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I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a marks of zero will be awarded.

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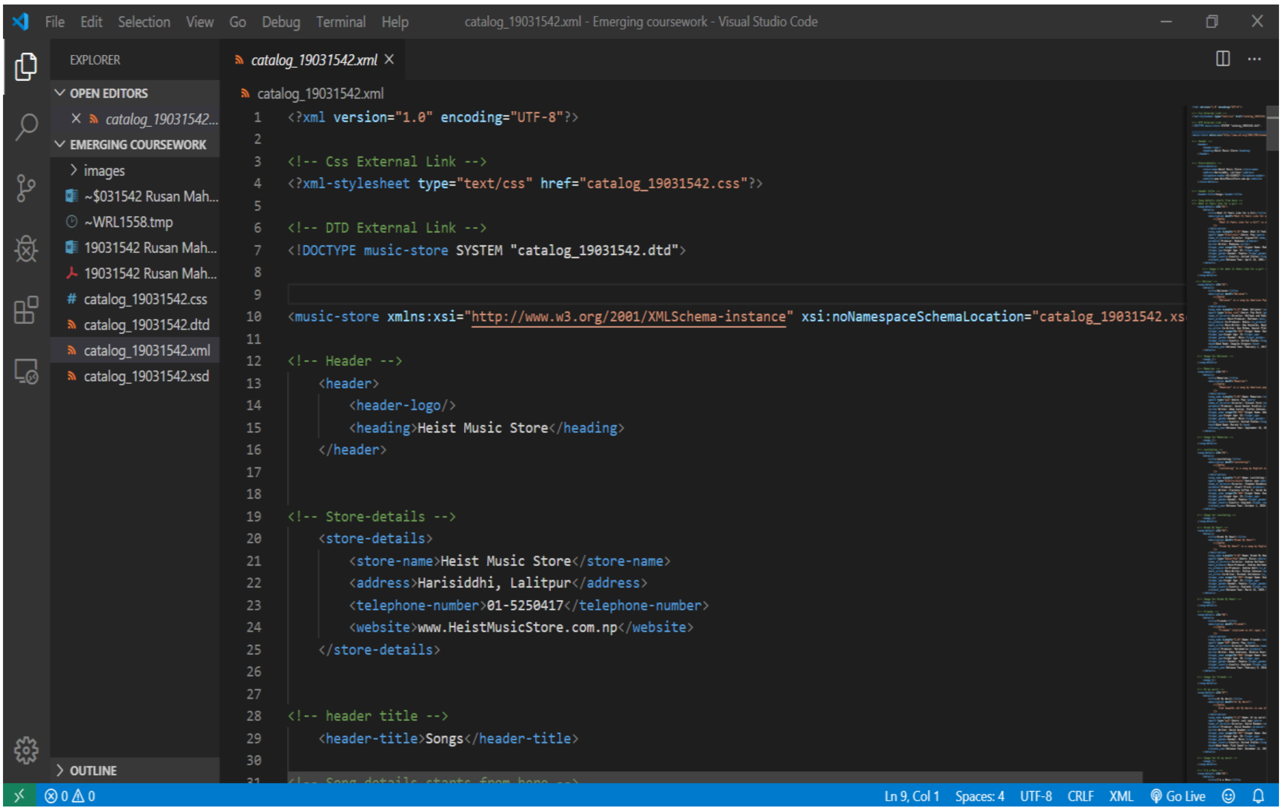
Introduction

This is second coursework of Emerging Programming Platforms and Technologies. We are assigned to model a system for music store. To build a system for music store we have used XML (Extensible Markup Language), CSS (Cascading Style Sheet), DTD (Document Type Definition), XSD (XML Schema Definition). XML is a text-based markup language derived from Standard Generalized Markup Language. XML tag identify the data and are used to store and organize the data, rather than specifying how to display it like HTML tags, which are used to display the data (tutorialspoint, 2021). By using XML, Web agents and robots are more efficient and produce more useful results. To complete this coursework XML, DTD, Schema, CSS are used and draw.io and Visual Studio Code is used.

XML:

XML stands for extensible markup language. A markup language is a set of codes, or tags, that describes the text in a digital document. XML is a more flexible than HTML and makes it possible to conduct complex business over the internet (Roche, 2000).



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

<!-- Css External Link -->
<?xml-stylesheet type="text/css" href="catalog_19031542.css"?>

<!-- DTD External Link -->
<!DOCTYPE music-store SYSTEM "catalog_19031542.dtd">


<music-store xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="catalog_19031542.xs

<!-- Header -->
    <header>
        <header-logo/>
        <heading>Heist Music Store</heading>
    </header>


<!-- Store-details -->
    <store-details>
        <store-name>Heist Music Store</store-name>
        <address>Harisiddhi, Lalitpur</address>
        <telephone-number>01-5250417</telephone-number>
        <website>www.HeistMusicStore.com.np</website>
    </store-details>


<!-- header title -->
    <header-title>Songs</header-title>

<!-- Song details starts from here -->
```

Figure 1: XML

Visual Studio Code:

This coursework is done in Visual Studio Code which is a text editor. Visual Studio Code known as VS Code is a free open-source text editor by Microsoft. VS code is available for Windows, Linux and macOS (educative, 2021).

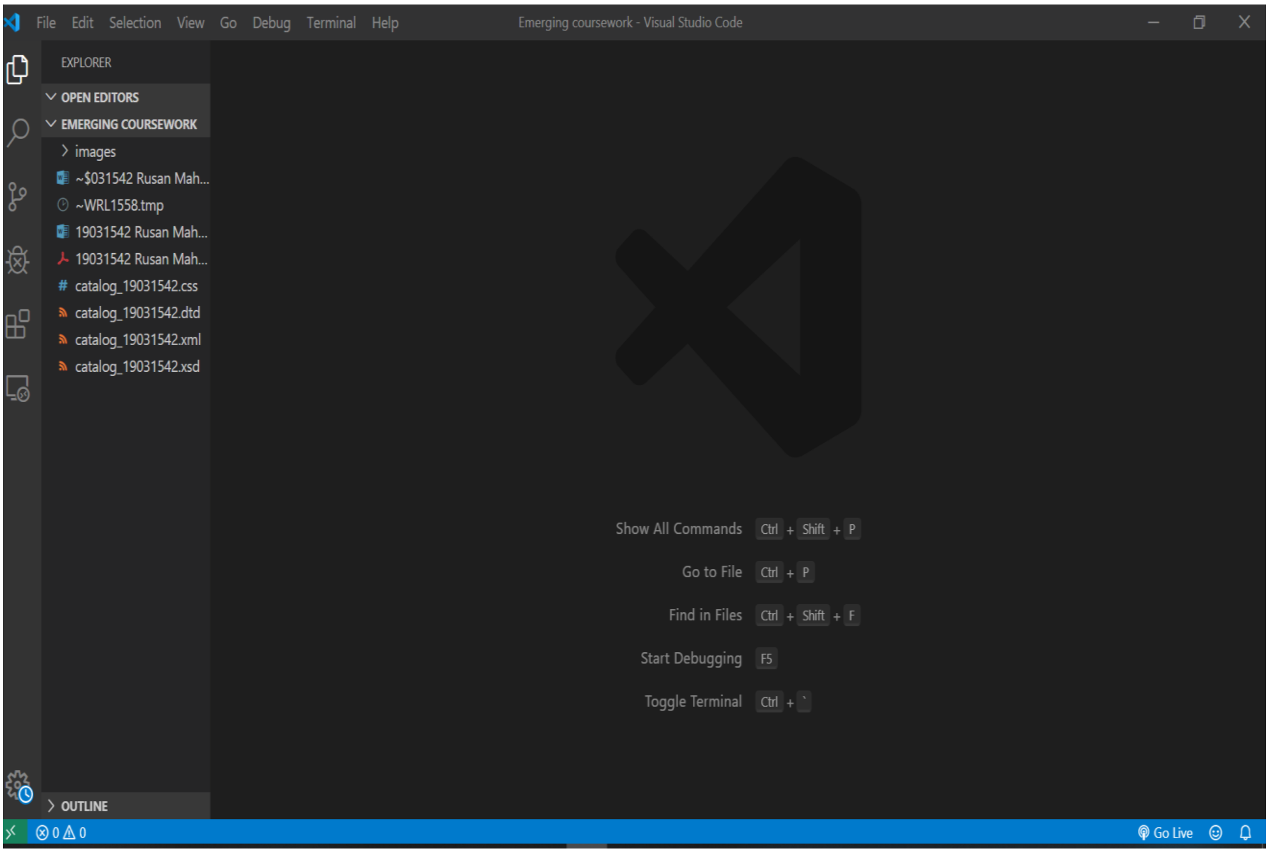
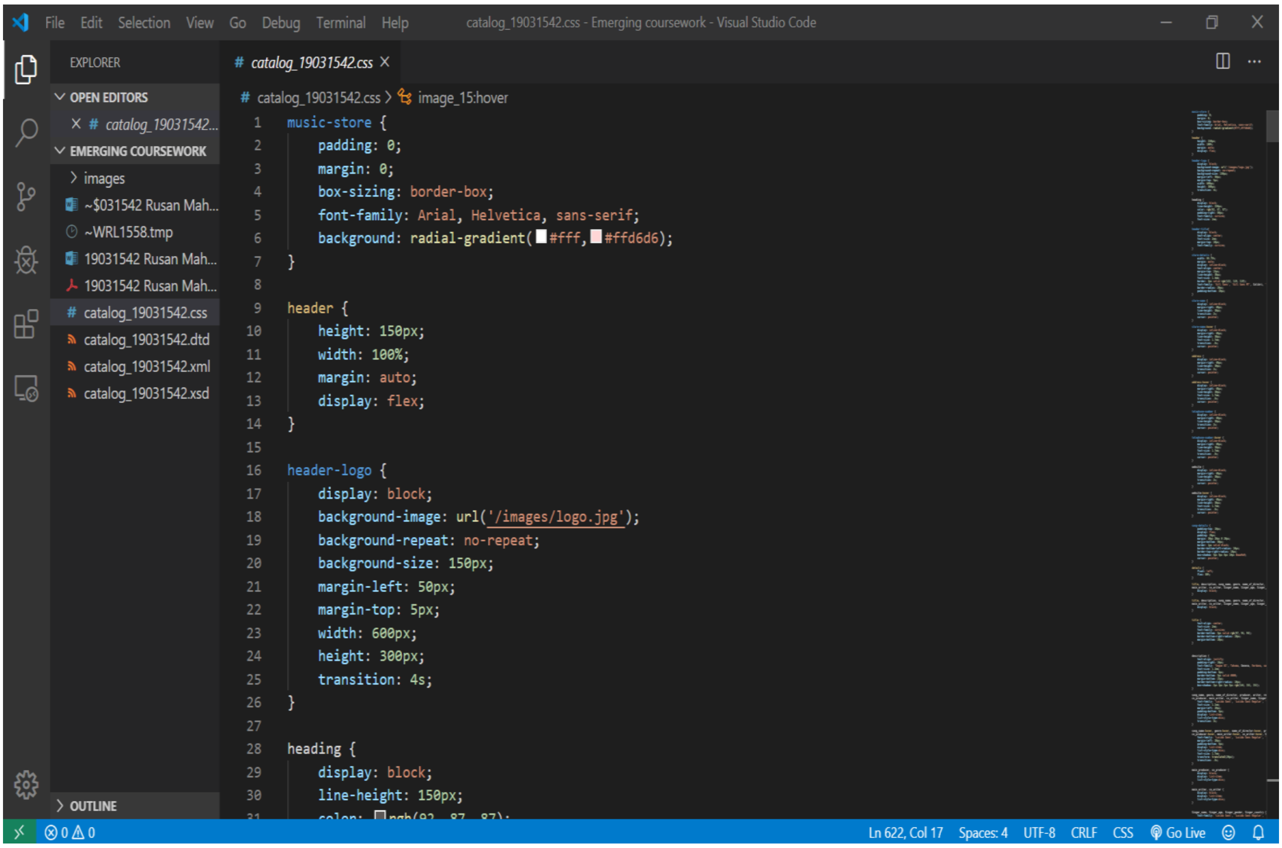


Figure 2: Visual Studio Code

CSS (Cascading Style Sheet):

Cascading Style Sheet is fondly referred to as CSS, is a simple design language intended to simplify the process of making web pages presentable. Using CSS, you can control the colour of the text, font styles, font families, layout designs and variety or other effects (tutorialsPoint, 2021).

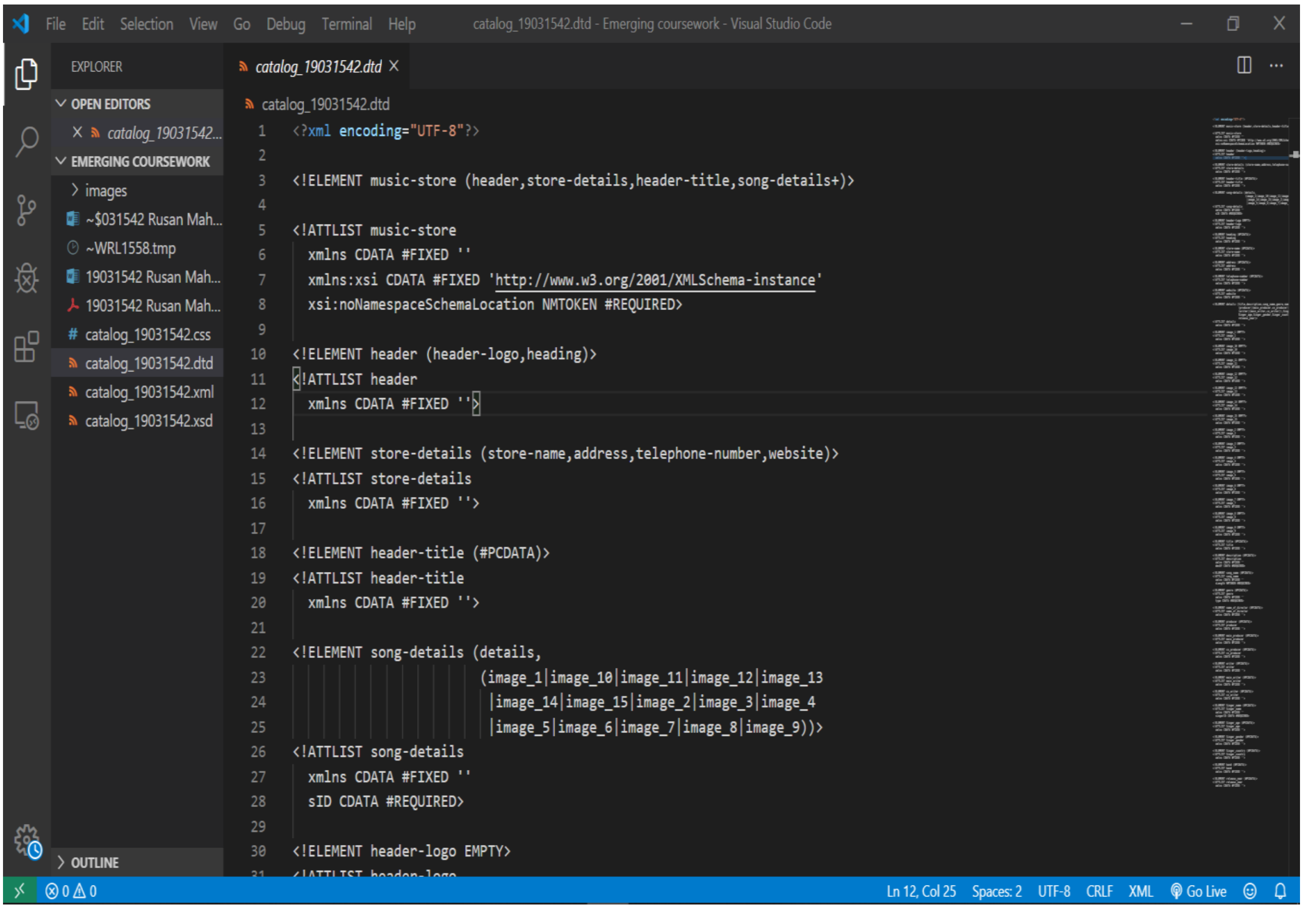


```css
music-store {
    padding: 0;
    margin: 0;
    box-sizing: border-box;
    font-family: Arial, Helvetica, sans-serif;
    background: radial-gradient(#fff,#ffd6d6);
}

header {
    height: 150px;
    width: 100%;
    margin: auto;
    display: flex;
}

header-logo {
    display: block;
    background-image: url('/images/logo.jpg');
    background-repeat: no-repeat;
    background-size: 150px;
    margin-left: 50px;
    margin-top: 5px;
    width: 600px;
    height: 300px;
    transition: 4s;
}

heading {
    display: block;
    line-height: 150px;
    color: rgb(92, 87, 87);
```

Figure 3: CSS (Cascading Style Sheet)

DTD (Document Type Declaration):

The XML Document Type Declaration, commonly knows as DTD, is a way to describe XML language precisely. An XML DTD can be either specified inside the document, or it can be kept in a separate document and then liked separately (tutorialspoint, 2021).

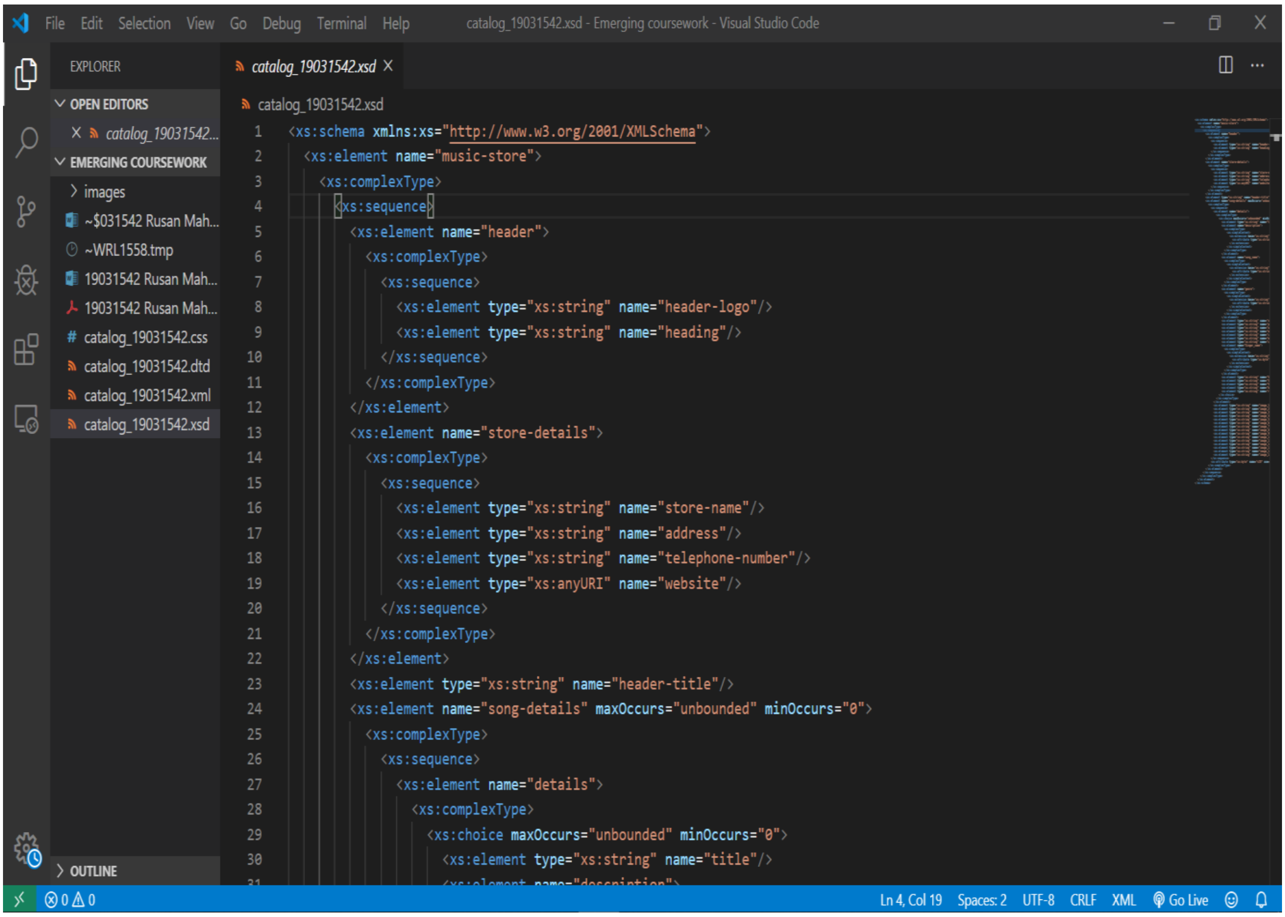


```
<?xml encoding="UTF-8"?>

<!ELEMENT music-store (header,store-details,header-title,song-details+)>

<!ATTLIST music-store
  xmlns CDATA #FIXED ''
  xmlns:xsi CDATA #FIXED 'http://www.w3.org/2001/XMLSchema-instance'
  xsi:noNamespaceSchemaLocation NMTOKEN #REQUIRED>

<!ELEMENT header (header-logo,heading)>
<!ATTLIST header
  xmlns CDATA #FIXED ''>

<!ELEMENT store-details (store-name,address,telephone-number,website)>
<!ATTLIST store-details
  xmlns CDATA #FIXED ''>

<!ELEMENT header-title (#PCDATA)>
<!ATTLIST header-title
  xmlns CDATA #FIXED ''>

<!ELEMENT song-details (details,
                        (image_1|image_10|image_11|image_12|image_13
                         |image_14|image_15|image_2|image_3|image_4
                         |image_5|image_6|image_7|image_8|image_9))>
<!ATTLIST song-details
  xmlns CDATA #FIXED ''
  sID CDATA #REQUIRED>

<!ELEMENT header-logo EMPTY>
<!ATTLIST header-logo
```

Figure 4: DTD (Document Type Declaration)

Schema (XSD):

XML Schema is commonly known as XML Schema Definition (XSD). It is used to describe and validate the structure and the content of XML data. XML schema defines the elements, attributes and data types. Schema element supports Namespaces (tutorialspoint, 2021).



```xml
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="music-store">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="header">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="header-logo"/>
              <xs:element type="xs:string" name="heading"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="store-details">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="store-name"/>
              <xs:element type="xs:string" name="address"/>
              <xs:element type="xs:string" name="telephone-number"/>
              <xs:element type="xs:anyURI" name="website"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element type="xs:string" name="header-title"/>
        <xs:element name="song-details" maxOccurs="unbounded" minOccurs="0">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="details">
                <xs:complexType>
                  <xs:choice maxOccurs="unbounded" minOccurs="0">
                    <xs:element type="xs:string" name="title"/>
                    <xs:element name="description">
```

Figure 5: Schema

XML Content

Tree Diagram

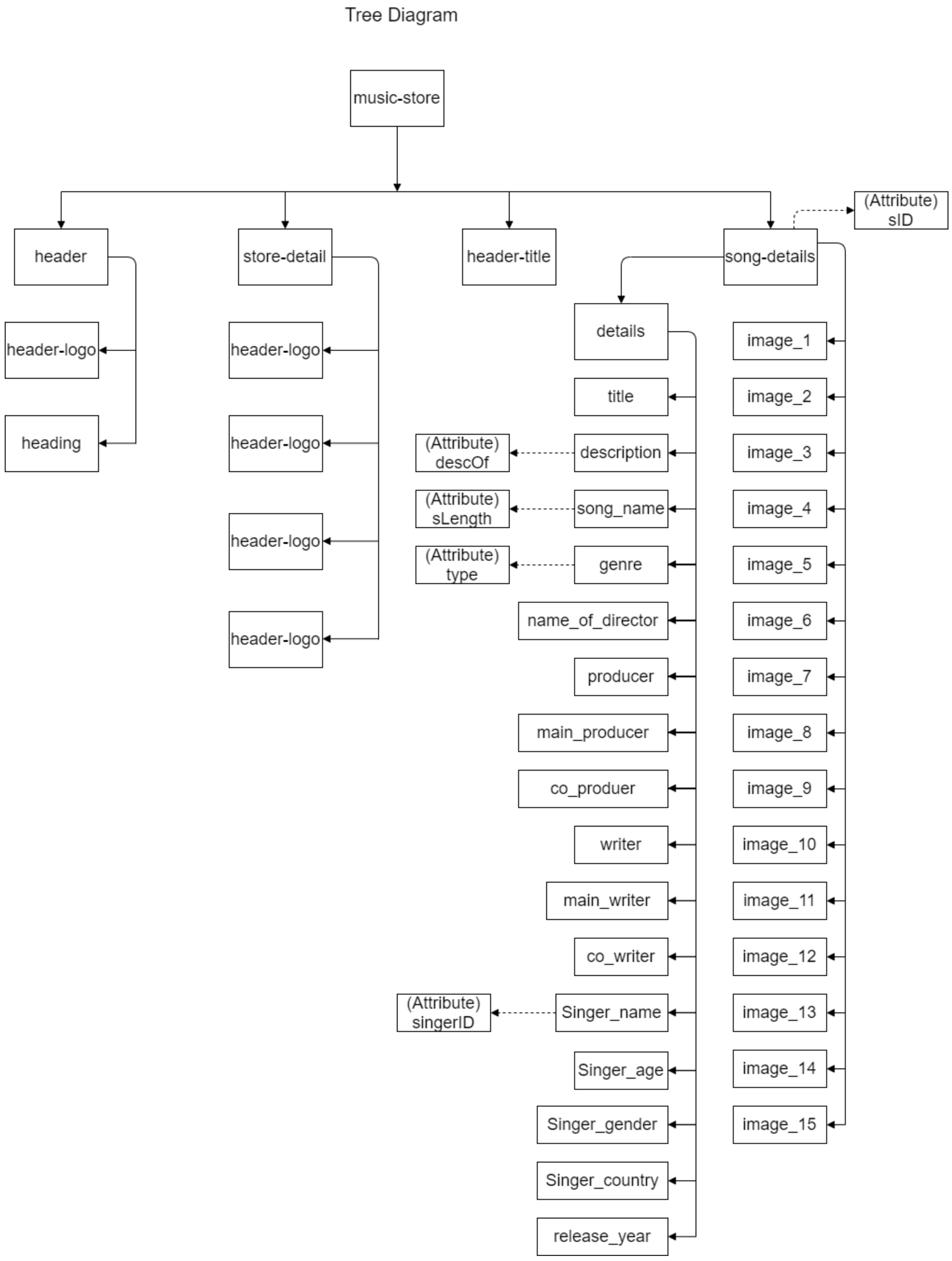


Figure 6: Tree Diagram

XML Content

XML stands for Extensible Markup Language. It is a text-based markup language derived from Standard Generalization Markup Language (SGML). XML tag recognize the data and it is used to store and organize data. XML has three important characteristics which make it useful in a variety of systems and solutions: XML is extensible, XML carries the data, does not present it, and XML is a public standard (tutorialspoint, 2021).

The XML code of this coursework is given below:

XML Code:

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

<!-- Css External Link -->
<?xml-stylesheet type="text/css" href="catalog_19031542.css"?>

<!-- DTD External Link -->
<!DOCTYPE music-store SYSTEM "catalog_19031542.dtd">


<music-store xmlns:xs="http://www.w3.org/2001/XMLSchema-instance" xs:noNamespaceSchemaLocation="catalog_19031542.xsd">

<!-- Header -->
    <header>
        <header-logo/>
        <heading>Heist Music Store</heading>
    </header>


<!-- Store-details -->
    <store-details>
        <store-name>Heist Music Store</store-name>
        <address>Harisiddhi, Lalitpur</address>
        <telephone-number>01-5250417</telephone-number>
        <website>www.HeistMusicStore.com.np</website>
    </store-details>


<!-- header title -->
    <header-title>Songs</header-title>

<!-- Song details starts from here -->
<!-- What it feels like for a girl -->
    <song-details sID="01">
        <details>
            <title>What It Feels Like for a Girl</title>
            <description desOf="What It Feels Like for a Girl">
                <![CDATA[
                    "What It Feels Like for a Girl" is a song recorded by American Singer Madonna for her eighth studio album Music. It was released as the third and final single from the album by Maveric Records.
                ]]>
            </description>
            <song_name sLength="4:35">Name: What It Feels Like For a Girl</song_name>
            <genre type="Electronic">Genre: Pop</genre>
            <name_of_director>Director: Sigsworth</name_of_director>
            <producer>Producer: Madonna</producer>
            <writer>Writer: Madonna</writer>
            <Singer_name singerID="001">Signer Name: Madonna</Singer_name>
            <Singer_age>Singer Age: 62</Singer_age>
            <Singer_gender>Gender: Female</Singer_gender>
            <Singer_country>Country: United States</Singer_country>
            <release_year>Release Year: April 16, 2001</release_year>
        </details>

    <!-- Image 1 for what it feels like for a girl -->
    <image_1/>
  </song-details>

  <!-- Beliver -->
  <song-details sID="02">
    <details>
      <title>Believer</title>
      <description desOf="Believer">
        <![CDATA[
          "Believer" is a song by American Pop Rock band Imagine Dragons. The song was released on February 1, 2017 through Interscope Records and Kidinakorner as the lead single from the band's third studio album.
        ]]>
      </description>
      <song_name sLength="3:23">Name: Believer</song_name>
      <genre type="Arena rock">Genre: Pop Rock</genre>
      <name_of_director>Director: Mattman and Robin</name_of_director>
      <main_producer>Main-Producer: Mattman</main_producer>
      <co_producer>Co-Producer: Robin</co_producer>
      <main_writer>Main-Writer: Dan Reynolds, Wayne Sermon</main_writer>
      <co_writer>Co-Writer: Ben McKee, Daniel Platzman</co_writer>
      <Singer_name singerID="002">Singer Name: Dan Reynolds</Singer_name>
      <Singer_age>Singer Age: 33</Singer_age>
      <Singer_gender>Gender: Male</Singer_gender>
      <Singer_country>Country: United States</Singer_country>
      <band>Band Name: Imagine Dragons</band>
      <release_year>Release Year: February 1, 2017</release_year>
    </details>

  <!-- Image for Believer -->
    <image_2/>
```

```
</song-details>

<!-- Memories -->
<song-details sID="03">
    <details>
        <title>Memories</title>
        <description desOf="Memories">
            <![CDATA[
                "Memories" is a song by American pop band Maroon 5, released through 222 on September 20, 2019. Lyrically, the song pays homepage to the memories of a lobed one who has since passed.
            ]]>
        </description>
        <song_name sLength="3:05">Name: Memories</song_name>
        <genre type="pop">Genre: Pop</genre>
        <name_of_director>Director: Vincent Ford</name_of_director>
        <producer>Producer: Jacod Kasher Hindlin</producer>
        <writer>Writer: Adam Levine, Stefan Johnson, Jordan Johnson</writer>
        <Singer_name singerID="003">Singer Name: Adam Levine</Singer_name>
        <Singer_age>Singer Age: 42</Singer_age>
        <Singer_gender>Gender: Male</Singer_gender>
        <Singer_country>Country: United States</Singer_country>
        <band>Band Name: Maroon 5</band>
        <release_year>Release Year: September 20, 2019</release_year>
    </details>

<!-- Image for Memories -->
    <image_3/>
</song-details>

<!-- Levitating -->
<song-details sID="04">
```

```
        <details>
            <title>Levitating</title>
            <description desOf="Levitating">
                <![CDATA[
                    "Levitating" is a song by English singer Dua Lipa from her second studio album, Future Nostalgia (2020). The song was written by Lipa, Clarence Coffee Jr., Sarah Hudson and Stephen Kozmeniuk, with the image of Mike Myers in Austin Powers in mind.
                ]]>
            </description>
            <song_name sLength="3:41">Name: Levitating</song_name>
            <genre type="Electro-disco">Genre: pop</genre>
            <name_of_director>Director: Stephen Kozmeniuk</name_of_director>
            <producer>Producer: Stuart Price</producer>
            <writer>Writer: Clarence Coffee Jr, Sarah Hudson</writer>
            <Singer_name singerID="004">Singer Name: Dua Lipa</Singer_name>
            <Singer_age>Singer Age: 25</Singer_age>
            <Singer_gender>Gender: Female</Singer_gender>
            <Singer_country>Country: England</Singer_country>
            <release_year>Release Year: October 1, 2020</release_year>
        </details>

    <!-- Image for Levitating -->
        <image_4/>
    </song-details>

    <!-- Break My Heart -->
    <song-details sID="05">
        <details>
            <title>Break My Heart</title>
            <description desOf="Break My Heart">
                <![CDATA[
                    "Break My Heart" is a song by English singer Dua Lipa from her second studio album, Future Nostalgia (2020). The song was written by Lipa, Ali Tamposi, Stefan Johnson, Jordan K. Johnson, and Andrew Watt, with the latter of the five handling production alongside the Monsters & Strangerz.
                ]]>
            </description>
            <song_name sLength="3:48">Name: Break My Heart</song_name>
            <genre type="Dance-Pop">Genre: Disco</genre>
            <name_of_director>Director: Andrew Wortman</name_of_director>
            <main_producer>Main-Producer: Andrew Wortman</main_producer>
            <co_producer>Co-Producer: Andrew Watt</co_producer>
            <main_writer>Main-Writer: Stefan Johnson</main_writer>
            <co_writer>Co-Writer: Michael Hutchence</co_writer>
            <Singer_name singerID="005">Singer Name: Dua Lipa</Singer_name>
            <Singer_age>Singer Age: 25</Singer_age>
            <Singer_gender>Gender: Female</Singer_gender>
            <Singer_country>Country: England</Singer_country>
            <release_year>Release Year: March 25, 2020</release_year>
        </details>

    <!-- Image for Break My Heart -->
        <image_5/>
    </song-details>

    <!-- Friends -->
    <song-details sID="06">
        <details>
            <title>Friends</title>
            <description desOf="Friends">
                <![CDATA[
                    "Friends" (stylized in all caps) is a song by American record producer Marshmello and English singer Anne-Marie. It was written and
                    produced by Marshmello, with additional writing from Anne-Marie, Eden Anderson, Richard Boardman, Jasmine Thompson, Nat Dunn, Sarah Blanchard and Pablo Bowman.
                ]]>
            </description>
            <song_name sLength="3:26">Name: Friends</song_name>
            <genre type="EDM">Genre: Pop</genre>
            <name_of_director>Director: Marshmello</name_of_director>
            <producer>Producer: Marshmello</producer>
            <writer>Writer: Eden Andreson, Natalie Dunn</writer>
            <Singer_name singerID="006">Singer Name: Anne Marie</Singer_name>
            <Singer_age>Singer Age: 30</Singer_age>
            <Singer_gender>Gender: Female</Singer_gender>
            <Singer_country>Country: England</Singer_country>
            <release_year>Release Year: February 9, 2018</release_year>
        </details>

    <!-- Image for Friends -->
        <image_6/>
    </song-details>

    <!-- At my worst -->
    <song-details sID="07">
        <details>
            <title>At My Worst</title>
            <description desOf="At My Worst">
                <![CDATA[
                    Pink Sweat’s “At My Worst” is one of his latest hits, and it’s already racked up more than 34 million Spotify plays to date. The song, which is produced by John Hill and Pink Sweat$, appears on his 2020 EP, The Prelude. On the track, the Philly native sings about finding a partner who will stick with him despite his flaws.
                ]]>
            </description>
            <song_name sLength="3:12">Name: At my worst</song_name>
            <genre type="pop">Genre: soul pop</genre>
            <name_of_director>Director: David Bowden</name_of_director>
            <producer>Producer: David Bowden</producer>
            <writer>Writer: David Bowden</writer>
            <Singer_name singerID="007">Singer Name: David Bowden</Singer_name>
            <Singer_age>Singer Age: 29</Singer_age>
            <Singer_gender>Gender: Male</Singer_gender>
            <Singer_country>Country: United States</Singer_country>
            <band>Band Name: Pink Sweat's</band>
            <release_year>Release Year: November 12, 2020</release_year>
        </details>

    <!-- Image for At my worst -->
        <image_7/>
    </song-details>

    <!-- I'm a Mess -->
    <song-details sID="08">
        <details>
            <title>I'm a Mess</title>
            <description desOf="I'm a Mess">
                <![CDATA[
                    "I'm a Mess" is a song recorded by American singer Bebe Rexha for her debut studio album, Expectations (2018). It was released as the first and only single from the album on June 15, 2018, following an early radio release in the United States.
                ]]>
            </description>
            <song_name sLength="3:16">Name: I'm a Mess</song_name>
            <genre type="Pop">Genre: Pop Music</genre>
            <name_of_director>Director: Shelly Peiken</name_of_director>
            <main_producer>Main-Producer: Jussifer</main_producer>
            <co_producer>Co-Producer: Devon Corey</co_producer>
            <writer>Writer: Justin Tranter</writer>
            <Singer_name singerID="008">Singer Name: Bebe Rexha</Singer_name>
            <Singer_age>Singer Age: 31</Singer_age>
            <Singer_gender>Gender: Female</Singer_gender>
            <Singer_country>Country: United State</Singer_country>
            <release_year>Release Year: June 15, 2018</release_year>
        </details>

    <!-- Image for I'm a Mess -->
        <image_8/>
    </song-details>

    <!-- Psycho -->
    <song-details sID="09">
        <details>
            <title>Psycho</title>
            <description desOf="Psycho">
                <![CDATA[
                    "Psycho" is a song recorded by American rapper and singer Post Malone, featuring vocals from American singer Ty Dolla Sign. It was released through Republic Records on February 23, 2018, as the third single from Malone's second studio album.
                ]]>
            </description>
            <song_name sLength="3:57">Name: Psycho</song_name>
            <genre type="Rock">Genre: Rock</genre>
            <name_of_director>Director: Tyrone Griffin</name_of_director>
            <producer>Producer: Louis Bell, Post Malone</producer>
            <writer>Writer: Austin Post, Louis Bell</writer>
            <Singer_name singerID="009">Singer Name: Post Malone</Singer_name>
            <Singer_age>Singer Age: 25</Singer_age>
            <Singer_gender>Gender: Male</Singer_gender>
            <Singer_country>Country: United States</Singer_country>
            <release_year>Release Year: February 23, 2018</release_year>
        </details>

    <!-- Image for Psycho -->
        <image_9/>
    </song-details>

    <!-- Lonely -->
    <song-details sID="10">
        <details>
            <title>Lonely</title>
            <description desOf="Lonely">
                <![CDATA[
                    "Lonely" (also known as "Mr. Lonely") is a song by Senegalese-American singer and rapper Akon; it appears on his debut album, Trouble.
                ]]>
            </description>
            <song_name sLength="4:25">Name: Lonely</song_name>
            <genre type="pop">Genre: Jazz</genre>
            <name_of_director>Director: Bobby Vinton</name_of_director>
            <producer>Producer: Akon</producer>
            <writer>Writer: Bobby Vinton, Gene Allan</writer>
            <Singer_name singerID="010">Singer Name: Akon</Singer_name>
            <Singer_age>Singer Age: 48</Singer_age>
            <Singer_gender>Gender: Male</Singer_gender>
            <Singer_country>Country: United States</Singer_country>
            <release_year>Release Year: April 19, 2005</release_year>
        </details>

    <!-- Image for Lonely -->
        <image_10/>
```

```
</song-details>

<!-- Closer -->
<song-details sID="11">
    <details>
        <title>Closer</title>
        <description desOf="Closer">
            <![CDATA[
                "Closer" is a song by American DJ duo the Chainsmokers featuring American singer Halsey. Andrew Taggart (one half of the Chainsmokers) also provides his vocals in the song. It was released on July 29, 2016, through Disruptor Records and Columbia Records.
            ]]>
        </description>
        <song_name sLength="4:07">Name: Closer</song_name>
        <genre type="Future bass">Genre: Pop</genre>
        <name_of_director>Director: Joe King</name_of_director>
        <producer>Producer: Ashley Frangipane</producer>
        <writer>Writer: Shaun Frank, Isaac Slade</writer>
        <Singer_name singerID="011">Singer Name: Chainsmoker and Halsey</Singer_name>
        <Singer_age>Singer Age: 34 and 26</Singer_age>
        <Singer_gender>Gender: Male and Female</Singer_gender>
        <Singer_country>Country: United States</Singer_country>
        <release_year>Release Year: July 29, 2016</release_year>
    </details>

<!-- Image for Closer -->
    <image_11/>
</song-details>

<!-- Dance Monkey -->
<song-details sID="12">
    <details>
```

```
            <title>Dance Monkey</title>
            <description desOf="Dance Monkey">
                <![CDATA[
                    "Dance Monkey" is a song by Australian singer Tones and I, released on 10 May 2019 as the second single (first in the US) from Tones and I's debut EP The Kids Are Coming. The song was produced and mixed by Konstantin Kersting.
                ]]>
            </description>
            <song_name sLength="3:29">Name: Dance Monkey</song_name>
            <genre type="Electric Pop">Genre: Pop</genre>
            <name_of_director>Director: Toni Watson</name_of_director>
            <producer>Producer: Konstanitin Kersting</producer>
            <writer>Writer: Toni Watson</writer>
            <Singer_name singerID="012">Singer Name: Toni Watson</Singer_name>
            <Singer_age>Singer Age: 22</Singer_age>
            <Singer_gender>Gender: Male</Singer_gender>
            <Singer_country>Country: Australia</Singer_country>
            <release_year>Release Year: 10 May, 2019</release_year>
        </details>

    <!-- Image for Dance Monkey -->
        <image_12/>
    </song-details>

    <!-- Sweet But Psycho -->
    <song-details sID="13">
        <details>
            <title>Sweet But Psycho</title>
            <description desOf="Sweet but Psycho">
                <![CDATA[
                    "Sweet but Psycho" is a song by American singer Ava Max, released on August 17, 2018, through Atlantic Records as the first single from
```

```
her debut studio album, Heaven & Hell (2020). The song was written by Max, Madison Love, Tix, Cook Classics, and the producer Cirkut. It is a pop, dance-pop, electropop, and synth-pop song with lyrics about the perception of a woman.
            ]]>
        </description>
        <song_name sLength="3:08">Name: Sweet but Psycho</song_name>
        <genre type="Electric pop">Genre: Jazz</genre>
        <name_of_director>Director: Andreas Andresen</name_of_director>
        <producer>Producer: Cirkut</producer>
        <writer>Writer: William Lobban-Bean</writer>
        <Singer_name singerID="013">Singer Name: Ava Max</Singer_name>
        <Singer_age>Singer Age: 27</Singer_age>
        <Singer_gender>Gender: Female</Singer_gender>
        <Singer_country>Country: United States</Singer_country>
        <release_year>Release Year: August 17, 2018</release_year>
    </details>

<!-- Image for Sweet But Psycho -->
    <image_13/>
</song-details>

<!-- Rap God -->
<song-details sID="14">
    <details>
        <title>Rap God</title>
        <description desOf="Rap God">
            <![CDATA[
                "Rap God" is a song by American rapper Eminem. The song premiered via YouTube on October 14, 2013, and was released in the United States on October 15, 2013, as the third single from Eminem's eighth studio album, The Marshall Mathers LP 2 (2013).
            ]]>
        </description>
        <song_name sLength="6:07">Name: Rap God</song_name>
        <genre type="rap">Genre: Pop</genre>
        <name_of_director>Director: Narsgakk Natgers</name_of_director>
        <producer>Producer: Filthy.co</producer>
        <main_writer>Main-Writer: Stephen Hacker</main_writer>
        <co_writer>Co-Writer: Douglas Davis</co_writer>
        <Singer_name singerID="014">Singer Name: Eminem</Singer_name>
        <Singer_age>Singer Age: 48</Singer_age>
        <Singer_gender>Gender: Male</Singer_gender>
        <Singer_country>Country: United States</Singer_country>
        <release_year>Release Year: October 15, 2013</release_year>
    </details>

<!-- Image of Rap God -->
    <image_14/>
</song-details>

<!-- Pretty Girl -->
<song-details sID="15">
    <details>
        <title>Pretty Girl</title>
        <description desOf="Pretty Girl">
            <![CDATA[
                "Pretty Girl" is a song by American singer and songwriter Maggie Lindemann. It is her first major-label single, and was released on September 30, 2016, through 300 Entertainment. The song was written by Lindemann, Sasha Sloan, and Sean Myer, with the production being handled by Jayson DeZuzio.
            ]]>
        </description>
        <song_name sLength="3:20">Name: Pretty Girl</song_name>
```

```
            <genre type="Pop">Genre: Cheat Codes X Cade remix</genre>
            <name_of_director>Director: Sasha Sloan</name_of_director>
            <producer>Producer: Jayson DeZuzio</producer>
            <writer>Writer: Maggie Linderman</writer>
            <Singer_name singerID="015">Singer Name: Maggie Linderman</Singer_name>
            <Singer_age>Singer Age: 22</Singer_age>
            <Singer_gender>Gender: Female</Singer_gender>
            <Singer_country>Country: United States</Singer_country>
            <release_year>Release Year: September 30, 2016</release_year>
        </details>

    <!-- Image for Pretty Girl -->
        <image_15/>
    </song-details>
</music-store>


```

Schema Content

XSD stands for XML Schema Definition and it is a way to describe the structure of a XML document. It defines the rules for all the attributes and elements in a XML document. XSD checks the correctness of the structure of the XML file (GeeksforGeeks, 2020).

The XSD code is given below:

Schema Code:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="music-store">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="header">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="header-logo"/>
              <xs:element type="xs:string" name="heading"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="store-details">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="store-name"/>
              <xs:element type="xs:string" name="address"/>
              <xs:element type="xs:string" name="telephone-number"/>
              <xs:element type="xs:anyURI" name="website"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element type="xs:string" name="header-title"/>
        <xs:element name="song-details" maxOccurs="unbounded" minOccurs="0">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="details">
          <xs:complexType>
            <xs:choice maxOccurs="unbounded" minOccurs="0">
              <xs:element type="xs:string" name="title"/>
              <xs:element name="description">
                <xs:complexType>
                  <xs:simpleContent>
                    <xs:extension base="xs:string">
                      <xs:attribute type="xs:string" name="desOf" use="optional"/>
                    </xs:extension>
                  </xs:simpleContent>
                </xs:complexType>
              </xs:element>
              <xs:element name="song_name">
                <xs:complexType>
                  <xs:simpleContent>
                    <xs:extension base="xs:string">
                      <xs:attribute type="xs:string" name="sLength" use="optional"/>
                    </xs:extension>
                  </xs:simpleContent>
                </xs:complexType>
              </xs:element>
              <xs:element name="genre">
                <xs:complexType>
                  <xs:simpleContent>
                    <xs:extension base="xs:string">
                      <xs:attribute type="xs:string" name="type" use="optional"/>
                    </xs:extension>
                  </xs:simpleContent>
                </xs:complexType>
              </xs:element>
              <xs:element type="xs:string" name="name_of_director"/>
              <xs:element type="xs:string" name="producer"/>
              <xs:element type="xs:string" name="writer"/>
              <xs:element type="xs:string" name="main_producer"/>
              <xs:element type="xs:string" name="co_producer"/>
              <xs:element type="xs:string" name="main_writer"/>
              <xs:element type="xs:string" name="co_writer"/>
              <xs:element name="Singer_name">
                <xs:complexType>
                  <xs:simpleContent>
                    <xs:extension base="xs:string">
                      <xs:attribute type="xs:byte" name="singerID" use="optional"/>
                    </xs:extension>
                  </xs:simpleContent>
                </xs:complexType>
              </xs:element>
              <xs:element type="xs:string" name="Singer_age"/>
              <xs:element type="xs:string" name="Singer_gender"/>
              <xs:element type="xs:string" name="Singer_country"/>
              <xs:element type="xs:string" name="band"/>
              <xs:element type="xs:string" name="release_year"/>
            </xs:choice>
          </xs:complexType>
        </xs:element>
        <xs:element type="xs:string" name="image_1" minOccurs="0"/>
        <xs:element type="xs:string" name="image_2" minOccurs="0"/>
        <xs:element type="xs:string" name="image_3" minOccurs="0"/>
        <xs:element type="xs:string" name="image_4" minOccurs="0"/>
        <xs:element type="xs:string" name="image_5" minOccurs="0"/>
        <xs:element type="xs:string" name="image_6" minOccurs="0"/>
        <xs:element type="xs:string" name="image_7" minOccurs="0"/>
        <xs:element type="xs:string" name="image_8" minOccurs="0"/>
        <xs:element type="xs:string" name="image_9" minOccurs="0"/>
```

```
              <xs:element type="xs:string" name="image_10" minOccurs="0"/>
              <xs:element type="xs:string" name="image_11" minOccurs="0"/>
              <xs:element type="xs:string" name="image_12" minOccurs="0"/>
              <xs:element type="xs:string" name="image_13" minOccurs="0"/>
              <xs:element type="xs:string" name="image_14" minOccurs="0"/>
              <xs:element type="xs:string" name="image_15" minOccurs="0"/>
            </xs:sequence>
            <xs:attribute type="xs:byte" name="sID" use="optional"/>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

DTD Content

DTD stands for Document Type Definition and it is a document which defines the structure of an XML document. It is used to describe the attributes of XML languate precisely. There are two types of DTD: External DTD and Interna DTD. It checks that a XML document has a valid structure or not (GeeksforGeeks, 2020).

The DTD Code is given below:

DTD Code:

```
<!ELEMENT music-store (header,store-details,header-title,song-details+)>

<!ATTLIST music-store
  xmlns:xs CDATA #FIXED 'http://www.w3.org/2001/XMLSchema-instance'
  xs:noNamespaceSchemaLocation NMTOKEN #REQUIRED>

<!ELEMENT header (header-logo,heading)>
<!ELEMENT store-details (store-name,address,telephone-number,website)>
<!ELEMENT header-title (#PCDATA)>
<!ELEMENT song-details (details,(image_1?,image_2?,image_3?,image_4?,image_5?,image_6?,image_7?,image_8?,image_9?,image_10?,
            image_11?,image_12?,image_13?,image_14?,image_15?))>

<!ATTLIST song-details sID CDATA #REQUIRED>

<!ELEMENT header-logo EMPTY>
<!ELEMENT heading (#PCDATA)>
<!ELEMENT store-name (#PCDATA)>
<!ELEMENT address (#PCDATA)>
<!ELEMENT telephone-number (#PCDATA)>
<!ELEMENT website (#PCDATA)>

```

```
<!ELEMENT details (title,description,song_name,genre,name_of_director,producer*,main_producer*,co_producer*,
writer*,main_writer*,co_writer*,Singer_name,Singer_age,Singer_gender,Singer_country,band*,release_year)>

<!ELEMENT image_1 EMPTY>
<!ELEMENT image_2 EMPTY>
<!ELEMENT image_3 EMPTY>
<!ELEMENT image_4 EMPTY>
<!ELEMENT image_5 EMPTY>
<!ELEMENT image_6 EMPTY>
<!ELEMENT image_7 EMPTY>
<!ELEMENT image_8 EMPTY>
<!ELEMENT image_9 EMPTY>
<!ELEMENT image_10 EMPTY>
<!ELEMENT image_11 EMPTY>
<!ELEMENT image_12 EMPTY>
<!ELEMENT image_13 EMPTY>
<!ELEMENT image_14 EMPTY>
<!ELEMENT image_15 EMPTY>

<!ELEMENT title (#PCDATA)>

<!ELEMENT description (#PCDATA)>
<!ATTLIST description desOf CDATA #REQUIRED>

<!ELEMENT song_name (#PCDATA)>
<!ATTLIST song_name sLength NMTOKEN #REQUIRED>

<!ELEMENT genre (#PCDATA)>
<!ATTLIST genre type CDATA #REQUIRED>

```

```
<!ELEMENT name_of_director (#PCDATA)>
<!ELEMENT producer (#PCDATA)>
<!ELEMENT main_producer (#PCDATA)>
<!ELEMENT co_producer (#PCDATA)>
<!ELEMENT writer (#PCDATA)>
<!ELEMENT main_writer (#PCDATA)>
<!ELEMENT co_writer (#PCDATA)>

<!ELEMENT Singer_name (#PCDATA)>
<!ATTLIST Singer_name singerID CDATA #REQUIRED>

<!ELEMENT Singer_age (#PCDATA)>
<!ELEMENT Singer_gender (#PCDATA)>
<!ELEMENT Singer_country (#PCDATA)>
<!ELEMENT band (#PCDATA)>
<!ELEMENT release_year (#PCDATA)>
```

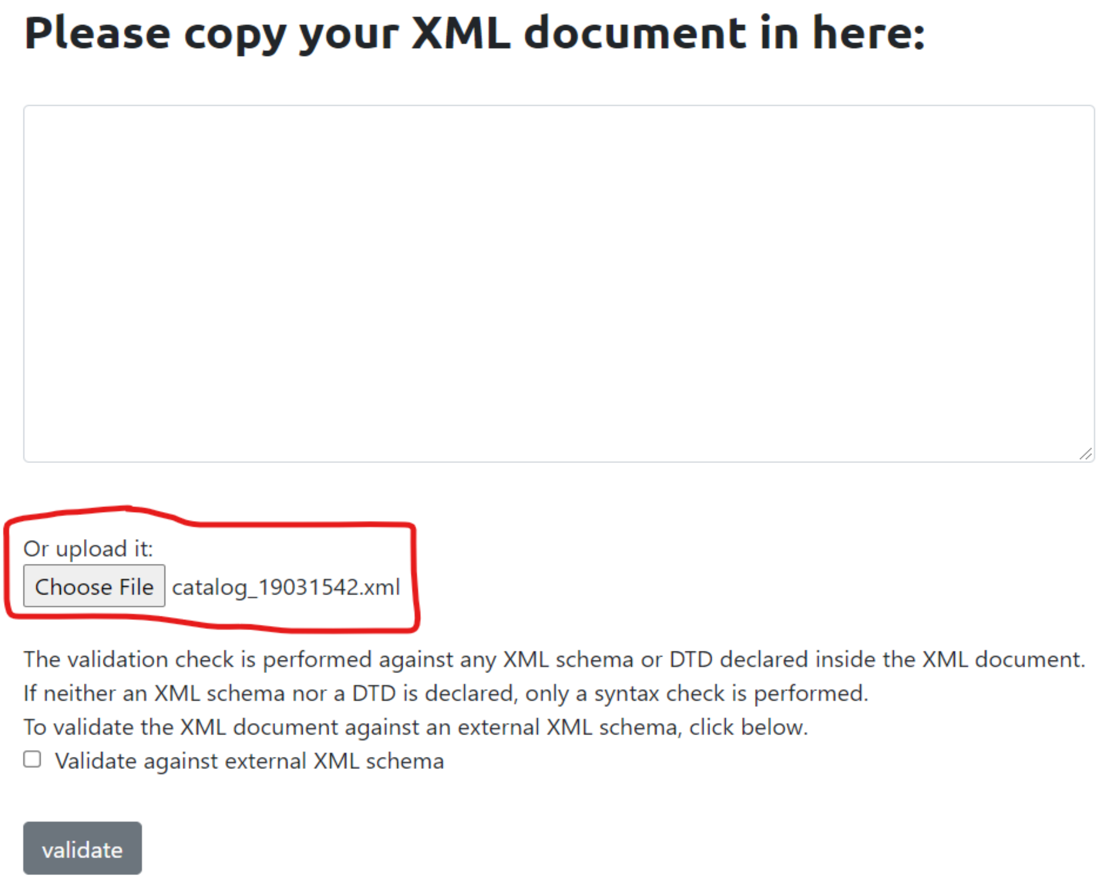
Testing

Software Testing is a method to check whether the actual software product matches expected requirements and to ensure that software produce is Defect free. The purpose of software testing is to identify errors, gaps or missing requirements in contrast to actual requirements. Some prefer saying software testing as a White Box and Black Box Testing (Guru99, 2021).

Test 1:

Test No	1
Objective:	Check XML is well form or not
Action:	Checking XML document well form or not
Expected Result:	XML should be well formed
Actual Output:	XML is well formed
Conclusion:	Test is successful.

Table 1: Test 1



Please copy your XML document in here:

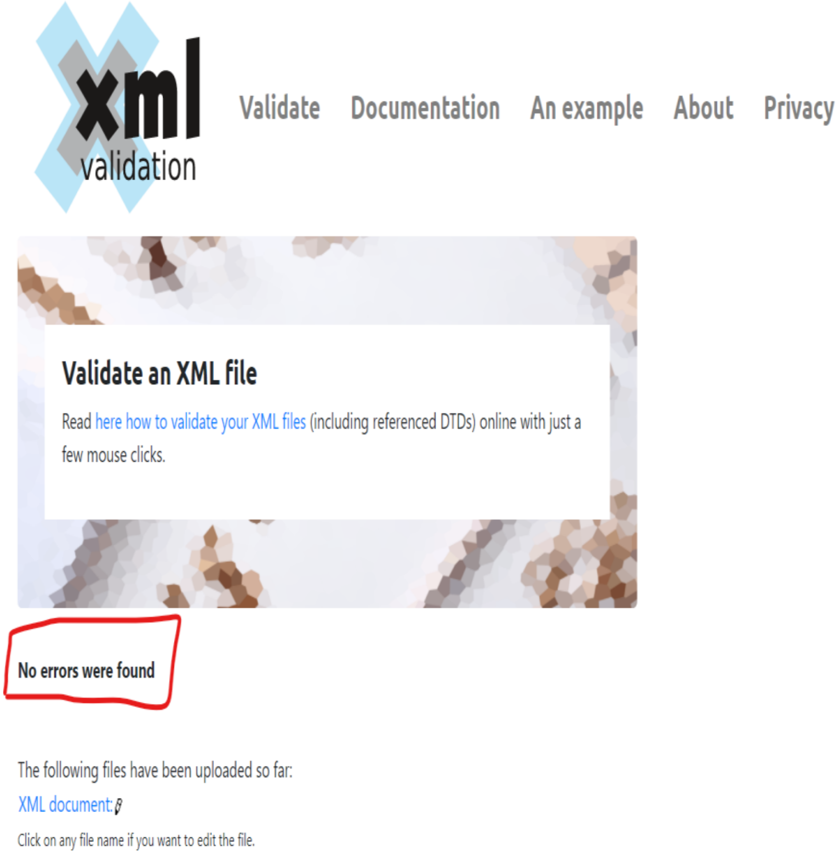
Or upload it:

catalog_19031542.xml

The validation check is performed against any XML schema or DTD declared inside the XML document.
If neither an XML schema nor a DTD is declared, only a syntax check is performed.
To validate the XML document against an external XML schema, click below.

□ Validate against external XML schema

Figure 7: Inserting xml file in validating site



Validate an XML file

Read here how to validate your XML files (including referenced DTDs) online with just a few mouse clicks.

No errors were found

The following files have been uploaded so far:
XML document:

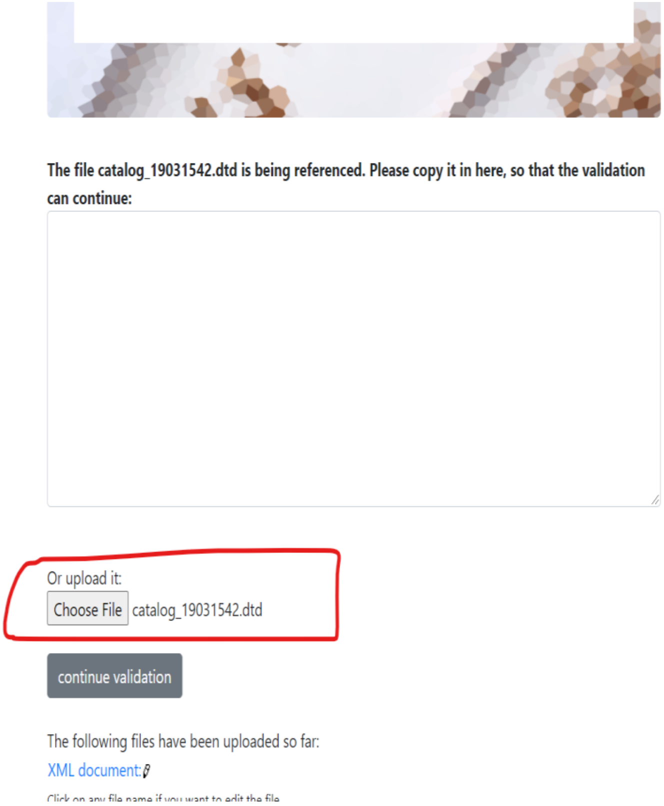
Click on any file name if you want to edit the file.

Figure 8: No errors found in xml file

Test 2:

Test No	2
Objective:	Check DTD is error free
Action:	Checking DTD is error free
Expected Result:	DTD should be error free
Actual Output:	Error Displayed
Conclusion:	Test is unsuccessful.

Table 2: Test 2



The file catalog_19031542.dtd is being referenced. Please copy it in here, so that the validation can continue:

Or upload it:

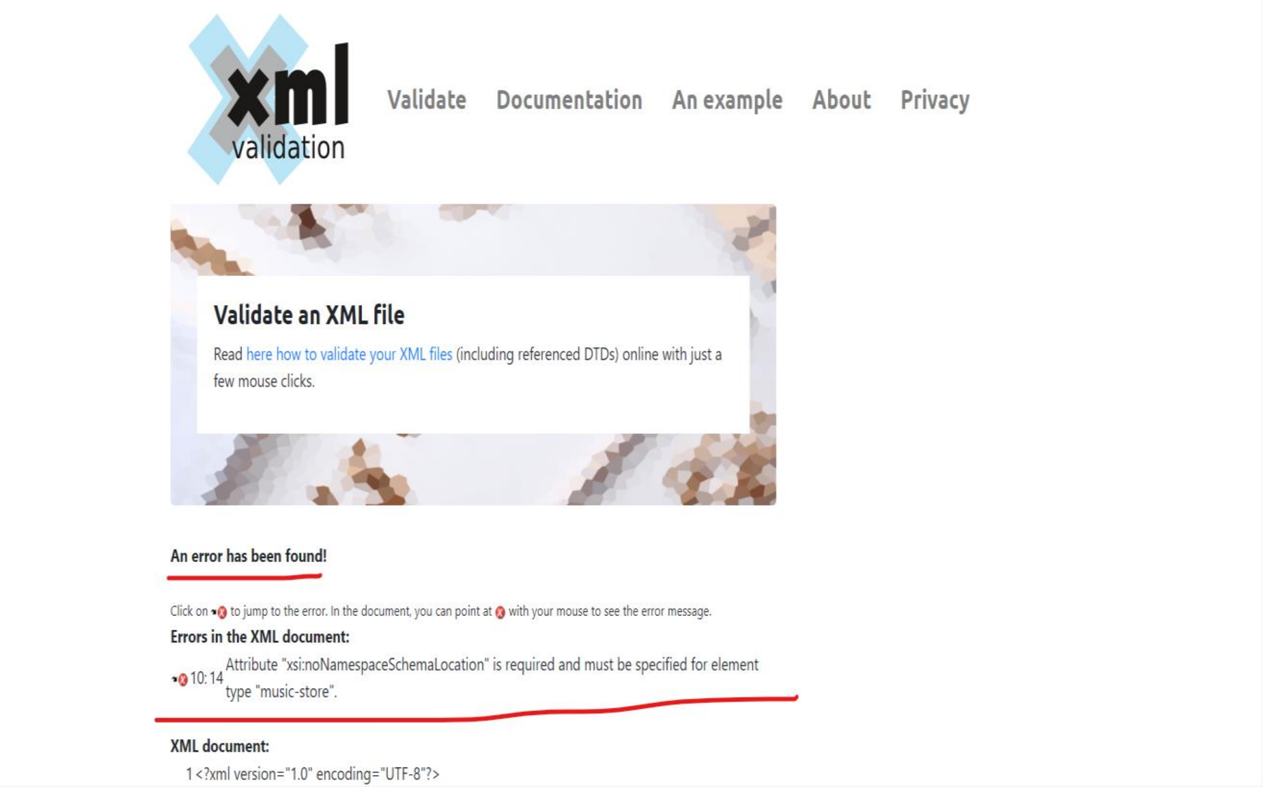
Choose File catalog_19031542.dtd

The following files have been uploaded so far:

XML document: ✎

Click on any file name if you want to edit the file

Figure 9: Inserting DTD file in validating site



Validate an XML file

Read here how to validate your XML files (including referenced DTDs) online with just a few mouse clicks.

An error has been found!

Click on to jump to the error. In the document, you can point at with your mouse to see the error message.

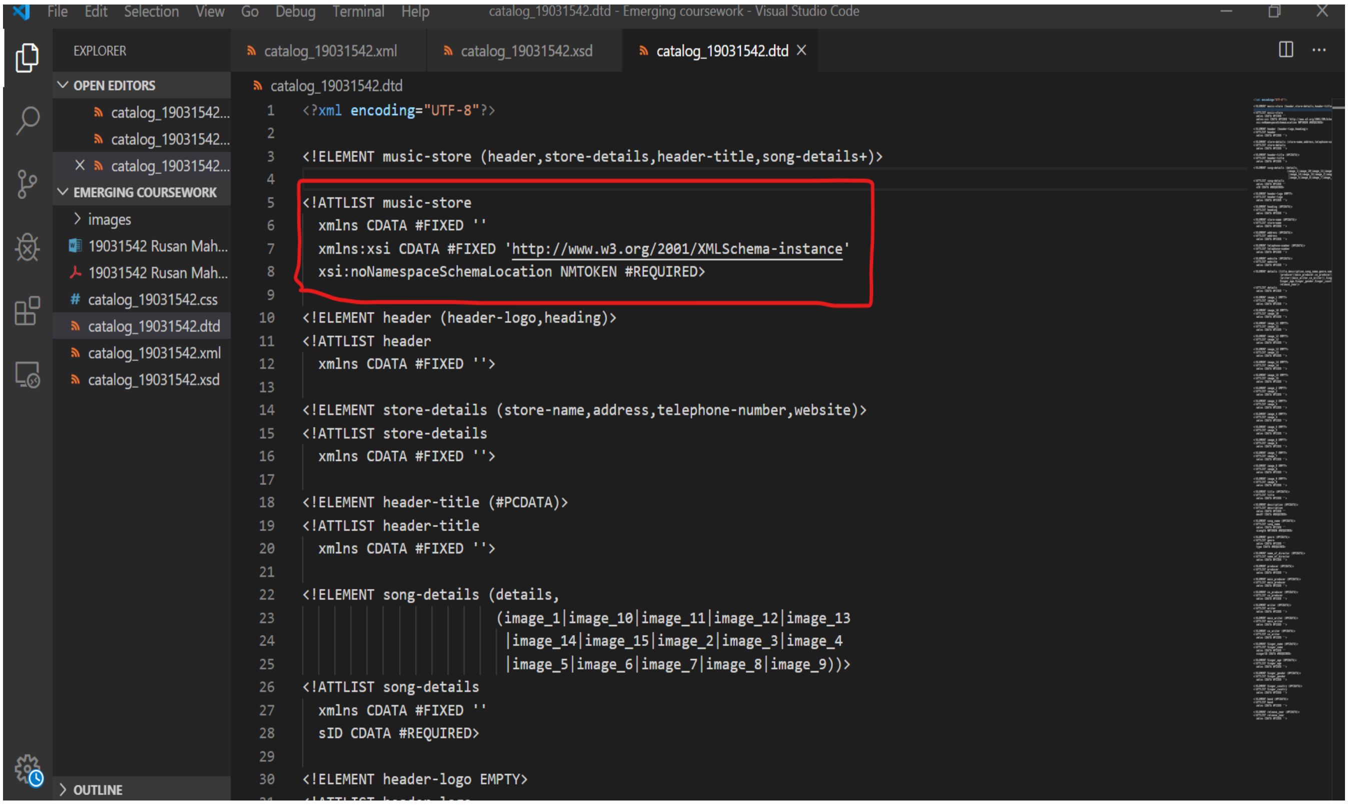
Errors in the XML document:

10: 14 Attribute "xsi:noNamespaceSchemaLocation" is required and must be specified for element type "music-store".

XML document:

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

Figure 10: Error occurs during validating DTD



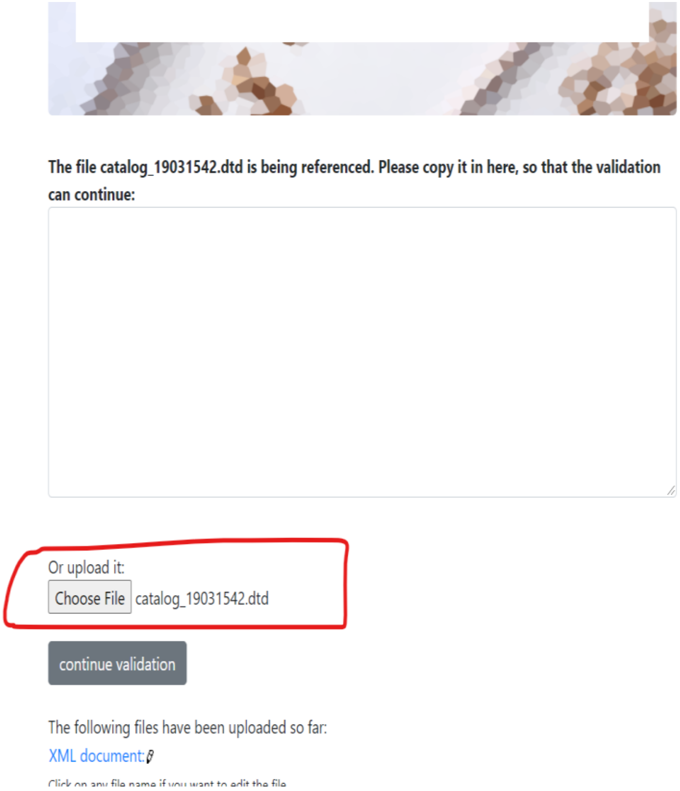
```
<?xml encoding="UTF-8"?>

<!ELEMENT music-store (header,store-details,header-title,song-details+)>

<!ATTLIST music-store
  xmlns CDATA #FIXED ''
  xmlns:xsi CDATA #FIXED 'http://www.w3.org/2001/XMLSchema-instance'
  xsi:noNamespaceSchemaLocation NMTOKEN #REQUIRED>

<!ELEMENT header (header-logo,heading)>
<!ATTLIST header
  xmlns CDATA #FIXED ''>

<!ELEMENT store-details (store-name,address,telephone-number,website)>
<!ATTLIST store-details
  xmlns CDATA #FIXED ''>

<!ELEMENT header-title (#PCDATA)>
<!ATTLIST header-title
  xmlns CDATA #FIXED ''>

<!ELEMENT song-details (details,
                        (image_1|image_10|image_11|image_12|image_13
                         |image_14|image_15|image_2|image_3|image_4
                         |image_5|image_6|image_7|image_8|image_9))>
<!ATTLIST song-details
  xmlns CDATA #FIXED ''
  sID CDATA #REQUIRED>

<!ELEMENT header-logo EMPTY>
```

Figure 11: Error occurs due to the code inside red border code

Test 3:

Test No	3
Objective:	Check DTD is error free
Action:	Checking DTD is error free
Expected Result:	DTD should be error free
Actual Output:	DTD is error free
Conclusion:	Test is successful.

Table 3: Test 3



The file catalog_19031542.dtd is being referenced. Please copy it in here, so that the validation can continue:

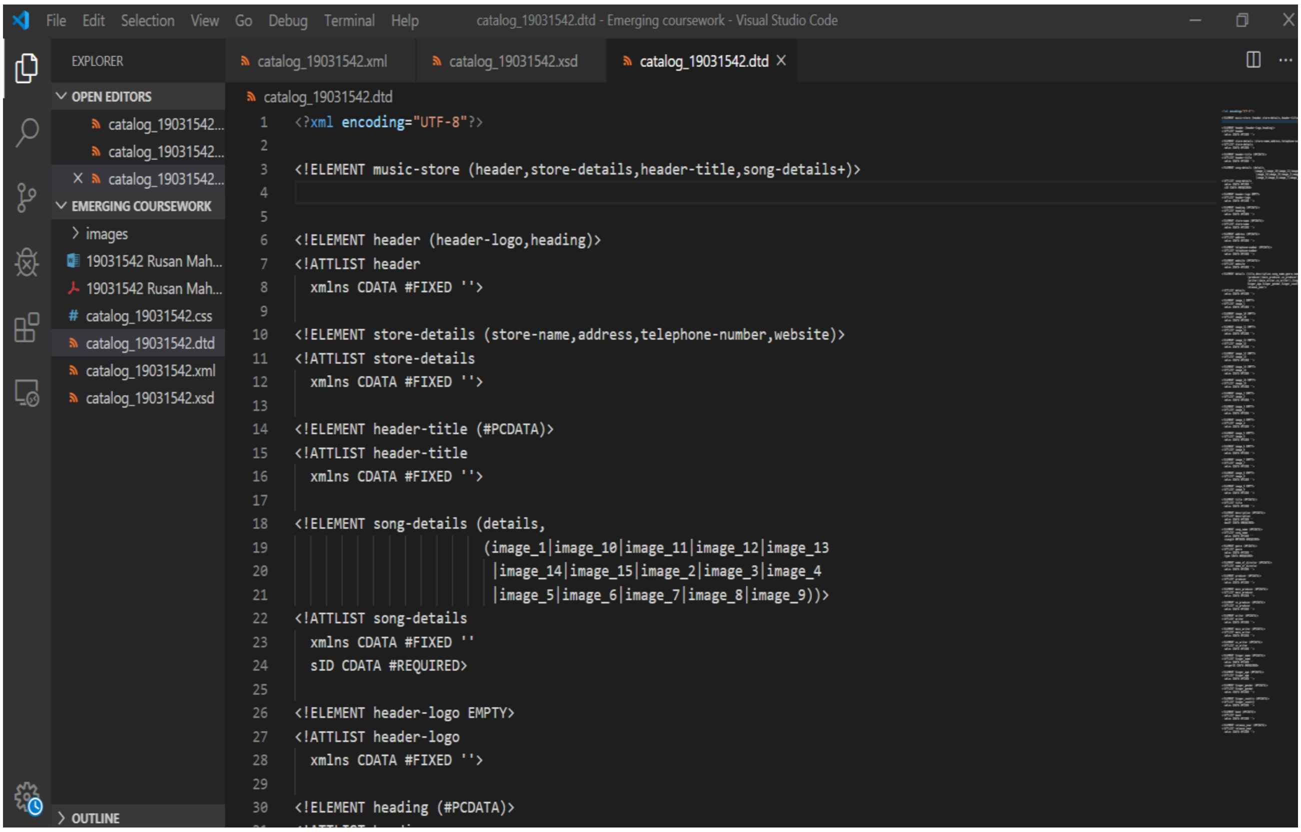
Or upload it:

The following files have been uploaded so far:

XML document:

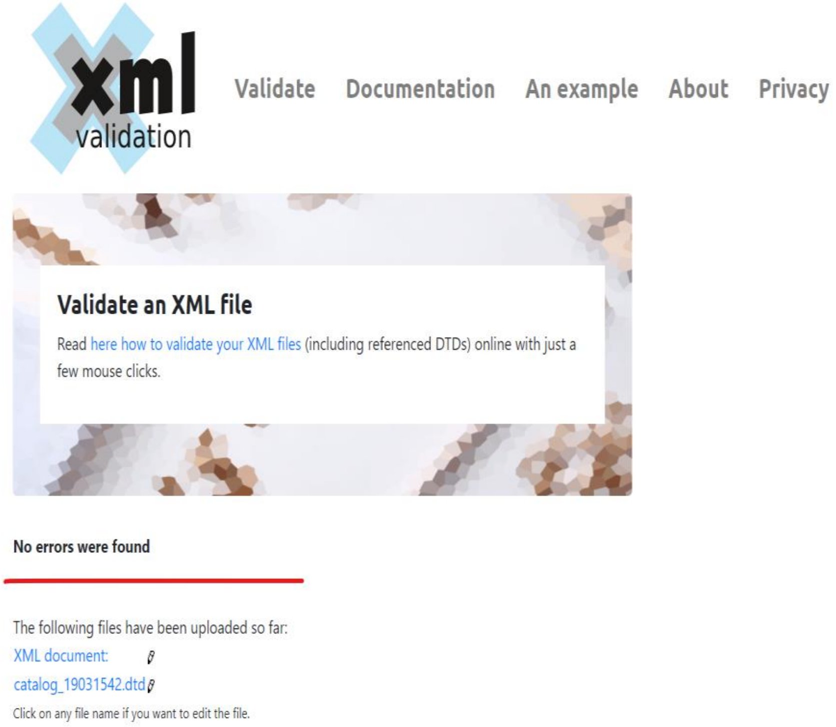
Click on any file name if you want to edit the file

Figure 12: inserting DTD file in validating site



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

<!ELEMENT music-store (header,store-details,header-title,song-details+)>


<!ELEMENT header (header-logo,heading)>
<!ATTLIST header
  xmlns CDATA #FIXED ''>

<!ELEMENT store-details (store-name,address,telephone-number,website)>
<!ATTLIST store-details
  xmlns CDATA #FIXED ''>

<!ELEMENT header-title (#PCDATA)>
<!ATTLIST header-title
  xmlns CDATA #FIXED ''>

<!ELEMENT song-details (details,
                        (image_1|image_10|image_11|image_12|image_13
                         |image_14|image_15|image_2|image_3|image_4
                         |image_5|image_6|image_7|image_8|image_9))>
<!ATTLIST song-details
  xmlns CDATA #FIXED ''
  sID CDATA #REQUIRED>

<!ELEMENT header-logo EMPTY>
<!ATTLIST header-logo
  xmlns CDATA #FIXED ''>

<!ELEMENT heading (#PCDATA)>
```

Figure 13: fixed error in DTD



Validate an XML file

Read here how to validate your XML files (including referenced DTDs) online with just a few mouse clicks.

No errors were found

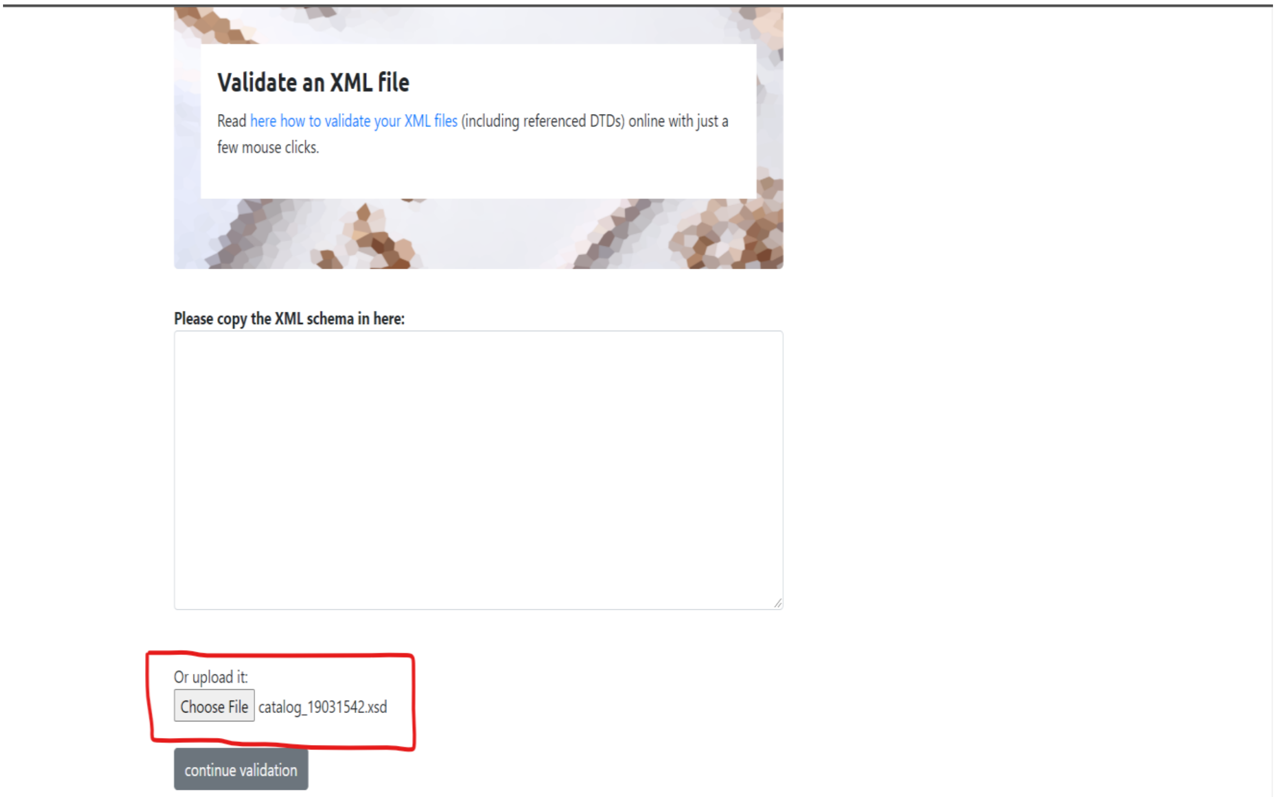
The following files have been uploaded so far:
XML document:
catalog_19031542.dtd
Click on any file name if you want to edit the file.

Figure 14: No errors found validating DTD

Test 4:

Test No	4
Objective:	Check Schema is error free
Action:	Checking Schema is error free
Expected Result:	Schema should be error free
Actual Output:	Error Displayed
Conclusion:	Test is unsuccessful.

Table 4: Test 4



Validate an XML file

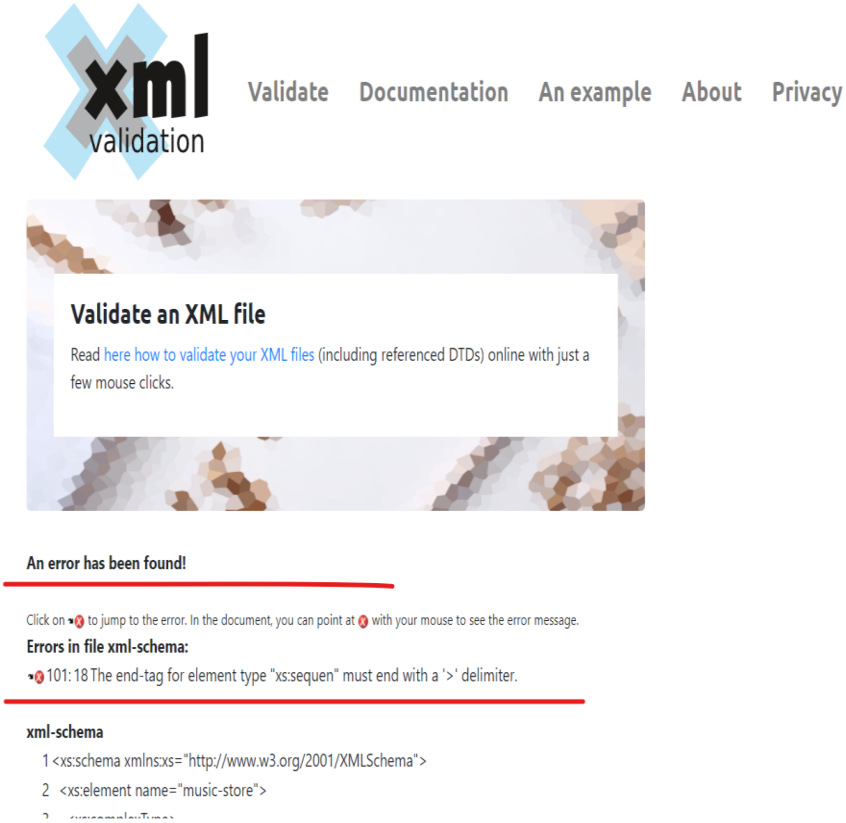
Read here how to validate your XML files (including referenced DTDs) online with just a few mouse clicks.

Please copy the XML schema in here:

Or upload it:

catalog_19031542.xsd

Figure 15: Inserting schema file in validating site



Validate an XML file

Read here how to validate your XML files (including referenced DTDs) online with just a few mouse clicks.

An error has been found!

Click on ⮡⊗ to jump to the error. In the document, you can point at ⊗ with your mouse to see the error message.

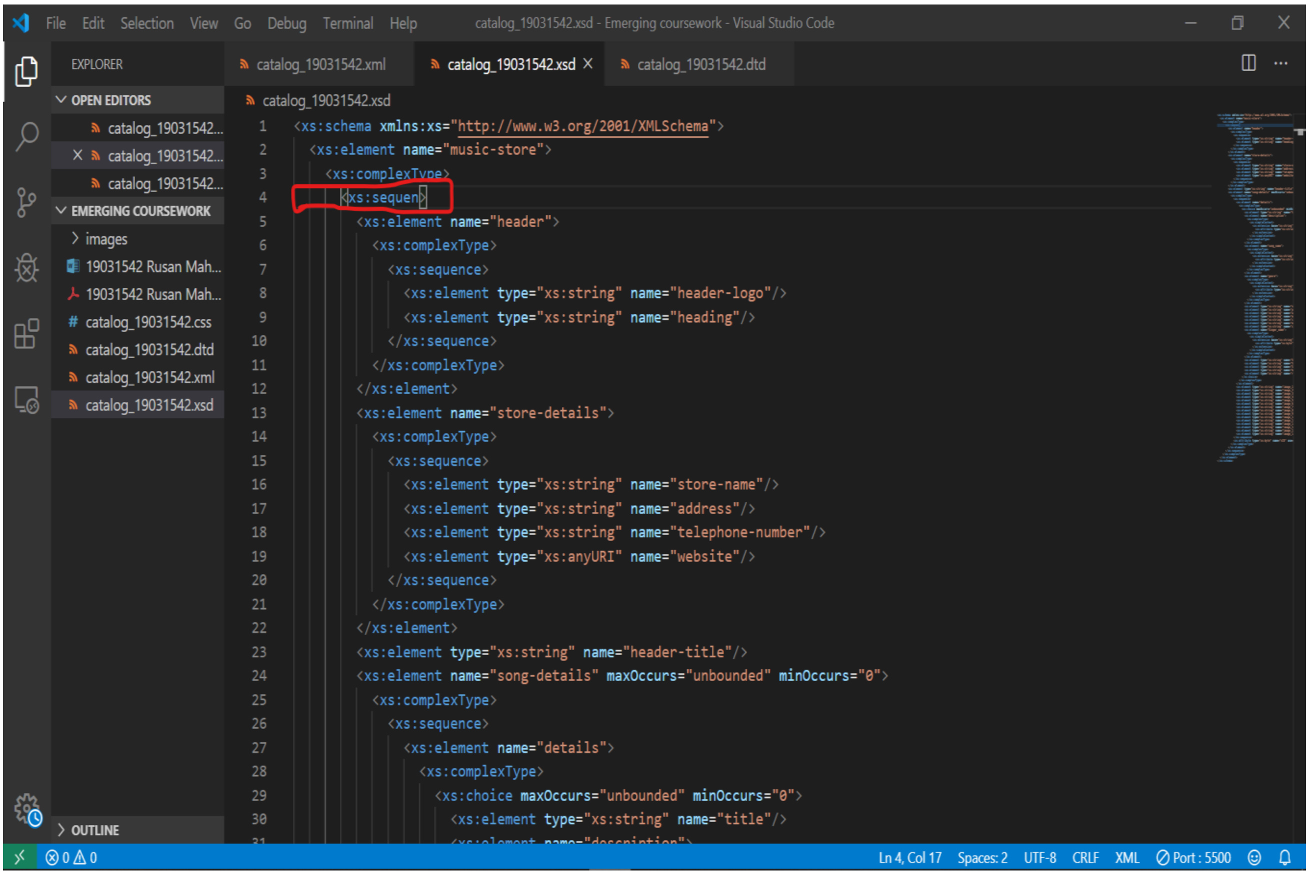
Errors in file xml-schema:

⮡⊗ 101:18 The end-tag for element type "xs:sequen" must end with a '>' delimiter.

xml-schema

```
1 <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
2  <xs:element name="music-store">
```

Figure 16: Error occurs during validating schema file



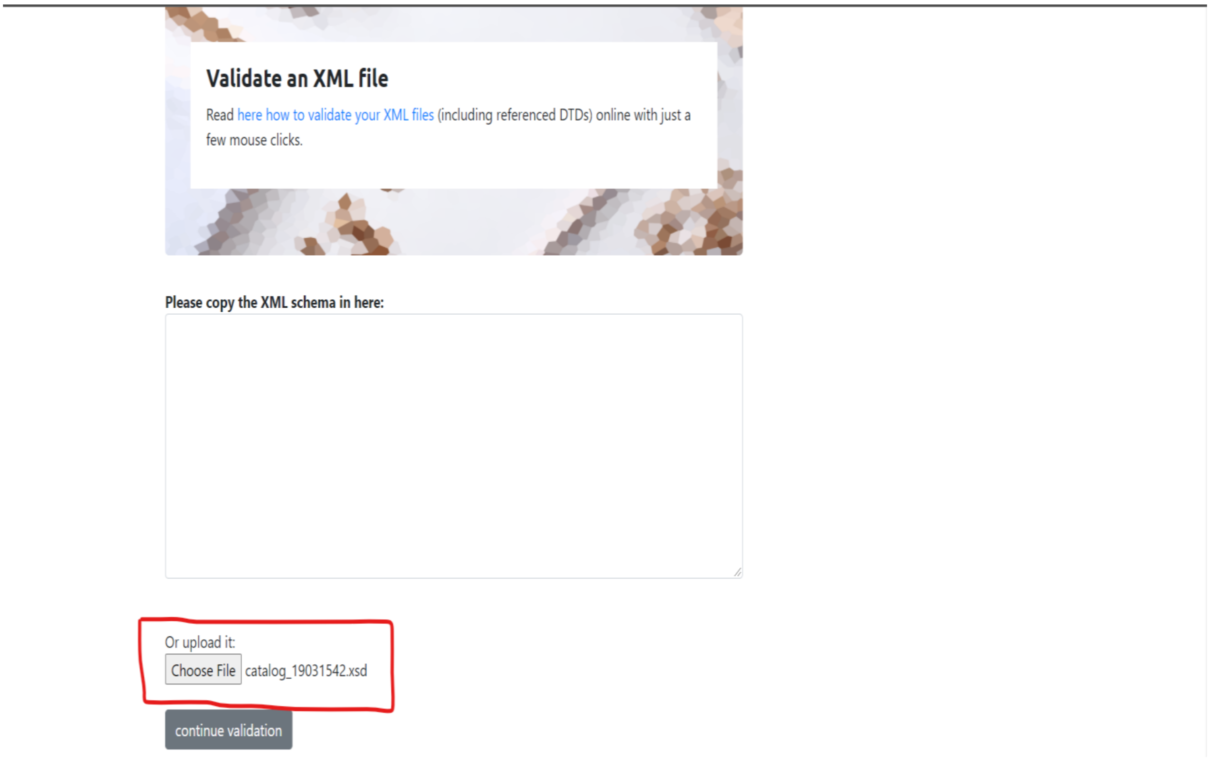
```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="music-store">
    <xs:complexType>
      <xs:sequen>
        <xs:element name="header">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="header-logo"/>
              <xs:element type="xs:string" name="heading"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="store-details">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="store-name"/>
              <xs:element type="xs:string" name="address"/>
              <xs:element type="xs:string" name="telephone-number"/>
              <xs:element type="xs:anyURI" name="website"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element type="xs:string" name="header-title"/>
        <xs:element name="song-details" maxOccurs="unbounded" minOccurs="0">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="details">
                <xs:complexType>
                  <xs:choice maxOccurs="unbounded" minOccurs="0">
                    <xs:element type="xs:string" name="title"/>
                    <xs:element name="description">
```

Figure 17: Error occurs from code inside red border: wrong tag

Test 5:

Test No	5
Objective:	Check Schema is error free
Action:	Checking Schema is error free
Expected Result:	Schema should be error free
Actual Output:	Schema is error free
Conclusion:	Test is successful.

Table 5: Test 5



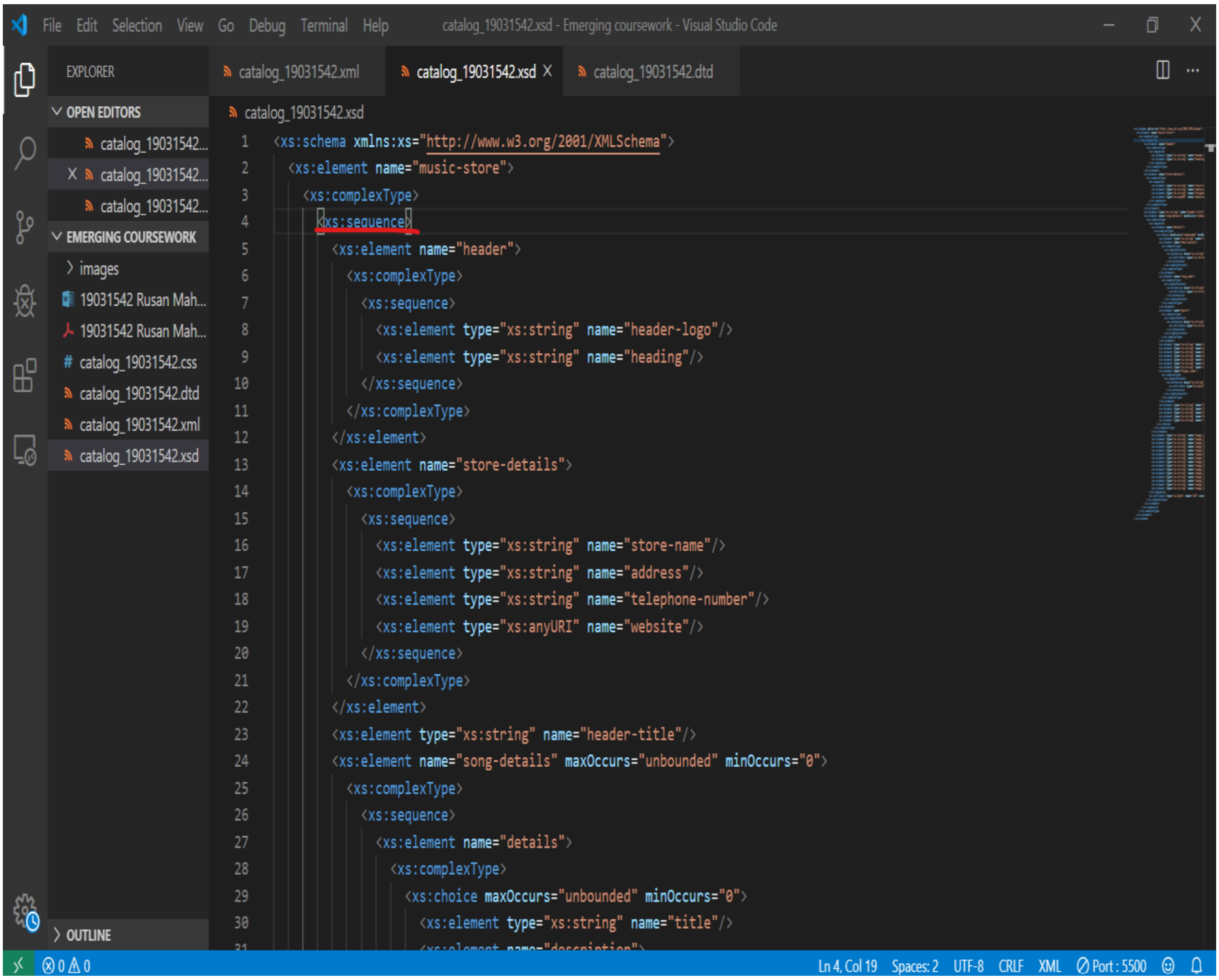
Validate an XML file

Read here how to validate your XML files (including referenced DTDs) online with just a few mouse clicks.

Please copy the XML schema in here:

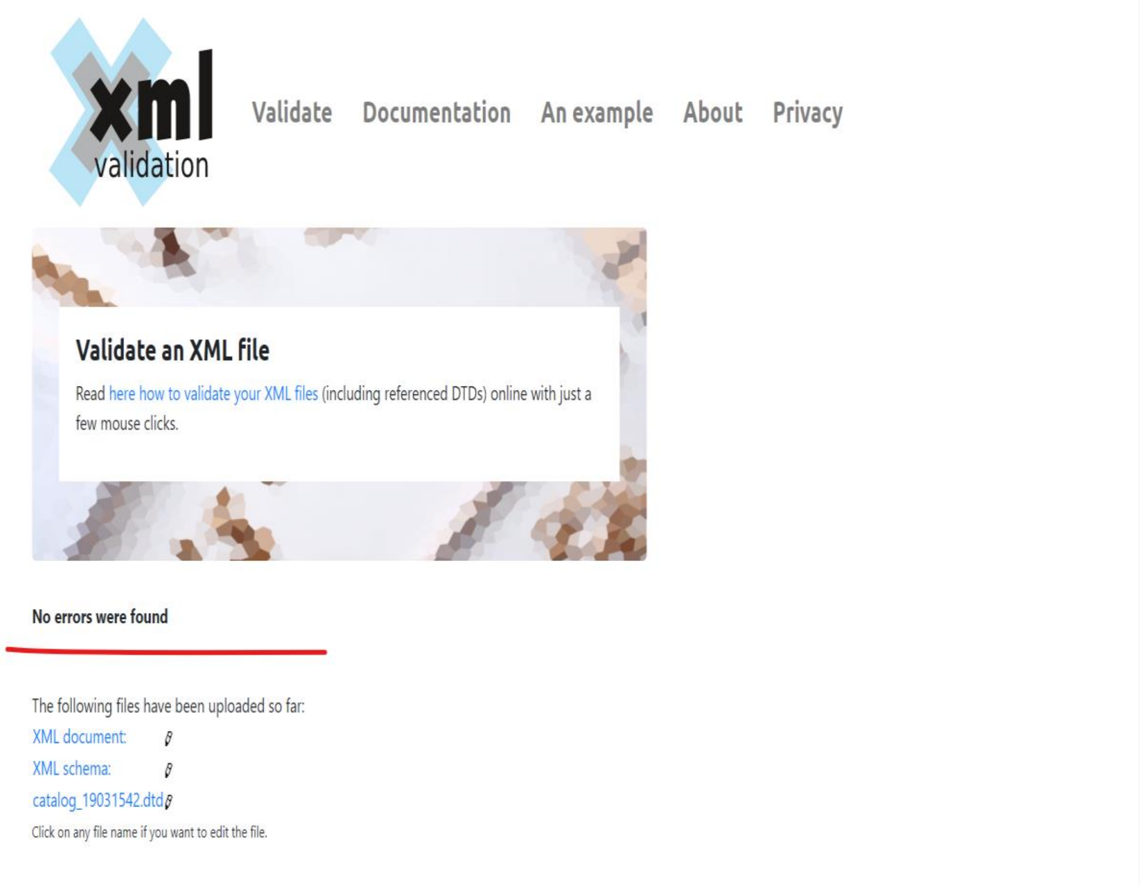
Or upload it:

Figure 18: Inserting schema file in validating site



```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="music-store">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="header">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="header-logo"/>
              <xs:element type="xs:string" name="heading"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="store-details">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="store-name"/>
              <xs:element type="xs:string" name="address"/>
              <xs:element type="xs:string" name="telephone-number"/>
              <xs:element type="xs:anyURI" name="website"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element type="xs:string" name="header-title"/>
        <xs:element name="song-details" maxOccurs="unbounded" minOccurs="0">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="details">
                <xs:complexType>
                  <xs:choice maxOccurs="unbounded" minOccurs="0">
                    <xs:element type="xs:string" name="title"/>
                    <xs:element name="description">
```

Figure 19: Error fixed of schema file



Validate an XML file

Read here how to validate your XML files (including referenced DTDs) online with just a few mouse clicks.

No errors were found

The following files have been uploaded so far:

XML document:

XML schema:

catalog_19031542.dtd

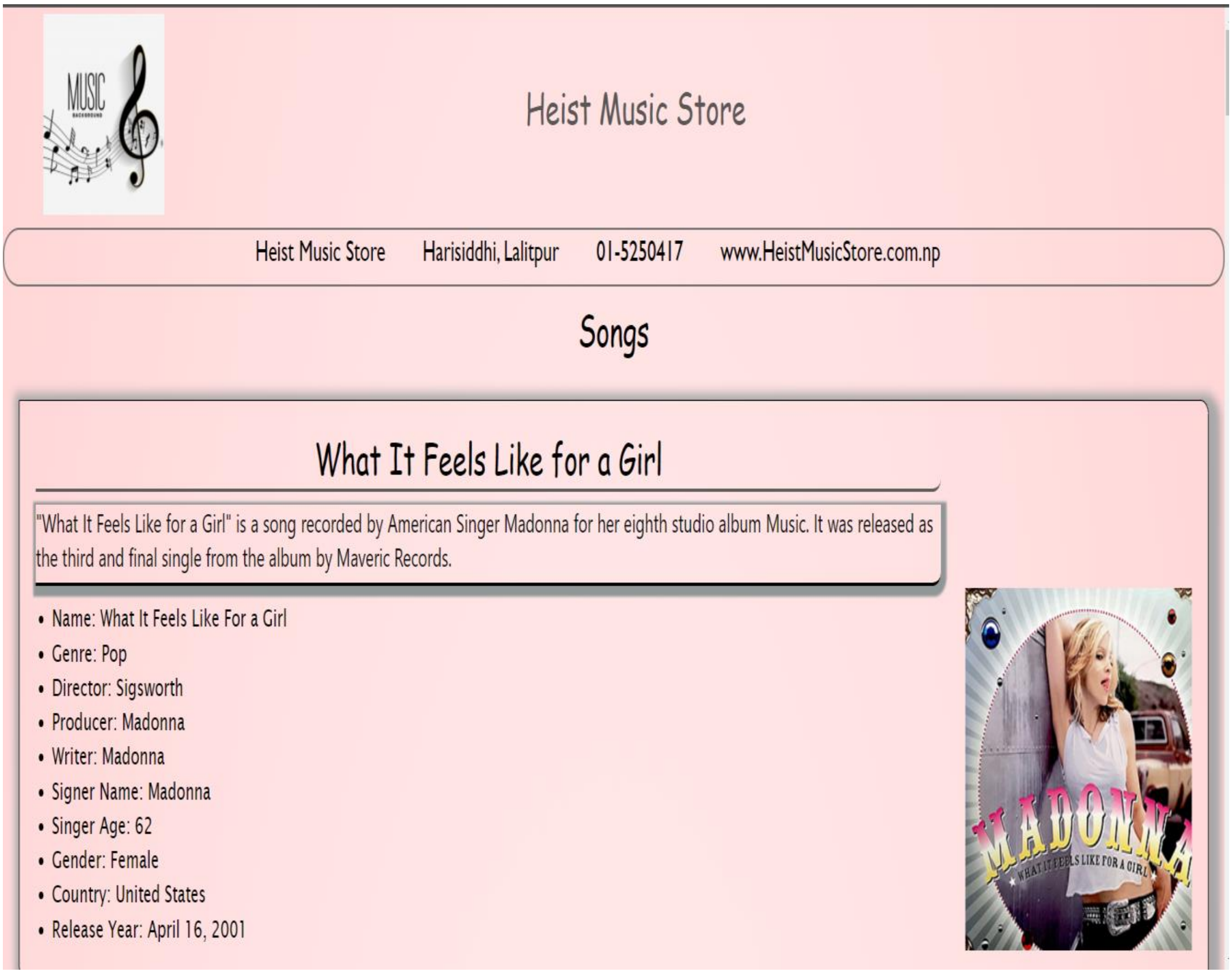
Click on any file name if you want to edit the file.

Figure 20: No errors found validating schema file

Test 6:

Test No	6
Objective:	Check XML after applying CSS
Action:	Check XML after applying CSS
Expected Result:	XML should be run with design in it
Actual Output:	XML run with design in it
Conclusion:	Test is successful.

Table 6: Test 6



Heist Music Store

Heist Music Store Harisiddhi, Lalitpur 01-5250417 www.HeistMusicStore.com.np

Songs

What It Feels Like for a Girl

"What It Feels Like for a Girl" is a song recorded by American Singer Madonna for her eighth studio album Music. It was released as the third and final single from the album by Maveric Records.

- Name: What It Feels Like For a Girl
- Genre: Pop
- Director: Sigsworth
- Producer: Madonna
- Writer: Madonna
- Signer Name: Madonna
- Singer Age: 62
- Gender: Female
- Country: United States
- Release Year: April 16, 2001

Figure 21: XML after applying CSS

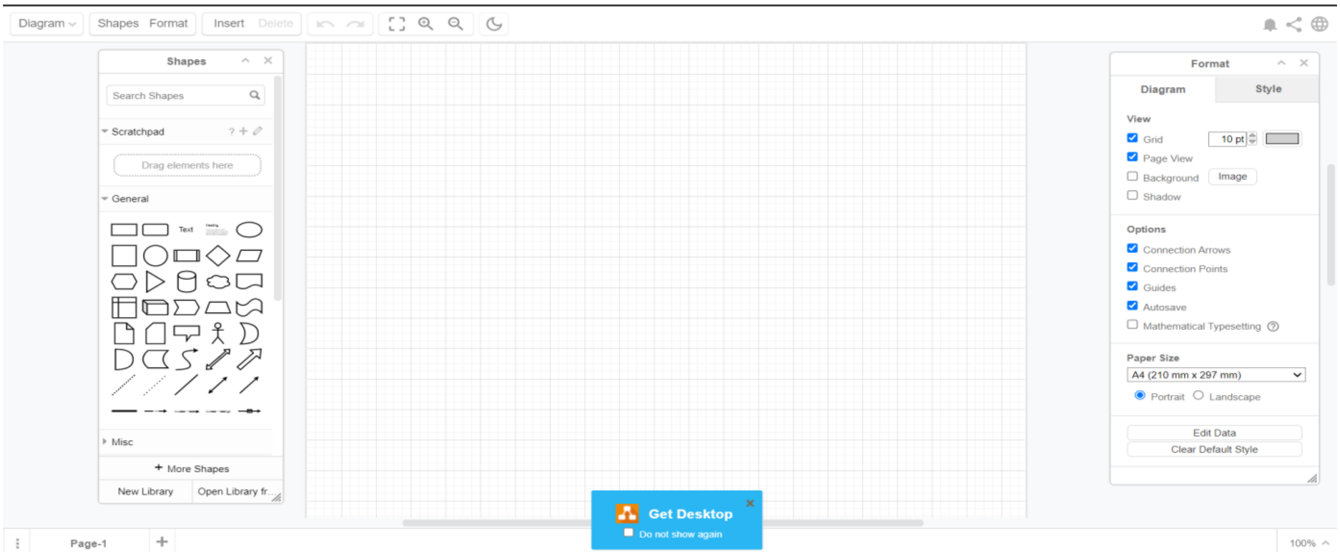
How you developed the coursework?

I have studied the given question in the coursework and planned for starting this coursework. I have made a list of tasks to complete this coursework. After completely studying the scenario given in the coursework, I started developing system using XML (Extensible Markup Language), DTD (Document Type Definition) and Schema/XSD (XML Schema Definition). After all coding files are completed, I started validating in online site www.xmlvalidation.com. Some errors occur on DTD and Schema and for the correction took references from different websites, lecture slides, watched tutorial video and have a console with friends of the problem overcame the error. After all coding are correct, I started doing documentation for this coursework. At first, I make a tree diagram of the XML and started writing introduction for this coursework. In this coursework we are assigned to do minimum 5 testing and while doing testing found error in XML document.

For this coursework work I have used 2 tools: draw.io and visual studio code. And 1 website www.xmlvalidation.com is used for validating XML, DTD and Schema content.

Draw.io:

Draw.io is a software or making diagrams and charts. The software allows you to choose from an automatic layout function, or create a custom layout. Draw.io has options for storing saved charts in the cloud, on a server, or network storage at a data center, depending on your needs (Computer Hope, 2020).



Format: Diagram | Style

View
☑ Grid 10 pt
☑ Page View
☐ Background
☐ Shadow

Options
☑ Connection Arrows
☑ Connection Points
☑ Guides
☑ Autosave
☐ Mathematical Typesetting

Paper Size
A4 (210 mm x 297 mm)
● Portrait ○ Landscape

Figure 22: Draw.io

Visual Studio Code:

Visual Studio Code combines the simplicity of a source code editor with powerful developer tooling, like intelliSense code completion and debugging. Visual Studio Code supports macOS, Linux, and Windows and so you can hit the ground running, no matter the platform (Microsoft, 2021).

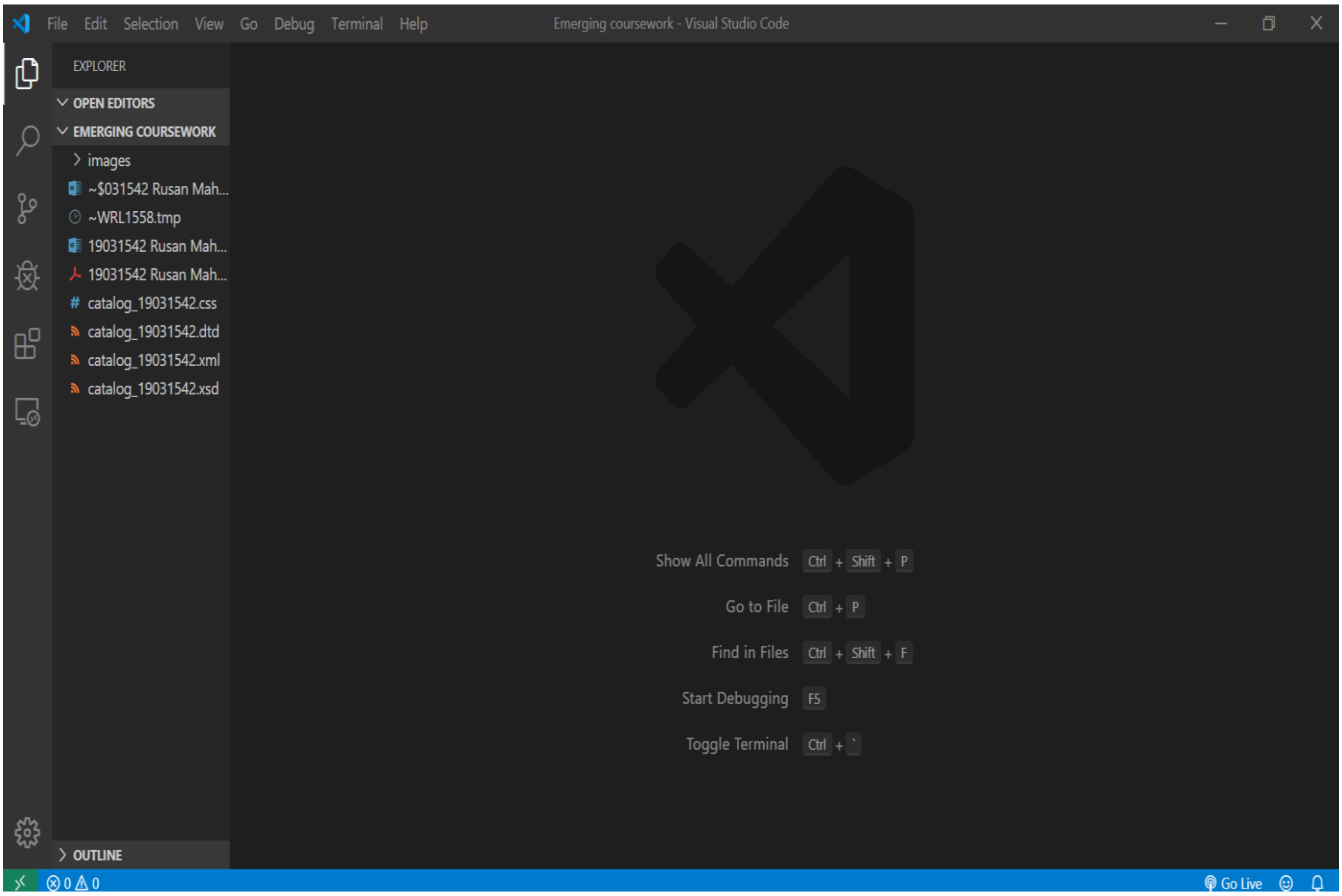


Figure 23: Visual Studio Code

Difference between Schema and DTD

DTD stands for Document Type Definition and it is a document which defines the structure of an XML document. XSD stands for XML Schema Definition and it is a way to describe the structure of XML document (GeeksforGeeks, 2020). The difference between Schema and DTD are:

DTD	Schema (XSD)
DTD are the declarations that define a document type for SGML.	XSD describes the elements in a XML document.
It does not support namespace.	It supports namespace.
It is comparatively harder than XSD.	It is relatively more-simpler than DTD.
It does not support datatypes	It supports datatypes.
SGML syntax is used for DTD	XML is used for writing XSD.
It is not extensible in nature.	It is extensible in nature.
It does not give us much control on structure of XML document (GeeksforGeeks, 2020).	It gives us more control on structure of XML document (GeeksforGeeks, 2020).
DTD does not support namespace.	XSD supports namespace.

Critical Evaluation

This coursework is about making a music store system. It took a lot of time to complete this coursework. It was very difficult to complete this coursework. For making XML document it was easy but designing it through CSS is a bit complex. I have build a music system in which both programmer and beginner programmer can understand code. As per the requirement of coursework, I have researched and put 15 songs, 5 attribute and 5 optional elements. The main problem I have faced in this coursework is to design XML file with CSS. I have faced many problems in this coursework. Some problems are: Image not shown during CSS design, error in DTD and Schema.

DTD and Schema are the one which is most difficult part to understand in this coursework. I have researched in different websites and watch lecture video make DTD and Schema completely error free. To compete DTD it took 3 to 4 hours to make it completely error free. Another problem I have faced is styling XML content with CSS. I was confused how to use floating box and design the system. I took reference from another site for design and for some other styles I took reference from w3School and completed the coding full error free.

Conclusion

In conclusion, I have researched and completed the coursework with full dedication. Visual Studio Code is used to build the music store system. At first, it was difficult for me to do DTD and Schema and by taking references from workshop projects and internet I have completed this project. This project has given us confidence in our XML, DTD and Schema coding and research skills. In this project I have tried different types of Schema but Russian Doll is easiest Schema.

This module helped me to understand about XML and use of DTD and Schema in project. Also learned to draw tree diagram of the system. From my point of view, the purpose of this coursework is to learn how to use XML and learn why it is used in real world. I learned that XML is used to provide a software and hardware-independent way of storing, transporting and sharing data. I have also learned how to use CSS in in XML document and how to design it properly. Some errors were occurred during developing program and for the correction took references from different websites, lecture slides, watched tutorial video and have a console with friends of the problem overcame during this coursework.

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