

Due on: Tuesday 30.05.2006 (in lecture (only definition type questions) & via email (coding type questions))

Exercise 2.1

- a) [4 points] How is namespace information represented in XPath data model? What are namespaces used for? Explain the concept of XML Namespaces.
- b) [5 points] Download **bookstore.xml** from the department webpage. Create four XPath expressions.
 - 1) Select every title in the document with the attribute "lang" set to *de*
 - 2) Select the last book element of the current node
 - 3) Select every node of the document
 - 4) Select all book elements under the books element that have **price** greater than 30.
- c) [4 points] Refer to the XPath lecture slides number 20/42. Can we query it in another way around? i.e. find out all the authors first then look at the book titles? Why or why not?

Exercise 2.2

- a) [2 points] Change all the **titles** from **bookstore.xml** that contain the word "XML" to the word "Extensible Markup Language" and the rest of the titles to uppercase.
- b) [2 points] Change all the **prices** from **bookstore.xml** that cost above 35.00 to 40.00.
- c) [5 points] Given the following Expressions and Results (see next page), generate the corresponding XML document.

[Hint: To run some of the Expressions in Exchanger, you might require to use XQuery by adding "xquery version '1.0';" as header of the xquery file (*.xq) and then your following Expression. Next execute XQuery in Exchanger.]

Expression	Result
count(/**)	7
count(/*@*)	6
count(//argument)	2
count(//class)	1
count(//function)	2
count(//description)	1
count(//return)	1
count(//text())	1
count(//function/return)	1
count(//function/argument)	2
count(//class/*)	3
count(//description/*)	0
//class/description	{"This class handles input"}
//@name	{"input", "text", "number"}
//@type	{"string", "int", "string"}
//return/@type	{"int"}
//argument/@type	{"string", "string"}
boolean(//function/@name)	true
boolean(//class/@name)	true

Exercise 2.3

- a) [4 points] Which namespace does each “title” and “year” elements associated with in the following xml document. Does it violate namespace constraints? Explain.

```
<?xml version="1.0"?>
<movies xmlns:xmllib="http://www.xmlmovielibrary.com/movies.dtd">
  <xmllib:title>Star Wars:Episode I-The Phantom
Menace</xmllib:title>
  <xmllib:year>1999</xmllib:year>
  <purchase xmlns:xmllib="http://www.othermovielib.com/movies.dtd">
    <xmllib:title>Star Wars:Episode II-Attack of the Clones
</xmllib:title>
    <xmllib:year>2002</xmllib:year>
  </purchase>
  <xmllib:title>Star Wars:Episode III-Revenge of the Sith
</xmllib:title>
  <xmllib:year>2005</xmllib:year>
</movies>
```

- b) [8 points] Download food.xml, recipe.dtd and ingredients.dtd from the department webpage.

Normally the prefixes defined in a XML document must match those in the corresponding DTD(s). Design a workaround solution that uses DTD techniques for this restriction. (i.e. allowing prefixes in the xml document to be different from the ones defined in the DTD) Modify the food.xml and the corresponding DTDs, in such a way that it can be flexible enough to allow different definitions of prefixes for the “ingredient” namespace (the prefixes “fd” is not hard-coded in the DTD). E.g. when using an other prefix say “fd1” instead of “fd”, we only have to make changes to the XML document without making changes to the DTD document(s).

Exercise 2.4

- a) [6 points] Given the following example xml document, design a suitable DTD -- as specific as possible in structure level, such that the document is valid w.r.t. the DTD.

```
<bank xmlns="http://www.cgnm.de/xml/bank.dtd"
xmlns:ac="http://www.cgnm.de/xml/account.dtd">
<ac:account account_num="_1">
  sin="123456789"
  name="Ben"
  city="Crazy Town">
<ac:accountType
  account_type="Checking"
  balance="100">
  <account_activity
    operation_type="W"
    amount="99"/>
</ac:accountType>
<ac:accountType
  account_type="Saving"
  balance="100"/>
</ac:account>
<ac:account
  account_num="_2"
  sin="234567801"
  name="Tony"
  city="City of Angel">
<ac:accountType
  account_type="Checking"
  balance="890">
  <ac:account_activity
    operation_type="D"
    amount="800"/>
</ac:accountType>
</ac:account>
</bank>
```