

CSE632 Semantic Web

Assignment - 1

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Question 1

@prefix : <http://www.iiitd.ac.in/sweb/a1/q1/> .

@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .

@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .

@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

A. :juiceMadeOfFruit

rdf:type rdf:Property ;

rdfs:domain :FruitJuice ;

rdfs:range :Fruit .

B. :Apple rdf:type :Fruit.

C. :juiceMadeOfFruit rdf:subPropertyOf :juiceMadeOf

D. :MixedFruitJuice :hasIngredients :Banana, :Orange, :Pineapple, :Watermelon .

E. :MixedFruitJuice :hasIngredients [

:Fruit :Orange ;

:Quantity "2"^^xsd:integer

], [

:Fruit :Pomegranate ;

:Quantity "1"^^xsd:integer

], [

:Fruit :Pineapple ;

:Quantity "1"^^xsd:integer

].

F. :OrangeJuice :hasIngredients [

:Fruit :Orange ;

:Quantity "3"^^xsd:integer

], [

:Other :TablespoonOfSalt ;

:Quantity "1"^^xsd:integer

].

G. :MixedFruitJuice rdfs:subClassOf :FruitJuice.

H. :Fruit rdf:type rdfs:Class

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:FruitJuice      rdf:type      rdfs:Class
:MixedFruitJuice rdf:type      rdfs:Class
I. :juiceMadeOfFruit      rdf:type      rdf:Property.
   :juiceMadeOf           rdf:type      rdf:Property.
J. :juice :cost [
      :glassCount "1"^^xsd:integer ;
      rdf:value    "25"^^xsd:integer ;
      :currency    "INR"^^xsd:string
    ].

```

Question - 2

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@prefix : <http://www.iiitd.ac.in/sweb/a1/q2/> .
@prefix property: <http://www.iiitd.ac.in/sweb/a1/q2/property#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix foaf: <http://xmlns.com/foaf/0.1/> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

property:Likes a rdf:Property ;
  rdfs:domain rdfs:Resource ;
  rdfs:range rdfs:Resource .

property:madeOf a rdf:Property ;
  rdfs:domain rdfs:Resource ;
  rdfs:range rdfs:Resource .

property:Preference a rdf:Property ;
  rdfs:domain rdfs:Resource ;
  rdfs:range rdfs:Resource .

property:FruitMealPreference rdf:subPropertyOf property:Preference ;
  rdfs:domain rdfs:Resource ;
  rdfs:range rdfs:Literal .

:FruitJuice      rdf:type      rdfs:Class .

:OrangeJuice      rdfs:subClassOf      :FruitJuice .
:AppleJuice      rdfs:subClassOf      :FruitJuice .

```

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:MixedFruitJuice    rdfs:subClassOf    :FruitJuice .

:Mary a foaf:Person ;
    property:Likes [
        a rdf:Bag ;
        rdf:_1    :OrangeJuice ;
        rdf:_2    :AppleJuice ;
        rdf:_3    :MixedFruitJuice
    ] ;
    property:Preference [
        a rdf:Seq ;
        rdf:_1    :MixedFruitJuice ;
        rdf:_2    :OrangeJuice ;
        rdf:_3    :AppleJuice
    ] ;
    property:FruitMealPreference [
        a rdf:Alt ;
        rdf:_1    "Pineapple"^^xsd:string ;
        rdf:_2    "Orange"^^xsd:string ;
        rdf:_3    "Apple"^^xsd:string
    ] .

:MixedFruitJuice    property:madeOf    _:item1 .
_:item1
    rdf:first    "Orange"^^xsd:string ;
    rdf:rest     _:item2 .
_:item2
    rdf:first    "Apple"^^xsd:string ;
    rdf:rest     _:item3 .
_:item3
    rdf:first    "Papaya"^^xsd:string ;
    rdf:rest     _:item4 .
_:item4
    rdf:first    "Banana"^^xsd:string ;
    rdf:rest     rdf:nil .

```

1. I used Bag to list the likes of Juices. Bag container is used to describe a list of items that are intended to be unordered. Since Mary likes Orange Juice, Apple Juice and Mixed Fruit Juice, we can directly add all 3 to the same set of liked juices.

2. For preference order of juices, I used Seq container. It is used to describe a list of items that are intended to be ordered.
3. For fruit meal preference, I used Alt container. It is used to describe a list of alternate values. Only one value can be selected from Alt container.
4. For mixed fruit juice that is made of **only** Orange, Apple, Papaya and Banana. I used RDF Collections because they are used to describe groups that contain only the specified items. In our case we were describing “which fruits are used to make mixed fruit juice”. Using RDF Collections i have listed only those fruits which are used to make mixed fruit juice.

Question 3

Tool used for visualization - [RDF Data Visualization](#)

Uses rdflib and Graphviz Library to create svg graphs.

Created a relation between start node and end node using RDF Triples.

Question 4

- Handled empty cell (by length etc.)
- Created custom uri, by removing special characters except space and replacing space with underscore.

Classes:

- Movie and TV Show are a Class
- Node containing whole data itself is a type of Movie or a TV Show.
- All Cast and Directors are type of Person class and also Person itself is a Class.

Properties:

- hasTitle
- countries
- hasRating
- listedIn
- releaseYear
- duration
- description
- dateAdded

I have also used some predefined properties like rdf: label from the Vocabulary. Domain and Range of all the properties are listed in TTL file.

Ref -

http://w3schools.sinsixx.com/rdf/rdf_collections.asp.htm

<https://www.w3.org/2007/02/turtle/primer/>

<https://jena.apache.org/documentation/javadoc/jena/org/apache/jena/vocabulary/RDF.html>

<https://jena.apache.org/documentation/javadoc/jena/org/apache/jena/vocabulary/RDFS.html#subPropertyOf>