

## Ex no. 10

## XML DATABASE AND ITS VALIDATION USING XML SCHEMA

### Aim:

To create an XML database to store structured data and validate it using an XML Schema (XSD) to ensure the correctness and structure of the data.

### Explanation:

- XML (Extensible Markup Language):  
A language used to store and share data. It is easy for both humans and computers to read.
- XML Database:  
An XML file that holds data using tags. It works like a simple database and is used for sharing or saving structured data.
- XML Schema (XSD):  
A file that defines the correct format and rules for an XML file. It checks if the data in the XML is correct.
- Validation Process:  
Validation means checking the XML file using the XSD to make sure the data follows the rules.

### Step 1: Create an XML Database

File name: students.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<students xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="students.xsd">
  <student>
    <id>101</id>
    <name>Alice</name>
    <course>Computer Science</course>
    <age>20</age>
  </student>
  <student>
```

```
<id>102</id>

<name>Bob</name>

<course>Information Technology</course>

<age>22</age>

</student>

</students>
```

## Step 2: Create the XML Schema

File name: students.xsd

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

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:element name="students">

    <xs:complexType>

      <xs:sequence>

        <xs:element name="student" maxOccurs="unbounded">

          <xs:complexType>

            <xs:sequence>

              <xs:element name="id" type="xs:integer"/>

              <xs:element name="name" type="xs:string"/>

              <xs:element name="course" type="xs:string"/>

              <xs:element name="age" type="xs:integer"/>

            </xs:sequence>

          </xs:complexType>

        </xs:element>

      </xs:sequence>

    </xs:complexType>

  </xs:element>

</xs:schema>
```

### **Step 3: Validation**

- The XML file (students.xml) includes a reference to the XML Schema (students.xsd) using the xsi: noNamespaceSchemaLocation attribute.
- An XML validator (such as an IDE like VS Code, online XML validator, or code using parsers like Python's lxml) is used.
- During validation, the XML parser checks whether the XML elements, order, and data types match those specified in the XSD.

#### **How to Use an XML Validator:**

1. Online Validator:
  - Go to a site like <https://www.freeformatter.com/xml-validator-xsd.html>.
  - Paste or upload your XML file.
  - Upload the corresponding XSD file.
  - Click "Validate."
  - See the result.

#### **Result:**

The XML file was successfully validated against the XML Schema. Validation result: The XML database is valid as per the XML Schema.