

**NPRG036: XML Technologies**

Practical Classes 1 and 2:

# **XML, DTD: Exercises**

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# Exercise 1

- Create an XML document with the following sample real estate data
  - Root element *real-estate* will contain a sequence of sub-elements *agencies*, *owners*, *properties* and *flats*, all with an empty content
  - Ensure well-formedness

# Exercise 2



- Create an internal DTD for the previous XML document
  - Ensure its validity
  - Then try to break it

# Exercise 3

- Move the previous DTD to an external file and validate the XML document again

# Exercise 4



- Extend the previous DTD such that...
  - Elements *agencies*, *owners*, *properties* and *flats* can now contain particular *agency*, *owner*, *property* and *flat* elements respectively
    - Agency = name, e-mail, phone
    - Owner = name
    - Property = name, description, number of flats, features, owner reference
    - Flat = name, description, features, property reference
  - Use attributes for references, otherwise elements
  - Use only CDATA and #PCDATA for content and values
- Extend the XML document such that it contains 1 sample agency, 1 owner, 1 property, and 2 flats
  - Ensure well-formedness and validity

# Exercise 5



- Modify both the DTD and XML:
  - Description of properties...
    - may now contain a text with references to flats
    - E.g.: ...<flatReference flatName="A1001">...</flatReference>...
  - Description of flats...
    - now contains a structured description with an arbitrary, but still well-formed XML fragment

# Exercise 6

- Extend both the DTD and XML:
  - Agencies, owners and properties must now have right one *address* (directly after their *name*)
  - Each address consists of:
    - Street and number
    - Postal code
    - State
    - Country
  - Respect the order, but note also that country is optional and when missing, postal code must be placed at the end (i.e. after state and not before)

# Exercise 7



- Modify both the DTD and XML:
  - Address, e-mail and phone records of agencies may now be specified in an arbitrary order
  - Ensure that there are at least 2 flats
  - If *features* (of properties and flats) are specified, then at least 2 and at most 5 of them are provided



# Exercise 8

- Extend both the DTD and XML:
  - Flats can now be associated with internal records
  - Each record contains...
    - Date and additional textual information, or
    - sequence of at least one nested record

# Exercise 9



- Modify and extend both the DTD and XML:
  - Add language attribute to the root element
    - The value needs to be fixed to *EN*
  - Add comfort level attribute to flats
    - Only *A, B, C, D, E* or *F* values are allowed
    - *F* is the default value
  - References to owners of properties are now optional

# Exercise 10



- Modify and extend both the DTD and XML:
  - Add attributes with unique artificial identifiers to owners, properties and flats
    - E.g. *o1*, *o2* in case of owners etc.
  - Transform all the existing references from names to these new identifiers
  - Use *ID* and *IDREF* data types
- Try to violate the referential integrity

# Exercise 11



- Extend both the DTD and XML:
  - Insert the following fragment into a *description* of a selected *flat* in a way that it is not interpreted as XML
    - `<span class="btn">Button</span>`
    - Use entities
  - Declare a new parsed entity for the superscript of 2 and use it as well
    - Unicode `U+00B2` (178)

# Exercise 12

- Extend the XML document:
  - Insert the following fragment into a description of one of the flats using a *CDATA* section:
    - `<span class="btn">Button</span>`
  - Generate a date of one of the flat records using a PHP processing instruction:
    - `echo date("Y-m-d");`
  - Add comments to visually separate individual parts of the document

# Exercise 13

- Modify the DTD schema:
  - Using parameter entities and conditional sections, declare 2 modes for the content of owners:
    - Verbose
      - Everything
    - Standard
      - Everything except the description
  - Activate the standard mode and adjust the XML document appropriately