CSci 5131 Advanced Internet Programming (Spring 2009)
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Assignment 6: Building Web Services using Java, XML, and WSDL
Due Date: May 5, 2009
This assignment can done in a group of up to 2 students

Objective:

The goals of this assignment are to learn the following:
1. XML Schema Development
2. WSDL (Web Services Description Language)
3. Developing web services using Java and WSDL using the Axis framework
4. JDBC Connectivity

PART 1: (20 points)
In this part, you are asked to develop and XML schema to describe a book. The schema will have the following elements as described below:

Root element: with tag-name *book* with contents of *bookType*, as described below.

bookType will have the following sequence of elements, and attributes:
1. *title* - one element of type string
2. *author* - at least one or up to three elements of type authorType, as described below
3. *description* - zero or one element of type string
4. *isbn* - one element of type *isbnType,* as described below
5. *price* - one element of type priceType, as described below
6. *publisher* - one element of type string
7. *year* - zero or one element of type *yearType*, as described below
8. *edition* - zero or one element of type *editionNumber*, as described below
The *bookType* will have the following two optional attributes:
1. *id* - attribute of "ID" type
2. *cover* - attribute of *coverType*, described below

authorType will have the following sequence of elements, and attributes
   firstname - one element of type string
   lastname - one element of type string
   One optional attribute called *title* or *personTitle* type, as described below.

personTitle will be an enumeration of two strings: *Doctor* and *Professor*.

isbnType will be a subtype of string with 3 digits, followed by a dash(-), followed by 5 digits.

priceType will be a subtype of string, containing 1 to 3 digits, followed by a dot (.), and then followed by two digits, allowing price in the range 1.00 to 999.99.

yearType will be a subtype of integer, allowing years in the range 1900 to 2020, both included in the range.

editionNumber will be a subtype of integer, allowing numbers in the range 1 to 10, both included in the range.

coverType will be a an enumeration of two strings: *Hardcover* and *Paperback*.

You can use the following link to validate your schema:
   http://www.w3.org/2001/03/webdata/xsv

See these instance examples which should be validated by your schema.

PART 2 (80 points):

Problem Description
In this part of the assignment you will create a Java Web Service. Specifically, you will design a Book Web Service. It will store information about various books and provide a set of interfaces to obtain this information.
The service will store the following information about various books in MySQL database:
-   Title
-   ISBN
-   Author
-   Publisher
-   Price
-   Edition
-   Published Year.
-   ***All the above fields will be of type String.***

The service will provide the following interfaces:
-   String[ ] getBooks(String author)
-   String getISBN(String title)
-   String[ ] getAuthors(String title)
-   String getPublisher(String title)
-   String getEdition(String title)
-   String getPrice(String title)
-   String getPublicationYear(String title)

-    String getTitle(String isbn)
-    String[ ] getTitles(String[ ] isbn)
-   String [ ] getAuthors(String isbn)
-   String getPublisher(String isbn)
-   String getEdition(String isbn)
-   String getPrice(String isbn)
-   String getPublicationYear(String isbn)

Items to be implemented:

1. Book information:
    a. Please store the book information in a Mysql database table. Use the following format for the table.
        i.   Table Name: "BookTable"
        ii. Column Names: ISBN, Title, Author, Year, Price, Edition, Publisher, Description
        iii. Column Types: Char

2. Web Service: BookWebService.jws

3. Clients: You will implement two clients as detailed below.
    a. BookClient1.java:
        This client will use the model of "Dynamic Service Invocation". This means that you will have to use the "Service", and the "Call" objects to talk to the BookWebService

    b. BookClient2.java:
        This client will contact the BookWebService by using the service "stubs" for this purpose. You will have to generate the service stubs by using the WSDL2Java tool. Please check the provided Calculator example to see how to use this tool.

4. WSDL: BookWebService.wsdl

Steps:
- Download and install Tomcat
- Download and install Axis
- To install a web service on Tomcat, you will need to put the corresponding ".jws" file in the webapps directory of your Tomcat installation.