CS 6314, Spring 2016
Dr. Mithun Balakrishna
Homework 4
Due April 3rd, 2016 11:59 pm

A. Submission Instructions:

- Submit your solutions via eLearning.
- Please submit a single zip file with the following files:
  - XML Schema file
  - XML file
  - HTML file(s). **Please create a separate HTML page(s) for this homework**
  - JSON file
  - A ReadMe file with instructions on how to access the demo. Additionally, please indicate where in the demo, the TA can access the solution for a particular problem
- 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. Author Information:
   a. Author Name:
      i. Author Last Name: String datatype where first letter is a capital letter
      ii. Author Middle Initial: String datatype containing only one capital letter followed by a period
      iii. Author First Name: String datatype where first letter is a capital letter
   b. Author Date of Birth: Date datatype containing values from 01 January 1900 to 31st October 2015

   c. Author Highest Education: String datatype that can contain one of the following values: BA, BS, MS, MBA, or PHD
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. Suite Number (Optional): Integer datatype
         3. City: String datatype where first letter is a capital letter
         4. Zip Code: Integer datatype with values from 11111 to 99999
         5. Country: String datatype where all letters are capital letters
3. Book Information:
   a. Title: String datatype where first letter of each word is a capital letter and maximum size of 100 characters.
   b. ISBN: String datatype with the following pattern: xxx-xxx-xxxx where x is a number or letter
   c. Price: Decimal datatype with currency type attribute
   d. Publication Date: Date datatype
   e. Total Time in Circulation: Duration datatype
   f. Author Information (one or more): Reference to the previously defined “Author Information” XSD structure
   g. Publisher Information: Reference to the previously defined “Publisher Information” XSD structure

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

http://schneegans.de/sv/

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 (50 points)

a. **(10 points)** Using the XML Schema defined in Question 1, create a XML document containing information for five (5) books of your choice. 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. **(25 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 in the XML document

   ii. Total cost of all the books written by an author for a particular publisher

   iii. Name and book titles of all authors that have a MS or MBA

   iv. Book title, author name(s), and publisher name of all the books that cost less than $100

   v. Book title, author name(s), and publisher name of all the books that were published after 2010

3. XML to JSON (10 points)

Below is an XML file. Your task is to transform it into an equivalent JSON notation.

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<glossary>
  <title>example glossary</title>
  <GlossDiv>
    <title>S</title>
    <GlossList>
      <GlossEntry ID="SGML" SortAs="SGML">
        <GlossTerm>Standard Generalized Markup Language</GlossTerm>
        <Acronym>SGML</Acronym>
        <Abbrev>ISO 8879:1986</Abbrev>
        <GlossDef>
          <para>A meta-markup language, used to create markup
languages.</para>
          <GlossSeeAlso OtherTerm="GML"/>
          <GlossSeeAlso OtherTerm="XML"/>
        </GlossDef>
        <GlossSee OtherTerm="markup"/>
      </GlossEntry>
    </GlossList>
  </GlossDiv>
</glossary>
```