

**CMPT-354 D1 Fall 2008**  
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**Solution Assignment 9**

Total marks: 150 (15 % of the assignments)  
Posted: November 21, 2008  
Due date: November 28, 2008

**Introduction**

This is a paper and pencil assignment on XML and XQuery. Please, submit a hard copy of your solution to the assignment drop box.

**Assignment 9.1**

Consider the following XML schema.

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleType name="stringtype">
    <xs:restriction base="xs:string"/>
  </xs:simpleType>
  <xs:simpleType name="inttype">
    <xs:restriction base="xs:positiveInteger"/>
  </xs:simpleType>
  <xs:simpleType name="dectype">
    <xs:restriction base="xs:decimal"/>
  </xs:simpleType>
  <xs:simpleType name="orderidtype">
    <xs:restriction base="xs:string">
      <xs:pattern value="[0-9]{6}"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="shiptotype">
    <xs:sequence>
      <xs:element name="name" type="stringtype"/>
      <xs:element name="address" type="stringtype"/>
      <xs:element name="city" type="stringtype"/>
      <xs:element name="country" type="stringtype"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="itemtype">
    <xs:sequence>
      <xs:element name="title" type="stringtype"/>
      <xs:element name="note" type="stringtype" minOccurs="0"/>
      <xs:element name="quantity" type="inttype"/>
      <xs:element name="price" type="dectype"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="shipordertype">
    <xs:sequence>
```

```

        <xs:element name="orderperson" type="stringtype"/>
        <xs:element name="shipto" type="shiptotype"/>
        <xs:element name="item" maxOccurs="unbounded"
            type="itemtype"/>
    </xs:sequence>
    <xs:attribute name="orderid" type="orderidtype" use="required"/>
</xs:complexType>
<xs:element name="shiporderDB">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="shiporder" maxOccurs="unbounded"
                type="shipordertype"/>
        </xs:sequence>
    </xs:complexType>
</xs:element>
</xs:schema>

```

Create a valid XML document with a "shiporderDB" root element and two "shiporder" elements. (50 marks)

We assume that the XML schema is stored in the file "shiporder.xsd" in the same directory as the XML document.

```

<?xml version="1.0" encoding="ISO-8859-1"?>
<shiporderDB
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="shiporder.xsd">
  <shiporder orderid="889923">
    <orderperson>John Smith</orderperson>
    <shipto>
      <name>Paul Larson</name>
      <address>1234 100th St.</address>
      <city>Surrey, BC</city>
      <country>Canada</country>
    </shipto>
    <item>
      <title>Database Systems: The Complete Book</title>
      <note>Second Edition</note>
      <quantity>1</quantity>
      <price>49.90</price>
    </item>
    <item>
      <title>Data Mining: Concepts and Techniques</title>
      <quantity>1</quantity>
      <price>59.90</price>
    </item>
  </shiporder>
  <shiporder orderid="712456">
    <orderperson>John Smith</orderperson>
    <shipto>
      <name>Christine Swartz</name>
      <address>777 Hastings St</address>
      <city>Vancouver, BC</city>
      <country>Canada</country>
    </shipto>
    <item>
      <title>The Kyte Runner</title>
      <note>Christmas sale</note>
      <quantity>1</quantity>
      <price>10.50</price>
    </item>
  </shiporder>
</shiporderDB>

```

```

    <item>
      <title>Hide your heart</title>
      <quantity>1</quantity>
      <price>9.90</price>
    </item>
  </shiporder>
</shiporderDB>

```

## Assignment 9.2

Consider an XML document “ShiporderDB.xml” that conforms to the above XML schema. Formulate the following queries on this XML document in XQuery. Where applicable, eliminate duplicate results. (100 marks)

- a) Find the items ordered in “Vancouver” with maximum price among these items, as a sequence of item elements. (25 marks)

```

let $items := doc("ShiporderDB.xml")/shiporderDB/shiporder
  [contains(shipto/city,'Vancouver')]/item
  $max := max($items/price)
for $i in doc("ShiporderDB.xml")/shiporderDB/shiporder
  [contains(shipto/city,'Vancouver')]/item
where $i/price = $max
return
  $i

```

- b) For all shiporders that contain an item that has “computer” in its title, produce a result element consisting of the orderid and the number of items. (25 marks)

```

for $s in doc("ShiporderDB.xml")/shiporderDB/shiporder
where some $i in $s/item satisfies contains($i/title,"computer")
return <result>
  {$s/@orderid}
  {count($s/item)}
</result>

```

- c) For all orderpersons who have shipped an order to the US, find the orderperson and the sequence of all items shipped. Include all information belonging to the same orderperson into one result element. (25 marks)

```

for $o in (distinct-values(doc("ShiporderDB.xml")
  /shiporderDB/shiporder[shipto/country = "US"]/orderperson))
return <result>
  {$o}
  {for $s in (doc("ShiporderDB.xml")/shiporderDB/shiporder/
    where $o/parent::shiporder = $s
    return $s/item}
  </result>

```

- d) Find all shiporders that contain an item that both has “Data” in the title and has a price of > \$50. (25 marks)

```

for $i1 in doc("ShiporderDB.xml")/shiporderDB/shiporder/item
  [contains(title,'Data')]
  $i2 in doc("ShiporderDB.xml")/shiporderDB/shiporder/item[price > 50.0]
where $i1 = $i2
return $i1/parent::shiporder

```