University of Patras

Computer Engineering & Informatics Department

Knowledge Representation in WEB

1st exercise

1. Using an XML Validator (e.g. Notepad ++), validate the XML file.
2. Add a new data type (simpleType) for element "Day" to the XML schema, to accept only the following values: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday.
3. Add a new data type (simpleType) for "Time" to the XML Schema to accept only string values of 11 characters and follow the pattern "2 digits, colon, 2 digits, dash, 2 digits, colon, 2 digits", such as: "15:30-18:00".
4. Make an appropriate change to the XML Schema so that each "Event" element can contain more than one, but less than ten "Lecture" elements.
5. Set an attribute in the XML Schema under "Lecture", called "Classroom" with type: string with less than 8 characters. This feature should be mandatory on each "Lecture" element.
6. Convert the inline declaration of the type of the elements "Event", "Lecture", "day", "time", "classroom" to global.
7. Transfer the statement of the "Event" element to be global and use the reference (ref) in the "Schedule" element in it.
8. Create three new types that derive from the type "eventType":

- The type "lessonType" is an extension of the type "eventType", adding the additional element "Professor".
- The type "SeminarType" is a restriction of the type "eventType" so as to contain only one "Lecture" element.
- The type "labType" is a restriction of the type "eventType" so that elements of this type do not contain the "classroom" attribute.

7. Define globally three elements "lesson", "Seminar" and "Lab" of type "lessonType", "seminarType" and "labType" respectively, in order to use (SubstituteGroup) where reference is made to an "Event" element.
8. Format the following queries in XPath:

   - What are the Titles of the courses (Lessons) held on Monday.

   - What courses are taught in classroom "BA".

   - Return the events (Lecture nodes) in which the professor is “Hatzilygeroudis”.

9. Create an XML Transform File (XSL) so that the test XML file appears as shown below. Specifically, a table should be displayed that contains all the lessons of the program

with the respective professor and the day it is taught. The results should be filtered based on the day they are taught and depending on it have a different color.

Schedule

Title	Professor	Day
Constraint Satisfaction Problems		Monday
Artificial Intelligence		Monday
AI Programming	Hatzilygeroudis	Monday
Artificial Intelligence	Hatzilygeroudis	Wednesday
Introduction to Procedural Programming	Hatzilygeroudis	Wednesday
Artificial Intelligence	Hatzilygeroudis	Thursday
Knowledge Representation in Web	Hatzilygeroudis	Friday

10. Develop a GUI application in JAVA, in which you load the xml file, and if it is valid based on the corresponding xml schema, you will present the contents in a table. The user will also be able to import new data (lectures) into the xml file. Finally, it can filter the data displayed in the table by choosing a day of the week.