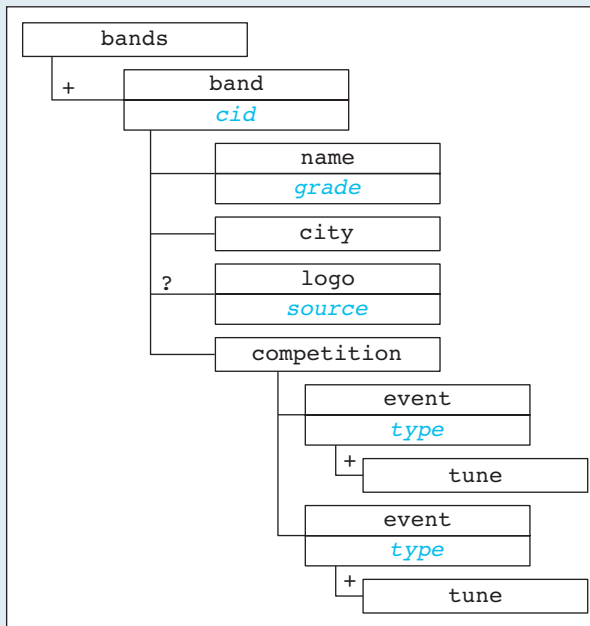2. In the photos.dtd file, declare the following elements:
   a. The **catalog** element, containing one or more **photo** elements
   b. The **photo** element, containing the following sequence of child elements—**name**, **description**, **date**, and (optionally) **images**
   c. The **name**, **description**, and **date** elements, containing only parsed character data
   d. The **images** element, containing one or more **img** elements
   e. The **img** element, containing empty content
3. Declare the following attributes in the DTD:
   a. The **type** attribute, a required attribute of the **catalog** element, containing a valid XML name (*Hint*: Use the NMTOKEN data type.)
   b. The **cid** attribute, a required ID attribute of the **photo** element
   c. The **donatedBy** attribute, an optional attribute of the **photo** element, containing character data
   d. The **metadata** attribute, a required attribute of the **name** element, containing a list of valid XML names (*Hint*: Use the NMTOKENS data type.)
   e. The **src** attribute, a required attribute of the **img** element, containing character data
4. Save your changes to the photos.dtd file.
5. In the photos.xml file, directly after the comment section, insert a DOCTYPE that references the system location photos.dtd.
6. Save your changes to the photos.xml file.
7. Verify that the photos.xml file is well formed, and then validate it. Revalidate after correcting each error in the code, if necessary, until the document passes validation. (*Hint*: Because this document uses an external DTD, you must correct any validation errors related to the DTD in the photos.dtd file.) Note that you cannot use http://validator.w3.org to validate an XML file against a nonpublic external DTD file, so you must use a program such as Exchanger to validate this file.

Case Problem 2

APPLY

Data File needed for this Case Problem: mdpbatxt.xml

Midwest Developmental Pipe Band Association   Jacob St. John works as a coordinator for the Midwest Developmental Pipe Band Association (MDPBA), and is responsible for coordinating competitions for the MDPBA's many developmental pipe bands in the midwestern United States. A pipe band is a musical group consisting of pipe players and drummers. Pipe bands are traditional in Great Britain, as well as in other parts of the world that have received British cultural influence. Part of Jacob's job is to maintain a document that lists competition entries for each pipe band. Jacob has asked for your help in creating XML documents that maintain a consistent document structure. He has created a sample document describing five pipe bands. The document lists the competition program for each pipe band. Each program includes exactly two events in which each band plays one or more tunes. One event type is a March, Strathspey, & Reel (MSR). The other event type is a Medley event. Figure 2-34 shows a tree diagram for the vocabulary.

| Figure 2-34 | Structure of the mdpba document |

The document also contains an optional `logo` element that stores information about graphic files of the pipe band logos. Any DTD you create for this document also must work with the unparsed data contained in these graphic files.

Complete the following:

1. Using your text editor, open **mdpbatxt.xml** from the xml02 ▸ case2 folder provided with your Data Files, enter *your name* and *today's date* in the comment section of the file, and then save the file as **mdpba.xml**.

2. Review the contents of the mdpba.xml file. Directly after the comment section, insert a DOCTYPE that includes DTD statements for the following elements:

    a. The **bands** element, containing at least one occurrence of the child element `band`

    b. The **band** element, containing child elements in the sequence `name`, `city`, `logo` (optional), and `competition`

    c. The **name** and **city** elements, containing parsed character data

    d. The **logo** element as an empty element

    e. The **competition** element, containing exactly two child elements named `event`

    f. The **event** element, containing at least one occurrence of the child element `tune`

    g. The **tune** element, containing parsed character data

3. Declare the following required attributes in the DTD:

    a. The **band** element should contain a single required attribute named **cid** containing an ID value.

    b. The **name** element should contain a required attribute named **grade** with values limited to **1**, **2**, **3**, **4**, **5**, **juvenile**, and **novice**.

    c. The **logo** element should contain a required entity attribute named **source**.

    d. The **event** element should contain a required attribute named **type** with values limited to **MSR** or **Medley**.

4. Declare a notation named **JPG** with a system location equal to **image/jpg**.

5. Create two unparsed entities within the internal subset to the DTD. Each entity should reference the **JPG** notation. The first entity should be named **celtic** and reference the celtic.jpg file. The second entity should be named **badger** and reference the badger.jpg file.

6. Save your changes to the mdpba.xml file.

7. Verify that the document is well formed and then validate it.