ITA LAB 2

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1. For the below XML file create a DTD and XSD file.

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

<emails>
<email>
 <to>Vimal</to>
 <from>Sonoo</from>
 <heading>Hello</heading>
 <body>Hello brother, how are you!</body>
</email>
<email>
 <to>Peter</to>
 <from>Jack</from>
 <heading>Birth day wish</heading>
 <body>Happy birth day Tom!</body>
</email>
</emails>
```

DTD:

```xml
<?xml encoding="UTF-8"?>
<!ELEMENT emails (email*)>
<!ELEMENT email (to,from,heading,body)>
<!ELEMENT to (#PCDATA)>
<!ELEMENT from (#PCDATA)>
<!ELEMENT heading (#PCDATA)>
<!ELEMENT body (#PCDATA)>
```

XSD

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="emails">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="email" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="to" type="xs:string" />
              <xs:element name="from" type="xs:string" />
              <xs:element name="heading" type="xs:string" />
              <xs:element name="body" type="xs:string" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

2. For the below XML file create a DTD and XSD file.
   - In the example below the book category should be cooking, children or web and if not then by default it should be general.
   - The book id should be unique.
   - The user can enter at the max 100 books.
   - The first letter of the author should be in capital.
   - The year of publication shouldn't be less than 1900.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<bookstore>
 <book category="COOKING" id = "b1">
   <title lang="en">Everyday Italian</title>
   <author>Giada De Laurentiis</author>
   <year>2005</year>
   <price>30.00</price>
 </book>
 <book category="CHILDREN" id= "b2">
   <title lang="en">Harry Potter</title>
   <author>J K. Rowling</author>
   <year>2005</year>
   <price>29.99</price>
 </book>
 <book category="WEB " id = "b3">
```

```xml
   <title lang="en">Learning XML</title>
   <author>Erik T. Ray</author>
   <year>2003</year>
   <price>39.95</price>
 </book>
</bookstore>
```

DTD:

```
<!ELEMENT bookstore (book)*>
<!ELEMENT book (title,author,year,price)>
<!ATTLIST book category (COOKING|CHILDREN|WEB) "GENERAL">
<!ATTLIST book id ID #REQUIRED>
<!ELEMENT title (#PCDATA)>
<!ATTLIST title lang NMTOKEN #REQUIRED>
<!ELEMENT author (#PCDATA)>
<!ELEMENT year (#PCDATA)>
<!ELEMENT price (#PCDATA)>
```

XSD:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="bookstore">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="book" maxOccurs="100">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="title">
                <xs:complexType>
                  <xs:simpleContent>
                    <xs:extension base="xs:string">
                      <xs:attribute name="lang" use="required" />
                    </xs:extension>
                  </xs:simpleContent>
                </xs:complexType>
              </xs:element>
              <xs:element name="author">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:pattern value="[A-Z].*" />
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="year">
                <xs:simpleType>
                  <xs:restriction base="xs:integer">
                    <xs:minInclusive value="1900" />
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="price" type="xs:float" />
            </xs:sequence>
            <xs:attribute default="GENERAL" name="category" type="cat" />
            <xs:attribute name="id" type="xs:ID" />
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

  <xs:simpleType name="cat">
    <xs:restriction base="xs:string">
      <xs:enumeration value="COOKING" />
```

```xml
            <xs:enumeration value="CHILDREN" />
            <xs:enumeration value="WEB" />
            <xs:enumeration value="GENERAL" />
        </xs:restriction>
    </xs:simpleType>
</xs:schema>
```