CS 6314, Fall 2017
Dr. Mithun Balakrishna
Homework 4
Due November 5th, 2017 11:59 pm

A. Submission Instructions:

- Submit your solutions via eLearning.
- Please submit a single zip file with the following files:
  - XML Schema file (Question 1)
  - XML file (Question 2.a)
  - HTML file(s) (Questions 2.b & 2.c). **Please create a separate HTML page(s) for this homework**
  - Source code and executable (Question 3)
  - A ReadMe file with instructions on how/where to access (for Questions 1 & 2) and run (for Question 3) the solutions
- Late Submission Penalty:
  - up to 2 hours late — 10% deduction
  - 2 - 4 hours late — 20% deduction
  - 4 - 12 hours late — 35% deduction
  - 12 - 24 hours late — 50% deduction
  - 24 - 48 hours late — 75% deduction
  - more than 48 hours late — 100% deduction (zero credit)

B. Problems:

1. XML Schema (40 points)

Create a XML Schema (i.e. XSD) to describe the structure of an XML document that can contain the following information:

1. Book Information:
   a. ~~Book Title: String datatype where first letter is a capital letter~~
   b. ~~Author Name: String datatype; Minimum 1~~
   c. ~~Book Publication Date: Date datatype~~
   d. ~~Cost: the value should be in the decimal format with a 'USD' currency type attribute~~
   e. Publisher Information: Reference to the defined "Publisher Information" XSD structure which is described next.
2. Publisher Information:
   i. ~~Publisher Name: String datatype where first letter of each word is a capital letter~~
   ii. Publisher Address: A sequence of the following elements:

1. ~~Street Name: String datatype of the following format: "Number Street_Name~~"
2. ~~City: String datatype where first letter is a capital letter~~
3. ~~Zip Code: Integer datatype with values from 11111 to 99999~~
4. ~~Country: String datatype where all letters are capital letters~~

Each of the above elements/attributes occurs only once unless otherwise specified. Each optional element occurs at most once.

Please use freely available online XML Schema validators such as:

www.utilities-online.info/xsdvalidation

*The page is to be created using a plain text editor such as WordPad, NotePad, Emacs, VI, etc. You **CANNOT** use any graphical XML Schema authoring software applications.*

2. XML Document Creation and Display (40 points)

a. **(10 points)** Using the XML Schema defined in Question 1, create a XML document containing information for twenty (20) books of your choice. Your XML should contain:
   i. ~~At least 5 different publishers~~
   ii. ~~At least 2 publishers from the same city~~
   iii. ~~At least 4 books from 3 different publishers with price more than 25 Dollars but less than 100 Dollars~~
   iv. ~~At least 10 books from 2 different publishers with release date after 2010~~

   ~~The XML Schema should be used to validate the information populated into the XML document~~

b. **(15 points)** ~~Display the all information contained in the XML document (created in Question 2.a) on a HTML page (in a tabular format) by traversing the XML DOM object using JavaScript~~

c. **(15 points)** Create XPath queries to display the following information contained in the XML document (created in Question 2.a) on a HTML page:
   i. ~~Total cost of all the books created by publishers from the same city~~
   ii. ~~Title, author names, and publication date of all books that cost more than 25 Dollars but less than 100 Dollars~~
   iii. ~~Name of authors that have published at least one book after 2010~~

3. XML to JSON (20 points)

Below is an XML file. Your task is to programmatically transform this particular type of XML structure into an equivalent JSON notation. Submit your source code and executable with instructions on how to run the program. Please note that your code will be tested on a XML with same structure but with different values.

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<chapter>
  <title>Chapter 1</title>
  <section>
    <title>Section 1</title>
    <paragraph number="1" page="24">
       <text>This is a sample text about everything good. </text>
       <glossterms OtherTerm="good"/>
       <glossterms OtherTerm="sample"/>
    </paragraph>
    <paragraph number="2" page="26">
       <text>This is a second sample text about everything good.
</text>
       <glossterms OtherTerm="second"/>
    </paragraph>
  </section>
  <section>
    <title>Section 2</title>
    <paragraph number="1" page="28">
       <text>This is a sample text about everything good. </text>
       <glossterms OtherTerm="good"/>
       <glossterms OtherTerm="sample"/>
    </paragraph>
    <paragraph number="2" page="28">
       <text>This is a second sample text about everything good.
</text>
       <glossterms OtherTerm="second"/>
    </paragraph>
  </section>
</chapter>
```