DEBREMARKOS INSTITUTE OF TECHNOLOGY
SCHOOL OF COMPUTING
XML DTD LAB EXCERCISES

Lab Session 2:

1. **Create an appropriate XML file based on the following DTD. In the place where multiple occurrence is allowed, write each element as maximum occurrence to 3 times.**

Product Catalog DTD ("catalog.dtd")

```
<!DOCTYPE CATALOG [

<!ENTITY AUTHOR "John Doe">
<!ENTITY COMPANY "JD Power Tools, Inc.">
<!ENTITY EMAIL "jd@jd-tools.com">

<!ELEMENT CATALOG (PRODUCT+)>

<!ELEMENT PRODUCT
(SPECIFICATIONS+,OPTIONS?,PRICE+,NOTES?)>
<!ATTLIST PRODUCT
NAME CDATA #IMPLIED
CATEGORY (HandTool|Table|Shop-Professional) "HandTool"
PARTNUM CDATA #IMPLIED
PLANT (Pittsburgh|Milwaukee|Chicago) "Chicago"
INVENTORY (InStock|Backordered|Discontinued) "InStock">

<!ELEMENT SPECIFICATIONS (#PCDATA)>
<!ATTLIST SPECIFICATIONS
WEIGHT CDATA #IMPLIED
POWER CDATA #IMPLIED>

<!ELEMENT OPTIONS (#PCDATA)>
<!ATTLIST OPTIONS
FINISH (Metal|Polished|Matte) "Matte"
ADAPTER (Included|Optional|NotApplicable) "Included"
CASE (HardShell|Soft|NotApplicable) "HardShell">

<!ELEMENT PRICE (#PCDATA)>
<!ATTLIST PRICE
MSRP CDATA #IMPLIED
WHOLESALE CDATA #IMPLIED
STREET CDATA #IMPLIED
SHIPPING CDATA #IMPLIED>

<!ELEMENT NOTES (#PCDATA)>
]>
```

ANSWER: SAMPLE XML

```
<CATALOG>
<PRODUCT NAME="SHOE" CATEGORY="HandTool" PLANT="Chicago"
INVENTORY="InStock">
<SPECIFICATIONS WEIGHT="245">Spec info.</SPECIFICATIONS>
<OPTIONS FINISH="Matte" ADAPTER="Included"
CASE="HardShell">&AUTHOR;</OPTIONS>
<PRICE>78.90</PRICE>
<NOTES>This is notes section</NOTES>
</PRODUCT>
</CATALOG>
```

Build a contact for yourself in the list based on the declarations in the following DTD. Once you have added a new contact, validate your XML document to insure that it is correct.

Contact DTD

```
<!ELEMENT contacts (contact*)>
<!ATTLIST contacts version CDATA #FIXED "1.0">
<!ATTLIST contacts source CDATA #IMPLIED>
<!ELEMENT contact (name, location, phone, knows,
description)>
<!ATTLIST contact person ID #REQUIRED>
<!ELEMENT name (first+, middle?, last)>
<!ELEMENT first (#PCDATA)>
<!ELEMENT middle (#PCDATA)>
<!ELEMENT last (#PCDATA)>
<!ELEMENT location (address | (latitude, longitude))*>
<!ELEMENT address (#PCDATA)>
<!ELEMENT latitude (#PCDATA)>
<!ELEMENT longitude (#PCDATA)>
<!ELEMENT phone (#PCDATA)>
<!ATTLIST phone kind (Home | Work | Cell | Fax) "Home">
<!ELEMENT knows EMPTY>
<!ELEMENT description (#PCDATA | em | strong | br)*>
<!ELEMENT em (#PCDATA)>
<!ELEMENT strong (#PCDATA)>
<!ELEMENT br EMPTY>
```

- Add a ***gender*** attribute declaration for the **<contact>** element. The attribute should allow two possible values: **male** and **female**. Make sure the attribute is required.

- Currently, each contact can have only one phone number. Modify the contact declaration so that each contact can have zero or more phone numbers. In addition, add declarations for **website** and **email** elements.

ANSWER: SAMPLE XML

```
<contacts source="example-source" version="1.0">
  <contact person="Mulusew">
      <name>
            <first>Wobetu</first>
            <middle>Shiferaw</middle>
            <last>Asmare</last>
      </name>
      <location>
          <address>Debre Markos</address>
      </location>
      <phone kind="Home">896546</phone>
      <knows/>
      <description>
           This is decription
            <em>This is em</em>
      </description>
  </contact>
</contacts>
```

1. An airline operates a set of flights. A flight has a flight number, an origin airport and a destination airport. All flights operate daily. When a passenger books a ticket, the airline registers their name, and assigns them a specific seat on a flight on a departure date. Assume all simple types are #PCDATA, except airports, which are either “BOS”, “SJU”, “SFO”, “JFK”, “DCA” or “MAD”. The DTD definition based on the above scenario is given below.

```
<?xml version="1.0" encoding="iso-8859-1"?>

<!ELEMENT flightlist (flight+)>
<!ELEMENT flight (passengers+)>
<!ATTLIST flight
  number #PCDATA origin
  ("BOS"|"SJU"|"SFO"|"JFK"|"DCA"|"MAD")
  dest
  ("BOS"|"SJU"|"SFO"|"JFK"|"DCA"|"MAD")>
<!ELEMENT passengers (passenger+)>
<!ATTLIST passengers date #PCDATA >
<!ELEMENT passenger EMPTY>
<!ATTLIST passenger name #PCDATA seat #PCDATA >
```

Then write an XML file that conforms to this DTD. Create 2 flights on 2 dates with 2 passengers per flight.

Answer: Sample valid XML

```
<?xml version="1.0" encoding="UTF-8"?>

<!DOCTYPE flightlist SYSTEM "flightlist.dtd">
<flightlist> <flight number="1" origin="BOS" dest="SJU">
<passengers date="20-12-2019"> <passenger name="Laura"
seat="1A"/> <passenger name="Anna" seat="1B"/>
</passengers>
<passengers date="20-12-2019"> <passenger name="Tatiana"
seat="1C"/> <passenger name="Candy" seat="1D"/>
</passengers>
</flight>

<flight number="1" origin="BOS" dest="SJU">
<passengers date="22-12-2019"> <passenger name="Laura"
seat="1A"/> <passenger name="Anna" seat="1B"/>
</passengers>
<passengers date="22-12-2019"> <passenger name="Tatiana"
seat="1C"/> <passenger name="Candy" seat="1D"/>
</passengers>
</flight>
</flightlist>
```