* **Aim :** Encode the given information using XML document. Define XML Schema and variable the documents. Write a stylesheet to style the data using XSLT.

* **Problem Statement** - Define a XML schema for XML repracentlion of shopping order data having following requirements.

→ should contain order id, description request, date and many line item.

→ Each line item element should contain movie, quantity and price.

→ Each actor should contain last name, first name and operating age.

* **Objective**

1) To understand XML
2) To learn validation of XML using XML schema
3) To design a stylesheet to style the XML document

* **Theory**

1) **XML**

XML stands for extensible markup language. XML was designed to store and transform data. It was designed to be self descriptive.

· It has sender information
· It has a heading
· It has a message body.

Theor

DTD and XML

→ DTD Stands for Document Type Definition
A DTD defines the structure and the legal
elements and attributes of an XML document.

→ The purpose of a DTD is to define the
structure and the legal elements and attributes
of an XML document.

3) XSLT

XSLT (Extensible Stylesheet language Transformation)
is a language for transforming XML documents
into other XML documents, and other formats such
as HTML for web pages, plain text or XSL formatting
objects, which may subsequently be converted other
formats, such as PDF, postscript, and PNG.

FAQ's

Q1) what is the difference between HTML & XML?

HTML	XML
Standard markup language for developing web pages and web applications	A markup language that defines a set of rules for encoding documents in a format that is both human & machine readable.

→ focuses on displaying data

→ Has predefined data element.

→ Is case sensitive

| → focuses on carrying information

→ Elements can be created by user

→ isn't case sensitive.

Q) What are advantages of XML Schema over DTD?.

Ans
a) XSD is extensible
b) XSD is defined in XML, No intermediate process by proce parser.
c) XSD supports data type. DTD doesn't support data types.
d) XSD supports default values. You can specify the default values of elements.

Q) What is meant by well formed XML document?

Ans
a) A well formed XML document must have a corresponding end tag for all of its start tags.
b) Nesting of elements within each other in an XML document must be proper.
c) In each element two attributes must'nt have same value
d) Markup characters must be properly specified.
e) An XML document can contain only one root element.

Q 4) How to validate an XML document?

Ans → An XML document can be validated using DTD or XSD.

→ It must start with XML declaration.

→ It must have one unique root element enclosing all the other keys.

→ All start keys must have an end key.

→ All keys are case sensitive.

→ All attribute values must be in quote.

→ For special char we use XML entities.

Q 5) What are XML namespace and why are they used?

Ans → An XML namespace is a collection of names that can be used as element or attribute names in an XML document. The namespace qualifies element names uniquely on the web in order to avoid conflicts between elements with the same name.

Q 6) What do the min occurs and maxoccurs attribute specify?

Ans → The min occurs attribute specifies the minimum number of times that element that can occur. It can have a value of 0 or any positive integer.

→ The maxoccur attribute specifies the maximum number of times that element can occur. It can have a value of any positive integer greater than or equal to the value of an minoccurs attribute. It can also take a value of understood, which indicates that no upper limit applies to the number of times the element can occur.

Q7) What in the use of extinssible shylesheet and how to associate it with a XML document?

Ans XSL is for creating a shylesheet that describes how data in sent over the web using XML is to be presented to the user.

XSLT helps transform XML to HTML,

It is the recommended shylesheet for XML and uses XPATH to find information in an XML document.

```
<html xsl:version "1.0" xmlns: XSL =
        " http://www.w3.org " >
```

```xml
<?xml version="1.0" encoding="utf-8"?>
<?xml-stylesheet type='text/xsl' href='tables.xslt'?>

<!--
- Database: 'Iteration3'
-->
<database>
    <!-- Table Artists -->
    <artists>
        <artist>
            <id>1</id>
            <name>Claude Monet</name>
            <date>November 14, 1840 - December 5, 1926</date>
            <genre>Modern</genre>
            <famous>Water Lilies, Poplars</famous>
            <location>Giverny, France</location>
            <general>Oscar-Claude Monet was a founder of French Impressionist painting and he moved the expressing of ones perceptions.</gener
        </artist>
        <artist>
            <id>2</id>
            <name>Leonardo Da Vinci</name>
            <date>April 15, 1452 - May 2, 1519</date>
            <genre>Rennaisance</genre>
            <famous>Mona Lisa, The Last Supper</famous>
            <location>Kingdom of France, Amboise</location>
            <general>Leonardo da Vinci or simply Leonardo, was an Italian Renaissance polymath whose areas of interest included invention, pa
        </artist>
        <artist>
            <id>3</id>
            <name>Michelangelo Simoni</name>
            <date>March 6, 1475 - February 18, 1564</date>
            <genre>Rennaisance</genre>
            <famous>David, The Last Judgement</famous>
            <location>Rome, Paal States</location>
            <general>Michelangelo was an Italian sculptor, painter, architect and poet of the High Renaissance born in the Republic of Floren
        </artist>
        <artist>
            <id>4</id>
```

```xml
            <location>Rome, Paal States</location>
            <general>Michelangelo was an Italian sculptor, painter, architect and poet of the High Renaissance born in the Republic of Floren
        </artist>
        <artist>
            <id>4</id>
            <name>Pablo Picasso</name>
            <date>October 25, 1881 - April 8, 1973</date>
            <genre>Modern</genre>
            <famous>La Vie, Kahnweiler</famous>
            <location>Mougins, France</location>
            <general>Pablo Picasso was a Spanish painter, sculptor, printmaker, ceramicist, stage designer, poet and playwright who spent mos
        </artist>
        <artist>
            <id>5</id>
            <name>Vincent Van Gogh</name>
            <date>March 30, 1853 / July 29, 1890</date>
            <genre>Rennaisance</genre>
            <famous>The Starry Night, Sunflowers</famous>
            <location>Auvers-sur-Oise, France</location>
            <general>Vincent Willem van Gogh was a Dutch Post-Impressionist painter who is among the most famous and influential figures in th
        </artist>
    </artists>

    <!-- Table Artworks -->
    <artworks>
        <artwork>
            <id>1</id>
            <name>Girl With a Pearl Earring</name>
            <date>1902</date>
            <type>Oil Painting</type>
            <dimensions>44.5cm x 39cm</dimensions>
            <location>Mauritshuis: The Hague</location>
            <artist>Johannes Vermeer</artist>
            <price>687</price>
            <genre>Baroque</genre>
            <general>Girl with a Pearl Earring is an oil painting by Dutch Golden Age painter Johannes Vermeer</general>
        </artwork>
```

```xml
            <artist>Johannes Vermeer</artist>
            <price>687</price>
            <genre>Baroque</genre>
            <general>Girl with a Pearl Earring is an oil painting by Dutch Golden Age painter Johannes Vermeer</general>
        </artwork>
        <artwork>
            <id>2</id>
            <name>Mona Lisa</name>
            <date>1503</date>
            <type>Oil Painting</type>
            <dimensions>77cm x 53cm</dimensions>
            <location>Louvre Museam: Paris</location>
            <artist>Leonardo Da Vinci</artist>
            <price>782</price>
            <genre>Renaissance</genre>
            <general>The Mona Lisa is a half-length portrait painting by the Italian Renaissance artist Leonardo da Vinci</general>
        </artwork>
        <artwork>
            <id>3</id>
            <name>Starry Night</name>
            <date>1889</date>
            <type>Oil Painting</type>
            <dimensions>73.7cm x 92.1cm</dimensions>
            <location>Museam of Modern Art: New York City</location>
            <artist>Vincent van Gogh</artist>
            <price>500</price>
            <genre>Post-Impressionism</genre>
            <general>The Starry Night is an oil on canvas by the Dutch post-impressionist painter Vincent van Gogh</general>
        </artwork>
        <artwork>
            <id>4</id>
            <name>The Kiss</name>
            <date>1907</date>
            <type>Oil Painting</type>
            <dimensions>180cm x 180cm</dimensions>
            <location>Osterreichische Galerie Belvedere: Vienna</location>
            <artist>Gustav Klmit</artist>
            <price>152</price>
```

```xml
            <price>564</price>
            <genre>Renaissance</genre>
            <general>The Last Supper is a late 15th-century mural painting by Leonardo da Vinci</general>
        </artwork>
    </artworks>

    <!-- Table Genres -->
    <genres>
        <genre>
            <id>1</id>
            <type>Abstract</type>
        </genre>
        <genre>
            <id>2</id>
            <type>Baroque</type>
        </genre>
        <genre>
            <id>3</id>
            <type>Post-Impressionism</type>
        </genre>
        <genre>
            <id>4</id>
            <type>Renaissance</type>
        </genre>
        <genre>
            <id>5</id>
            <type>Surrealism</type>
        </genre>
    </genres>

    <!-- Table Images -->
    <images>
        <image>
            <id>1</id>
            <name>Trinidad and Tobago</name>
            <path>images.jpg</path>
        </image>
        <image>
```

```xml
                <name>The Louvre Palace</name>
                <path>pictures/louvre.jpg</path>
            </image>
            <image>
                <id>5</id>
                <name>Michelangelo Simoni</name>
                <path>pictures/angelo.jpg</path>
            </image>
            <image>
                <id>6</id>
                <name>Mona Lisa</name>
                <path>pictures/monalisa.jpg</path>
            </image>
            <image>
                <id>7</id>
                <name>Claude Monet</name>
                <path>pictures/monet.jpg</path>
            </image>
            <image>
                <id>8</id>
                <name>A New Museum</name>
                <path>pictures/museum.jpg</path>
            </image>
            <image>
                <id>9</id>
                <name>Pablo Picasso</name>
                <path>pictures/pablopicasso.jpg</path>
            </image>
            <image>
                <id>10</id>
                <name>Starry Night</name>
                <path>pictures/starrynight.jpg</path>
            </image>
            <image>
                <id>11</id>
                <name>The British Museum</name>
                <path>pictures/britishmuseum.jpg</path>
            </image>
```

```xml
                <quantity>1</quantity>
                <shipping>50</shipping>
            </purchase>
        </purchases>

        <!-- Table Reviews -->
        <reviews>
            <review>
                <content>Amazing site!</content>
                <name>John</name>
            </review>
            <review>
                <content>Christmas came early!</content>
                <name>Santa</name>
            </review>
            <review>
                <content>Good Job!</content>
                <name>Felix</name>
            </review>
            <review>
                <content>Great site with awesome features!</content>
                <name>Billy</name>
            </review>
            <review>
                <content>Mona Lisa artwork came in perfect condition :)</content>
                <name>Phil</name>
            </review>
            <review>
                <content>This is a great website!</content>
                <name>Micheal</name>
            </review>
        </reviews>
    </database>
```

```xml
<?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>
            <body>
                <h1>Supratik Chauhduri</h1>
                <h1>PE 30</h1>
                <h1>WTL- XML Lab Assignment</h1>


                <h2>Artists</h2>


                <table border="1">
                    <tr bgcolor="#999999">
                        <th style="text-align:left">id</th>
                        <th style="text-align:left">name</th>
                        <th style="text-align:left">date</th>
                        <th style="text-align:left">genre</th>
                        <th style="text-align:left">famous</th>
                        <th style="text-align:left">location</th>
                        <th style="text-align:left">general</th>
                    </tr>
                    <xsl:for-each select="database/artists/artist">
                        <tr>
                            <td><xsl:value-of select="id"/></td>
                            <td><xsl:value-of select="name"/></td>
                            <td><xsl:value-of select="date"/></td>
                            <td><xsl:value-of select="genre"/></td>
                            <td><xsl:value-of select="famous"/></td>
                            <td><xsl:value-of select="location"/></td>
                            <td><xsl:value-of select="general"/></td>
                        </tr>
                    </xsl:for-each>
                </table>

                <h2>Artworks</h2>
```

```xslt
                    <th style="text-align:left">general</th>
                </tr>
                <xsl:for-each select="database/artworks/artwork">
                    <tr>
                        <td><xsl:value-of select="id"/></td>
                        <td><xsl:value-of select="name"/></td>
                        <td><xsl:value-of select="date"/></td>
                        <td><xsl:value-of select="type"/></td>
                        <td><xsl:value-of select="dimensions"/></td>
                        <td><xsl:value-of select="location"/></td>
                        <td><xsl:value-of select="artist"/></td>
                        <td><xsl:value-of select="price"/></td>
                        <td><xsl:value-of select="genre"/></td>
                        <td><xsl:value-of select="general"/></td>
                    </tr>
                </xsl:for-each>
            </table>


            <h2>Genres</h2>
            <table border="1">
                <tr bgcolor="#999999">
                    <th style="text-align:left">id</th>
                    <th style="text-align:left">type</th>
                </tr>
                <xsl:for-each select="database/genres/genre">
                    <tr>
                        <td><xsl:value-of select="id"/></td>
                        <td><xsl:value-of select="type"/></td>
                    </tr>
                </xsl:for-each>
            </table>


            <h2>Images</h2>
            <table border="1">
                <tr bgcolor="#999999">
                    <th style="text-align:left">id</th>
                    <th style="text-align:left">name</th>
                    <th style="text-align:left">path</th>
```

```xslt
                    <th style="text-align:left">name</th>
                    <th style="text-align:left">path</th>
                </tr>
                <xsl:for-each select="database/images/image">
                    <tr>
                        <td><xsl:value-of select="id"/></td>
                        <td><xsl:value-of select="name"/></td>
                        <td><xsl:value-of select="path"/></td>
                    </tr>
                </xsl:for-each>
            </table>


            <h2>Museums</h2>
            <table border="1">
                <tr bgcolor="#999999">
                    <th style="text-align:left">id</th>
                    <th style="text-align:left">name</th>
                    <th style="text-align:left">date</th>
                    <th style="text-align:left">location</th>
                    <th style="text-align:left">address</th>
                    <th style="text-align:left">people</th>
                    <th style="text-align:left">history</th>
                    <th style="text-align:left">famous</th>
                </tr>
                <xsl:for-each select="database/museums/museum">
                    <tr>
                        <td><xsl:value-of select="id"/></td>
                        <td><xsl:value-of select="name"/></td>
                        <td><xsl:value-of select="date"/></td>
                        <td><xsl:value-of select="location"/></td>
                        <td><xsl:value-of select="address"/></td>
                        <td><xsl:value-of select="people"/></td>
                        <td><xsl:value-of select="history"/></td>
                        <td><xsl:value-of select="famous"/></td>
                    </tr>
                </xsl:for-each>
            </table>
```

```xslt
            <table border="1">
                <tr bgcolor="#999999">
                    <th style="text-align:left">id</th>
                    <th style="text-align:left">name</th>
                    <th style="text-align:left">address</th>
                    <th style="text-align:left">credit</th>
                    <th style="text-align:left">artwork</th>
                    <th style="text-align:left">quantity</th>
                    <th style="text-align:left">shipping</th>
                </tr>
                <xsl:for-each select="database/purchases/purchase">
                    <tr>
                        <td><xsl:value-of select="id"/></td>
                        <td><xsl:value-of select="name"/></td>
                        <td><xsl:value-of select="address"/></td>
                        <td><xsl:value-of select="credit"/></td>
                        <td><xsl:value-of select="artwork"/></td>
                        <td><xsl:value-of select="quantity"/></td>
                        <td><xsl:value-of select="shipping"/></td>
                    </tr>
                </xsl:for-each>
            </table>

            <h2>Reviews</h2>
            <table border="1">
                <tr bgcolor="#999999">
                    <th style="text-align:left">content</th>
                    <th style="text-align:left">name</th>
                </tr>
                <xsl:for-each select="database/reviews/review">
                    <tr>
                        <td><xsl:value-of select="content"/></td>
                        <td><xsl:value-of select="name"/></td>
                    </tr>
                </xsl:for-each>
            </table>
        </body>
    </html>
```