

# XML Examples

CSC 436 – Fall 2005

Slides to be used in conjunction with class notes

## Example Toy Store

```
<xml version="1.0" standalone="yes">
<toystore>

  <Manuf>
    <Name>Fischer-Price</Name>
    <Addr>2 Main Street</Addr>
    <Phone>401-555-3344</Phone>
    <Toy>
      <Name>Farm House</Name>
      <Num>0001</Num>
      <Price>14.00</Price>
    </Toy>
    <Toy>
      <Name>Truck</Name>
      <Num>0002</Num>
      <Price>12.00</Price>
    </Toy>
    ...
  </Manuf>
  <Manuf> ... </Manuf>
```

## Example: An Address Book

```
<person>
  <name> MacNiel, John </name> } Exactly one name
  <greet> Dr. John MacNiel </greet> } At most one greeting
  <addr>1234 Huron Street </addr> } As many address lines
  <addr> Rome, OH 98765 </addr> } as needed (in order)
  <tel> (321) 786 2543 </tel> }
  <fax> (321) 786 2543 </fax> } Mixed telephones
  <tel> (321) 786 2543 </tel> } and faxes
  <email> jm@abc.com </email> } As many as needed
</person>
```

## A DTD for the address book

```
<!DOCTYPE addressbook [
  <!ELEMENT addressbook (person*)>
  <!ELEMENT person
    (name, greet?, address*, (fax | tel)*, email*)>
  <!ELEMENT name (#PCDATA)>
  <!ELEMENT greet (#PCDATA)>
  <!ELEMENT address (#PCDATA)>
  <!ELEMENT tel (#PCDATA)>
  <!ELEMENT fax (#PCDATA)>
  <!ELEMENT email (#PCDATA)>
]>
```

## Example Project Database

projects:

| title | budget | managedBy |
|-------|--------|-----------|
|-------|--------|-----------|

employees:

| name | ssn | age |
|------|-----|-----|
|------|-----|-----|

## Two DTDs for the Project DB

```
<!DOCTYPE db [  
  <!ELEMENT db      (projects,employees)>  
  <!ELEMENT projects (project*)>  
  <!ELEMENT employees (employee*)>  
  <!ELEMENT project  (title, budget, managedBy)>  
  <!ELEMENT employee (name, ssn, age)>  
  ...  

```

```
<!DOCTYPE db [  
  <!ELEMENT db      (project | employee)*>  
  <!ELEMENT project  (title, budget, managedBy)>  
  <!ELEMENT employee (name, ssn, age)>  
  ...  

```

## Specifying ID and IDREF attributes

```
<!DOCTYPE family [  
  <!ELEMENT family (person)*>  
  <!ELEMENT person (name)>  
  <!ELEMENT name (#PCDATA)>  
  <!ATTLIST person  
    id ID #REQUIRED  
    mother IDREF #IMPLIED  
    father IDREF #IMPLIED  
    children IDREFS #IMPLIED>  
>
```

## Some conforming data

```
<family>  
  <person id="jane" mother="mary" father="john">  
    <name> Jane Doe </name>  
  </person>  
  <person id="john" children="jane jack">  
    <name> John Doe </name>  
  </person>  
  <person id="mary" children="jane jack">  
    <name> Mary Doe </name>  
  </person>  
  <person id="jack" mother="mary" father="john">  
    <name> Jack Doe </name>  
  </person>  
</family>
```

## An alternative specification

```
<!DOCTYPE family [  
  <!ELEMENT family (person)*>  
  <!ELEMENT person (mother?, father?, children, name)>  
  <!ATTLIST person id ID #REQUIRED>  
  <!ELEMENT name (#PCDATA)>  
  <!ELEMENT mother EMPTY>  
  <!ATTLIST mother idref IDREF #REQUIRED>  
  <!ELEMENT father EMPTY>  
  <!ATTLIST father idref IDREF #REQUIRED>  
  <!ELEMENT children EMPTY>  
  <!ATTLIST children idrefs IDREFS #REQUIRED>  

```

## The revised data

```
<family>  
  <person id = "jane">  
    <name> Jane Doe </name>  
    <mother idref = "mary"></mother>  
    <father idref = "john"></father>  
  </person>  
  <person id = "john">  
    <name> John Doe </name>  
    <children idrefs = "jane jack"> </children>  
  </person>  
  ...  
</family>
```

## Bank DTD

```
<!DOCTYPE bank [  
  <!ELEMENT bank ( ( account | customer | depositor)+)>  
  <!ELEMENT account (account-number branch-name balance)>  
  <! ELEMENT customer(customer-name customer-street  
                        customer-city)>  
  <! ELEMENT depositor (customer-name account-number)>  
  <! ELEMENT account-number (#PCDATA)>  
  <! ELEMENT branch-name (#PCDATA)>  
  <! ELEMENT balance(#PCDATA)>  
  <! ELEMENT customer-name(#PCDATA)>  
  <! ELEMENT customer-street(#PCDATA)>  
  <! ELEMENT customer-city(#PCDATA)>  

```

## Bank DTD with Attributes

- ◆ Bank DTD with ID and IDREF attribute types.

```
<!DOCTYPE bank-2[  
  <!ELEMENT account (branch, balance)>  
  <!ATTLIST account  
    account-number ID # REQUIRED  
    owners IDREFS # REQUIRED>  
  <!ELEMENT customer(customer-name, customer-street,  
                      customer-city)>  
  <!ATTLIST customer  
    customer-id ID # REQUIRED  
    accounts IDREFS # REQUIRED>  
  ... declarations for branch, balance, customer-name,  
    customer-street and customer-city  

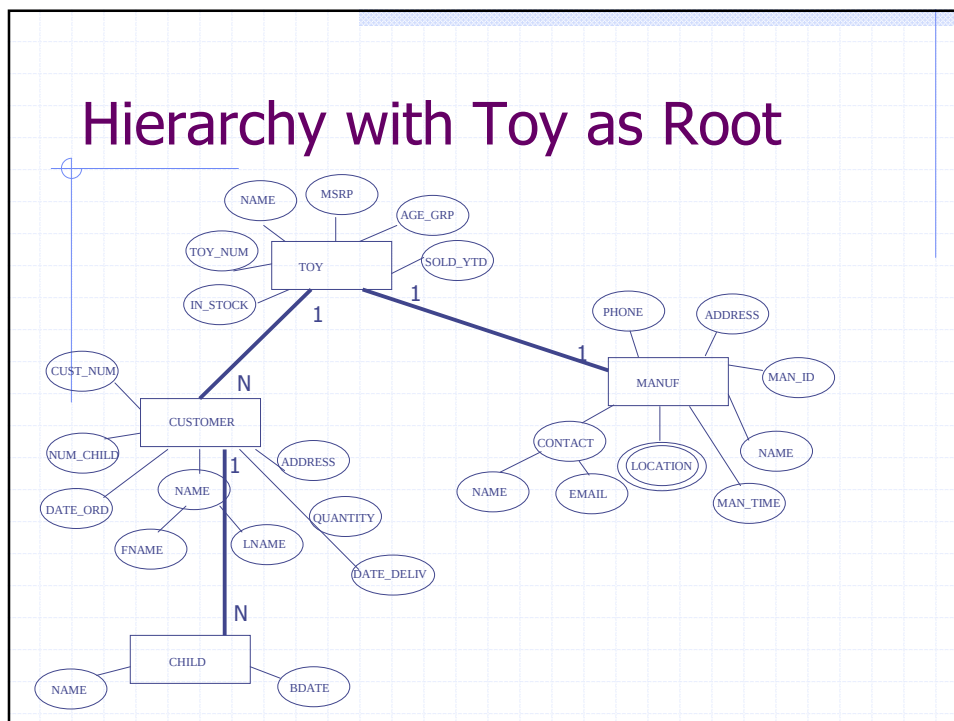
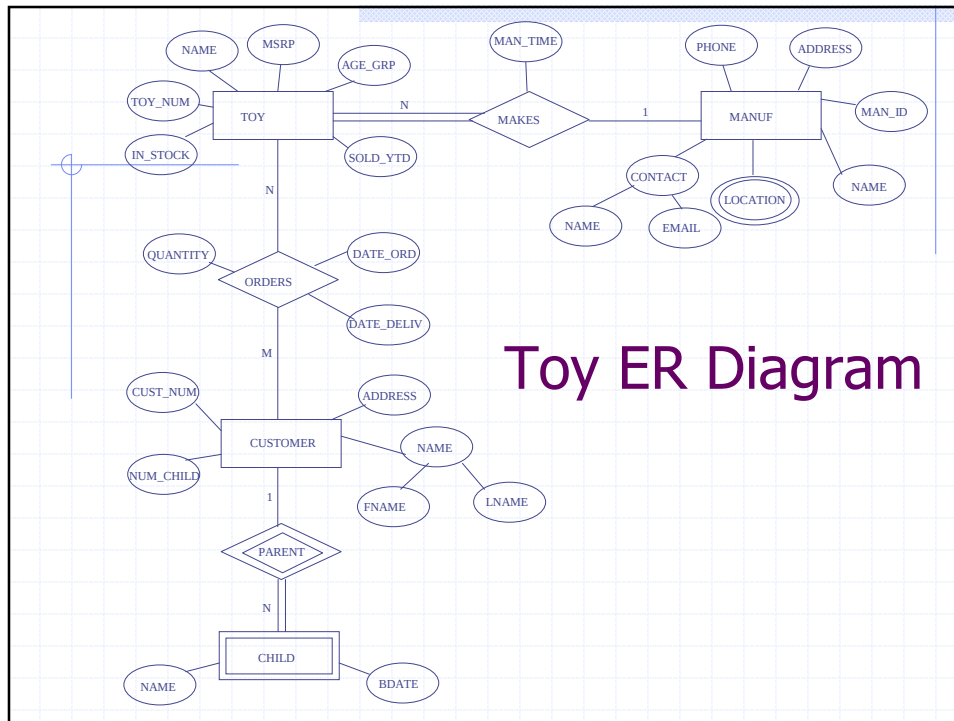
```

## XML data with ID and IDREF attributes

```
<bank-2>
  <account account-number="A-401" owners="C100 C102">
    <branch-name> Downtown </branch-name>
    <branch>500 </balance>
  </account>
  <customer customer-id="C100" accounts="A-401">
    <customer-name> Joe </customer-name>
    <customer-street> Monroe </customer-street>
    <customer-city> Madison </customer-city>
  </customer>
  <customer customer-id="C102" accounts="A-401 A-402">
    <customer-name> Mary </customer-name>
    <customer-street> Erin </customer-street>
    <customer-city> Newark </customer-city>
  </customer>
</bank-2>
```

## XML Schema Version of Bank DTD

```
<xsd:schema xmlns:xsd=http://www.w3.org/2001/XMLSchema>
  <xsd:element name="bank" type="BankType"/>
  <xsd:element name="account">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="account-number" type="xsd:string"/>
        <xsd:element name="branch-name" type="xsd:string"/>
        <xsd:element name="balance" type="xsd:decimal"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  .... definitions of customer and depositor ....
  <xsd:complexType name="BankType">
    <xsd:sequence>
      <xsd:element ref="account" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element ref="customer" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element ref="depositor" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```





# Toy XML Schema

```
<xsd:schema xmlns:xsd=http://www.w3.org/2001/XMLSchema>
<xsd:element name="toy" type="ToyType"/>
<xsd:element name="manuf">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="phone" type="xsd:string"/>
      <xsd:element name="man_id" type="xsd:string"/>
      ...
      <xsd:element name="man_time" type="xsd:decimal"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element name>
<xsd:element name="customer"> ...</xsd:element name>
<xsd:complexType name="ToyType">
  <xsd:sequence>
    <xsd:element ref="manuf" minOccurs="1" maxOccurs="1"/>
    <xsd:element ref="customer" minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>
```