#### **Web Stack Development LAB-5**

#### **1. Purpose and Overview**

The goal of this case study is to transform XML data related to ( Blood Donation Management system) into an HTML format using XSL, making it more accessible and user-friendly for display on a website. Additionally, the transformed data must be validated against an XML Schema Definition (XSD) to ensure it adheres to predefined rules and constraints.

#### **2. XML Data Structure**

The XML data structure for the Blood Donation Management system includes elements like donor information, blood type, donation date, and location. Below is an example structure:

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| --- |
| <BloodDonations>  <Donation>  <DonorID>101</DonorID>  <DonorName>John Doe</DonorName>  <BloodType>A+</BloodType>  <DonationDate>2024-08-12</DonationDate>  <Location>New York</Location>  </Donation>  <!-- Additional Donation Entries -->  </BloodDonations> |

#### **3. XSL Stylesheet (transform.xsl)**

The XSL stylesheet transforms the XML data into HTML.

|  |
| --- |
| <?xml version="1.0" encoding="UTF-8"?>  <xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">  <xsl:template match="/">  <html>  <head>  <title>Blood Donations</title>  </head>  <body>  <h1>Blood Donation Records</h1>  <table border="1">  <tr>  <th>Donor ID</th>  <th>Donor Name</th>  <th>Blood Type</th>  <th>Donation Date</th>  <th>Location</th>  </tr>  <xsl:for-each select="BloodDonations/Donation">  <tr>  <td><xsl:value-of select="DonorID"/></td>  <td><xsl:value-of select="DonorName"/></td>  <td><xsl:value-of select="BloodType"/></td>  <td><xsl:value-of select="DonationDate"/></td>  <td><xsl:value-of select="Location"/></td>  </tr>  </xsl:for-each>  </table>  </body>  </html>  </xsl:template>  </xsl:stylesheet> |

#### **4. XML Schema Definition (XSD)**

The XSD defines the structure and data types for the XML document.

|  |
| --- |
| <?xml version="1.0" encoding="UTF-8"?>  <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">  <xs:element name="BloodDonations">  <xs:complexType>  <xs:sequence>  <xs:element name="Donation" maxOccurs="unbounded">  <xs:complexType>  <xs:sequence>  <xs:element name="DonorID" type="xs:int"/>  <xs:element name="DonorName" type="xs:string"/>  <xs:element name="BloodType" type="xs:string"/>  <xs:element name="DonationDate" type="xs:date"/>  <xs:element name="Location" type="xs:string"/>  </xs:sequence>  </xs:complexType>  </xs:element>  </xs:sequence>  </xs:complexType>  </xs:element>  </xs:schema> |

#### **5. Transformation and Validation Process**

* **Transformation**: The XML data is transformed into HTML using the transform.xsl stylesheet. This can be done using an XSLT processor such as Saxon or a script in languages like Python or Java.
* **Validation**: The original XML file is validated against the schema.xsd using an XML validator. If any elements or attributes in the XML file do not adhere to the schema rules, validation errors will be reported.

#### **6. Testing Scenarios**

* **Valid Data**: An XML file that conforms to the XSD schema rules should successfully transform into HTML without any issues.
* **Invalid Data**: For instance, entering a non-numeric value in the DonorID field or an incorrect date format in DonationDate will trigger validation errors.

#### **7. Errors and Issues Encountered**

During validation, any discrepancies between the XML file and the XSD schema will be reported. Common issues include:

* **Type Mismatch**: A non-integer value in DonorID.
* **Date Format**: An incorrect date format in DonationDate.
* **Missing Elements**: Missing required elements, such as BloodType.

#### **8. Documentation**

* **XSL Stylesheet Purpose**: To transform XML data into a user-friendly HTML format for easy display on a website.
* **XSD Schema Purpose**: To enforce rules and constraints on the XML data, ensuring that it is well-formed and adheres to the defined structure.
* **Transformation & Validation**: The process was carried out using an XSLT processor and an XML validator tool. The transformed data was displayed in HTML format, and any validation errors were resolved to meet the schema requirements.