The University of the West Indies
COMP 6300 Advanced Internet Technologies, 2017/2018 Semester 2

Assignment 3 - XML Schemas

Due on: Monday 2nd April, 2017, 10:00 am

This assignment requires you to write XML Schemas for the following problem scenarios.

1) Suppose you are designing a new XML language that will be used to store information on library books and also on book loans. The information must be stored according to the following rules:
    - The entire collection of information must be held within an element called `library`.
    - The `library` element contains at least one (1) `book` element and possibly several `loan` elements. Individual `book` and `loan` elements may appear in any order.
    - A `book` element stores a book's title using a `title` element, and its author using an `author` element.
    - `book` elements have an attribute called `genre`, that can take one of the values "textbook", "novel", "report", or "dissertation".
    - `book` elements have a `callref` attribute that stores the book's unique library reference number. Library reference numbers begin with letters and continue with letters or numbers.
    - `loan` elements store the date on which a book was loaned in a `loandate` element and the date on which the book is due in a `duedate` element. The format for any date should be YYYY-MM-DD
    - `loan` elements have a `callref` attribute that stores the reference number of one of the `book` elements, corresponding to the book that was loaned.

Unless stated otherwise above, all elements and attributes are mandatory. Write an XML Schema document that can be used to enforce these rules. Treat all attributes as simply containing strings.

2) A company called VeriCard offers a credit card verification service that allows Internet-based companies to verify the authenticity of information supplied by online customers. The company uses an XML-based database to store information on all verification requests that are sent to them. The information is structured according to the rules given below. Write an XML Schema that would enforce the following rules:

- The root element is `verificationrequests`, and it contains zero or more `verificationrequest` elements.
- Each `verificationrequest` element has children elements called `transactionamount`, `cardinformation` and `ownerinformation` in that order.
- `transactionamount` represents the dollar value of the proposed credit card transaction.
- `cardinformation` has a child called `cardnumber`, as well as an attribute `cardtype`.
- `cardnumber` stores a 16-digit credit card number.
- `cardtype` can take one of the values “mastercard”, “visa”, or “discover”,
- `ownerinformation` has children elements `name` and `address`.
- `name` and `address` store strings.

3) A local community centre offers recreational courses listed in an online catalogue. The college uses an XML-based representation to store course-related information structured according to the rules given below. Write an XML Schema that would enforce the following rules:
   - The root element is `coursesOffered`, and it contains at least one or more `course` elements.
   - Each `course` element has one each of the following child elements `name`, `description`, `code`, `price` and `month` in that order.
   - `name` and `description` store strings.
   - `code` stores a 7-character course identifier as a string which must start with 3 uppercase letter characters followed by one numeric character that can be either 1, 2 or 3. The last three characters can be within the range 0 to 5 inclusive.
   - `price` can have a value of either 200 or 400.
   - `month` can have a value within the range 0 to 5 inclusive.
   - `course` has an attribute `type` which can take one of the values “pottery”, “music”, or “metal-smithing”

Submission Instructions

Submit your zipped solution files by the due date using the myElearning system. Please ensure your student ID is included at the top of all your submission files.