Ex1)

PREFIXES:

PREFIX rdf: http://www.w3.org/1999/02/22-rdf-syntax-ns#
PREFIX rdfs: http://www.w3.org/2000/01/rdf-schema#
PREFIX owl: http://www.w3.org/2002/07/owl#
PREFIX ex: http://GP-onto.fi.upm.es/exercise2#

a) Get all the classes

```
SELECT ?DISTINCT ? class
WHERE {
{
        ?class rdf:type owl:Class .
    }
    UNION
    {
    ?class rdf:type rdfs:Class .
    }
}
```

class
http://GP-onto.fi.upm.es/exercise2#OnFoot
http://GP-onto.fi.upm.es/exercise2#TransportMedium
http://GP-onto.fi.upm.es/exercise2#Hostel
http://GP-onto.fi.upm.es/exercise2#Establishment
http://GP-onto.fi.upm.es/exercise2#PhysicalPoint
http://GP-onto.fi.upm.es/exercise2#Stage
http://GP-onto.fi.upm.es/exercise2#TransportInfrastructure
http://GP-onto.fi.upm.es/exercise2#Bus
http://GP-onto.fi.upm.es/exercise2#Car
http://GP-onto.fi.upm.es/exercise2#BankService
http://GP-onto.fi.upm.es/exercise2#Service
http://GP-onto.fi.upm.es/exercise2#Bicycle
http://GP-onto.fi.upm.es/exercise2#PostalAddress
http://GP-onto.fi.upm.es/exercise2#Path
http://GP-onto.fi.upm.es/exercise2#Road
http://GP-onto.fi.upm.es/exercise2#Cathedral
http://GP-onto.fi.upm.es/exercise2#TouristicLocation
http://GP-onto.fi.upm.es/exercise2#City
http://GP-onto.fi.upm.es/exercise2#Locality
http://GP-onto.fi.upm.es/exercise2#Route
http://GP-onto.fi.upm.es/exercise2#SpacialThing
http://GP-onto.fi.upm.es/exercise2#LocationOfInterest
http://GP-onto.fi.upm.es/exercise2#Stretch
http://GP-onto.fi.upm.es/exercise2#Chapel
http://GP-onto.fi.upm.es/exercise2#GuestHouse
http://GP-onto.fi.upm.es/exercise2#Hotel
http://GP-onto.fi.upm.es/exercise2#Church
http://GP-onto.fi.upm.es/exercise2#Location
http://GP-onto.fi.upm.es/exercise2#Palace
http://GP-onto.fi.upm.es/exercise2#PostalService
http://GP-onto.fi.upm.es/exercise2#Town
http://GP-onto.fi.upm.es/exercise2#RestaurationService

b) Get the sub classes of the class Establishment

```
SELECT DISTINCT ?subclass
WHERE {
?subclass rdfs:subClassOf <http://GP-onto.fi.upm.es/exercise2#Establishment> .
}
```

subclass
http://GP-onto.fi.upm.es/exercise2#Hostel
http://GP-onto.fi.upm.es/exercise2#GuestHouse
http://GP-onto.fi.upm.es/exercise2#Hotel

c) Get the instances of the class city

```
SELECT DISTINCT ?city
WHERE {
?city rdf:type <http://GP-onto.fi.upm.es/exercise2#City> .
}
```

city
http://GP-onto.fi.upm.es/exercise2#ACoruC1a
http://GP-onto.fi.upm.es/exercise2#Santiago_de_Compostela
http://GP-onto.fi.upm.es/exercise2#Madrid

d) Get the number of inhabitants of Santiago de Compostela

```
SELECT ?population
WHERE {
?city rdf:type <http://GP-onto.fi.upm.es/exercise2#City> ;
rdfs:label "Santiago_de_Compostela" ;
<http://GP-onto.fi.upm.es/exercise2#hasInhabitantNumber> ?population .
}
```

population
" 300000 "^^<http://www.w3.org/2001/XMLSchema#integer>

e) Get the number of inhabitants of Santiago de Compostela and of Arzua

```
SELECT ?population
Where{
   {?town rdf:type ex:Town ;
        rdfs:label "Arzua" ;
        ex:hasInhabitantNumber ?population .}
  UNION
   {
   ?city rdf:type ex:City;
        rdfs:label "Santiago_de_Compostela";
        ex:hasInhabitantNumber ?population
}
```

population
" 38900 "^^<http://www.w3.org/2001/XMLSchema#integer>
" 300000 "^^<http://www.w3.org/2001/XMLSchema#integer>

f) Get different places with the inhabitants number, ordering the results by name of the place (ascending)

```
SELECT ?place ?label ?population
Where{
{
  ?place rdf:type ex:Town ;
        rdfs:label ?label ;
        ex:hasInhabitantNumber ?population.
}
 UNION
{
  ?place rdf:type ex:City ;
        rdfs:label ?label ;
        ex:hasInhabitantNumber ?population.
}
UNION
{  ?place rdf:type ex:Village ;
        rdfs:label ?label ;
        ex:hasInhabitantNumber ?population.
}
}
```

place	label	population
http://GP-onto.fi.upm.es/exercise2#Arzua	Arzua	" 38900 "^^<http://www.w3.org/2001/XMLSchema#integer>
http://GP-onto.fi.upm.es/exercise2#Santiago_de_Compostela	Santiago_de_Compostela	" 300000 "^^<http://www.w3.org/2001/XMLSchema#integer>

g) Get all the instances of Locality with their inhabitant number (if it exists)

```
SELECT DISTINCT ?locality ?label ?population
WHERE {
 ?locality rdf:type/rdfs:subClassOf* ex:Locality ;
        rdfs:label ?label .

 OPTIONAL {
  ?locality ex:hasInhabitantNumber ?population .
 }
}
```

locality	label	population
http://GP-onto.fi.upm.es/exercise2#Arzua	Arzua	" 38900 "^^<http://www.w3.org/2001/XMLSchema#integer>
http://GP-onto.fi.upm.es/exercise2#ACoruC1a	A Coruña	
http://GP-onto.fi.upm.es/exercise2#Santiago_de_Compostela	Santiago_de_Compostela	" 300000 "^^<http://www.w3.org/2001/XMLSchema#integer>
http://GP-onto.fi.upm.es/exercise2#Madrid	Madrid	

h) Get all the places with more than 200.000 inhabitants

```
SELECT ?place ?label ?population
Where{
{
  ?place rdf:type ex:Town ;
        rdfs:label ?label ;
        ex:hasInhabitantNumber ?population.

}
 UNION
{
  ?place rdf:type ex:City ;
        rdfs:label ?label ;
        ex:hasInhabitantNumber ?population.
}
UNION
{  ?place rdf:type ex:Village ;
        rdfs:label ?label ;
        ex:hasInhabitantNumber ?population.
}

FILTER (xsd:integer(?population) > 200000) .

}

ORDER BY ASC(?label)
```

place	label	population
http://GP-onto.fi.upm.es/exercise2#Santiago_de_Compostela	Santiago_de_Compostela	" 300000 "^^<http://www.w3.org/2001/XMLSchema#integer>

i) Get postal data of Pazo_Breogan (street, number, locality, province)

```
SELECT DISTINCT ?place ?address
Where{
  ?place rdf:type ex:Palace;
        rdfs:label "Pazo_Breogan" ;
        ex:hasAddress ?address .


}
```

place	address
http://GP-onto.fi.upm.es/exercise2#Pazo_Breogan	http://GP-onto.fi.upm.es/exercise2#GP_Santiago_Instance_85

j) Get the subclasses of class Location

```
SELECT DISTINCT ?subclass
Where{
  ?subclass rdfs:subClassOf ex:Location .

}
```

subclass
http://GP-onto.fi.upm.es/exercise2#LocationOfInterest

k) Get the instances of class Locality

```
SELECT DISTINCT ?locality ?label
Where{
  ?locality rdf:type/rdfs:subClassOf* ex:Locality ;
          rdfs:label ?label .


}
```

locality	label
http://GP-onto.fi.upm.es/exercise2#Arzua	Arzua
http://GP-onto.fi.upm.es/exercise2#ACoruC1a	A Coruña
http://GP-onto.fi.upm.es/exercise2#Santiago_de_Compostela	Santiago_de_Compostela
http://GP-onto.fi.upm.es/exercise2#Madrid	Madrid

l) Describe the resource with rdfs:label "Madrid"

```
DESCRIBE ?resource
Where{
  ?resource rdfs:label "Madrid" .
}
```

```
@prefix ns0:    <http://GP-onto.fi.upm.es/exercise2#> .
ns0:GP_Santiago_Instance_72     ns0:hasEnd      ns0:Madrid .
@prefix rdf:    <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
ns0:Madrid      rdf:type        ns0:City .
@prefix rdfs:   <http://www.w3.org/2000/01/rdf-schema#> .
ns0:Madrid      rdfs:label      "Madrid" ;
        ns0:isLocatedAtPoint    ns0:GP_Santiago_Instance_74 ;
        ns0:inProvince  "Madrid" .
```

m)Construct the RDF(S) graph that directly relates all the touristic places with their respective provinces, using a new property called ”isIn”

```
CONSTRUCT {
  ?touristicPlace ex:isIn ?province .
}

WHERE {
  ?touristicPlace rdf:type ex:TouristicLocation ;
                ex:locatedInProvince ?province .
}
```

n) Ask if there is some instance of Town

```
ASK WHERE {
  ?town rdf:type ex:Town .
}
```

true

o) Ask if there is some instance of Chapel

```
ASK WHERE {
  ?chapel rdf:type ex:Chapel .
}
```

false

EX2) Politician

1)

```
PREFIX dbo: <http://dbpedia.org/ontology/>

SELECT DISTINCT ?property
WHERE {
  ?politician rdf:type dbo:Politician .
  ?politician ?property ?value .
}
```

Result:
https://dbpedia.org/snorql/?query=%0D%0ASELECT+DISTINCT+%3Fproperty+%0D%0AWHERE+%7B%0D%0A++%3Fpolitician+rdf%3Atype+%3Chttp%3A%2F%2Fdbpedia.org%2Fontology%2FPolitician%3E+.%0D%0A++%3Fpolitician+%3Fproperty+%3Fvalue+.%0D%0A%7D

2)

```
PREFIX dbo: <http://dbpedia.org/ontology/>

SELECT DISTINCT ?property
WHERE {
    ?politician a dbo:Politician ;
                ?property ?_ .
    FILTER (?property != rdf:type)
}
```

Result:
https://dbpedia.org/snorql/?query=%0D%0ASELECT+DISTINCT+%3Fproperty%0D%0AWHERE+%7B%0D%0A++++%3Fpolitician+a+%3Chttp%3A%2F%2Fdbpedia.org%2Fontology%2FPolitician%3E+%3B%0D%0A++++++++++++++++%3Fproperty+%3F_+.%0D%0A++++FILTER+%28%3Fproperty+%21%3D+rdf%3Atype%29%0D%0A%7D

3)

```
PREFIX dbo: <http://dbpedia.org/ontology/>

SELECT DISTINCT ?property ?value
WHERE {
  ?politician rdf:type dbo:Politician .
  ?politician ?property ?value .
  FILTER(?property != rdf:type)  # Exclude rdf:type
}
```

Result:
https://dbpedia.org/snorql/?query=SELECT+DISTINCT+%3Fproperty+%3Fvalue%0D%0AWHERE+%7B%0D%0A++%3Fpolitician+rdf%3Atype+%3Chttp%3A%2F%2Fdbpedia.org%2Fontology%2FPolitician%3E+.%0D%0A++%3Fpolitician+%3Fproperty+%3Fvalue+.%0D%0A++FILTER%28%3Fproperty+%21%3D+rdf%3Atype%29++%23+Exclude+rdf%3Atype%0D%0A%7D

4)

```
PREFIX dbo: <http://dbpedia.org/ontology/>

SELECT DISTINCT ?politician ?property ?values
WHERE {
   ?politician a dbo:Politician ;
            ?property ?values .
   FILTER (?property != rdf:type)  # Exclude rdf:type from properties
}
```

https://dbpedia.org/snorql/?query=PREFIX+dbo%3A+%3Chttp%3A%2F%2Fdbpedia.org%2Fontology%2F%3E%0D%0A%0D%0ASELECT+DISTINCT+%3Fpolitician+%3Fproperty+%3Fvalues%0D%0AWHERE+%7B%0D%0A++++%3Fpolitician+a+dbo%3APolitician+%3B%0D%0A++++++++++++++++%3Fproperty+%3Fvalues+.%0D%0A++++FILTER+%28%3Fproperty+%21%3D+rdf%3Atype%29++%23+Exclude+rdf%3Atype+from+properties%0D%0A%7D

5)

```
PREFIX dbo: <http://dbpedia.org/ontology/>

SELECT ?property (COUNT(DISTINCT ?value) AS ?distinctCount)
WHERE {
  ?politician a dbo:Politician ;
            ?property ?value .
  FILTER(?property != rdf:type)  # Exclude rdf:type
}
GROUP BY ?property
ORDER BY ?property
```

https://dbpedia.org/snorql/?query=PREFIX+rdf%3A+%3Chttp%3A%2F%2Fwww.w3.org%2F1999%2F02%2F22-rdf-syntax-ns%23%3E%0D%0APREFIX+rdfs%3A+%3Chttp%3A%2F%2Fwww.w3.org%2F2000%2F01%2Frdf-schema%23%3E%0D%0APREFIX+dbo%3A+%3Chttp%3A%2F%2Fdbpedia.org%2Fontology%2F%3E%0D%0A%0D%0ASELECT+%3Fproperty+%28COUNT%28DISTINCT+%3Fvalue%29+AS+%3FdistinctCount%29%0D%0AWHERE+%7B%0D%0A++%3Fpolitician+a+dbo%3APolitician+%3B%0D%0A++++++++++++++%3Fproperty+%3Fvalue+.%0D%0A++FILTER%28%3Fproperty+%21%3D+rdf

%3Atype%29++%23+Exclude+rdf%3Atype%0D%0A%7D%0D%0AGROUP+BY+%3Fproperty%0D%0AORDER+BY+%3Fproperty