VU Semantic Technologies, RDFS and OWL

NAME: **MATRIKELNUMMER:**

Remember that you can user you Laptop, i.e. you can use your Laptop to look up the lecture slides, the Internet to look up RDFS or OWL2 Definitions or validate your RDFS, or Protégé to generate valid Functional Syntax. Because of this, **we also expect correct syntax from you**!

1) Express the following statements about the Best Exotic Majpoor Home for the Elderly and Beautiful in **RDFS**:

   a) Residents as well as Carers are Persons (1pt)

Ex:Resident rdfs:SubClassOf ex:Person

Ex:Carer rdfs:SubClassOf ex:Person

   b) Residents inhabit Suites (1pt) Hint: Use a domain and range statement on the property "inhabits"

Ex:inhabits rdfs:domain ex:Resident

Ex:inhabits rdfs:range ex:Suite

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2) Express the following statement about the Best Exotic Majpoor Home for the Elderly and Beautiful in **OWL2** using the Functional Syntax used also in the lecture. Hint: You can use Protégé 4.1 to express the statements and transcribe the functional syntax, or you look up the functional syntax in the web) (3pt):

Every Care Home Resident inhabits exactly one Suite, and each Suite is inhabited by 3-5 residents.

Use the following class names: "ex:Resident" for care home residents, "ex:Suite" for care home suites. Use the following property names: "ex:inhabits" and "ex:is-inhabited-by"

Make sure to express cardinality and existence.

Hint: Express Care Home Resident as subclass of the class of things that inhabit exactly one Suite, and in analogy Suites as subclass of things that are inhabited by 3-5 residents.

Every Care Home Resident inhabits exactly one Suite:

SubClassOf(:Resdient ObjectExactCardinality(1 inhabits   :Suite)

or

SubClassOf(:Resident ObjectMinCardinality(1   :inhabits   :Suite))

SubClassOf(:Resident ObjectMaxCardinality(1   :inhabits   :Suite))

Each Suite is inhabited by 3-5 residents:

SubClassOf(:Suite ObjectMinCardinality (3   :is-inhabited-by   Resident))

SubClassOf(:Suite ObjectMaxCardinality (5   :is-inhabited-by   Resident))

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3) In the two examples below, you are shown RDFS triples. In each example, one entity is bold. Please state the type(s) of this entity. (2pts)

    a) ex:talk-fast rdfs:subPropertyOf **ex:talk**

rdf:Property
rdfs:Resource

    b) ex:talk rdfs:domain **ex:Person**
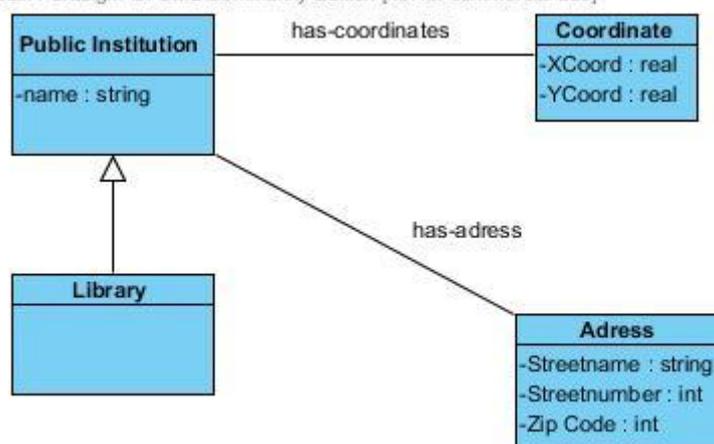
rdfs:Class
rdfs:Resource

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4) Given the following data, and the chosen ER model: Which of the RDFS triples below express the chosen ER model? Which of the OWL2 axioms below express the chosen ER model? (Note that the triples and axioms do not fully express the graphical ER model) (6pts)

XCoord	YCoord	NAME	ANSCHRIFT	PLZ	KAT3
1716156,5	5955831,33	Fachbibliothek HeilPädagogik-Kinderbücherei	Kalvariengürtel 62	8020	Bibliothek
1718871,78	5954165,43	Steiermärkisches Landesarchiv	Karmeliterplatz 3	8010	Bibliothek
1718123,09	5955325,1	Studienbibliothek der Pädagogischen Hochschule	Theodor-Körner-Straße 38	8010	Bibliothek
1718431,49	5952929,16	Frauenbibliothek	Radetzkystraße 18	8010	Bibliothek
1718677,86	5953933,37	Steirisches Volksliedwerk	Sporgasse 23	8010	Bibliothek

Visual Paradigm for UML Community Edition [not for commercial use]

Public Institution
-name : string

has-coordinates

Coordinate
-XCoord : real
-YCoord : real

Library

has-adress

Adress
-Streetname : string
-Streetnumber : int
-Zip Code : int

RDFS

a) ex:Library rdfs:subClassOf ex:PublicInstitution ☒

b) ex:PublicInstitution rdfs:subClassOf ex:Library ☐

c) ex:has-coordinates rdfs:domain ex:PublicInstitution ☒

d) ex:has-coordinates rdfs:domain ex:Coordinate ☐

e) ex:has-coordinates rdfs:range ex:PublicInstitution ☐

f) ex:has-coordinates rdfs:range ex:Coordinate ☒

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OWL2

g) SubClassOf(ex:Library ex:PublicInstitution) ☒

h) SubClassOf(ex:PublicInstitution ex:Library ☐

i) ObjectPropertyDomain(ex:has-coordinate ex:PublicInstitution) ☒

j) ObjectPropertyDomain(ex:has-coordinate ex:Library ☐

k) ObjectPropertyRange(ex:has-coordinate ex:PublicInstitution ☐

l) ObjectPropertyRange(ex:has-coordinate ex:Coordinate ☒