ITW202: Mobile Application
Unit IV: Developing for Android

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XML

Definition

XML stands for EXtensible Markup Language

XML is a markup language much like HTML

XML was designed to describe data, not to display data

XML tags are not predefined. You must define your own tags

XML is designed to be self-descriptive

The Difference Between XML and HTML

Note: XML is not a replacement for HTML.

XML and HTML were designed with different goals:

- XML was designed to describe data, with focus on what data is
- HTML was designed to display data, with focus on how data looks

HTML is about displaying information, while XML is about carrying information.

With XML You Invent Your Own Tags

The tags used in HTML are predefined. HTML documents can only use tags defined in the HTML standard (like <p>, <h1>, etc.).

XML allows the author to define his/her own tags and his/her own document structure.

With XML You Invent Your Own Tags

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE students SYSTEM "students.dtd">
<students>
    <student stdid="sonam1">
        <name>Sonam Choki</name>
        <salary>35000</salary>
    </student>
    <student stdid="sonam2">
        <name>Sonam Choki</name>
        <salary>35000</salary>
    </student>
    <student stdid="sonam3">
        <name>Sonam Choki</name>
        <salary>35000</salary>
    </student>
</students>
```

How Can XML be Used?

1. XML Simplifies Data Sharing

   XML data is stored in plain text format. This provides a software- and hardware-independent way of storing data.

How Can XML be Used?

2. XML Simplifies Data Transport

   One of the most time-consuming challenges for developers is to exchange data between incompatible systems over the Internet. Exchanging data as XML greatly reduces this complexity, since the data can be read by different incompatible applications.

How Can XML be Used?

3. XML Simplifies Platform Changes

Upgrading to new systems (hardware or software platforms), is always time consuming. Large amounts of data must be converted and incompatible data is often lost.

XML data is stored in text format. This makes it easier to expand or upgrade to new operating systems, new applications, or new browsers, without losing data.

How Can XML be Used?

4. XML Makes Your Data More Available
   With XML, your data can be available to all kinds of "reading machines" (Handheld computers, voice machines, news feeds, etc.), and make it more available for blind people, or people with other disabilities.

XML Tree


```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE students SYSTEM "students.dtd">
<students>
    <student stdid="sonam1">
        <name>Sonam Choki</name>
        <salary>35000</salary>
    </student>
    <student stdid="sonam2">
        <name>Sonam Choki</name>
        <salary>35000</salary>
    </student>
    <student stdid="sonam3">
        <name>Sonam Choki</name>
        <salary>35000</salary>
    </student>
</students>
```

XML Tree

- The first line is the XML declaration. It defines the XML version (1.0).
- The next line describes the root element of the document
- student tag is the child element
- Then we have two sub-child element.

XML Documents Form a Tree Structure

XML documents must contain a root element. This element is "the parent" of all other elements.
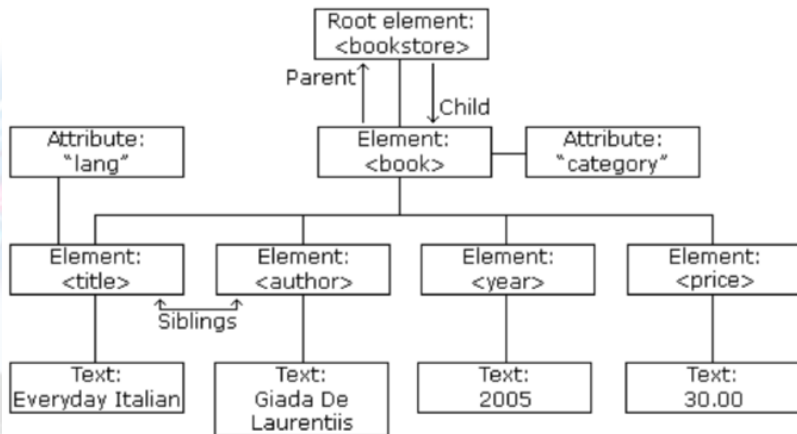
The elements in an XML document form a document tree. The tree starts at the root and branches to the lowest level of the tree.

XML Documents Form a Tree Structure

All elements can have sub elements (child elements):

```
<root>
 <child>
  <subchild>.....</subchild>
 </child>
</root>
```

XML Documents Form a Tree Structure

XML Syntax Rules

- All XML Elements Must Have a Closing Tag
- XML Tags are Case Sensitive
- XML Elements Must be Properly Nested
- XML Documents Must Have a Root Element
- XML Attribute Values Must be Quoted
- Entity References
- Comments in XML <!– This is a comment –>

Well Formed XML

XML documents that conform to the syntax rules above are said to be "Well Formed" XML documents.

XML Naming Rules

- Element names are case-sensitive
- Element names must start with a letter or underscore
- Element names cannot start with the letters xml (or XML, or Xml, etc)
- Element names can contain letters, digits, hyphens, underscores, and periods
- Element names cannot contain spaces

XML Attributes

In HTML, attributes provide additional information about elements:

Example: <student stdid="sonam1">

XML Attributes Must be Quoted

XML Namespaces

XML Namespaces provide a method to avoid element name conflicts.

XML Namespaces

XML Namespaces provide a method to avoid element name conflicts.

XML Namespaces

This XML carries HTML table information:

```
<table>
 <tr>
  <td>Apples</td>
  <td>Bananas</td>
 </tr>
</table>
```

This XML carries information about a table (a piece of furniture):

```
<table>
 <name>African Coffee Table</name>
 <width>80</width>
 <length>120</length>
</table>
```

Solving the Name Conflict Using a Prefix

```
<h:table>
 <h:tr>
  <h:td>Apples</h:td>
  <h:td>Bananas</h:td>
 </h:tr>
</h:table>

<f:table>
 <f:name>African Coffee Table</f:name>
 <f:width>80</f:width>
 <f:length>120</f:length>
</f:table>
```

Syntax for xml namespace:
xmlns:prefix="URI".

XML Namespaces - The xmlns Attribute

```xml
<root>

<h:table xmlns:h="http://www.w3.org/TR/html4/">
 <h:tr>
   <h:td>Apples</h:td>
   <h:td>Bananas</h:td>
 </h:tr>
</h:table>

<f:table xmlns:f="http://www.w3schools.com/furniture">
 <f:name>African Coffee Table</f:name>
 <f:width>80</f:width>
 <f:length>120</f:length>
</f:table>

</root>
```

XML Namespaces - The xmlns Attribute

When a namespace is defined for an element, all child elements with the same prefix are associated with the same namespace.

Uniform Resource Identifier (URI)

A Uniform Resource Identifier (URI) is a string of characters which identifies an Internet Resource.

XML Encoding

XML documents can contain international characters, like Norwegian , or French

To avoid errors, you should specify the encoding used, or save your XML files as UTF-8.

The first line in an XML document is called the prolog:
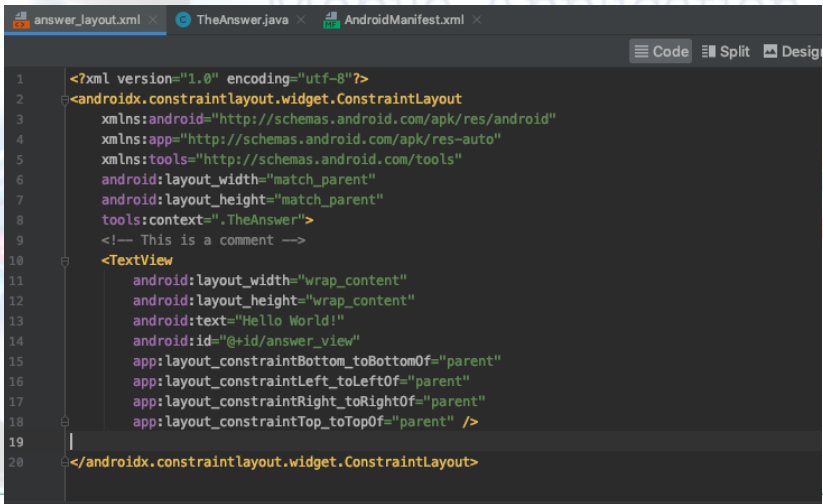
<?xml version="1.0"?>

XML Document Types

1. DTD - The original Document Type Definition. It focuses on structure of the document.
2. XML Schema - An XML-based alternative to DTD. it focuses on the content of the document.

XML in Android

Now you know how to interpret XML in Android.

XML in Android


```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".TheAnswer">
    <!-- This is a comment -->
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        android:id="@+id/answer_view"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

THANK YOU