

## Extensible Markup Language

- nested data

## XML (Extensible Markup Language)

### ▪ XML Data Model

- Meta language to define specific **exchange formats**
- Document format for **semi-structured data**
- Well formedness
- XML schema / DTD

```
<?xml version="1.0" encoding="UTF-8"?>
<data>
  <student id="1">
    <course id="INF.01017UF" name="DM"/>
    <course id="706.550" name="AMLS"/>
  </student>
  <student id="5">
    <course id="706.520" name="DIA"/>
  </student>
</data>
```

### ▪ XPath (XML Path Language)

- Query language for **accessing collections of nodes** of an XML document
- Axis specifies for ancestors, descendants, siblings, etc

/data/**student**[@id='1']/course/@name

↓  
"DM"  
"AMLS"

### ▪ XSLT (XML Stylesheet Language Transformations)

- Schema mapping (transformation) language for XML documents

### ▪ XQuery

- Query language to extract, transform, and analyze XML documents

- more verbose than [[JSON]]

## XML in [[SQL]]

- XML can be used as datatype
- various built-in functions to parse documents/create attributes/elements

```
INSERT INTO Students
(Fname, Lname, Doc)
VALUES('John', 'Smith',
xmlparse(<source_doc>));
```

- execution of XML expressions on XML attributes
  - Execute **XPath** expressions on XML types
  - XMLEXIST with **XPath instead of XQuery**
  - XPATH with optional namespace handling

```
SELECT Fname, Lname,  
       xpath('/student/@id',Doc)  
FROM Students
```