XML ?

eXtensible Markup Language

X M L

XML ?

- It is used for storing and transferring data.
- It is a markup language much like HTML.
- Unlike HTML, XML is case-sensitive, requires each tag is closed properly, and preserves whitespace.
- XML Tags need not to be predefined like HTML (therefore known as extensible).

XML ?

- A markup language is a language that annotates text so that the computer can manipulate that text.
- Most markup languages are human-readable because the annotations are written in a way to distinguish them from the text itself.
- It was designed to be self-descriptive.

XML in Android

- We create XML layouts in Android, and later alter them using Java logic.

- Resources are the additional files and static content an application needs, such as animations, color schemes, layouts, menu layouts.

- Each layout file must contain one (and only one!) root element.

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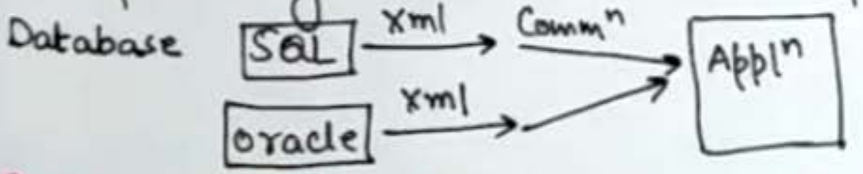
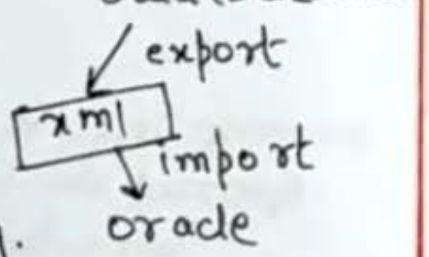
XML :- eXtensible Markup Language. (you can create your own tags.)

- → Used to Store and transport data.
- → Self descriptive.
- → Used to Carry data (Not used to display data)
- → Self-defined tags.
- → Platform and Language independent.
- → Helps in easy communication b/w two platforms.



Features and Advantages:-

i) Separates data from Html.
ii) Simplifies data sharing.
iii) Simplifies data transport.
iv) Increases data availability.
v) Simplifies platform change.



XML Example: (college)

↳ Hierarchial Structure. (college ← root; child ↳ class1, class2)

```
<?xml version="1.0" encoding="ISO-8859-1"?>   ↳ declaration
<college>   ← Root Element
  <class1>
    <Name>Amit</Name>
    <RollNo>1</RollNo>
  </class1>
  <class2>
    <Name>Mohan</Name>
    <RollNo>2</RollNo>
  </class2>
</college>
```

→ child Element.

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XML DTD:- XML Document Type Definition/Declaration
- → used to describe XML language precisely.
- → used to define structure of a XML document.
- → Contains list of legal elements.
- → used to perform validation.

DTD SYNTAX:-
```
<!DOCTYPE element DTD Identifier
  [ declaration 1
    declaration 2
  ]>
```

Types of DTD

Internal
elements are declared within the XML files.

Syntax:
```
<!DOCTYPE root-element
   [element-declaration]>
```

External
elements are declared outside XML file.

Syntax:
```
<!DOCTYPE root-
 element SYSTEM
 "file-name">
```

Internal DTD Example

```
<?xml version="1.0" encoding
="UTF-8">
<!DOCTYPE Address [
 <!Element Address (Name,
  Company, phone)>
 <!Element Name (#PCDATA)
 <!Element Company (#PCDATA)
]>
<Address>
 (1) <Name>___</Name>
 (2) <Company>__</Company>
 (3) <Phone>___</Phone>
</Address>
```

DTD

XML

Root Element

Root Element

External DTD Example

Add.dtd

XML File

```
<!DOCTYPE Address
SYSTEM "Add.dtd">
```

XML Namespaces:- used to avoid element name conflict in XML document.

→ It is a set of unique names.

→ Identified by URI (Uniform Resource Identifier)

→ Attribute name must start with "xmlns"

Syntax:- <element xmlns:name = "URL" >
name → Prefix
URL → URI

element and Attributes names belongs to URL.

Conflict: Generally conflict occurs when we try to mix XML documents from diff. XML Application.

Eg. of Conflict.

1.xml

```
<class>
  <name></name>
</class>
```

2.xml

```
<class>
  <name></name>
</class>
```

Conflict occurs due to same element name.

Example of Namespace: 1.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<c1:class xmlns:c1="class1 ....">
  <c1:name> Aman </c1:name>
</c1:class>
```

UTF-8 → URI
c1 → Prefix

2.xml

```
<c2:class xmlns:c2="class2 ...">
  <c2:name> Aman </c2:name>
</c2:class>
```

Now there will be no conflict due to namespace.

XML-Schemas:- Commonly Known as XML Schema Definition (XSD). It is used to describe & Validate the Structure and Content of XML Data.

→ It is a method of expressing Constraints about XML documents.

→ It is like DTD but provides more control on XML Structure.

Syntax: `<xs:schema xmlns:xs="____">`

Definition Types

Simple Type

used only in the Content of the text.

eg:- xs:Int, xs:String.

```
<xs:element name=
"Phone" type="xs:int"/>
```

Complex Type

It is the Container for other element definitions. Allows you to specify which child elements an element Can Contain & to provide some structure within Your XML documents

eg:- of Complex Type (Add.xsd)

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="Schema1....">
 <xs:element name="Address">
  <xs:ComplexType>
  <xs:sequence>
   <xs:element name="1Name" type="xs:string"/>
   <xs:element name="2Phone" type="xs:int"/>
  </xs:sequence>
 </xs:Complex type>
</xs:element>
</xs:schema>
```

Child elements should appear in sequence.

(Add.xml)

```
<?xml version="1.0" encoding="UTF-8"?>
<Address
  xsi:schemaLocation="____Add.xsd">
  1<Name> Aman </Name>
  2<Phone> 9810 </Phone>
</Address>
```

Path of Xml schema def^n.

123 → Error

abcd → Error

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HTML

i) Display Data (Look and feel).

ii) Markup language itself

iii) Not Case sensitive

iv) Predefined Tags

v) Static

eg:-

```
<html>
  <body>
    <p> HTML INTRO </p>
  </body>
</html>
```

Predefined Tag

display

XML

i) Transport and Store the data.

ii) Provide framework to define markup languages.

iii) Case-Sensitive

iv) Can Create own tags

v) Dynamic

eg:-

```
<College>
  <Class>
    <Name> </Name>
  </Class>
</College>
```

Custom tags

transport

DTD

i) Document Type definition

ii) doesn't support data-types.

iii) doesn't support name space.

iv) Doesn't define Order for child Elements

v) Not Extensible

eg:-

```
<!DOCTYPE Address[
<!Element Address (Name)>
<!Element Name (#PCDATA)>
]>
```

root

=

=

=

XSD

i) XML Schema definition.

ii) Supports

iii) Supports

iv) Order Can be defined.

v) Extensible → namespace.

eg:-

```
<xs: element name= "Address">
  <xs: Complex Type>
    <xs: sequence>
      <xs: elemenent name=
      "name" type= "xs:string" />
    </xs: sequence>
  </xs: Complex type>
</xs: element>
```

order

View

- It represents a rectangular area of the screen, and is responsible for **displaying information or content**, and event handling.

- Text, images, and buttons are all Views in Android.

ViewGroup

- It is essentially an **'invisible container'** that holds multiple Views or ViewGroups together, and defines their layout properties.

- Common View Groups
  - A List View displays a list of scrollable items.
  - A Grid View displays items in a two-dimensional scrollable grid.
  - A Table Layout groups views into rows and columns

Root View

- It is **Root** Element of XML Layout file.

- Common View Groups
  - A Linear Layout aligns its contents into a single direction, whether vertical or horizontal.
  - A Relative Layout displays its child content in positions relative to the parent.
  - A Frame Layout is a placeholder on a screen that display only a single view (Fragments)

XML Layout

Root View

activity_main.xml | MainActivity.java

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    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=".MainActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</LinearLayout>
```

Attributes

View(Child)

LinearLayout