

COS 425:
Database and Information
Management Systems

XML and information exchange continued

Last time:

XML document structure
XML querying with XQuery

Today:

XML name spaces
XML Schema definition
Conclusion

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Namespaces

- Exchanging XML documents with unrelated sites, unrelated applications requires **unambiguous identifiers** across sources of documents
- XML allows each source to specify a **globally unique name**: universal resource identifiers (URIs)
 - URLs
- Names within one source expect source to keep unambiguous

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Namespace specification

- Prepend **URI** to each tag or attribute name
http://www.princeton.edu:student
- Verbose – have **abbreviation mechanism**
Attribute **within root tag**: xmlns:abbrev="URI"

```
<students xmlns:PUstu="http://www.princeton.edu">
  <PUstu:student>
    <PUstu:year>2005</PUstu:year>
  ...

```

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Multiple namespaces

- One document can have several namespaces defined and used
 - Different sources
 - Sources need not be sites
- Namespace can denote specific XML standard
 - Extend types
 - Extend functions

`xmlns:xs="http://www.w3.org/2001/XMLSchema"`
Get types “`xs:string`”, “`xs:decimal`”

Leads us to ...

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Language *XML Schema*

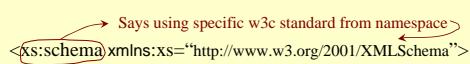
Standard for specifying schema of a document:

- Specify tag names, attribute names
- Declare leaf types (contents)
 - Built-in types
 - User-defined types
- Declare tag structure
 - tree model
- Specify constraints:
 - key
 - foreign key

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XML Schema specification

The schema for a document is
an **XML document**


`<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">`
... *specification of document*
`</xs:schema>`

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Board

Outline of XScheme **Basics**

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Putting example all together (Note NOT same R&G BOOKLIST example)

```
< xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="books" type="ListBooksType"/>
<xs:element name="book" type="BookType"/>
<xs:complexType name="BookType">
<xs:attribute name="in_print"/>
<xs:sequence>
<xs:element name="title" type="xs:string"/>
<xs:element name="isbn" type="xs:string"/>
<xs:element name="edition" type="xs:string"/>
<xs:element name="date" type="xs:string"/>
</xs:sequence>
</xs:complexType>
<xs:complexType name="ListBooksType">
<xs:sequence>
<xs:element ref="book" minOccurs="1" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>
</xs:schema>
```

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XML uses for information exchange

- Many and wide range of applications use XML to exchange information (data)
- Some examples:
 - PADS tool here (Prof. Walker) converts “ad hoc” (nonstandard) data file into an XML file
 - XML one of choices
 - XML standards for specifying 3D models
 - Acrobat (U3D)
 - Google (Collada)
 - describe security vulnerabilities
 - W3C specify XML standards

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SUMMARY

- XML is language for representing information (data) in **semi-structured** way
 - **Self documenting** by tag names
 - **Flexible formatting**
 - Began as language for generalizing specification of document display
- Generality allows XML to be important **information exchange format** for internet
- **XML Schema** provides **formal specification** of document schema
- XQuery provides SQL-like **query language** for extracting information from an XML document

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