Assignment III

Due on Thursday, 18th July

In this assignment you are given an instance (XML) document for which you have to write an XML schema. The instance document can be found at http://www.cs.uoregon.edu/classes/cis399xml/assn/digitalcameras.xml

Part I [35 pts]

Write an XML schema document for the above document that contains data about cameras. After that insert a reference to your schema document in the instance document.

The following few paragraphs will describe the data in the instance document. You will find that a DTD is ill equipped to describe camera data strictly according to that description. Use XML schemas to make sure that an instance document conforms to the description below as closely as possible. When not mentioned explicitly, you are expected to assign a suitable data type (integer, date, or create custom data types) to an entity. (You may refer to the appended DTD)

**Camera Data Description:** The given instance document comes from a collection of XML documents maintained by a superstore for consumer products. This particular document contains data about digital cameras available at that store.

Each document contains information about one or more digital cameras. The digital cameras are usually found in aisle CE2 (Consumer Electronics: Aisle 2) but that is likely to change. The store also needs to keep track of any discounts currently being offered in the digital cameras section.

Each digital camera contains information about the manufacturer, model number and its store identification number. In addition information regarding the cameras price, image capture capabilities, lens, flash, image storage and external connectivity is also stored in the document.

A camera’s image capture information includes the number of image quality levels (1,2,3,...), possible image resolutions (2448x1632, 2136x1440, 1800x1200, 1224x816), aspect ratio (3:2), and the CCD sensor (MegaPixels, 4MP, 2MP, etc). (Notice that the DTD uses PCDATA for all the above data. Use schemas to better describe these data types that you see above)

A camera’s lens information on digital zoom ratio (2x, 3x), optical zoom (2x, 3x) and the focal length (35mm – 105mm). The digital and optical zoom information is optional. Some cameras may have digital and optical zoom, others might have only digital zoom or neither.

A camera’s flash mechanism might be internal or external. It may contain on or more flash modes (auto, on, red-eye or off). The document also maintains a flash range description (Wide: 0.5 - 3.2m (1.6 - 10.5ft); Tele: 0.5 - 2.3m (1.6 - 7.5ft)).

Each camera has a usable memory type (CompactFlash Type 1, Sony MemoryStick). This memory might be included with the camera or might have to be purchased separately. The camera adopts one of four compression methods (jpeg or jpg, gif or png).

Finally the interfaces for extracting images could be either serial or USB. These are usually included with the camera kit.

Part II [5 pts]

Rewrite the schema document making the Schema elements (complexType, simpleContent, etc) the default namespace. (Refer to the first 4 slides of the presentation on July 11th if you are facing problems.)
Turning in your work:
• You need to turn in hard copies (two for part I and one for part II) of your work in class on the last day of class.
• Make all four files available over the web.
• You may work in groups of up to 4 in this assignment.

Validating your Document: Since the XML Schemas were approved by the W3C very recently, even the latest browsers do not come with built-in Schema Validation support. Therefore in order to validate your document, you are encouraged to use the following online Schema validator.

http://www.w3.org/2001/03/webdata/xsv

In order to use the above validator, you need to make both the instance document and the schema document available on the web. Enter both the urls separated by a space in the submit box and click submit to view results. (If you are having trouble with the server, please let me know.)

As usual, look out for announcements regarding the homework on the class web page.
digitalcameras.dtd

<!ELEMENT digitalcameras (digicam)+>
<!ATTLIST digitalcameras
location (CE1|CE2|CE3) "CE2"
discountsAvailable (yes|no) "no">

<!ELEMENT digicam (price, image_capture, lens, flash, memory, externalconnections)>
<!ATTLIST digicam
make CDATA #REQUIRED
modelnum ID #REQUIRED
itemID ID #REQUIRED>

<!ELEMENT price #PCDATA>
Your Schema must restrict price to appear in the form $(INTEGER)

<!ELEMENT image_capture (resolution+, aspectratio, megapixels)>
<!ATTLIST image_capture
quality_levels CDATA>

<!ELEMENT resolution #PCDATA>
Your Schema must restrict resolution to appear in the form INTEGER x INTEGER
<!ELEMENT aspectratio #PCDATA>
Your Schema must restrict aspect ratio to appear in the form INTEGER:INTEGER
<!ELEMENT megapixels #PCDATA>
Your Schema must restrict megapixels to appear in the form (INTEGER) MP

<!ELEMENT lens (focal_length, digital_zoom?, optical_zoom?)>
Your Schema should provide for these elements to occur in any order.
<!ATTLIST lens focus_type (auto|manual)#REQUIRED>

<!ELEMENT focal_length #PCDATA>
Your Schema must restrict focal_length to appear in the form (INT)mm – (INT)mm
<!ELEMENT digital_zoom #PCDATA>
Your Schema must restrict digital_zoom and optical_zoom to appear in the form (INT)x
<!ELEMENT optical_zoom #PCDATA>

<!ELEMENT flash flash_range_description, flash_modes>
Your Schema should provide for these elements to occur in any order.
<!ATTLIST flash internal (yes|no) "yes”>

<!ELEMENT flash_modes mode+>
Your Schema must restrict flash_modes to one of the four possible values.
<!ELEMENT flash_range_desc #PCDATA>
Your Schema must restrict flash_range_desc to appear in the form
Wide: (float) – (float)m ((float) – (float)ft);
Tele: (float) – (float)m ((float) – (float)ft)
<!ELEMENT mode #PCDATA>

<!ELEMENT memory usable_memory_type>
<!ATTLIST memory
included (yes|no) “yes”
compression (jpeg|jpg|gif|png) “jpeg”>

<!ELEMENT usable_memory_type #PCDATA>

<!ELEMENT externalconnections EMPTY>
<!ATTLIST externalconnections
included (yes|no) "yes”
type (serial|usb) #REQUIRED>