

NPRG036: XML Technologies

Practical Classes 5 and 6:

XML Schema: Exercises

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Exercise 1

- Create an XSD for a real estate XML document
 - Its root element *real-estate* contains a sequence of sub-elements *agencies*, *owners*, *properties* and *flats*, all with an empty content
 - Do not define any global complex type
 - Do not declare a target namespace
- Modify the XML document such that its validity can be checked with respect to this XSD

Exercise 2



- Extend the previous XSD schema for 02.xml
 - 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, number of flats
 - Flat = name, description, rate
 - Define global complex types for all the 4 main entities
 - Do not define global complex types for anything else
 - Use ordinary *xs:string* simple type for all text values

Exercise 3

- Extend the previous XSD schema for 03.xml
 - Add the following compulsory attributes
 - Identifiers of owners, properties and flats
 - References from flats to properties they belong to
 - Comfort levels of flats
 - Add the following optional attributes
 - References from properties to owners they belong to
 - Dates when flats were posted
 - Use *xs:string* simple type once again for all values

Exercise 4



- Extend the previous XSD schema for 04.xml
 - Choose appropriate predefined simple types for all text and attribute values and/or introduce your own derived global/anonymous simple types
 - Use DTD-based identifiers for owners, properties and flats as well as their mutual relationships
 - Allow only *A, B, C, D, E, F* values for comfort levels of flats
 - Rates of flats are positive integers or *0*
 - Flat identifiers must match regular expression `[fF][0-9]{1,5}`
 - Numbers of property flats should be equal to at most *1500*
 - Flat names must have at least *5* and at most *100* characters

Exercise 5



- Extend the previous XSD schema for 05.xml
 - Add *features* to properties and flats
 - Add an optional attribute to each *feature* describing a list of categories to which it is associated
 - Only a fixed list of predefined categories is permitted (*location, equipment, security, comfort*)
 - Do not allow its further derivations using restriction
 - *Features* element might be missing, otherwise 2 to 5 particular *feature* elements are expected

Exercise 6



- Extend the previous XSD schema for 06.xml
 - Define global *address* element
 - Address = street, postal code, city, and country
 - Country is optional and when missing, postal code must be placed at the end (i.e. after city and not before)
 - Add these addresses to agencies, owners, and properties (one address to each entity)
 - Use references for this purpose
 - All agency data (name, e-mail, phone and address) can now occur in arbitrary order

Exercise 7

- Extend the previous XSD schema for 07.xml
 - Modify flat *description*
 - It should now contain a mixed content with references to owners and properties using their IDs
 - E.g. ... <ownerRef ownerId="o1">...</ownerRef> ...
 - There can be an arbitrary number of these references, but owner references must occur before property references
 - Add optional property *description*
 - It should contain any well-formed and valid fragment of an XHTML web page
 - <http://www.w3.org/1999/xhtml>

Exercise 8



- Extend the previous XSD schema for 08.xml
 - Add the following keys
 - Identify properties using their *idProperty* attributes
 - Identify flats using their *idFlat* attributes
 - Identify flats also using pairs of their names and properties they belong to, i.e. using *name* and *propertyRef*
 - Add the following foreign key
 - References from flats to properties they belong to

Exercise 9

- Extend the previous XSD schema for 09.xml
 - Use assertions to verify the following integrity constraints
 - Each owner has a *name* and this name is immediately followed by *address* of residency

Exercise 10



- Extend the previous XSD schema
 - Introduce two new specific types of properties
 - Skyscraper
 - Extends *property* by adding a new attribute *numberOfFloors*
 - Cottage
 - Restricts *property* by removing *features* and *ownerRef*

Exercise 11

- Modify XML document 11.xml such that it becomes valid with respect to the previous XSD
 - i.e. such that elements *property* in *properties* are allowed to be instances of the newly introduced specific types for skyscrapers or cottages
 - Do not change the XSD

Exercise 12



- Modify the previous XSD schema for 12.xml
 - Use explicit substitutability instead of implicit for specific types of properties
 - I.e. use substitution groups