

NPRG036: XML Technologies

Practical Classes 1 and 2:

XML, DTD: Exercises

24. 2. 2020

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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 exactly 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
 - `Button`
 - 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:
 - `Button`
 - 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 properties:
 - Verbose
 - Everything
 - Standard
 - Everything except the description
 - Activate the standard mode and adjust the XML document appropriately