7. (3 points) Using the XSLT stylesheets previously written, develop a basic interactive Web site that displays the genealogy data of a given individual chosen by selecting him or her in a list of links.