National University of Sciences and Technology (NUST)
School of Electrical Engineering and Computer Science

Department of Computing

CS-344: Web Engineering

Class: BSCS-6AB

Lab 06: XML and DTD

Date: March 22, 2018

Time: 1000-1300 (BSCS-6B), 1400-1700 (BSCS-6A)

Instructor: Dr. Qaiser Riaz

Lab 06: XML and DTD

Introduction:
XML is a well-known model for data exchange and data representation. During lectures, students have learned basic concepts of XML syntax, building blocks of an XML document, document type definition etc. This lab will be focused on creating DTD and XML documents.

Lab Objectives:
The objective of this lab is to help students in creating XML documents and validating XML documents by defining document type definition. Students will use the theoretical concepts they have learned in the lectures to create XML documents.

Tools:

- Notepad++
- Dreamweaver
- Sublime
- Browser

Helping Material:
Lecture slides.

W3Schools: https://www.w3schools.com/xml/default.asp,
https://www.w3schools.com/xml/xml_dtd.asp

Lab Task

Task 1

Consider the following student database.

Students Information Table:

STID	Name	Phone	St. No	Street name	City	Prov.	Courses taken	Student Status	Degree
995435245	Ali	416-4245979	406	Main	Toronto	ON	1 3 4 5	Degree Student	BSc
995267842	Bob	613-5345660	12	Charles	Ottawa	ON	3 4 5	Special Student	
997458623	Carlos	905-2348638	5	King	Oshawa	ON		Special Student	
998112455	Fernando		101	Avenue	Montreal	QC	2 4 8 10	Degree Student	BEng
993457622	Jason	204-4562983	32	Main	Winnipeg	MB	1 2 3	Degree Student	BA
996112321	Jun	204-7893242	160	Pembina	Winnipeg	MB	5 7 10	Degree Student	BEng
995987345	Lee	647-9982342	35	Charles	Toronto	ON	3 4 7 9	Degree Student	BSc
997821345	Lueng		11	Yong	Toronto	ON		Degree Student	BSc
996453222	Mark	613-4561190	30	University	Ottawa	ON	1 5 6 7	Special Student	
997424563	Maria		11	Queen	Ottawa	ON	5	Special Student	
997345632	Nicolas	613-8932456	13	Cumberland	Ottawa	ON	9 10	Special Student	

Course Information Table:

ID	Course Name	Department	Allowable Student Status
1	Introduction to Databases	CS	Degree Student, Special Student
2	Numerical Methods	CS	Degree Student, Special Student
3	Operating Systems	CS	Degree Student
4	Computer Graphics	CS	Degree Student
5	Calculus Sci I	MAT	Special Student
6	Complex Variables	MAT	Degree Student, Special Student
7	Groups and Symmetry	MAT	Degree Student
8	Introduction to Economics	Economics	Degree Student, Special Student
9	Microeconomic Theory	Economics	Degree Student
10	Energy & Resources	Economics	Special Student

Question 1:

Define a DTD, *students.dtd*, for documents that list all courses offered, and then the courses taken by each student. The DTD should allow each registered student to take 0 or more courses. Phone numbers are optional. Also, only degree students have a degree attribute. A course may be taken by students whose status is degree, special or both. A student may be taking a course for

which he/she can't get credit (e.g., a special student taking a course for which only degree students get credit).

Question 2:
Provide an XML document, *students.xml*, which captures the information given in the tables above and is consistent with *students.dtd*.

Question 3:
Define a DTD that validates following XML document:

```
<?xml version="1.0" encoding="UTF-8"?>
<student>
        <firstName>Luca</firstName>
        <lastName>Rossi</lastName>
        <id>281283</id>
        <plan>
        <courses year="3">
                <course>
                        <name> Programmazione Orientata agli Oggetti </name>
                        <shortName>POO</shortName>
                        <record>
                                <grade>30</grade>
                                <date>13/06/11</date>
                        </record>
                </course>
                <course>
                        <name>Analisi e progettazione del software</name>
                        <shortName>APS</shortName>
                </course>
        </courses>
        </plan>
</student>
```

Question 4:
Define a DTD that validates following XML document:

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<email>
        <from> luca.rossi.917@gmail.com </from>
        <to> atzeni@dia.uniroma3.it </to>
        <content>
                Dear <person> Paolo </person>,
                here are some very hard exercises for the upcoming assignment of <course> web
                engineering </course>:
                <exercises>
                        <exercise>
                                <topic> DTD </topic>
                                <description> From Instance to DTD </description>
                        </exercise>
                        <exercise>
                                <topic> XPath </topic>
                                <description> Find students with average grade better than 26
                                </description>
                        </exercise>
                </exercises>
                Best Regards,
                <person> Luca </person>
        </content>
</email>
```

Deliverables

Compile a single word document by filling in the solution part and submit this Word file on LMS. You must include your name, ID, and class on first page. The lab grading policy is as follows: The lab is graded between 0 to 10 marks. For some of the labs, students have to present their solutions in a viva session. In case of any problems with submissions on LMS, you should contact your lab engineers: Mr. Ehsan Gul - ahsan.gul@seecs.edu.pk or Ms. Ayesha Asif ayesha.asif@seecs.edu.pk.