**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>

1. **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>