Introduction to Databases (winter term 2004/2005)

Assignment 11

RWTH Aachen: hand in on January 27, 2005 after the lecture
B-IT: hand in on January 27, 2005 during tutorial

For the RWTH students, we have updated the list on our web page with the number of points you have reached so far. Please check if there are any inconsistencies with your notes.

To plan the written examination on February 16, we would like you to register by the form linked from our home page. Those who already registered for the exam at the central examination office (e.g. the master students) do not have to register again.

Task 11.1 (RDF) (4 Points)
Model the following informally described knowledge by formulating appropriate RDF statements:

- We consider five music songs. The first three songs (We are the champions, Bohemian Rhapsody, Flash) are interpreted by Queen, the fourth song (Englishman in New York) by Sting and the last (Yesterday) by The Beatles.
- There are two ‘mini-samplers’. The first (with the name ‘Greatest Songs I’) contains the first, third and the last song (in that order). The second sampler (‘All Favourites’) contains the first, the second and the fourth song (in that order).
- The Sting song sounds similar to Yesterday. This is at least Joe Smith’s opinion.
- Joe Smith is 30 years old and lives in Aachen.
- His favourite songs are the first, the third and the last song.
- Freddy Mercury is the lead singer of Queen, Brian May is the guitarist.

To uniquely identify the resources in your statements, you can invent URIs of a common namespace (e.g. you could bind the namespace prefix i5 to the address http://www-i5.informatik.rwth-aachen.de/EBD04/MusicRDF).

a) Construct an RDF graph visualisation of your model.

b) Give an XML serialization of this graph (as presented in the lecture).

Task 11.2 (XQuery) (3 Points)
We consider an XML database that consists of the sample XML documents presented in the „XML Query Use Cases“ working draft by the W3C available at http://www.w3.org/TR/xquery-use-cases.

In this task we concentrate on the first Use Case (XMP), that deals with books, their names, authors, publishers, etc.

Express the following questions as XQuery expressions. To test your answers you can e.g. use the online demo of the Qizx/open implementation\(^1\), which also allows you to directly inspect and execute the Use Case queries from the W3C working draft (XMP-Q1 . . . XMP-Q12). These queries can serve as a good starting point for your solutions.

\(^1\)accessible at http://www.xmlmind.com:8080/xqdemo/xquery.html
a) List title, author(s) and publisher of all books published by Addison Wesley before 1995.

b) List all publishers (each publisher is listed once) with all titles of books they have published. Use the distinct-values function to realize this in XQuery.

c) List all publishers with their number of publications (use the function count). Present the result in the following form:

```xml
<result>
  <publisher name="..." noPublications="..."/>
</result>
```

d) List all books with their prices (as given in bib.xml) sorted by their titles in the following form

```xml
<res>
  <book title="..." price="..."/>
</res>
```

e) List all books with their title, authors, price, and source. Prices and their source are listed in the file prices.xml The result should have the following structure:

```xml
<result>
  <book>
    <title> ... </title>
    <author> first author </author>
    <author> second author </author>
    <price> ... </price>
    <source> ... </source>
  </book>
  <book> ... </book>
</result>
```

This means especially that a book may be listed multiple times if it is available at different sources.

On the XQuery home page of the W3C (http://www.w3.org/XML/Query) you find additional information (including some tutorials) about this query language.

**Task 11.3 (XSLT)**

(2 Points)

On our homepage you find a small sample XML document that contains contact information (name, address and telephone number) of persons and companies.

Write an XSLT stylesheet that transforms XML documents with that structure to a simple telephone list of only the given companies in the following format:

```xml
<TelephoneList>
  <entry>
    <name>BigBusiness</name>
    <tele>032 13242123</tele>
  </entry>
  <entry>
    <name>Small Business</name>
    <tele>0049 23789234</tele>
  </entry>
  ...
</TelephoneList>
```

To develop and test your stylesheet you can e.g. use the Home Edition of Altova’s XMLSpy.[2]

Again, you are invited to visit the W3C home page[3] to learn more about XSLT.

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2http://altova.com/download_spy_home.html
3http://www.w3.org/Style/XSL/