

XML Simplified

Module 3 – DTDs

Module 4 – XML Schema

Lab Guide for Lab2

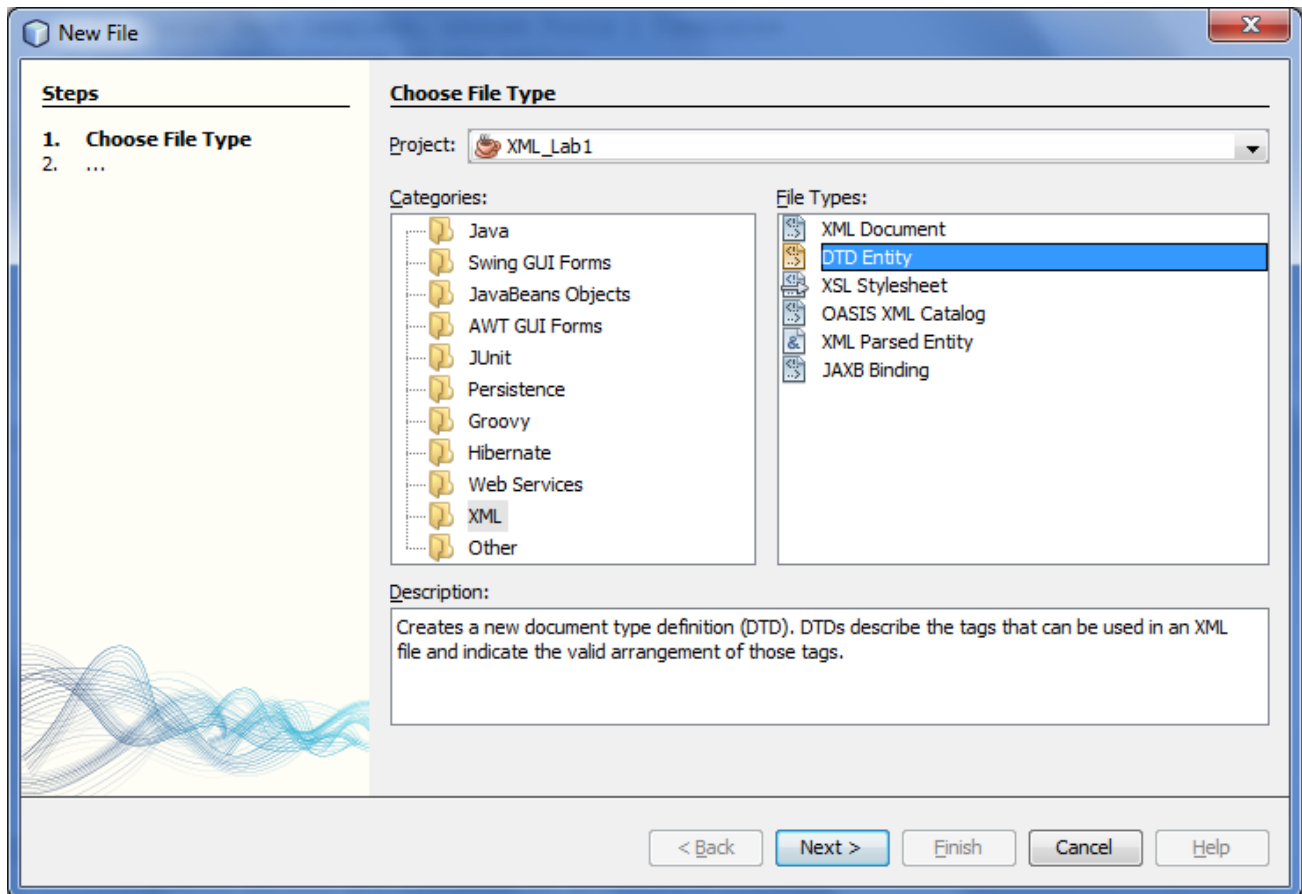
Session Objectives

In this session, you will be practicing with

- Create Internal DTD
- Create External DTD
- Create XML Schema

Part 1 – Getting started (30 minutes)

1. **Internal DTD:** Open NetBean (or another Editor for XML) and type the following code to create Internal DTD

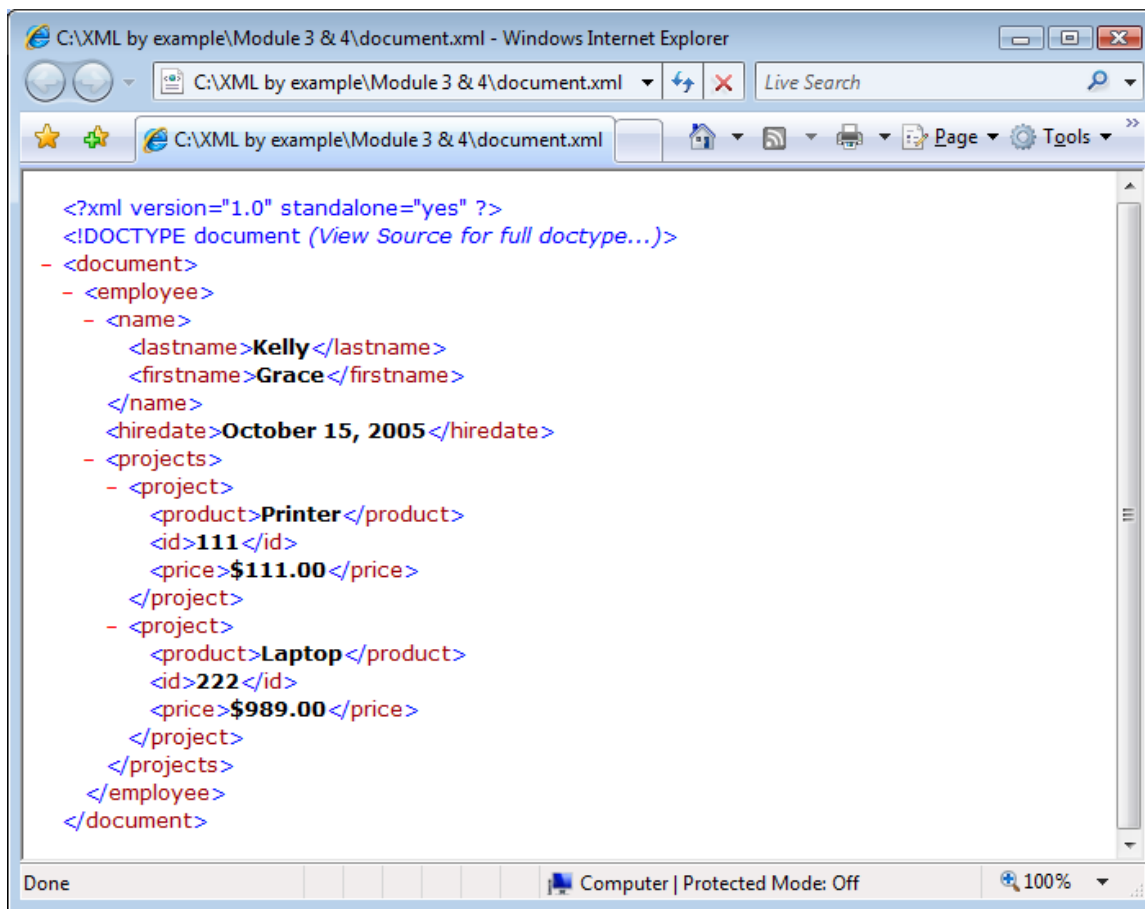


```

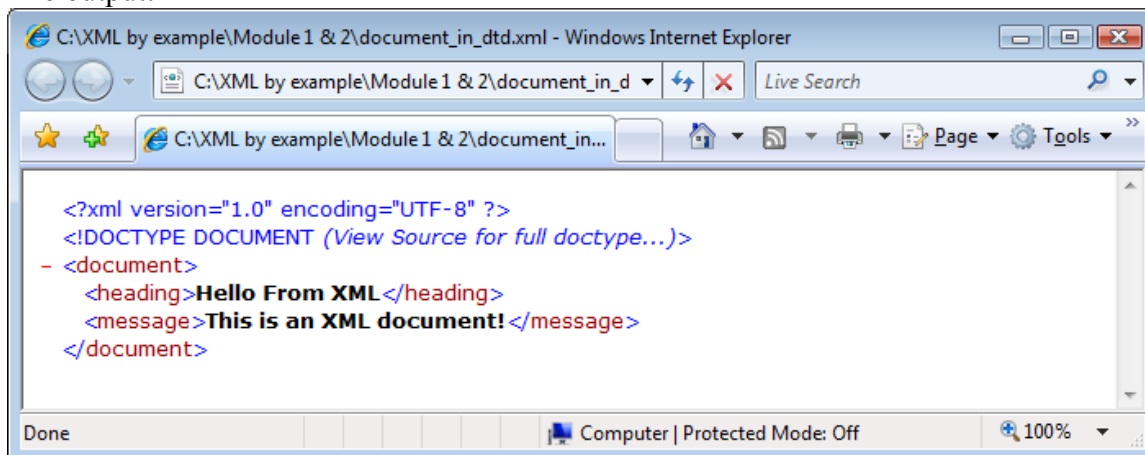
<?xml version = "1.0" standalone="yes"?>
<!DOCTYPE document [
<!ELEMENT document (employee)*>
<!ELEMENT employee (name, hiredate, projects)>
<!ELEMENT name (lastname, firstname)>
<!ELEMENT lastname (#PCDATA)>
<!ELEMENT firstname (#PCDATA)>
<!ELEMENT hiredate (#PCDATA)>
<!ELEMENT projects (project)*>
<!ELEMENT project (product,id,price)>
<!ELEMENT product (#PCDATA)>
<!ELEMENT id (#PCDATA)>
<!ELEMENT price (#PCDATA)>
]>
<document>
  <employee>
    <name>
      <lastname>Kelly</lastname>
      <firstname>Grace</firstname>
    </name>
    <hiredate>October 15, 2005</hiredate>
    <projects>
      <project>
        <product>Printer</product>
        <id>111</id>
        <price>$111.00</price>
      </project>
      <project>
        <product>Laptop</product>
        <id>222</id>
        <price>$989.00</price>
      </project>
    </projects>
  </employee>
</document>

```

Save the code as **document.xml** file and open it in the browser



The output:



You can use the +, *, and ? symbols in content model sequences. For example, here's how you might specify that there can be one or more `<name>` elements for an employee, an optional `<hiredate>` element, and any number of `<project>` elements.

Like this:

```

<?xml version = "1.0" standalone="yes"?>
<!DOCTYPE document [
<!ELEMENT document (employee)*>
<!ELEMENT employee (name+, hiredate?, projects*)>
<!ELEMENT name (lastname, firstname)>
<!ELEMENT lastname (#PCDATA)>
<!ELEMENT firstname (#PCDATA)>
<!ELEMENT hiredate (#PCDATA)>
<!ELEMENT projects (project)*>
<!ELEMENT project (product,id,price)>
<!ELEMENT product (#PCDATA)>
<!ELEMENT id (#PCDATA)>
<!ELEMENT price (#PCDATA)>
]>
<document>
  <employee>
    <name>
      <lastname>Kelly</lastname>
      <firstname>Grace</firstname>
    </name>
    <hiredate>October 15, 2005</hiredate>
    <projects>
      <project>
        <product>Printer</product>
        <id>111</id>
        <price>$111.00</price>
      </project>
      <project>
        <product>Laptop</product>
        <id>222</id>
        <price>$989.00</price>
      </project>
    </projects>
  </employee>
</document>

```

Save and open again in the browser

2. **External DTD:** Open NetBean (or another Editor for XML) and type the following code and save in turn **Book.xml** and **Book.dtd** files:

```

<?xml version="1.0"?>
<!DOCTYPE BOOK System "Book.dtd">
<BOOK>
  <OPENER>
    <TITLE_TEXT>
      All About Me
    </TITLE_TEXT>
  </OPENER>
  <PART ID="P01">
    <HEADER>Welcome To My Book</HEADER>
    <CHAPTER>
      <CHAPTER_NUMBER>CHAPTER 1</CHAPTER_NUMBER>
      <CHAPTER_TEXT>
        <p>&GLAD;</p>
        <p>There's so much to say!</p>
        <p>Where should we start?</p>
        <p>How about more about me?</p>
      </CHAPTER_TEXT>
    </CHAPTER>
  </PART>
</BOOK>

```

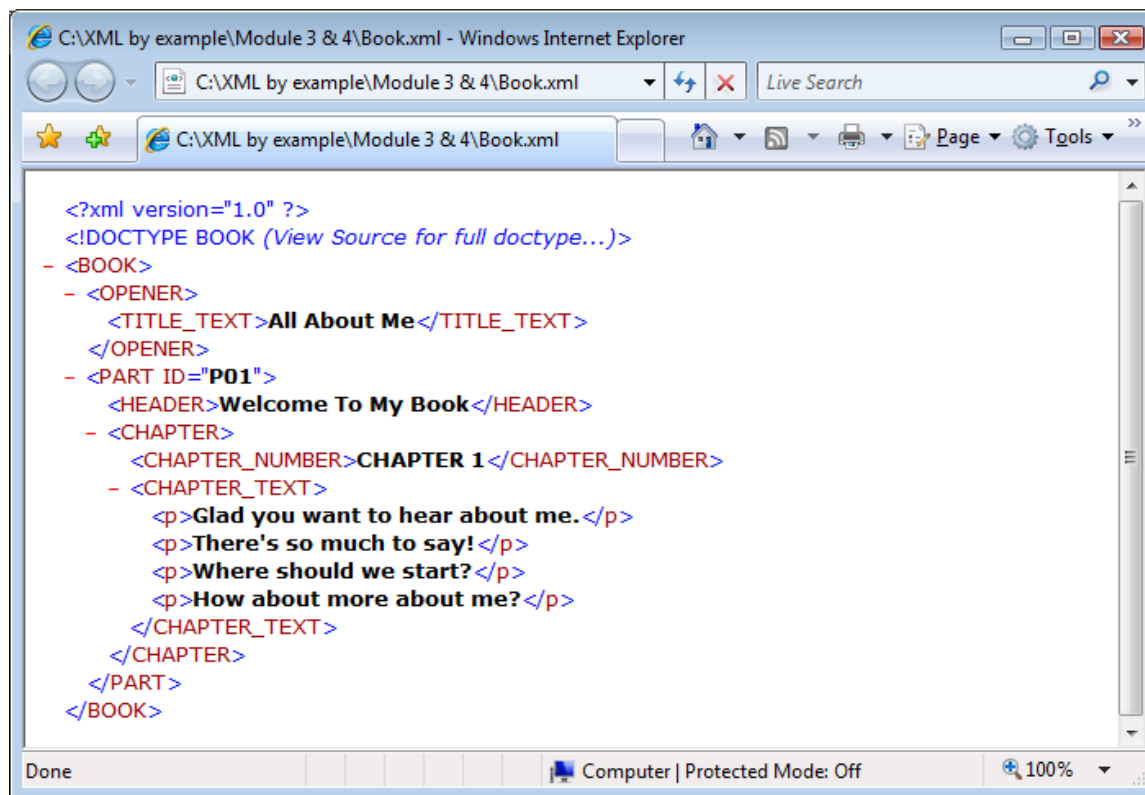
```

<!ELEMENT p (#PCDATA)>
  <!ELEMENT BOOK (OPENER, SUBTITLE?, INTRODUCTION?, (SECTION |
PART)+)>
  <!ELEMENT OPENER (TITLE_TEXT)*>
  <!ELEMENT TITLE_TEXT (#PCDATA)>
  <!ELEMENT SUBTITLE (#PCDATA)>
  <!ELEMENT INTRODUCTION (HEADER, p+)>
  <!ELEMENT PART (HEADER, CHAPTER+)>
  <!ELEMENT SECTION (HEADER, p+)>
  <!ELEMENT HEADER (#PCDATA)>
  <!ELEMENT CHAPTER (CHAPTER_NUMBER, CHAPTER_TEXT)>
  <!ELEMENT CHAPTER_NUMBER (#PCDATA)>
  <!ELEMENT CHAPTER_TEXT (p)+>
  <!ATTLIST PART ID CDATA #REQUIRED>
  <!ENTITY GLAD "Glad you want to hear about me.">

```

Open **Book.xml** file in the browser

The output:



3. XML Schema:

Copy and save the following codes as in turn **CustomerDocument.xml** and **CustomerDocument.xsd** files:

```
<?xml version="1.0" encoding="UTF-8"?>
<document xmlns="http://xmlpowercorp"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://xmlpowercorp CustomerDocument.xsd"
  documentDate="2005-03-02">
  <comment>Good risk</comment>
  <mortgagee phone="888.555.1234">
    <name>James Blandings</name>
    <location>1234 299th St</location>
    <city>New York</city>
    <state>NY</state>
  </mortgagee>
  <mortgages>
    <mortgage loanNumber="66 7777 88">
      <property>The Hackett Place</property>
      <date>2005-03-01</date>
      <loanAmount>80000</loanAmount>
      <term>15</term>
    </mortgage>
    <mortgage loanNumber="11 8888 22">
      <property>123 Acorn Drive</property>
      <date>2005-03-01</date>
      <loanAmount>90000</loanAmount>
      <term>15</term>
    </mortgage>
    <mortgage loanNumber="33 4444 11">
      <property>99 West Pocusset St</property>
      <date>2005-03-02</date>
      <loanAmount>100000</loanAmount>
      <term>30</term>
    </mortgage>
    <mortgage loanNumber="55 3333 88">
      <property>19 Johnson Place</property>
      <date>2005-03-02</date>
      <loanAmount>110000</loanAmount>
      <term>30</term>
    </mortgage>
    <mortgage loanNumber="22 6666 99">
      <property>345 Notingham Court</property>
      <date>2005-03-02</date>
      <loanAmount>120000</loanAmount>
      <term>30</term>
    </mortgage>
  </mortgages>
  <bank phone="888.555.8888">
    <name>XML Bank</name>
    <location>12 Schema Place</location>
    <city>New York</city>
    <state>NY</state>
  </bank>
</document>
```

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://xmlpowercorp"
xmlns="http://xmlpowercorp"
elementFormDefault="qualified">
  <xsd:annotation>
    <xsd:documentation>
      Mortgage record XML schema.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:element name="document" type="documentType"/>
  <xsd:complexType name="documentType">
    <xsd:sequence>
      <xsd:element ref="comment" minOccurs="1"/>
      <xsd:element name="mortgagee" type="recordType"/>
      <xsd:element name="mortgages" type="mortgagesType"/>
      <xsd:element name="bank" type="recordType"/>
    </xsd:sequence>
    <xsd:attribute name="documentDate" type="xsd:date"/>
  </xsd:complexType>
  <xsd:complexType name="recordType">
    <xsd:sequence>
      <xsd:element name="name" type="xsd:string"/>
      <xsd:element name="location" type="xsd:string"/>
      <xsd:element name="city" type="xsd:string"/>
      <xsd:element name="state" type="xsd:string"/>
    </xsd:sequence>
    <xsd:attribute name="phone" type="xsd:string"
      use="optional"/>
  </xsd:complexType>
  <xsd:complexType name="mortgagesType">
    <xsd:sequence>
      <xsd:element name="mortgage" minOccurs="1" maxOccurs="8">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="property" type="xsd:string"/>
            <xsd:element name="date" type="xsd:date"
              minOccurs="0"/>
            <xsd:element name="loanAmount"
              type="xsd:decimal"/>
            <xsd:element name="term">
              <xsd:simpleType>
                <xsd:restriction base="xsd:integer">
                  <xsd:maxInclusive value="30"/>
                </xsd:restriction>
              </xsd:simpleType>
            </xsd:element>
          </xsd:sequence>
          <xsd:attribute name="loanNumber"
            type="loanNumberType"/>
        </xsd:complexType>
      </xsd:element>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:simpleType name="loanNumberType">
    <xsd:restriction base="xsd:string">
      <xsd:pattern value="\d{2} \d{4} \d{2}"/>
    </xsd:restriction>
  </xsd:simpleType>

```


You can use Netbeans tool to validate xml or using the following javascript:

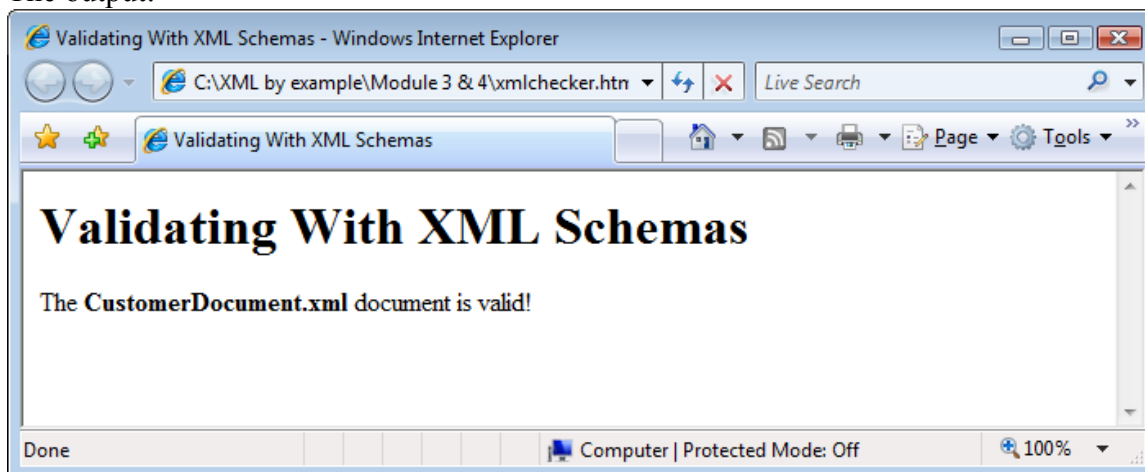
Use XML validators or the code below to valid the **CustomerDocument.xml** file

```
<HTML>
  <HEAD>
    <TITLE>
      Validating With XML Schemas
    </TITLE>
    <SCRIPT LANGUAGE="JavaScript">
      document.write("<H1>Validating With XML Schemas</
H1>");
      var parser = new
ActiveXObject("MSXML2.DOMDocument.4.0");
      parser.validateOnParse = true;

      if (parser.load("CustomerDocument.xml")) {
        document.write("The <b>CustomerDocument.xml<b>
document is valid!");
      } else {
        if (parser.parseError.errorCode != 0) {
          document.write(parser.parseError.reason);
        }
      }
    </SCRIPT>
  </HEAD>

  <BODY></BODY>
</HTML>
```

The output:



Part 2 – Workshops (30 minutes)

- Quickly look at Module 3 and Module 4's workshops to view the basic steps creating DTD Entity and Schema document.
- Try to create and the validation of XML document in another Editor, such as Macromedia Dreamweaver. Discuss with your class-mate and your instructor if needed.

Part 3 – Lab Assignment (60 minutes)

Do the assignment for Module 3 and 4 carefully. Discuss with your class-mates and your instructor if needed. See ACT_ASSGN_XML_03.pdf and ACT_ASSGN_XML_04.pdf file.

Part 4 – Do it your self

Create the schema for the following file:

```
<FPTAptech>
<Student Sex="Female">
  <Name>
    <FName>Dinh</FName>
    <LName>Anh</LName>
  </Name>
  <Age>18</Age>
</Student>
<Student Sex="Female">
  <Name>
    <FName>Phan</FName>
    <LName>Tu</LName>
  </Name>
  <Age>22</Age>
</Student>
<Student Sex="Male">
  <Name>
    <FName>Kiet</FName>
    <LName>Do</LName>
  </Name>
  <Age>15</Age>
</Student>
</FPTAptech>
```

Requirments:

- FPTAptech element contains unlimit number of Student elements
- Sex: must be Male or female
- Age must be greate than 14