LONDON METROPOLITAN UNIVERSITY

islington college
(इस्लिङ्टन कलेज)

Module Code & Module Title

CS5004NA Emerging Programming Platforms & Technologies

Assessment Weightage & Type

30% Individual Coursework

Year and Semester

2018-19 Autumn / 2018-19 Spring

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Assignment Due Date: 6th May 2019

Assignment Submission Date: 6th May 2019

Word Count: 1275

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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1. Introduction

XML is (Extensible Markup Language) is a simple set of rules. This set of rules identifies how the tags can be defined to separate document into individual parts and subparts. XML is similar to HTML but XML is designed in such a way that it is restricted to only one vocabulary. It can be customised for each corporate. The markup rules are based on an earlier markup language called Standard Generalised Markup Language (SGML). (Williamson, 2001)

Document kind definition (DTD) refers to a group of markup declarations that outline a document kind for normal Generalized language (SGML) languages. DTDs outline the structure of a category of documents through part and attribute-list declarations. DTD helps parsers validate documents. it's formally suggested by the globe Wide internet syndicate. (Techopedia, 2019)

PHP stands for Hypertext Preprocessor. PHP is a server-side scripting language designed specifically for web development. PHP can be easily attached in HTML files and HTML codes can also be written in a PHP file. PHP codes are executed on server. (GeeksforGeeks, 2019)

2. XML Content

2.1 Tree Diagram

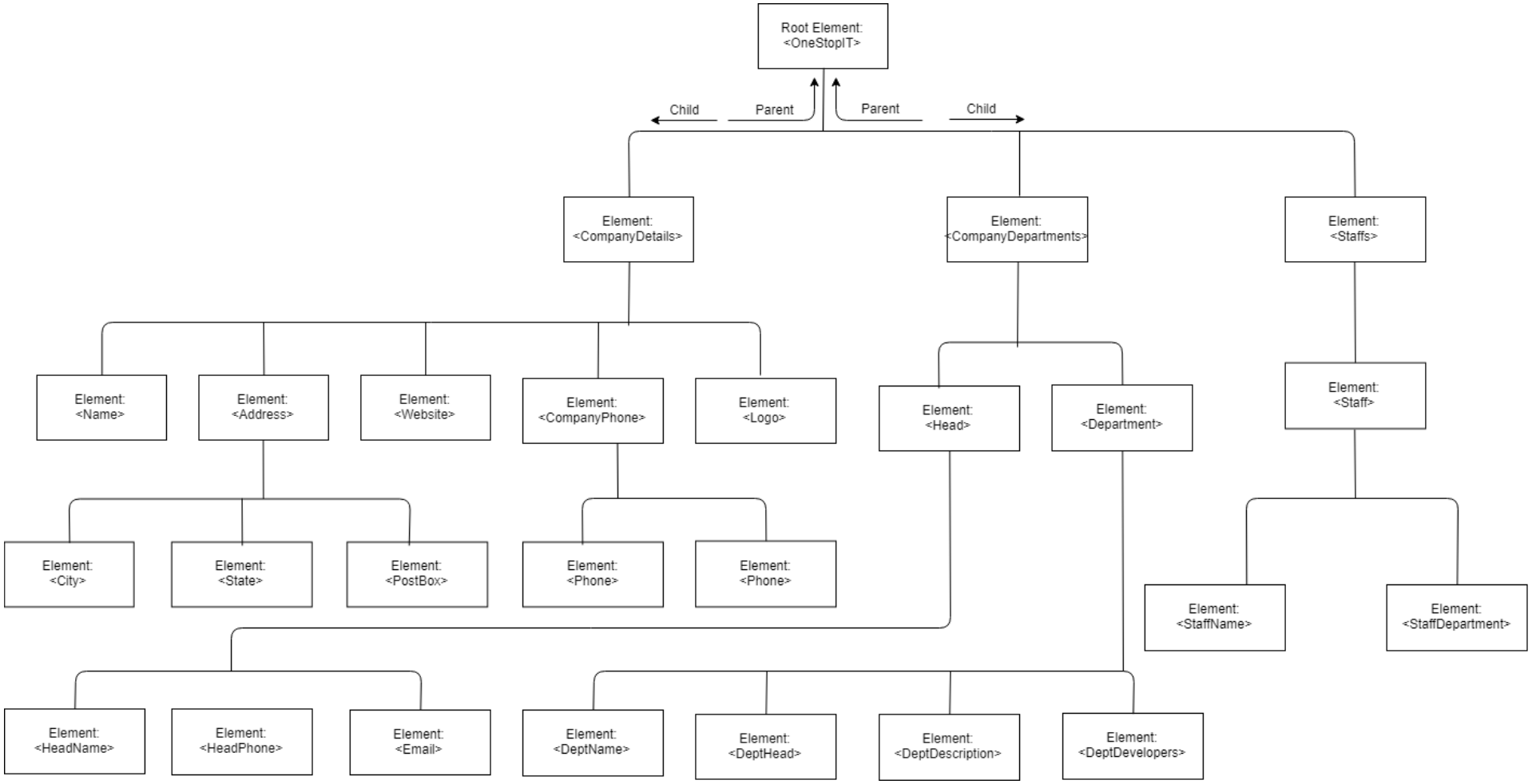

Figure 1 Tree Diagram

2.2 XML Code

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE OneStopIT SYSTEM "catalog_17030948.dtd">
<?xml-stylesheet href="catalog_17030948.css"?>
<OneStopIT>
  <CompanyInfo>
    <Name>One Stop IT Company</Name>
    <Address>
      <City>Lalitpur</City>
      <State>State-3</State>
      <PostBox>0234</PostBox>
    </Address>
    <Phone>015555555</Phone>
    <Phone>015454545</Phone>
    <Website>www.onestopit.com</Website>
    <Logo/>
  </CompanyInfo>
  <CompanyDepartments>
    <CompanyHead>
      <HeadName>Summit Shakya</HeadName>
      <Landline>014444444</Landline>
      <Mobile>7418529630</Mobile>
```

```
    <Email>summitshakya@hotmail.com</Email>
  </CompanyHead>
  <Department deptID="1">
    <DeptName>Production</DeptName>
    <DeptHead>Sujan Mahat</DeptHead>
    <DeptDescription>The production department works for development of products.</DeptDescription>
    <NumberOfProjects>5 tasks </NumberOfProjects>
  </Department>
  <Department deptID="2">
    <DeptName>Marketing</DeptName>
    <DeptHead>Lijen Basnet</DeptHead>
    <DeptDescription>This department works for the betterment of the business.</DeptDescription>
    <NumberOfProjects>2 tasks </NumberOfProjects>
  </Department>
  <Department deptID="3">
    <DeptName>Accounting</DeptName>
    <DeptHead>Rehana Shrestha</DeptHead>
    <DeptDescription>This department works for maintaining the accounting records of the company.</DeptDescription>
    <NumberOfProjects>2 tasks </NumberOfProjects>
  </Department>
```

```
    <Department deptID="4">
      <DeptName>Human Resource Management</DeptName>
      <DeptHead>Siron Rana</DeptHead>
      <DeptDescription>This department works for management of available human resources in the company.</DeptDescription>
      <NumberOfProjects>1 tasks </NumberOfProjects>
    </Department>
    <Department deptID="5">
      <DeptName>Research And Development</DeptName>
      <DeptHead>Malina Joshi</DeptHead>
      <DeptDescription>This department works for betterment of available services and development of new services.</DeptDescription>
      <NumberOfProjects>1 tasks </NumberOfProjects>
    </Department>
  </CompanyDepartments>
  <Staffs>
    <Staff DeptID="1" StaffID="ST01">
      <StaffName>Sudip</StaffName>
      <DepartmentName>Production</DepartmentName>
    </Staff>
    <Staff DeptID="1" StaffID="ST02">
      <StaffName>Tejashwi</StaffName>
      <DepartmentName>Production</DepartmentName>
```

```
  </Staff>
  <Staff DeptID="1" StaffID="ST03">
    <StaffName>Bibek</StaffName>
    <DepartmentName>Production</DepartmentName>
  </Staff>
  <Staff DeptID="2" StaffID="ST04">
    <StaffName>Sulav</StaffName>
    <DepartmentName>Accounting</DepartmentName>
  </Staff>
  <Staff DeptID="2" StaffID="ST05">
    <StaffName>Angel</StaffName>
    <DepartmentName>Accounting</DepartmentName>
  </Staff>
  <Staff DeptID="3" StaffID="ST06">
    <StaffName>Ayusha</StaffName>
    <DepartmentName>Marketing</DepartmentName>
  </Staff>
  <Staff DeptID="4" StaffID="ST07">
    <StaffName>Salin</StaffName>
    <DepartmentName>Human Resource Management</DepartmentName>
  </Staff>
  <Staff DeptID="4" StaffID="ST08">
    <StaffName>Kunjal</StaffName>
```

```
      <DepartmentName>Human Resource Management</DepartmentName>
    </Staff>
    <Staff DeptID="5" StaffID="ST09">
      <StaffName>Kashish</StaffName>
      <DepartmentName>Research And Development</DepartmentName>
    </Staff>
    <Staff DeptID="5" StaffID="ST10">
      <StaffName>Nimesh</StaffName>
      <DepartmentName>Research And Development</DepartmentName>
    </Staff>
  </Staffs>
</OneStopIT>
```

3. DTD Content

```
<!ELEMENT OneStopIT (CompanyInfo, CompanyDepartments, Staffs)>

<!ELEMENT CompanyInfo (Name, Address, Phone+, Website,Logo)>
<!ELEMENT Name (#PCDATA)>
<!ELEMENT Address (City, State, PostBox)>
<!ELEMENT City (#PCDATA)>
<!ELEMENT State (#PCDATA)>
<!ELEMENT PostBox (#PCDATA)>
<!ELEMENT Phone (#PCDATA)>
<!ELEMENT Website (#PCDATA)>
<!ELEMENT Logo (#PCDATA)>

<!ELEMENT CompanyDepartments (CompanyHead, Department+)>

<!ELEMENT CompanyHead (HeadName, Landline, Mobile, Email)>
<!ELEMENT HeadName (#PCDATA)>
<!ELEMENT Landline (#PCDATA)>
<!ELEMENT Mobile (#PCDATA)>
<!ELEMENT Email (#PCDATA)>

<!ELEMENT Department (DeptName, DeptHead, DeptDescription, NumberOfProjects*)>
<!ATTLIST Department deptID CDATA #REQUIRED>
```

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

<!ELEMENT DeptHead (#PCDATA)>

<!ELEMENT DeptDescription (#PCDATA)>

<!ELEMENT NumberOfProjects (#PCDATA)>


<!ELEMENT Staffs (Staff+)>

<!ELEMENT Staff (StaffName, DepartmentName)>

<!ATTLIST Staff DeptID CDATA #REQUIRED>

<!ATTLIST Staff StaffID CDATA #REQUIRED>

<!ELEMENT StaffName (#PCDATA)>

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

4. Testing

4.1 Test 1

```php
$connect = new mysqli ($server, $username, $password, $database);

if ($connect->connect_error)
{
    die("Connection failed: " . $connect->connect_error);
}
else{
    echo "Connected with database.";
}
```

Figure 2 Code for database connectivity

Connected with database.

```
<?xml version="1.0" encoding="UTF-8"?>
<OneStopIT>
  <CompanyInfo>
    <Name>One Stop IT Company</Name>
    <Address>
```

Figure 3 Database Connected

Test No.	**1**
Action	Connecting PHP with databse.
Expected Output	The connection with PHP file and database will be made.
Actual Output	The connection with PHP file and database was made.
Test Result	Successful

Table 1 Test Case 1

4.2 Test 2

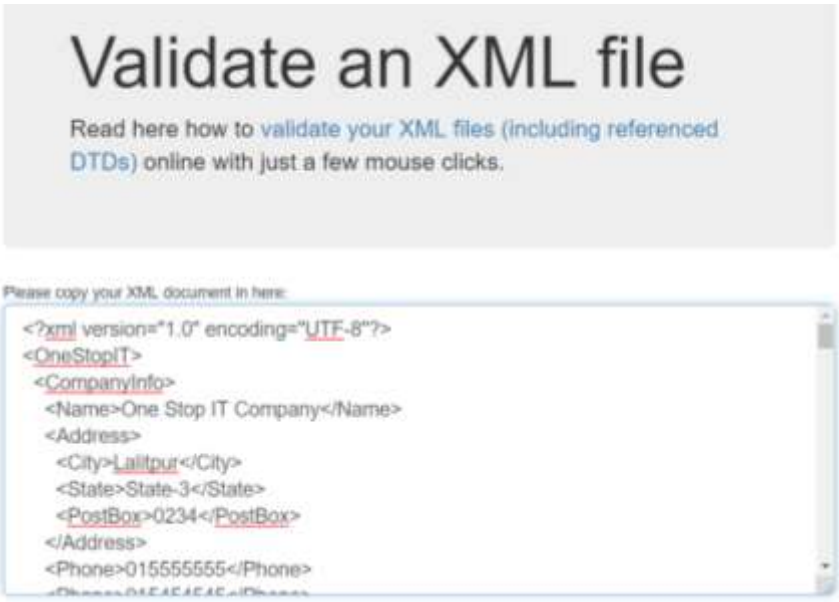

Figure 4 Uploading XML Content For Validation

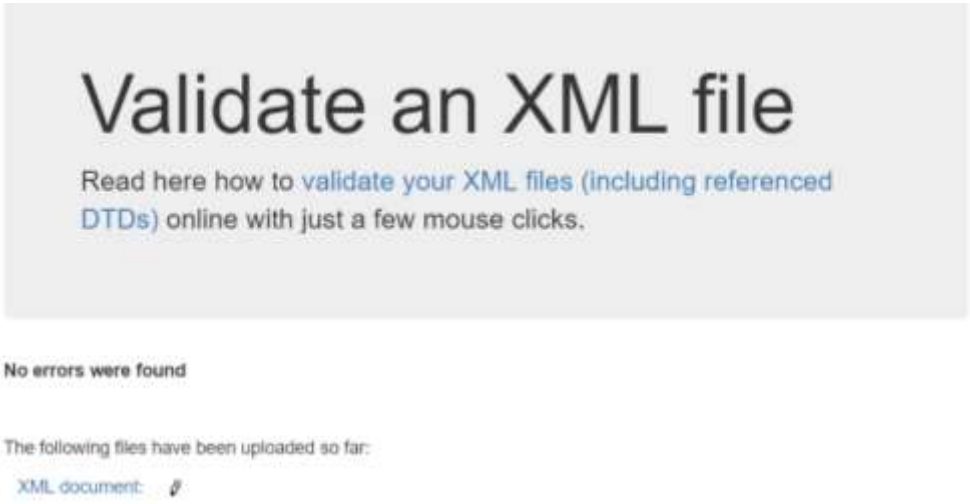

Figure 5 Validation Successful

Test No.	**2**
Action	The XML content was uploaded to a xml validation website for validation.
Expected Output	There will be no errors in XML document.
Actual Output	There was no errors in XML document.
Test Result	Successful

Table 2 Test Case 2

4.3 Test 3

Figure 6 uploading DTD File

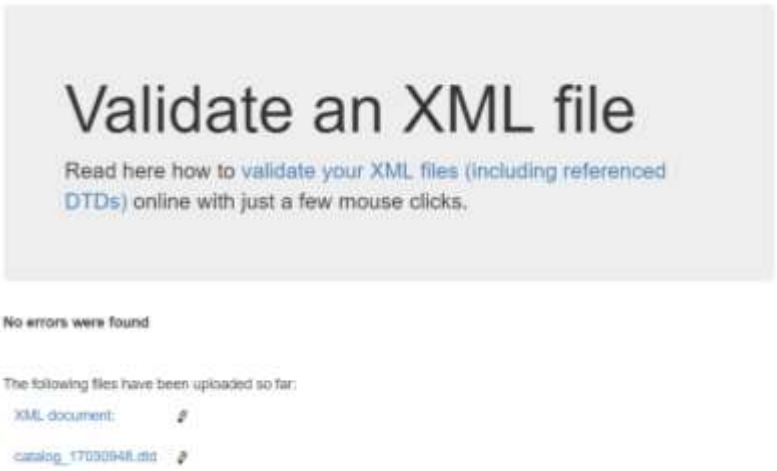

Figure 7 DTD Validation Successful

Test No.	**3**
Action	The DTD content was uploaded with XML file on xml validation website for validation.
Expected Output	There will be no errors in DTD Validation.
Actual Output	There was no errors in DTD Validation.
Test Result	Successful

Table 3 Test Case 3

4.4 Test 4

```
<?xml version="1.0" encoding="UTF-8"?>
<OneStopIT>
  <CompanyInfo>
    <Name>One Stop IT Company</Name>
    <Address>
      <City>Lalitpur</City>
      <State>State-3</State>
      <PostBox>0234</PostBox>
    </Address>
    <Phone>015555555</Phone>
    <Phone>015454545</Phone>
    <Website>www.onestopit.com</Website>
    <Logo/>
  </CompanyInfo>
  <CompanyDepartments>
    <CompanyHead>
      <HeadName>Summit Shakya</HeadName>
      <Landline>014444444</Landline>
      <Mobile>7418529630</Mobile>
      <Email>summitshakya@hotmail.com</Email>
    </CompanyHead>
    <Department deptID="1">
      <DeptName>Production</DeptName>
      <DeptHead>Sujan Mahat</DeptHead>
      <DeptDescription>The production department works for development of products.</DeptDescription>
      <NumberOfProjects>5 tasks </NumberOfProjects>
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      <DeptName>Marketing</DeptName>
      <DeptHead>Lijen Basnet</DeptHead>
      <DeptDescription>This department works for the betterment of the business.</DeptDescription>
      <NumberOfProjects>2 tasks </NumberOfProjects>
    </Department>
    <Department deptID="3">
      <DeptName>Accounting</DeptName>
      <DeptHead>Rehana Shrestha</DeptHead>
      <DeptDescription>This department works for maintaining the accounting records of the company.</DeptDescription>
      <NumberOfProjects>2 tasks </NumberOfProjects>
    </Department>
    <Department deptID="4">
      <DeptName>Human Resource Management</DeptName>
      <DeptHead>Siron Rana</DeptHead>
      <DeptDescription>This department works for management of available human resources in the company.</DeptDescription>
      <NumberOfProjects>1 tasks </NumberOfProjects>
    </Department>
    <Department deptID="5">
      <DeptName>Research And Development</DeptName>
```

Figure 8 Generating XML code with PHP

Test No.	**4**
Action	PHP code was written to generate XML code.
Expected Output	Proper XML file as per required will be generated.
Actual Output	Proper XML file as per required was generated.
Test Result	Successful

Table 4 Test Case 4

5. Tools Used

5.1 Visual Studio Code

Visual Studio Code is a source-code editor which is developed by Microsoft for Windows, Linux and macOS. It allows debugging, highlighting syntax and auto completion of code.

It was used in this assessment to develop the XML and DTD code. It provided an easy environment to develop XML and DTD code by auto completion of code and highlighting syntax.

5.2 Google Chrome

Google Chrome is a web browser. It was used in the assessment to view the XML file.

5.3 xmlvalidation.com

xmlvalidation.com is a website used to validate the XML document and then validate it against the DTD provided by the user. It was used to validate the created XML against the DTD.

5.4 draw.io

draw.io is an online tool to draw various diagrams. It was used in this assessment to draw the tree diagram.

6. Limitations of DTD and CSS

6.1 Limitation of DTD

The limitations of DTD are:

1. It does not support namespaces. In DTD, namespaces have to be defined within DTD which violates the purpose of using namespace.
2. It supports only the text string data type.
3. It is not object oriented due to which concept of inheritance cannot be applied in DTDs. (TutorialsPoint, 2019)

6.2 Limitation of CSS

The limitation of CSS are:

1. Available in different levels: There is CSS, CSS 1 up to CSS 3 which results in confusion among the developers.
2. Fragmentation: The CSS that works on one browser may not always work with another browser. It creates difficulty to test compatibility trying on multiple programs.
3. Lacks security: CSS is an open text-based system, it does not have any built-in security that will protect it from being overridden. In some cases, the CSS might be overridden unknowingly. (Ayres, 2016)

7. Critical Evaluation

The coursework was fulfilled with much trails and errors. The coursework started with creation of XML tree structure. The structure had to be changed few times so that it would fit the assessment requirements. Before developing the PHP code, it was stressful designing the database to store data. Then the PHP code was written with much research. PHP was the most difficult part in the coursework. Many syntax errors and logical errors arose while in development process. Such errors were tackled by consulting the tutor and also with own research from the internet. DTD was a comparatively easier part to tackle. It definitely took some research but still it was easier. CSS was developed at the last phase of development.

8. Conclusion

The coursework was divided into two parts and they were development and documentation. The development was done by using XML PHP and DTD. XML is very similar to HTML. With xml the coursework was fully completed using other files such PHP, DTD and CSS. The contents for the XML file was brought together by adding the information from the database. With much research, the coursework was completed successfully.

The second part of the coursework was documentation. The documentation is included with all the asked requirements by the coursework such as testing, XML document, DTD document, critical analysis etc. The documentation part is the part that brings everything together. With all the proper formatting and citation, the coursework was completed successfully. A thankful words for the module teachers for throughout the year and module.

9. References

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