Emerging Programming Platforms and Technologies
CS5004NI
Course Work

Submitted By: Prayash Bikram Shah
Student ID: 16033180

Submitted To: Mr. Dhurba Sen & Mr. Nikhil Pandey
Submission Date: May 8th, 2018

ABSTRACT

This report shows the documentation of developing an online model system using XML and how an XML developer develops system with certain requirements. It consists of a tree diagram showing tree structures then the contents of the three files which are XML, DTD and CSS respectively. Then testing was performed to check the files had any errors or not and whether the browser renders the style sheet or not. Some of the limitation of DTD and CSS with the development and problem faced explained.

Table of Contents

TABLE OF FIGURES

Table of Tables

1.INTRODUCTION

This report gives out the details of the model of a system that has been designed by me. I was handed out a certain scenario and given out minimum requirements to develop a system for an online electronic store. This system is built upon using XML and validating it with Document Type Definition (DTD). The design of this system was done by using Cascading Style Sheet (CSS). Below are the aims and objectives of this system.

1.1 AIMS:

- Develop a model of a system for an online electronic store.
- The store will include the details of it like name, address, contact number, website address and a logo.
- It will contain some items for sale like CPU, Monitor, Mouse, Keyboard, hard disk, speakers etc.
- Each of the item will have a name, item number, description, quantity and price.
- Each monitor will have additional information on manufacturer, resolution, dimension, color.
- Monitors will have an optional information on speaker.
- All CPU have monitors, keyboard, hard disk and speakers.
- CPU item will have option of delivery which will be free or express.

1.2 OBJECTIVES:

- Build this system using XML.
- Insert at least 10 pieces of data or more.
- Validate the XML document with DTD.
- Style this document with CSS.
- Use at least one border, two different font sizes and families, two different font colors and display a logo image.
- Complete all the requirements and aims of this assessment.

2.DOCUMENT STRUCTURE

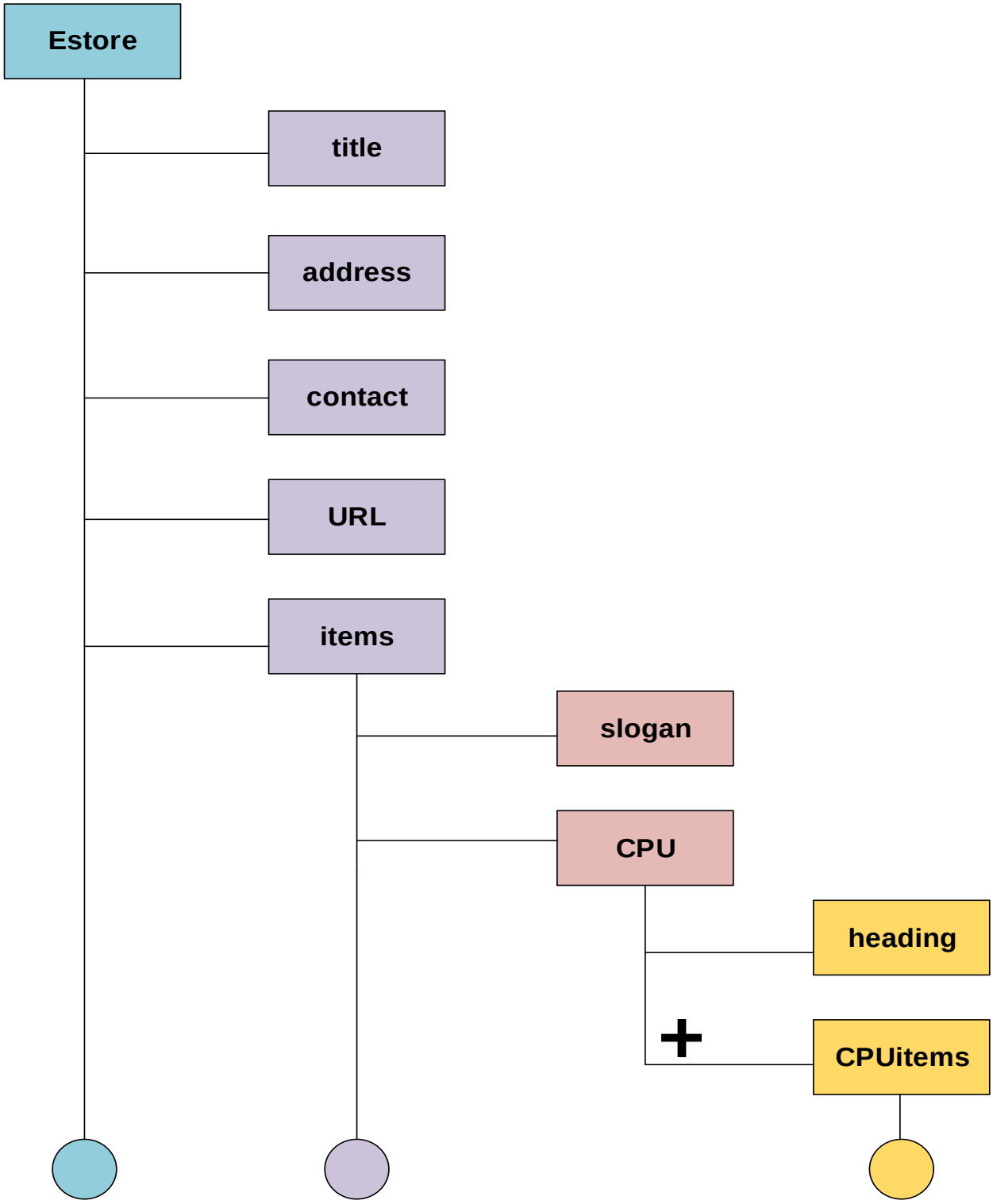

Figure 1 Tree Diagram Part 1

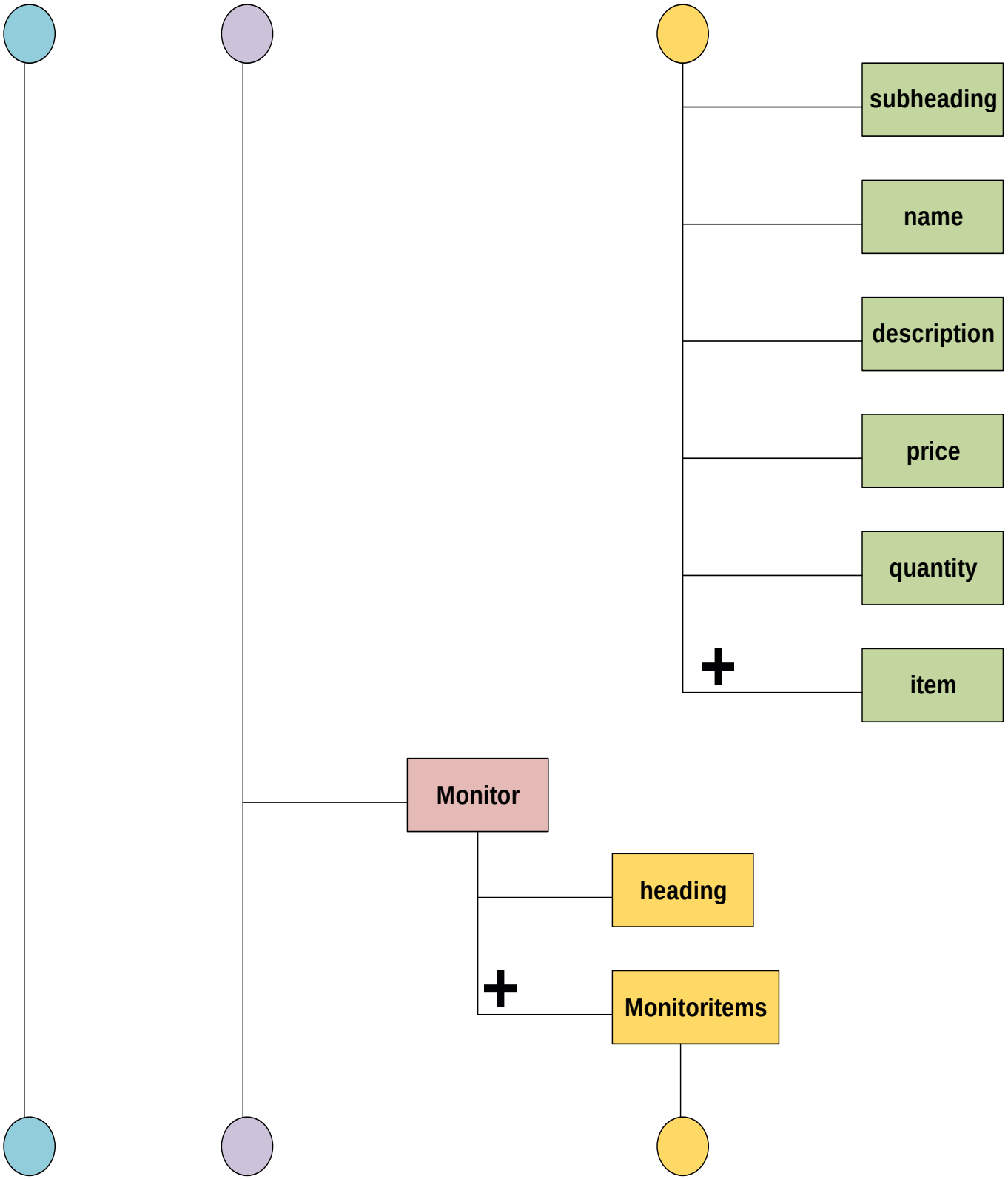

Figure 2 Tree Diagram Part 2

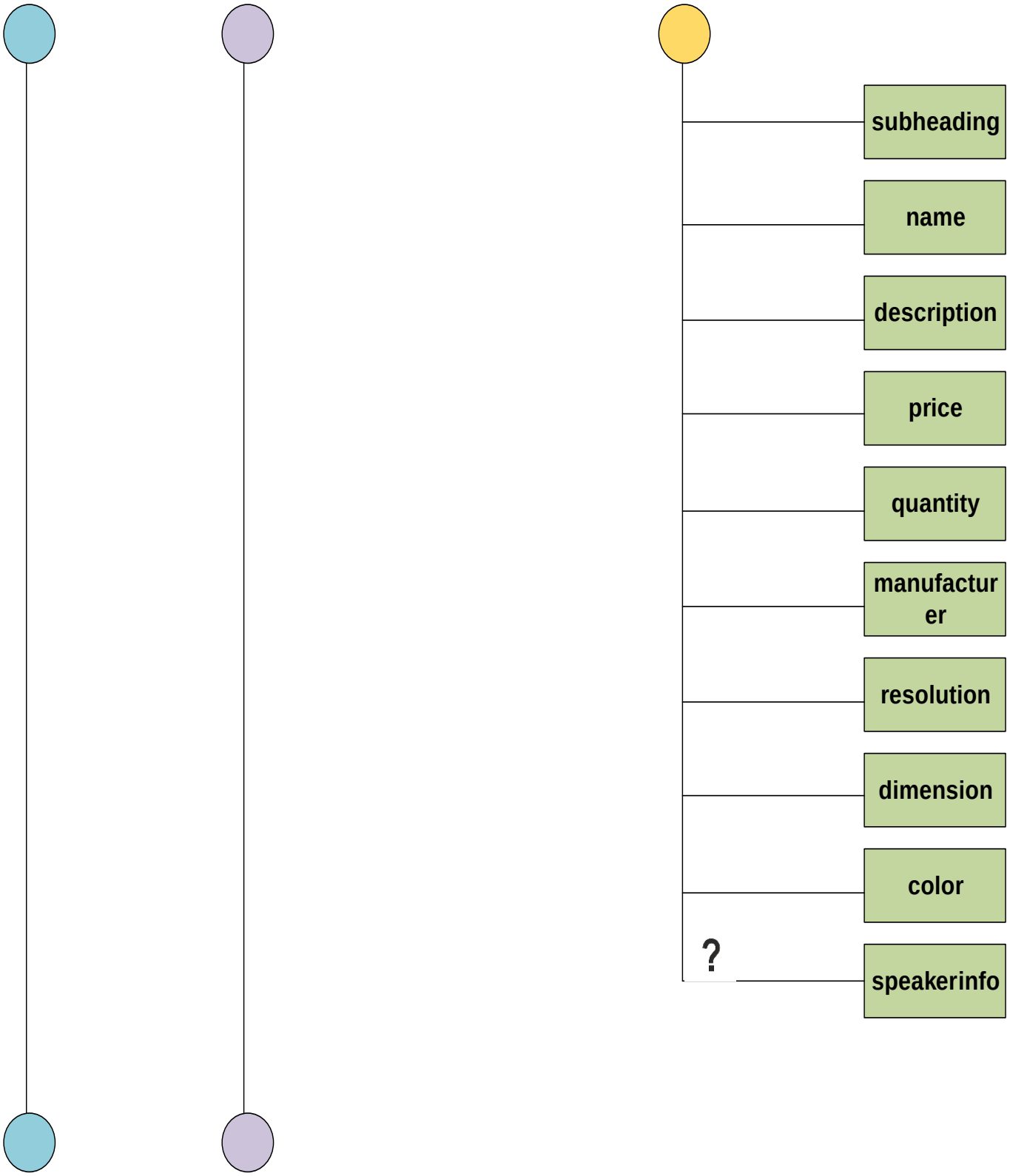

Figure 3 Tree Diagram Part 3

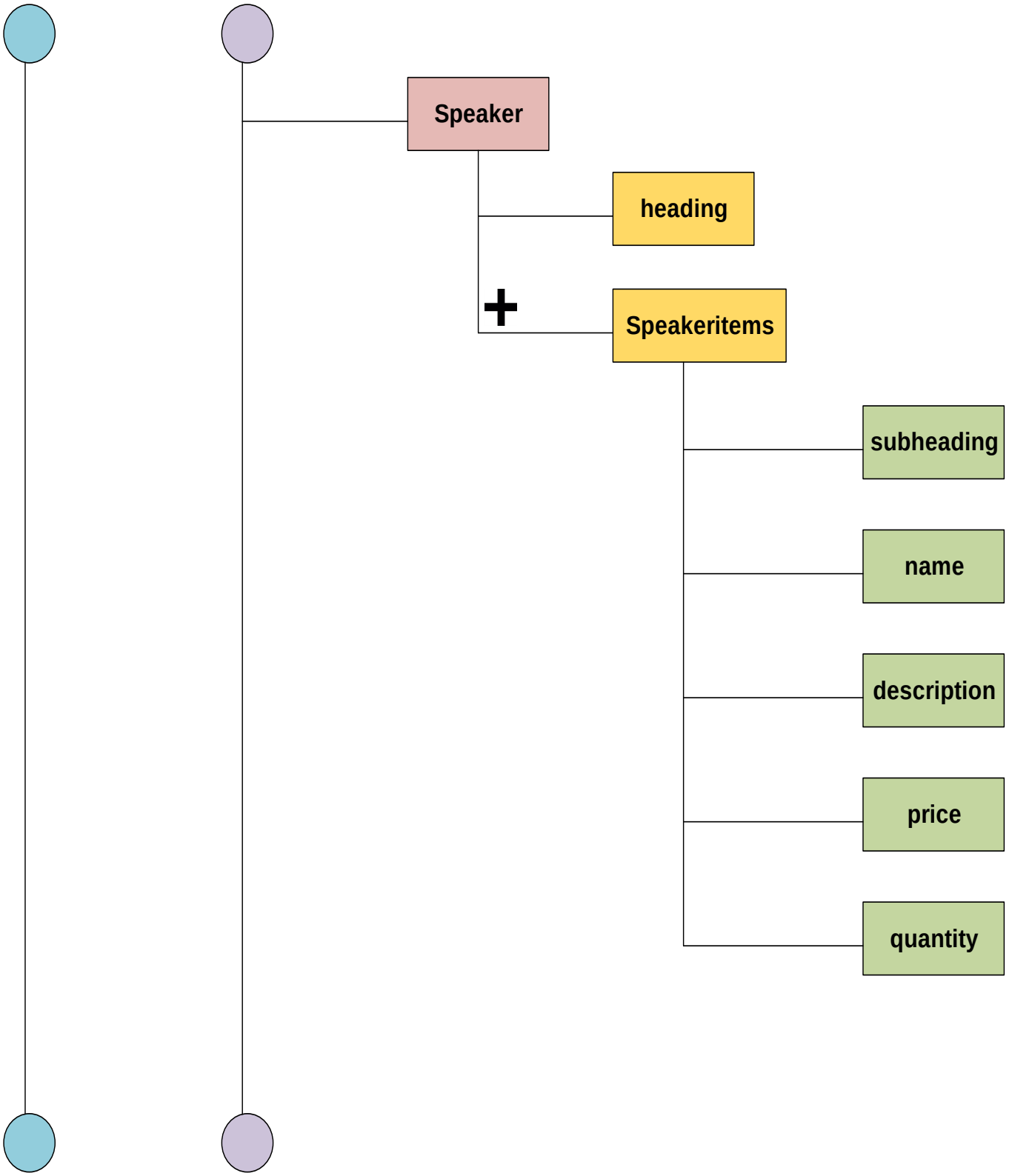

Figure 4 Tree Diagram Part 4

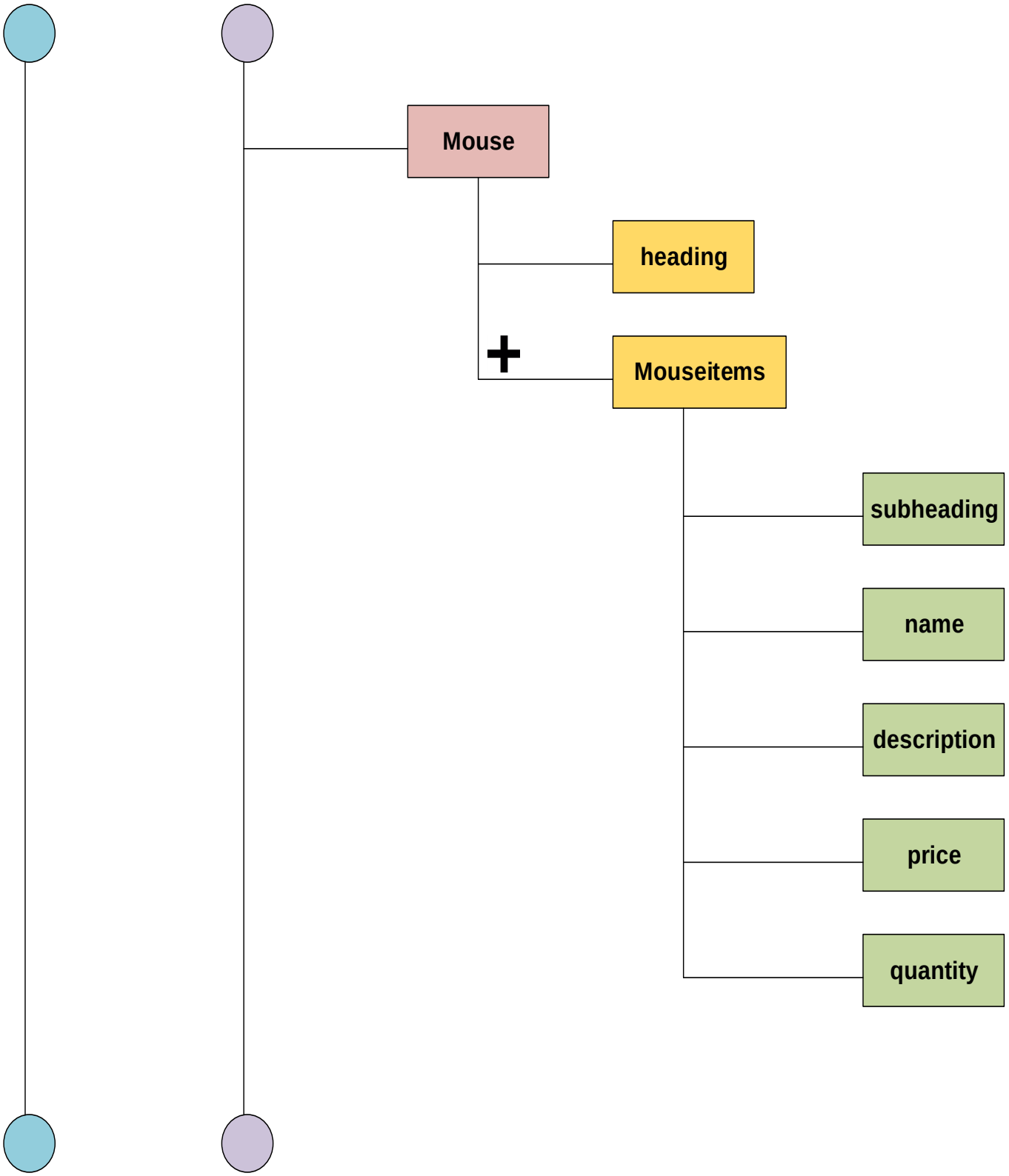

Figure 5 Tree Diagram Part 5

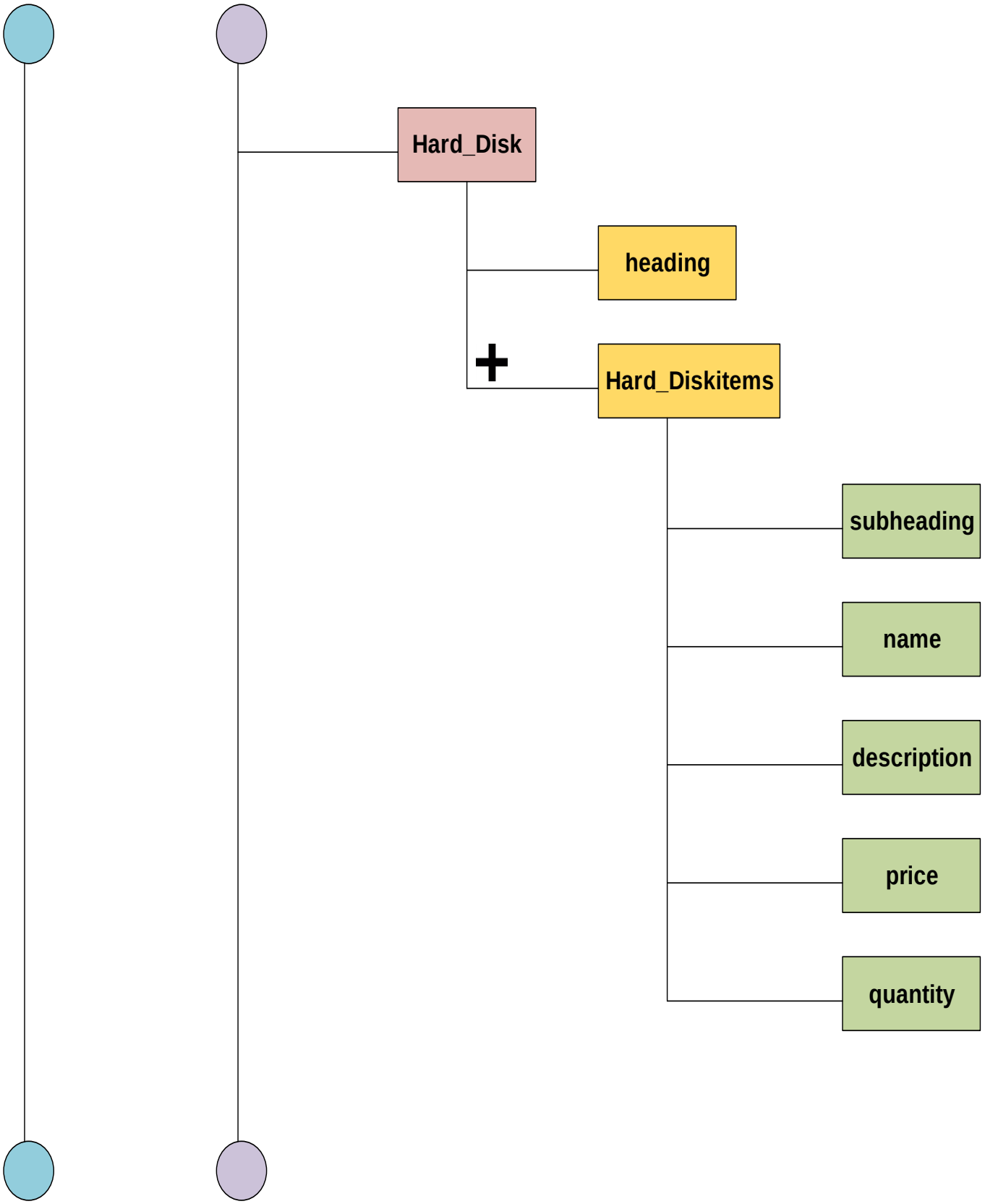

Figure 6 Tree Diagram Part 6

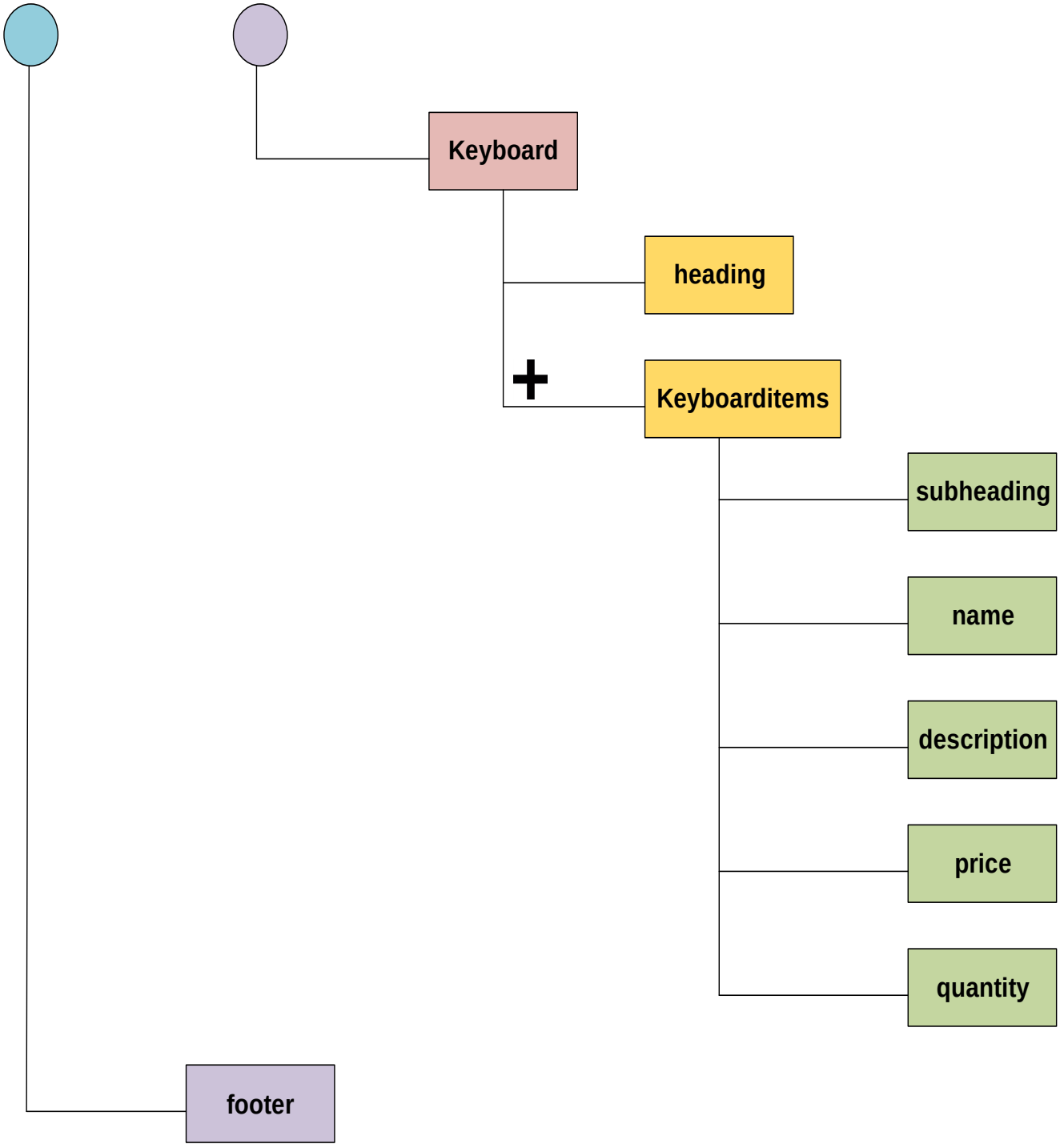

Figure 7 Tree Diagram Part 7

3.DTD

<!ELEMENT Estore (title, address, contact, URL, items, footer)>

<!ELEMENT title (#PCDATA)>

<!ELEMENT address (#PCDATA)>

<!ELEMENT contact (#PCDATA)>

<!ELEMENT URL (#PCDATA)>

<!ELEMENT items (slogan, CPU, Monitor,Speaker, Mouse, Hard_Disk, Keyboard)>

<!ELEMENT slogan (#PCDATA)>

<!ELEMENT CPU (heading, CPUitems+)>

<!ELEMENT heading (#PCDATA)>

<!ELEMENT CPUitems (subheading, name, description, price, quantity, item+)>

<!ATTLIST CPUitems id ID #REQUIRED delivery (Free|Express) #REQUIRED>

<!ELEMENT subheading (#PCDATA)>

<!ELEMENT name (#PCDATA)>

<!ELEMENT description (#PCDATA)>

<!ELEMENT price (#PCDATA)>

<!ELEMENT quantity (#PCDATA)>

<!ELEMENT item (#PCDATA)>

<!ELEMENT Monitor (heading, Monitoritems+)>

<!ELEMENT Monitoritems (subheading, name, description, price, quantity, manufacturer, resolution, dimension, color, speakerinfo?)>

<!ATTLIST Monitoritems id ID #REQUIRED CPUitemsID IDREF #IMPLIED type (LED|LCD|CRT) #REQUIRED>

<!ELEMENT manufacturer (#PCDATA)>

<!ELEMENT resolution (#PCDATA)>

<!ELEMENT dimension (#PCDATA)>

<!ELEMENT color (#PCDATA)>

<!ELEMENT speakerinfo (#PCDATA)>

<!ELEMENT Speaker (heading, Speakeritems+)>

<!ELEMENT Speakeritems (subheading, name, description, price, quantity)>

<!ATTLIST Speakeritems id ID #REQUIRED CPUitemsID IDREF #IMPLIED>

<!ELEMENT Mouse (heading, Mouseitems+)>

<!ELEMENT Mouseitems (subheading, name, description, price, quantity)>

<!ATTLIST Mouseitems id ID #REQUIRED CPUitemsID IDREF #IMPLIED>

<!ELEMENT Hard_Disk (heading, Hard_Diskitems+)>

<!ELEMENT Hard_Diskitems (subheading, name, description, price, quantity)>

<!ATTLIST Hard_Diskitems id ID #REQUIRED CPUitemsID IDREF #IMPLIED>

<!ELEMENT Keyboard (heading, Keyboarditems+)>

<!ELEMENT Keyboarditems (subheading, name, description, price, quantity)>

<!ATTLIST Keyboarditems id ID #REQUIRED CPUitemsID IDREF #IMPLIED>

<!ELEMENT footer (#PCDATA)>

4.XML Document

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet href= "catalog_16033180.css"?>
<!DOCTYPE Estore SYSTEM "catalog_16033180.dtd">
<Estore>
<title>Shah Electorics Store</title>
<address>New Colony, Sukedhara, Kathmandu, Nepal</address>
<contact>CALL US @ +9774444444, +977984141414</contact>
<URL>VIST US @ www.shahelectronics.com</URL>
<items>
        <slogan>BEST DEALS BEST PRODUCTS</slogan>
        <CPU>
                <heading>CPU Section</heading>
    <CPUitems id="id_1" delivery="Free">
        <subheading>ITEM NUMBER 1</subheading>
        <name>Name: Intel Core i9-7920X</name>
        <description>Description: Best for gaming</description>
        <price>Buy At: $1000</price>
        <quantity>Available Quantity: 12</quantity>
        <item>Monitor: BenQ EX3501R</item>
        <item>Keyboard: Corsair K95 RGB Platinum</item>
        <item>Hardrive: WD Blue 1TB</item>
        <item>Speaker: Logitech X-540 5.1</item>
    </CPUitems>
    <CPUitems id="id_2" delivery="Express">
        <subheading>ITEM NUMBER 2</subheading>
        <name>Name: AMD Ryzen 5 2600X</name>
        <description>Description: One of the best of AMDs</description>
        <price>Buy At: $230</price>
```

```
    <quantity>Available Quantity: 9</quantity>
    <item>Monitor: Alienware AW3418DW</item>
    <item>Keyboard: Patriot Viper V770</item>
    <item>Hardrive: Seagate Barracuda 1TB</item>
    <item>Speaker: Logitech Z906 5.1</item>
</CPUitems>
    </CPU>
    <Monitor>
        <heading>Monitor Section</heading>
        <Monitoritems id="id_3" CPUitemsID="id_1" type="LED">
            <subheading>ITEM NUMBER 3</subheading>
            <name>Name: BenQ EX3501R</name>
            <description>Description: Best for gaming</description>
            <price>Buy At: $850</price>
            <quantity>Available Quantity: 1</quantity>
            <manufacturer>Manufacturer: BenQ</manufacturer>
            <resolution>Resoultion: 3440&#215;1440</resolution>
            <dimension>Dimension: 35 inch</dimension>
            <color>Color: Black</color>
        </Monitoritems>
        <Monitoritems id="id_4" CPUitemsID="id_2" type="LCD">
            <subheading>ITEM NUMBER 4</subheading>
            <name>Name: Alienware AW3418DW</name>
            <description>Description: Best for gaming</description>
            <price>Buy At: $1150</price>
            <quantity>Available Quantity: 1</quantity>
            <manufacturer>Manufacturer: Alienware</manufacturer>
            <resolution>Resolution: 3440&#215;1440</resolution>
            <dimension>Dimension: 34 inch</dimension>
            <color>Color: Greyish</color>
```

```
                <speakerinfo>Speaker: Logitech Z906 5.1</speakerinfo>
            </Monitoritems>
        </Monitor>
        <Speaker>
            <heading>Speaker Section</heading>
            <Speakeritems id="id_5" CPUitemsID="id_1">
                <subheading>ITEM NUMBER 5</subheading>
                <name>Name: Logitech X-540 5.1</name>
        <description>Description: Surround Sound Speaker System</description>
        <price>Buy At: $449</price>
        <quantity>Available Quantity: 1</quantity>
            </Speakeritems>
            <Speakeritems id="id_6" CPUitemsID="id_2">
                <subheading>ITEM NUMBER 6</subheading>
                <name>Name: Logitech Z906 5.1</name>
        <description>Description: Surround Sound Speaker System - THX, Dolby Digital and
DTS Digital Certified</description>
        <price>Buy At: $300</price>
        <quantity>Available Quantity: 1</quantity>
            </Speakeritems>
        </Speaker>
        <Mouse>
            <heading>Mouse Section</heading>
            <Mouseitems id="id_7" CPUitemsID="id_1">
                <subheading>ITEM NUMBER 7</subheading>
                <name>Name: SteelSeries Rival 600</name>
        <description>Description: Lift off distance detection, customizable weight, 60-million click
mechanical switches</description>
        <price>Buy At: $80</price>
        <quantity>Available Quantity: 1</quantity>
```

```
        </Mouseitems>
        <Mouseitems id="id_8" CPUitemsID="id_2">
            <subheading>ITEM NUMBER 8</subheading>
            <name>Name: Corsair Dark Core RGB SE</name>
    <description>Description: Qi wireless charging, Interchangeable side grip, Omron switches, Fully programmable buttons, Dynamic multi-color 3-zone backlighting</description>
    <price>Buy At: $90</price>
    <quantity>Available Quantity: 1</quantity>
        </Mouseitems>
    </Mouse>
    <Hard_Disk>
        <heading>Hard Disk Section</heading>
        <Hard_Diskitems id="id_9" CPUitemsID="id_1">
            <subheading>ITEM NUMBER 9</subheading>
            <name>Name: WD Blue 1TB</name>
    <description>Description: Calculates optimum seek speeds to lower power consumption, noise and vibration</description>
    <price>Buy At: $44</price>
    <quantity>Available Quantity: 1</quantity>
        </Hard_Diskitems>
        <Hard_Diskitems id="id_10" CPUitemsID="id_2">
            <subheading>ITEM NUMBER 10</subheading>
            <name>Name: Seagate Barracuda 1TB</name>
    <description>Description: The thinnest and highest-capacity 2.5-Inch Hard Drive available.</description>
    <price>Buy At: $46</price>
    <quantity>Available Quantity: 1</quantity>
        </Hard_Diskitems>
    </Hard_Disk>
    <Keyboard>
        <heading>Keyboard Section</heading>
```

```
            <Keyboarditems id="id_11" CPUitemsID="id_1">
                <subheading>ITEM NUMBER 11</subheading>
                <name>Name: Corsair K95 RGB Platinum</name>
        <description>Description: Expensive and large footprint</description>
        <price>Buy At: $145</price>
        <quantity>Available Quantity: 1</quantity>
            </Keyboarditems>
            <Keyboarditems id="id_12" CPUitemsID="id_2">
                <subheading>ITEM NUMBER 12</subheading>
                <name>Name: Patriot Viper V770</name>
        <description>Description: The Patriot Viper V770 replaces the G.Skill Ripjaws KM780 RGB as the best overall gaming keyboard.</description>
        <price>Buy At: $117</price>
        <quantity>Available Quantity: 1</quantity>
            </Keyboarditems>
        </Keyboard>
</items>
<footer> CopyRight &#169; prayash.shah@gmail.com </footer>
</Estore>
```

5.CSS

```
Estore{
        background-image: url("background.jpg");
        background-size: 100% 100%;
    margin-left: 25px;
    margin-right: 25px;
}
title{
        display: block;
        width: auto;
        font-family: "Courier New";
        font-size: 70pt;
        color: white;
        background-image: url("images.png");
    background-repeat: no-repeat;
    background-size: 140px 115px;
    background-position: right top;
        text-align: left;
}
address{
        display: block;
        width: 500px;
        font-family: "Courier New";
        font-size: 15pt;
        font-style: italic;
        color: white;
        text-align: left;
}
contact{
```

```
        display: block;
        width: 500px;
        font-family: "Courier New";
        font-size: 15pt;
        font-style: italic;
        color: white;
        text-align: left;
}
URL{
        display: block;
        width: 500px;
        font-family: "Courier New";
        font-size: 15pt;
        font-style: italic;
        color: white;
        text-align: left;
}
items{
        display: block;
    width: auto;
    border: 25px;
    padding: 25px;
}
CPU{
        display:block;
    width: auto;
    border: 25px;
    padding: 25px;
    margin: 25px;
    background-color: #181B2E
```

```
}
slogan{
        display:block;
        font-family: Georgia;
        font-size: 15pt;
        font-style: italic;
    padding-left: 23px;
        color: red;
    float:left;
}
heading{
        display:block;
        font-family: Georgia;
        font-size: 20pt;
        color: rgb(253, 118, 1);
        text-align: center;
}
CPUitems{
        display:inline-block;
    width: 40%;
    border: 25px;
    padding: 25px;
    margin: 25px;
    border:solid 2px #20D9FE
}
Monitor{
        display:block;
    width: auto;
    border: 25px;
    padding: 25px;
```

```
    margin: 25px;
    background-color: #181B2E
}
Monitoritems{
        display:inline-block;
    width: 40%;
    border: 25px;
    padding: 25px;
    margin: 25px;
    border:solid 2px #20D9FE
}
Keyboard{
        display:block;
    width: auto;
    border: 25px;
    padding: 25px;
    margin: 25px;
    background-color: #181B2E
}
Keyboarditems{
        display:inline-block;
    width: 40%;
    border: 25px;
    padding: 25px;
    margin: 25px;
    border:solid 2px #20D9FE
}
Mouse{
        display:block;
    width: auto;
```

```
    border: 25px;
    padding: 25px;
    margin: 25px;
    background-color: #181B2E
}
Mouseitems{
        display:inline-block;
    width: 40%;
    border: 25px;
    padding: 25px;
    margin: 25px;
    border:solid 2px #20D9FE
}
Hard_Disk{
        display:block;
    width: auto;
    border: 25px;
    padding: 25px;
    margin: 25px;
    background-color: #181B2E
}
Hard_Diskitems{
        display:inline-block;
    width: 40%;
    border: 25px;
    padding: 25px;
    margin: 25px;
    border:solid 2px #20D9FE
}
Speaker{
```

```
        display:block;
    width: auto;
    border: 25px;
    padding: 25px;
    margin: 25px;
    background-color: #181B2E
}
Speakeritems{
        display:inline-block;
    width: 40%;
    border: 25px;
    padding: 25px;
    margin: 25px;
    border:solid 2px #20D9FE
}
subheading{
        display:block;
        font-family: "Times New Roman";
        font-size: 20pt;
        color:orange;
}
name, description, price, quantity, manufacturer, resolution, dimension, color, item, speakerinfo{
        display:list-item;
        color: white;
}
footer{
    display: block;
    width: 500px;
    font-family: "Courier New";
    font-size: 15pt;
```

```
    font-style: italic;
    color: white;
    float: right;
}
```

6.TESTING

6.1 TEST A

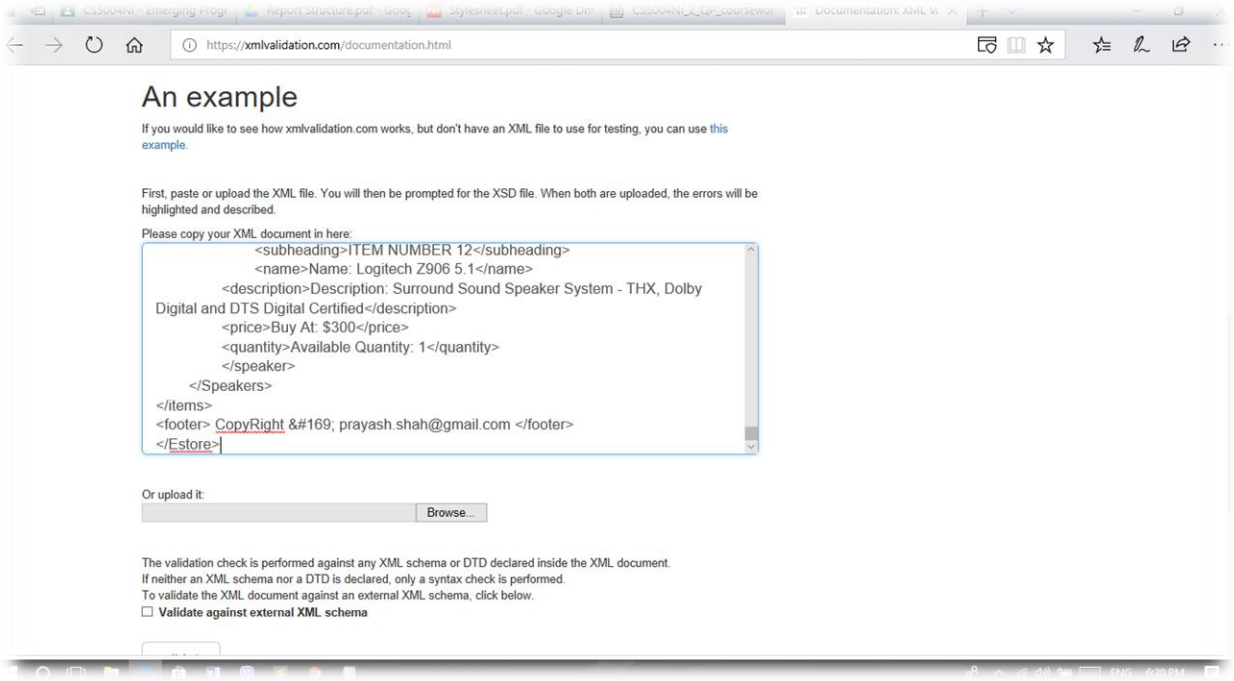

Figure 8 Testing Part A.1 Inserting XML content

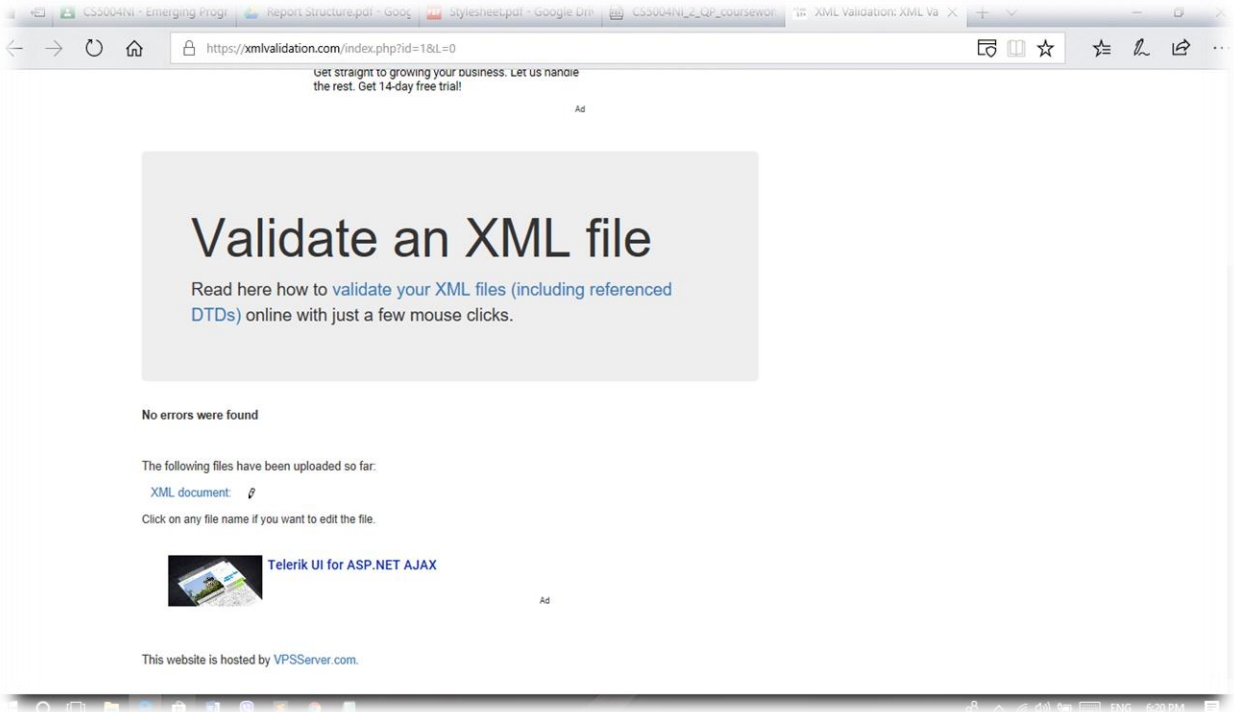

Figure 9 Testing Part A.2 Result of validation

Test Description	
Purpose: Validating XML Document only.	
Input Given:	Content of XML file.
Output Expected:	No errors to be found.
Actual Output:	No errors found.
Observation: XML validation website did not show any error in the document.	

Table 1 Testing A

6.2 TEST B

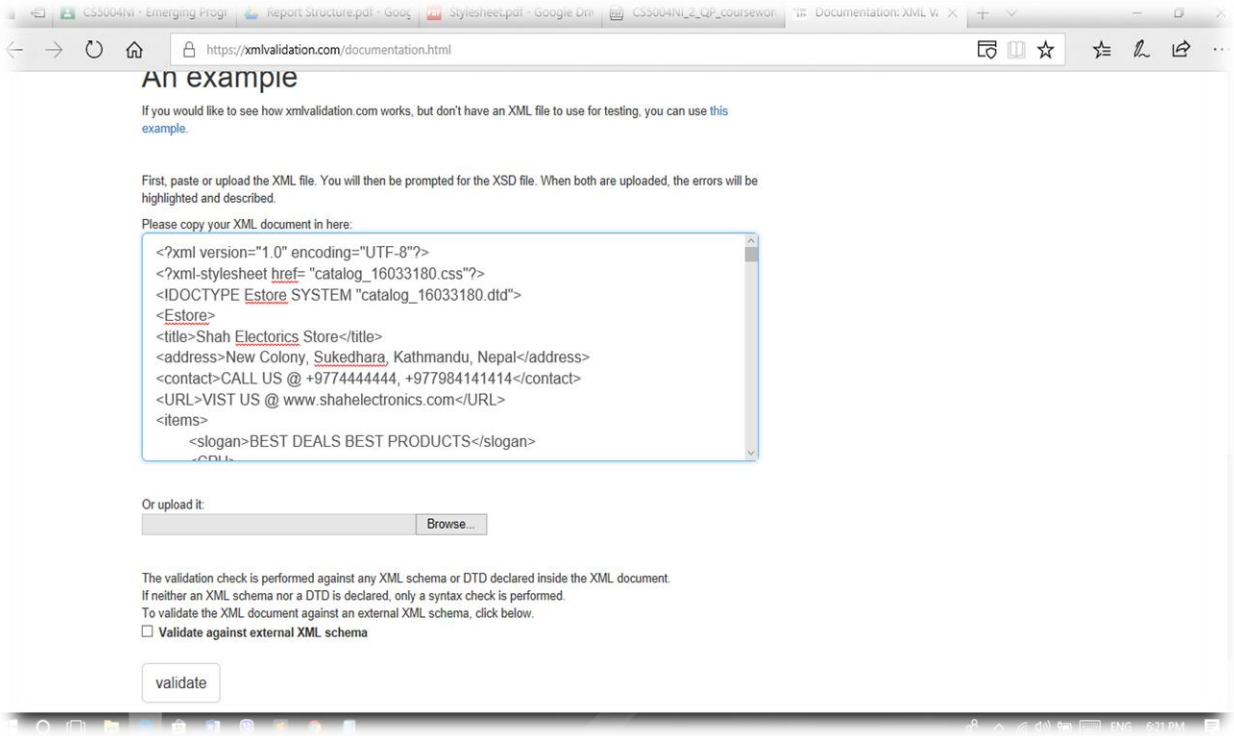

Figure 10 Testing Part B.1 Inserting XML content

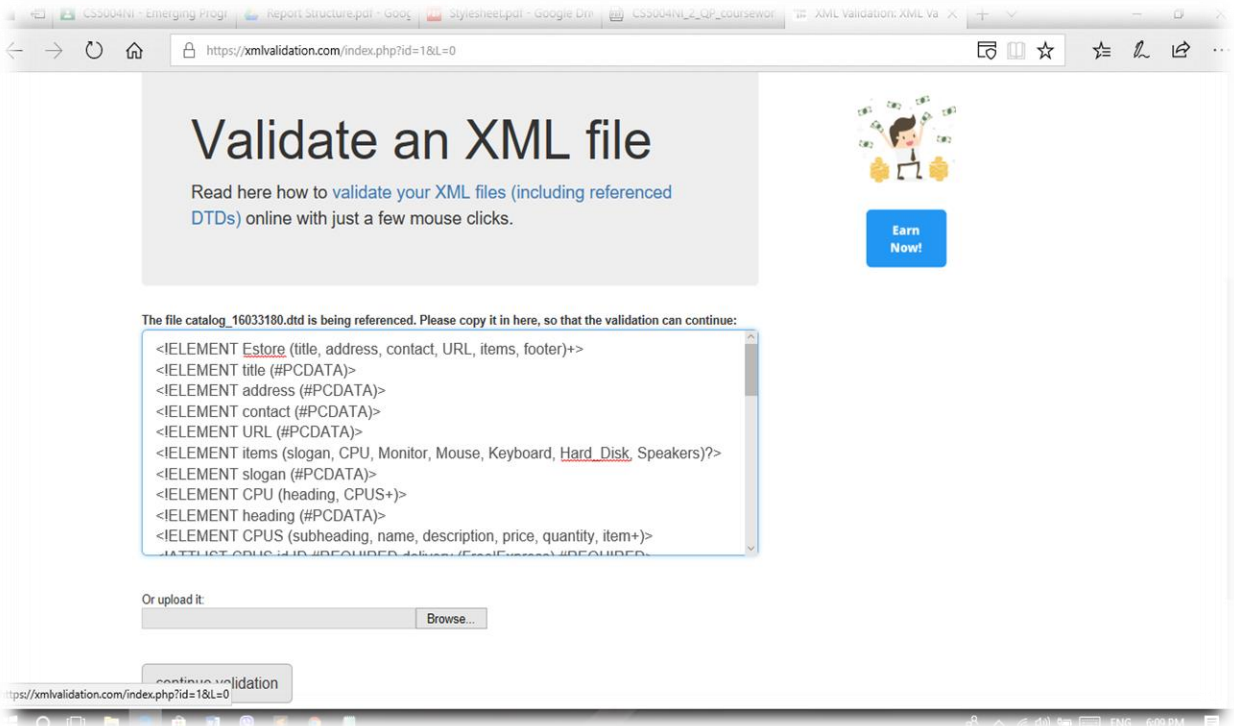

Figure 11 Testing Part B.2 Inserting DTD content

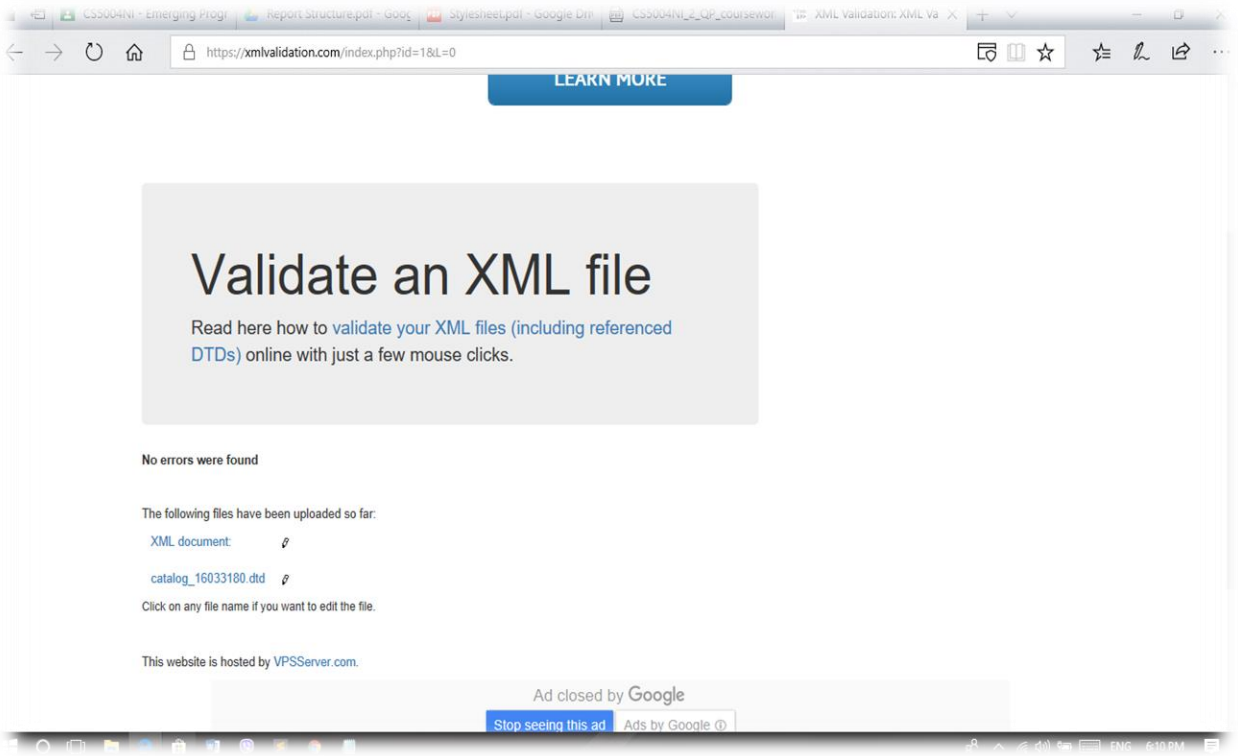

Figure 12 Testing Part B.3 Result of Validation of both file's content.

Test Description	
Purpose: Validating XML with DTD file.	
Input Given:	Contents of XML file and DTD file.
Output Expected:	No errors to be found.
Actual Output:	No errors found.
Observation: When content of XML file was inserted the website asked for the DTD file too after it and both were inserted and no errors were displayed.	

Table 2 Testing B

6.3 TEST C

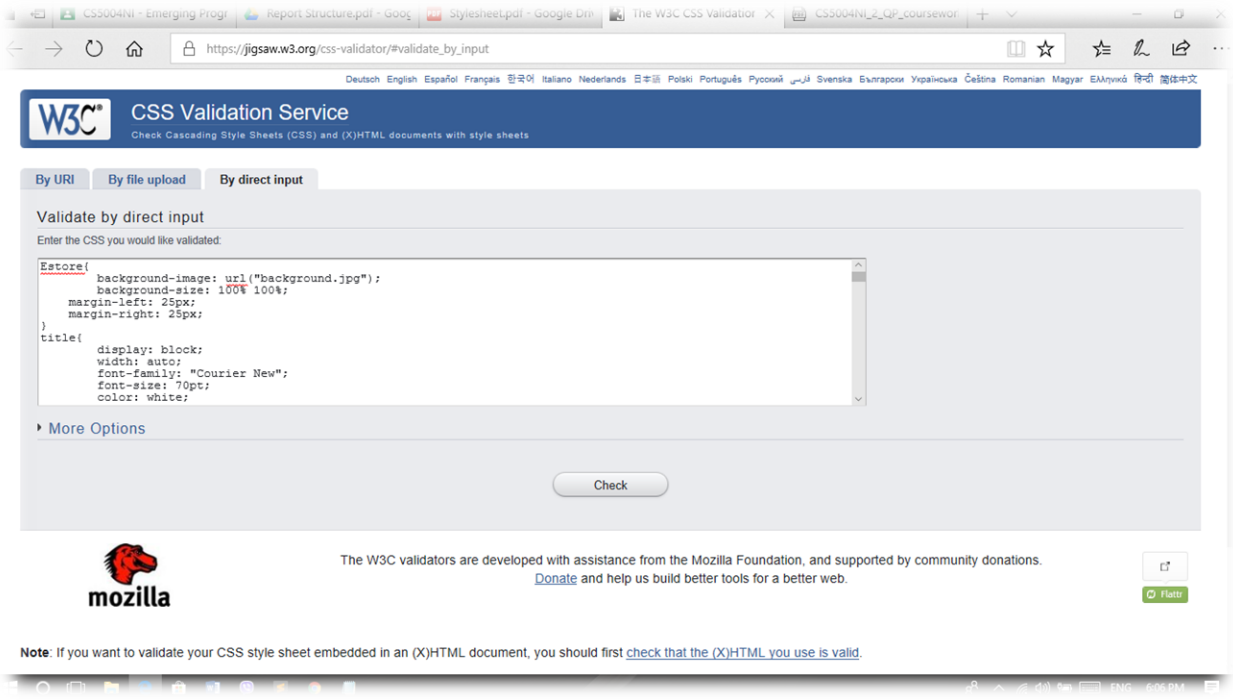

Figure 13 Testing Part C.1 Inserting CSS content

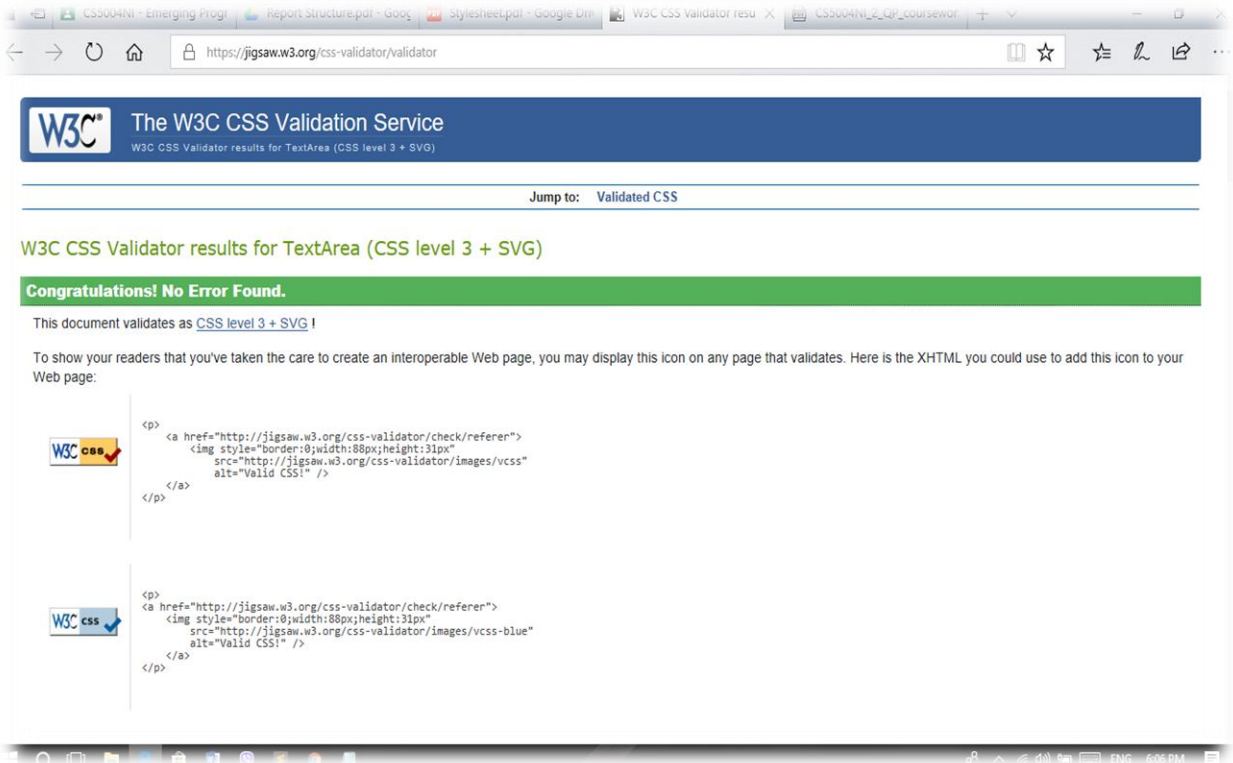

Figure 14 Testing Part C.2 Result of validation of CSS

Test Description	
Purpose: Validating CSS file.	
Input Given:	Content of CSS file.
Output Expected:	No errors to be found.
Actual Output:	No errors displayed and found.
Observation: Contents of CSS file was inserted and check button was clicked and it displayed no errors in the CSS file.	

Table 3 Testing C

6.4 TEST D

Figure 15 Testing Part D.1 Display of the file with CSS

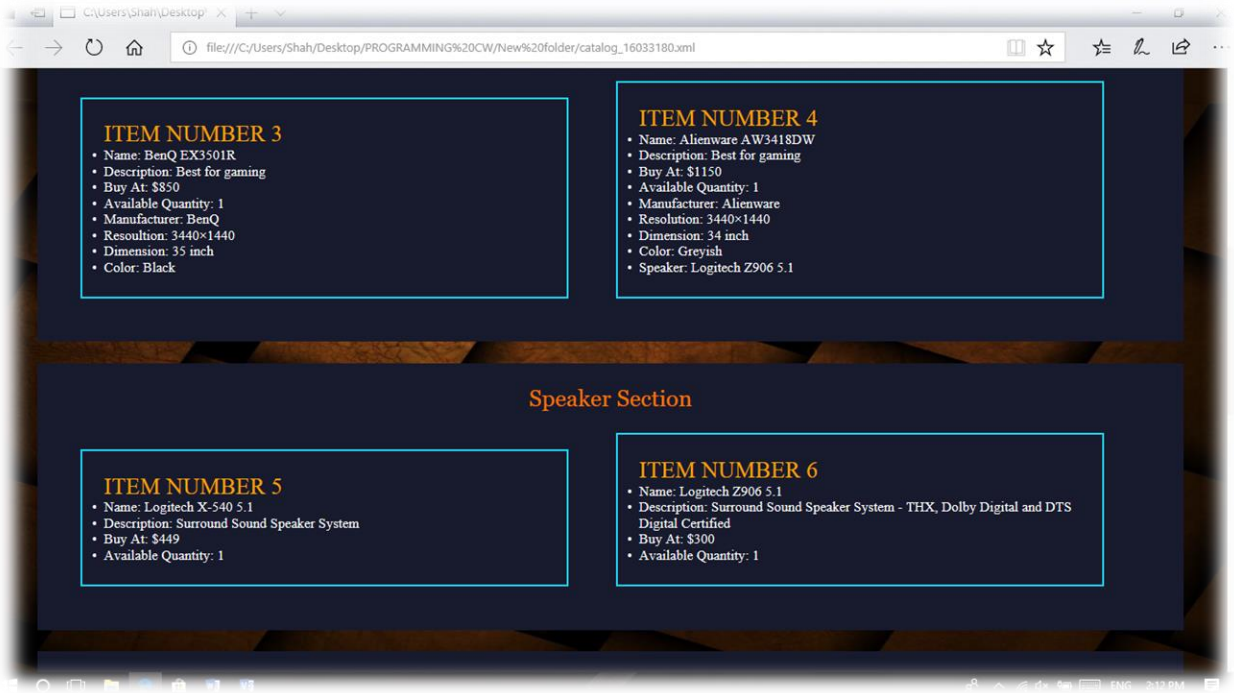

Figure 16 Testing Part D.2 Display of the file with CSS

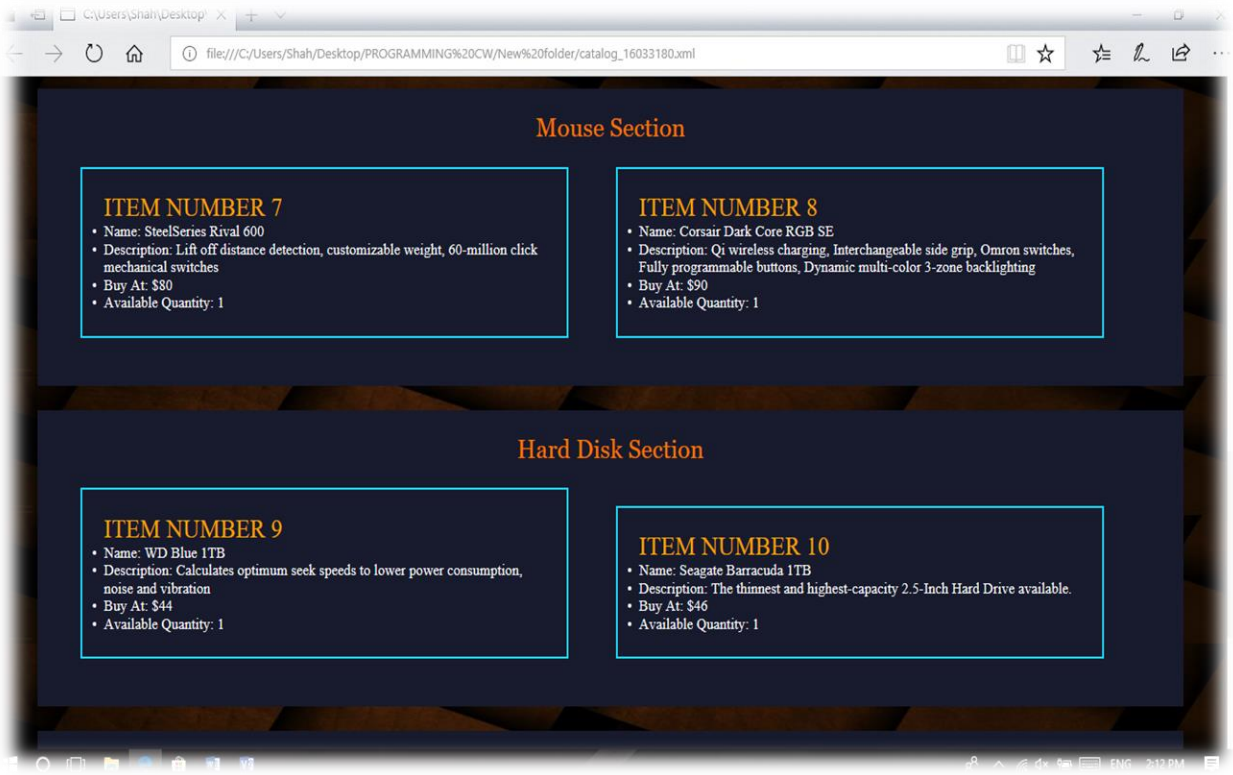

Figure 17 Testing Part D.3 Display of the file with CSS

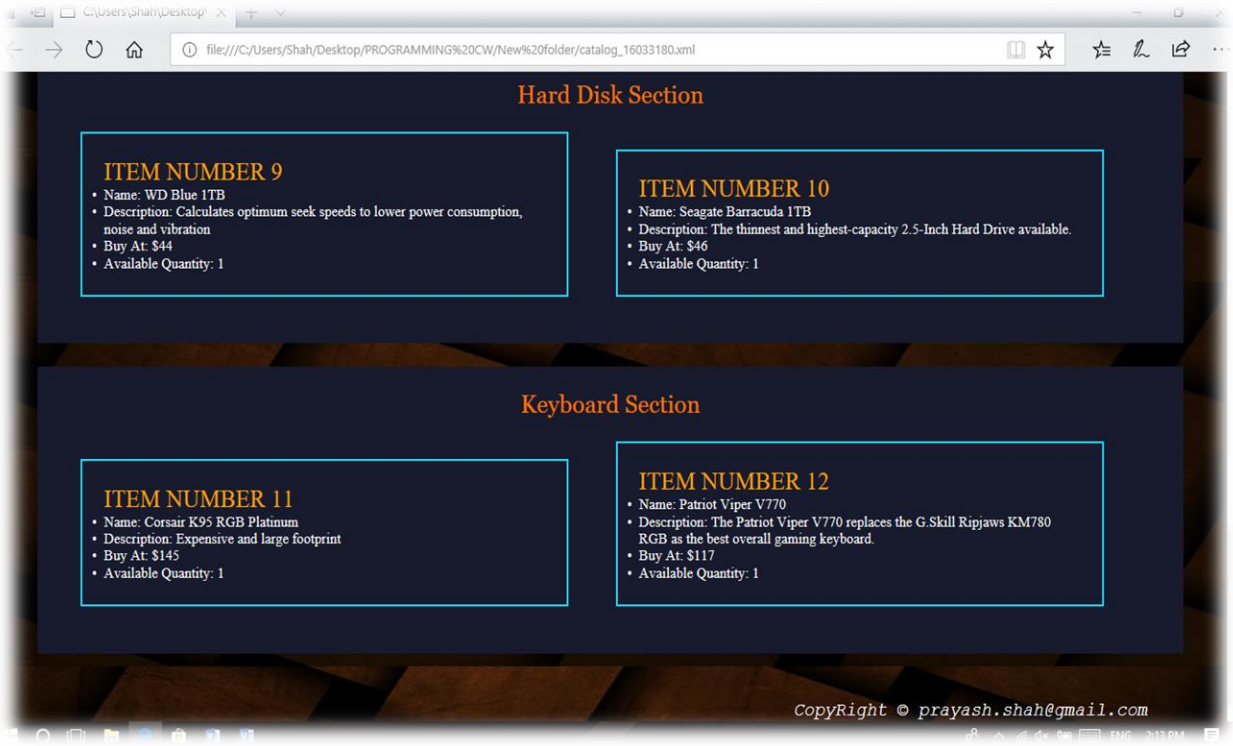

Figure 18 Testing Part D.4 Display of the file with CSS

Test Description	
Purpose: Checking whether the CSS is properly rendered by the browser.	
Input Given:	XML file opened in a browser to check the stylesheet.
Output Expected:	Proper rendering of the style that was done in the CSS file for the XML file.
Actual Output:	CSS was properly rendered.
Observation: Inserted CSS file into XML and opened XML on a browser to check the rendering of CSS.	

Table 4 Testing D

7.COURSEWORK DEVELOPMENT

This course work was first started with making Tree diagram in a rough sketch and worked with it to make it an easy and perfect structure for the system. The final work was designed using Visio and inserted in the report. After creating tree structure, a DTD file was created and DTD was coded using a sublime text editor. Looking at the tree structure and DTD file XML coding was started for the system to insert values in the online system. Validation was done of the XML first to check whether the file has any errors or not. Then DTD was linked to XML document and both the file was validated to check any errors. Validation was done from "www.xmlvalidation.com" website for DTD and XML. Finally, then the design for the online system was started by creating a CSS file where are the styling was done for the system. This CSS file was validated using "https://jigsaw.w3.org/css-validator/#validate_by_input" website.

8.CHALLENGES FACED

While development of this coursework I had faced a lot of challenges. First of all, time management was the challenge I faced as I had to work on other coursework too with this one. As the deadline for other coursework were at the same day I had to figure out a way to progress this coursework to an end before the deadline with other ones. During the process of writing an XML document I was confident but when I wrote the DTD to validate my XML document a lot of errors was displayed and it took me almost a day to solve all of the errors and validate my XML and DTD document. Though I still do not know whether images can be inserted in XML or not as I tried a lot when inserting a logo and pictures in the XML document I failed and at last I inserted the logo via Cascading Style Sheet (CSS). Styling this system was the easiest I thought, but while styling my system I had a lot in my mind and was not able to come to final decision about how I should display the contents. Finally, with the help of some research I did on google and ideas I learned from different tutorials on YouTube I started building up my CSS and designing it on my unique idea and show some creativeness on this work.

9.LIMITATION of DTD and CSS

9.1 CSS:

Cascading Style Sheets being able to style and present the document is a stylish manner it has a lot of limitation or let's just say some disadvantages when styling some hard and complex applications. Some of the limitations are as follows:

- Unlike other languages this is not a programming language which has no support decision structures and will be extended if wanted by the designer (Stuart Culshaw, 1997).
- Page numbers are not generated by CSS or any text (Stuart Culshaw, 1997).
- Sibling Relationship is not available in CSS which means we need to style every other paragraph in bold if we want to render it (Stuart Culshaw, 1997).
- CSS does not have the ability to grab an item from a place and use it in another place (Stuart Culshaw, 1997).
- This is a simple box-oriented formatting model and assumes a particular writing direction which is horizontal as it is oriented toward Western languages (Stuart Culshaw, 1997).

9.2 DTD:

Document Type Definition is one of the effective mechanism when it's about validating an XML document. DTD has various limitation such as:

- DTD is not like XML, which means it is non-XML syntax and non-extensible (Ron Schmelzer, 2002).
- XML document can only have one single DTD (Ron Schmelzer, 2002).
- This is nota object oriented and has no inheritance (Ron Schmelzer, 2002).
- If namespaces are to be used the entire namespace are to defined within the DTD. So, DTD does not support namespaces that well (Ron Schmelzer, 2002).
- There is only one data type for DTD which is the text string and does not support XML DOM (Ron Schmelzer, 2002).

10.CONCLUSION

This coursework is based on making a model system using XML platform. An online system was designed for Shah Electronics Store which has an item like CPU, Monitor, Mouse, Keyboard, Hard drive and speaker. These items have some description, price, available quantity and other extra information on some of the items. Styling was done using Cascading Style Sheet (CSS). This system has many places for improvements and limitation. Some improvements that can be made are the item's pictures could be displayed with the items. Then a bit improvement in CSS could be done. Overall this assessment has helped me to learn about XML, DTD and CSS and also design a tree structure for the XML document. A lot of new things and problem tacking techniques was also learned and experienced and even putting right logic at right place was something I learned while the development of this assessment.

References

Ron Schmelzer, T. V., 2002. *DTD Drawbacks and Alternatives | Validating XML with the Document Type Definition (DTD) | InformIT.* [Online]
Available at: http://www.informit.com/articles/article.aspx?p=28255&seqNum=5
[Accessed 29 April 2018].

Stuart Culshaw, M. L. M. M., 1997. *Web Review: Limitations of CSS for Complex Applications.* [Online]
Available at:
https://people.apache.org/~jim/NewArchitect/webrevu/1997/11_28/webauthors/11_28_97_5.html
[Accessed 28 April 2018].