

Exercises: DTD

Basi di dati 2

Luca Rossi

rossi@dia.uniroma3.it

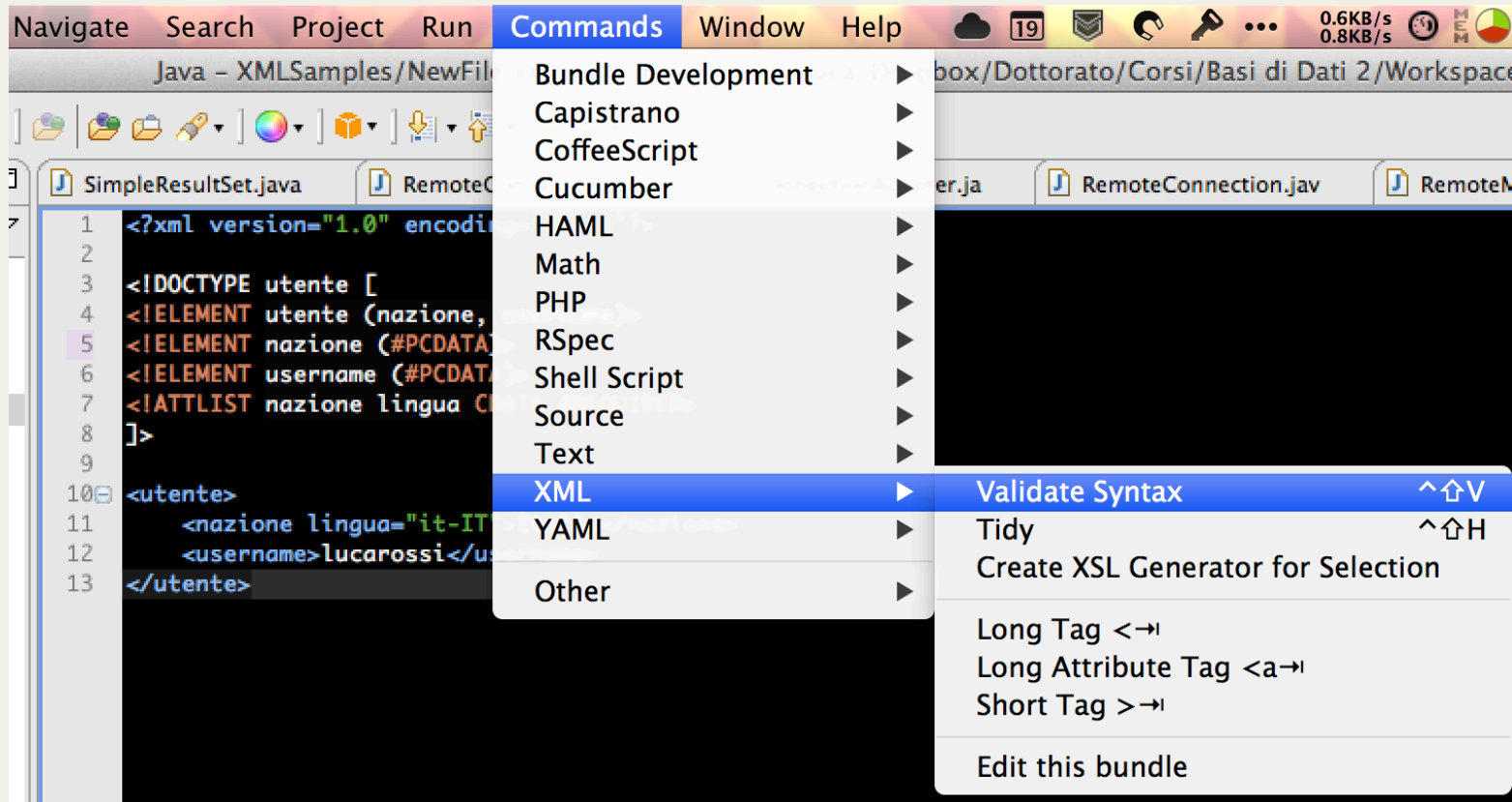
Disheng Qiu

disheng@dia.uniroma3.it

Hints:

Use a validator:

- **Eclipse** has an embedded XML/DTD validator
- **W3Schools**: http://www.w3schools.com/dom/dom_validate.asp



Hints:

Avoid Copy/Paste:

- **Skype, Word, Powerpoint** and other rich editors will break your XML inserting invisible chars between the tags



Common mistakes:

- **Order of mixed content**
 - Wrong: `(#PCDATA,elem1,elem2)`
 - Right: `(#PCDATA | elem1 | elem2)*`
- **Non-deterministic sequences**
 - Wrong: `(this | this, that | other)`
 - Right: `(this, that?) | other`
- **Attributes modifiers are needed**
 - Wrong: `<!ATTLIST elem attr CDATA>`
 - Right: `<!ATTLIST elem attr CDATA #IMPLIED>`

Exercises:

2x From instance to DTD

2x From DTD to instance

1x From specs to instance to DTD

Exercise 1: *Orders*

From instance to DTD

Ex.1 - From instance to DTD

```
<?xml version="1.0"?>
<shiporder orderid="889923">
  <orderperson> John Smith </orderperson>
  <shipto>
    <name> Ola Nordmann </name>
    <address> Langgt 23 </address>
    <city> 4000 Stavanger </city>
    <country> Norway </country>
  </shipto>
  <item>
    <title> Empire Burlesque</title>
    <note> Special Edition </note>
    <quantity> 1 </quantity>
    <price> 10.90 </price>
  </item>
  <item>
    <title> Hide your heart</title>
    <quantity>1</quantity>
    <price>9.90</price>
  </item>
</shiporder>
```

Ex.1 - From instance to DTD: Solution

```
<?xml version="1.0"?>
<!DOCTYPE shiporder[
<!ELEMENT shiporder (orderperson,shipto,item+)>
<!ATTLIST shiporder orderid CDATA #REQUIRED>
<!ELEMENT orderperson (#PCDATA)>
<!ELEMENT shipto (name,address,city,country)>
<!ELEMENT name (#PCDATA)>
<!ELEMENT address (#PCDATA)>
<!ELEMENT city (#PCDATA)>
<!ELEMENT country (#PCDATA)>
<!ELEMENT item (title,note?,quantity,price)>
<!ELEMENT title (#PCDATA)>
<!ELEMENT note (#PCDATA)>
<!ELEMENT quantity (#PCDATA)>
<!ELEMENT price (#PCDATA)>
]>
```


Exercise 2: *Lettera*

From instance to DTD

Ex.2 - From instance to DTD

<lettera>

Gentile <cliente> tal dei tali </cliente>,

la informiamo che i seguenti articoli da lei ordinati non sono più disponibili a magazzino:

<ordine num="1234">

<articolo>

<codice>1</codice>

<descr>articolo 1</descr>

</articolo>

<articolo>

<codice>5</codice>

<descr>articolo 5</descr>

</articolo>

</ordine>

Cordiali saluti,

<responsabile><tit>dr.</tit>Mario Rossi</responsabile>

</lettera>

Ex.2 - From instance to DTD: Solution

```
<?xml version="1.0"?>
<!DOCTYPE lettera[
<!ELEMENT lettera (#PCDATA|cliente|ordine|responsabile)*>
<!ELEMENT cliente (#PCDATA)>
<!ELEMENT ordine (articolo+)>
<!ATTLIST ordine num CDATA #REQUIRED>
<!ELEMENT articolo (codice,descr)>
<!ELEMENT codice (#PCDATA)>
<!ELEMENT descr (#PCDATA)>
<!ELEMENT responsabile (#PCDATA|tit)*>
<!ELEMENT tit (#PCDATA)>
]>
```

Exercise 3: *Catene Montuose*

From DTD to instance

Ex.3 - From DTD to instance

```
<?xml version="1.0"?>  
<!DOCTYPE cateneMontuose[  
<!ELEMENT cateneMontuose (catenaMontuosa*)>  
<!ELEMENT catenaMontuosa (monte+)>  
<!ELEMENT monte (nome, regione?, altezza?)>  
<!ELEMENT nome (#PCDATA)>  
<!ELEMENT regione (#PCDATA)>  
<!ELEMENT altezza (#PCDATA)>  
<!ATTLIST altezza unitaMisura CDATA #REQUIRED>  
>
```

Ex.3 - From DTD to instance: Solution

```
<cateneMontuose>
  <catenaMontuosa>
    <monte>
      <nome> Monte Bianco </nome>
      <regione> Valle d'Aosta </regione>
      <altezza unitaMisura="metri">4810</altezza>
    </monte>
  </catenaMontuosa>
  <catenaMontuosa>
    <monte>
      <nome>Gransasso</nome>
    </monte>
  </catenaMontuosa>
</cateneMontuose>
```

Exercise 4: *Stock/Used cars*

From DTD to instance

Ex.4 - From DTD to instance

```
<?xml version="1.0"?>  
<!DOCTYPE stock[  
  <!ELEMENT stock (new-car | used-car)*>  
  <!ELEMENT new-car (model, price)>  
  <!ELEMENT used-car (model, price, mileage, condition?)>  
  <!ELEMENT model (#PCDATA)>  
  <!ELEMENT price (#PCDATA)>  
  <!ELEMENT mileage (#PCDATA)>  
  <!ELEMENT condition (#PCDATA)>  

```


Ex.4 - From DTD to instance: Solution

```
<stock>
  <new-car>
    <model>Fiat Panda</model>
    <price>12000</price>
  </new-car>
  <used-car>
    <model>Fiat Bravo</model>
    <price>4000</price>
    <mileage>1000</mileage>
    <condition>Good</condition>
  </used-car>
  <used-car>
    <model>Ferrari</model>
    <price>400000</price>
    <mileage>100</mileage>
  </used-car>
</stock>
```

Exercise 5: *Football matches*

From specs to instance to DTD

Ex.5 - From specs to instance to DTD

- Consider an application in which the results of football games are to be represented in XML.
- For each **game**, we want to be able to represent the **two teams** involved, which one was playing at **home**, which **players** scored goals (some of which may have been **penalties**) and the **time** when each was scored, and which players were shown **yellow** or **red cards**.
- You might use some attributes.

Ex.5 - From specs to instance to DTD: Solution

```
<games>
  <game score="1-1">
    <home-team>Roma</home-team>
    <ex-team>Lazio</ex-team>
    <scores>
      <score time="15">
        <player>Klose</player>
      </score>
      <score time="85" type="penalty">
        <player>Totti</player>
      </score>
    </scores>
    <yellow>
      <player>Totti</player>
      <player>Hernanes</player>
    </yellow>
    <red>
      <player>Kjaer</player>
    </red>
  </game>
</games>
```

Ex.5 - From specs to instance to DTD: Solution

```
<?xml version="1.0"?>
<!DOCTYPE games[
  <!ELEMENT games (game)*>
  <!ELEMENT game (home-team, ex-team, scores, yellows, reds)>
  <!ELEMENT home-team (#PCDATA)>
  <!ELEMENT ex-team (#PCDATA)>
  <!ELEMENT scores (score)*>
  <!ELEMENT yellows (player)*>
  <!ELEMENT reds (player)*>
  <!ELEMENT score (player)*>
  <!ELEMENT player (#PCDATA)>
  <!ATTLIST game score CDATA #REQUIRED>
  <!ATTLIST score time CDATA #REQUIRED>
  <!ATTLIST score type (field|penalty) #IMPLIED>
]>
```