MET CS 751 – Web Services

Homework 1 (100 Points)

Q1. Define a *PurchaseOrder* schema with its own namespace as per the following requirements:

- **An *addressType* with the following elements in sequence:**
  - **name, company (optional), street, city, state, zipCode, country**
- **An *itemType***
  - **An optional *description* element**
  - **Required attributes *upc* (of the form XXX-DD) and *quantity***
- **An element *purchaseOrder* of type *purchaseOrderType* (explicit) containing the following elements in sequence:**
  - ***billTo***
  - ***order* with the following child element (unbounded)**
    - ***item***
  - **and the required attributes**
    - ***orderId* (numeric), *submitted* (date), *customerId* (numeric)**

Q2. Define an *Invoice* schema with its own namespace as per the following requirements:

- **Import the *PurchaseOrder* schema defined in Q1**
- **A *priceType* by imposing a restriction on the *decimal* type (from XML Schema definition)**
  - **Minimum inclusive value of 0.05**
  - **Maximum inclusive value of 100000**
- **An *itemType***
  - **Extend the purchase order's *itemType* with the following required attribute:**
    - ***unitPrice*, of type *priceType***
- **An element *invoice* of type *invoiceType* (explicit) containing the following elements in sequence:**
  - ***billTo***
  - ***order* with the following child element (unbounded)**
    - ***item***
  - ***tax, shipping, totalCost*** (all of them of type *priceType*)
  - **and the required attributes**
    - ***invoiceId* (numeric), *invoiceDate* (date), *orderId* (numeric), *customerId* (numeric)**

Q3. Write a program that reads a purchase order XML document and writes a corresponding invoice XML document. The input document should contain at least three items (5 units of the first item at $2 each, 10 units of the second item at $3 each, and 15 units of the third item at $4 each. Use 5% of the total for tax and $10 for shipping)

Sample Input:

```
<?xml version="1.0" encoding="utf-8"?>
<po:purchaseOrder
  xmlns:po="http://www.kalathur.com/po"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.kalathur.com/po
                      ./purchaseOrder2.xsd"
       orderId="555555" submitted="2013-01-23" customerId="1000">
  <billTo>
    <name>Suresh Kalathur</name>
    <company>Boston University</company>
    <street>808 Comm Ave</street>
    <city>Boston</city>
    <state>MA</state>
    <zipCode>02215</zipCode>
    <country>USA</country>
  </billTo>
  <order>
    <item upc="XYZ-01" quantity="5">
      <description>First Item</description>
    </item>
    <item upc="XYZ-02" quantity="10">
      <description>Second Item</description>
    </item>
    <item upc="XYZ-03" quantity="15">
      <description>Third Item</description>
    </item>
  </order>
</po:purchaseOrder>
```

Sample Output:

```
<?xml version="1.0" encoding="utf-8"?>
<inv:invoice
  xmlns:inv="http://www.kalathur.com/invoice"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.kalathur.com/invoice
                      ./invoice.xsd"
      invoiceId="123456" invoiceDate="2013-01-31"
      orderId="555555" customerId="1000">
  <billTo>
    <name>Suresh Kalathur</name>
    <company>Boston University</company>
    <street>808 Comm Ave</street>
    <city>Boston</city>
    <state>MA</state>
    <zipCode>02215</zipCode>
    <country>USA</country>
  </billTo>
  <order>
    <item upc="XYZ-01" quantity="5" unitPrice="2.00">
      <description>First Item</description>
    </item>
    <item upc="XYZ-02" quantity="10" unitPrice="3.00">
      <description>Second Item</description>
    </item>
    <item upc="XYZ-03" quantity="15" unitPrice="4.00">
      <description>Third Item</description>
    </item>
  </order>
  <tax>5.00</tax>
  <shipping>10.00</shipping>
  <totalCost>115.00</totalCost>
</inv:invoice>
```

Submission:

Zip your project and upload to the Assignments section before the due date.