

## Activity: Declaring Attributes in an XML Schema

### Problem Statement

The Marketing Manager at CyberShoppe sends its product information from its head office to the branch offices. The branch offices update this file and send it back to the head office on a routine basis. The product details must be stored in a consistent format at all branches. Restrictions must be placed on the type of data that can be saved in the data store, to ensure uniformity and consistency of information.

CyberShoppe sells two categories of products, books and toys. Product details include the product name, a brief description, product price, and the available quantity on hand. The product price must always be greater than zero. In addition to these details, the data store needs to store the category and product ID.

### Solution

To solve the preceding problem, perform the following tasks:

1. Identify the elements and attributes required in the XML document.
2. Declare the required elements and attributes.
3. Create an XML document.
4. Validate the XML document against the schema.

Task 1: Identifying the Elements and Attributes Required in the XML Document

The following table lists the elements required to store product details in the XML document.

<i>Element</i>	<i>Description</i>
<i>PRODUCTDATA</i>	<i>Acts as the root element for all other elements that are used in the XML document.</i>
<i>PRODUCT</i>	<i>Represents the details, that is, the product name, description, price, and quantity for each product.</i>
<i>PRODUCTNAME</i>	<i>Represents the product name.</i>
<i>DECSRIPTION</i>	<i>Represents the product description.</i>
<i>PRICE</i>	<i>Represents the product price.</i>

<b><i>Element</i></b>	<b><i>Description</i></b>
<i>QUANTITY</i>	<i>Represents the available product quantity.</i>

### *Elements Required in the XML Document*

The following table lists the attributes required to store product details in XML document.

<b><i>Attribute</i></b>	<b><i>Description</i></b>
<i>PRODID</i>	<i>Represents the ID that uniquely identifies each product.</i>
<i>CATEGORY</i>	<i>Represents the category to which a product belongs. The value of this attribute can be set to Toy or Book.</i>

### *Attributes Required in the XML Document*

## Task 2: Declaring the Required Elements and Attributes

To declare the elements and attributes to be used to store information about products, type the following code in Notepad, and save the file as `product.xsd`:

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<xsd:element name="PRODUCTDATA" type="prdata"/>
<xsd:complexType name="prdata">
  <xsd:sequence>
    <xsd:element name="PRODUCT" type="prdt"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="prdt">
  <xsd:sequence>
    <xsd:element name="PRODUCTNAME" type="xsd:string"/>
    <xsd:element name="DESCRIPTION" type="xsd:string"/>
    <xsd:element name="PRICE" type="xsd:positiveInteger"/>
    <xsd:element name="QUANTITY" type="xsd:integer"/>
  </xsd:sequence>
  <xsd:attribute name="PRODID" type="xsd:string" use="required"/>
  <xsd:attribute name="CATEGORY" type="cat" use="required"/>
</xsd:complexType>
<xsd:simpleType name="cat">
<xsd:restriction base="xsd:string">
  <xsd:pattern value="Toy|Book"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:schema>
```

### Task 3: Creating an XML Document

The XML document that you create should conform to the rules specified in the XSD document for the given scenario. To create the XML document, type the following code in Notepad, and save the file as `product.xml`:

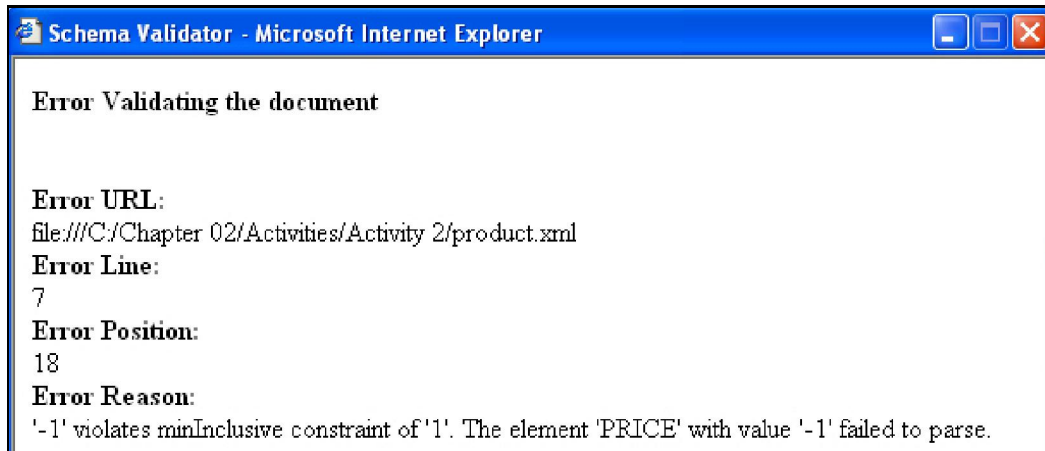
```
<?xml version="1.0"?>
<PRODUCTDATA>
  <PRODUCT PRODID="P001" CATEGORY="Toy">
    <PRODUCTNAME>Mini Bus</PRODUCTNAME>
    <DESCRIPTION>This is a toy for children aged 4 and
      above</DESCRIPTION>
    <PRICE>75</PRICE>
    <QUANTITY>54</QUANTITY>
  </PRODUCT>
</PRODUCTDATA>
```

### Task 4: Validating the XML Document Against the Schema

To validate the XML document against the XML schema stored in the XSD document, perform the following steps:

1. Open `Index.htm` from the `Learning Environment` folder.
2. Click the **Schema Validator** link. This will open the **XML – Schema Validator Module** form.
3. In the **XML-Schema Validator Module** form, type the path for `product.xml` in the **Enter the XML File Name** text box and the path for `product.xsd` in the **Enter the XSD File Name** text box.
4. Click the **Validate** button.

If the XML document conforms to the schema, a new page with the message, **No Error** is displayed in a new browser window. If the XML document does not conform to the schema, a Web page with the relevant error message is displayed in a new browser window. For example, if the price of the product is -1, then in this case the XML document will not be according to the schema. The error message as shown in the following figure will be displayed.



*XML Schema Validator Showing Error Message*