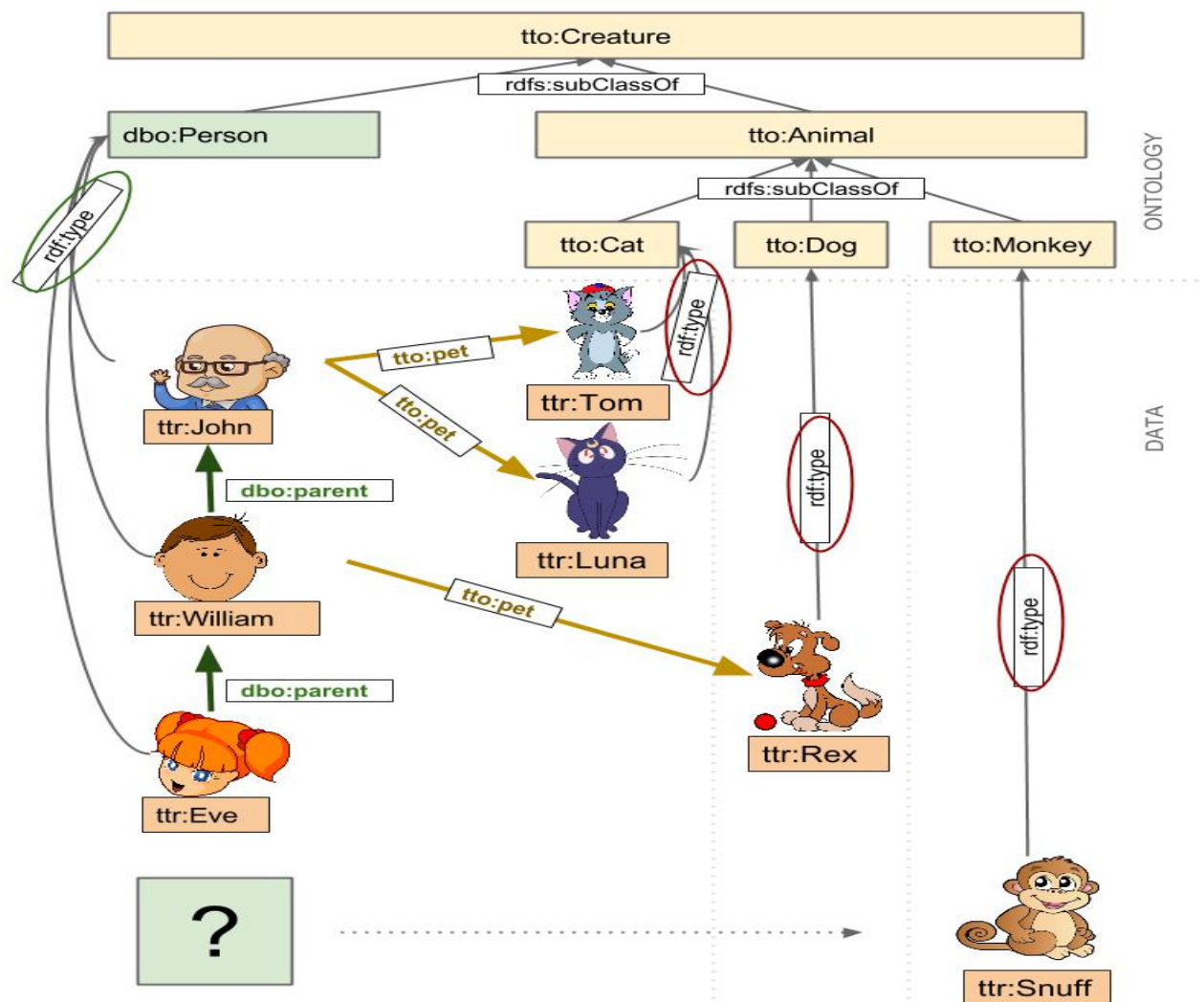


## SEMANTIC WEB –SPARQL

### ASSIGNMNET\_code\_done\_by\_me

Assignment SPARQL

Create owl file to describe the following using Protégé:



1.

Run the queries in protege for the questions given in the site <https://sparql>

[playground.sib.swiss/](http://playground.sib.swiss/) numbered - 200 till 209 using the owl file you have created. Then try to run 220 (by filling in the \*\*\* blanks). Take a screenshot of the SPARQL code box

& the output and paste it in a word file for each question. (1.1 to 1.11)

2.

Write a SPARQL statement to find out: How many triplets are contained in the dataset? Take a screenshot of the SPARQL code box and the output and paste in the word file.

3.

Write a SPARQL statement to find out: How many instances of a "Animal" class are declared? Take a screenshot of the SPARQL code box and the output and paste below.

## SOLUTION:

```
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix : <http://example.org/prabal/ontology#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
```

### #class

```
:Creature a owl:Class ;
    rdfs:label "creature"^^xsd:string.
```

```
:Person a owl:Class ;
    rdfs:subClassOf :Creature .
```

```
:Animal a owl:Class ;
    rdfs:label "animal"^^xsd:string ;
    rdfs:subClassOf :Creature .
```

```
:Cat a owl:Class ;
    rdfs:label "cat"^^xsd:string ;
    rdfs:subClassOf :Animal .
```

```
:Dog a owl:Class ;
    rdfs:label "dog"^^xsd:string ;
    rdfs:subClassOf :Animal .
```

```
:Monkey a owl:Class ;
    rdfs:label "monkey"^^xsd:string ;
    rdfs:subClassOf :Animal .
```

### #property

```
:parent a rdf:ObjectProperty ;
    rdfs:domain :Person ;
    rdfs:range :Person .
```

```
:pet a rdf:ObjectProperty ;  
    rdfs:domain :Person ;  
    rdfs:label "domestic animal"^^xsd:string ;  
    rdfs:range :Animal .
```

```
:sex a owl:DatatypeProperty ;  
    rdfs:domain :Creature ;  
    rdfs:label "sex"^^xsd:string ;  
    rdfs:range xsd:string .  
:name a owl:DatatypeProperty ;  
    rdfs:domain :Creature ;  
    rdfs:label "name"^^xsd:string ;  
    rdfs:range xsd:string .
```

# individuals

```
:John a :Person ;  
    :name "John"^^xsd:string ;  
    :pet :Luna , :Tom ;  
    :sex "male"^^xsd:string .
```

```
:William a :Person ;  
    :parent :John ;  
    :name "William"^^xsd:string ;  
    :pet :Rex ;  
    :sex "male"^^xsd:string .
```

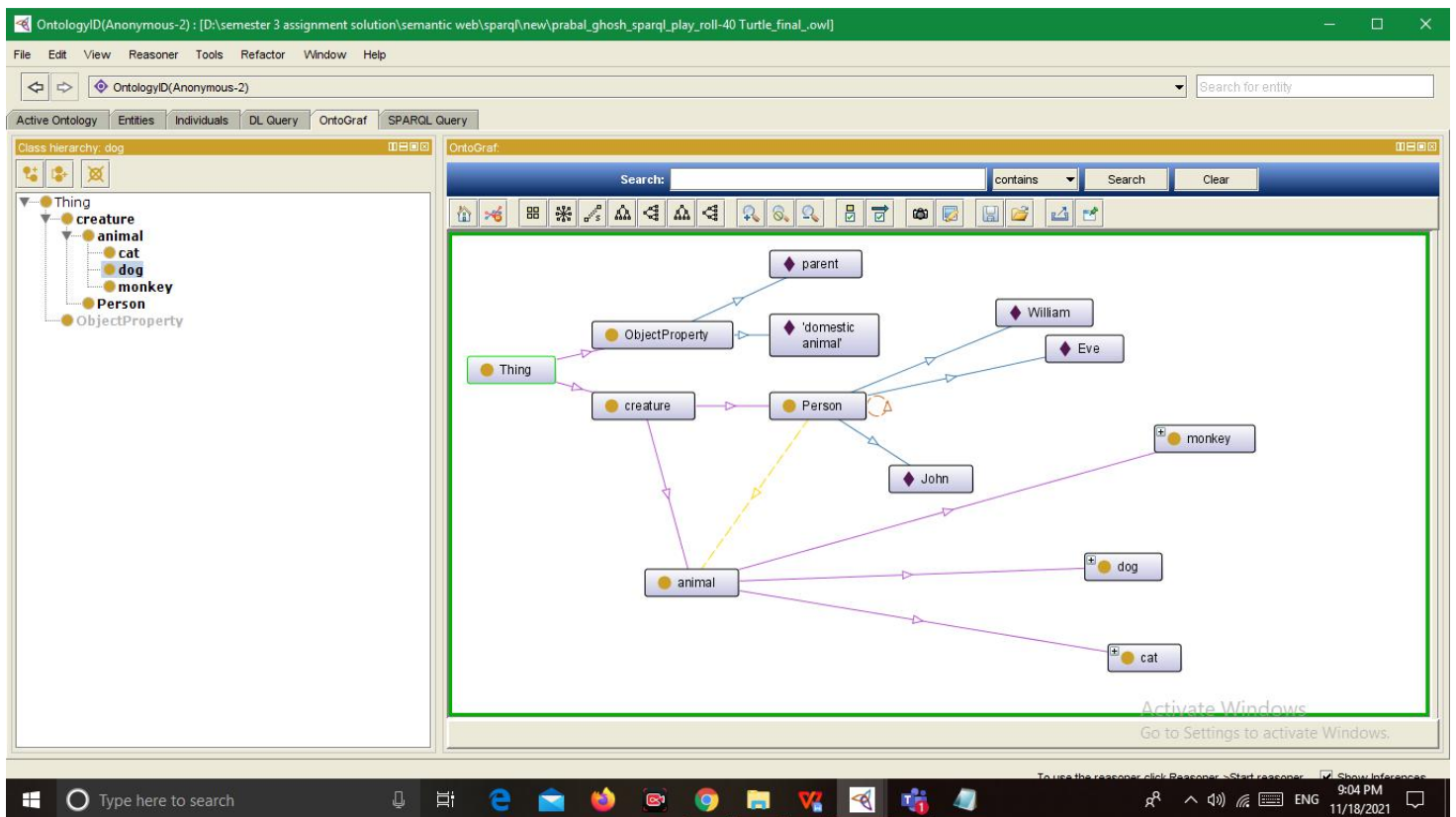
```
:Eve a :Person ;  
    :parent :William ;  
    :name "Eve"^^xsd:string ;  
    :pet :Snuff ;  
    :sex "female"^^xsd:string .
```

```
:Tom a :Cat ;  
    :name "Tom"^^xsd:string ;  
    :sex "male"^^xsd:string .
```

```
:Luna a :Cat ;  
    :name "Luna"^^xsd:string ;  
    :sex "female"^^xsd:string .
```

```
:Rex a :Dog ;  
    :name "Rex"^^xsd:string ;  
    :sex "male"^^xsd:string .
```

```
:Snuff a :Monkey ;  
    :name "snuff"^^xsd:string ;  
    :sex "male"^^xsd:string .
```



```
SELECT DISTINCT * WHERE {
  ?s ?p ?o
} LIMIT 10
```

OntologyD(Anonymous-2) : [D:\semester 3 assignment solution\semantic web\sparql\new\prabal\_ghosh\_sparql\_play\_roll-40 Turtle.owl]

File Edit View Reasoner Tools Refactor Window Help

OntologyD(Anonymous-2) Search for entity

Active Ontology Entities Individuals DL Query OntoGraf SPARQL Query

SPARQL query:

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
SELECT DISTINCT ?s ?p ?o
WHERE {
}
LIMIT 10

```

s	p	o
John	type	Person
John	type	NamedIndividual
Person	type	Class
306079aa_6591_4316_8b96_5e135fd3fdf	hashCode	"-1547338417"^^<http://www.w3.org/2001/XMLSchema#int>
306079aa_6591_4316_8b96_5e135fd3fdf	sourceOntology	<urn:AnonId:251e7f7_e8d0_4fb8_a740_ed50103a5d78>
creature	label	"creature"^^<http://www.w3.org/2001/XMLSchema#string>
string	type	Datatype
label	type	AnnotationProperty
2352e874_76b1_48b0_a652_67f1ebc8629b	hashCode	"-1966216423"^^<http://www.w3.org/2001/XMLSchema#int>
2352e874_76b1_48b0_a652_67f1ebc8629b	sourceOntology	<urn:AnonId:251e7f7_e8d0_4fb8_a740_ed50103a5d78>

Execute

Activate Windows  
Go to Settings to activate Windows.

Type here to search

1:20 AM  
11/18/2021

200)

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

PREFIX owl: <http://www.w3.org/2002/07/owl#>

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

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

prefix :<http://example.org/prabal/ontology#>

```

select ?thing where {
  ?thing rdf:type :Person
}

```

OntologyD(Anonymous-2) : [D:\semester 3 assignment solution\semantic web\sparql\new\prabal\_ghosh\_sparql\_play\_roll-40 Turtle.owl]

File Edit View Reasoner Tools Refactor Window Help

OntologyD(Anonymous-2) Search for entity

Active Ontology Entities Individuals DL Query OntoGraf SPARQL Query

SPARQL query:

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
prefix :<http://example.org/prabal/ontology#>

select ?thing where {
  ?thing rdf:type :Person
}

```

thing
John
Eve
William

Execute

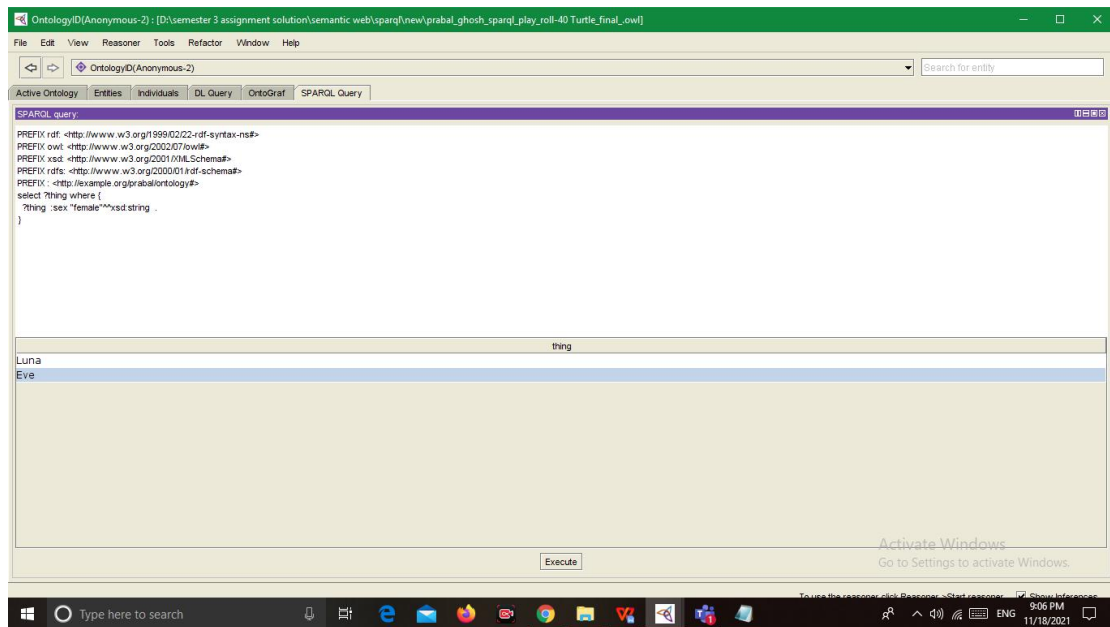
Activate Windows  
Go to Settings to activate Windows.

Type here to search

1:23 AM  
11/18/2021

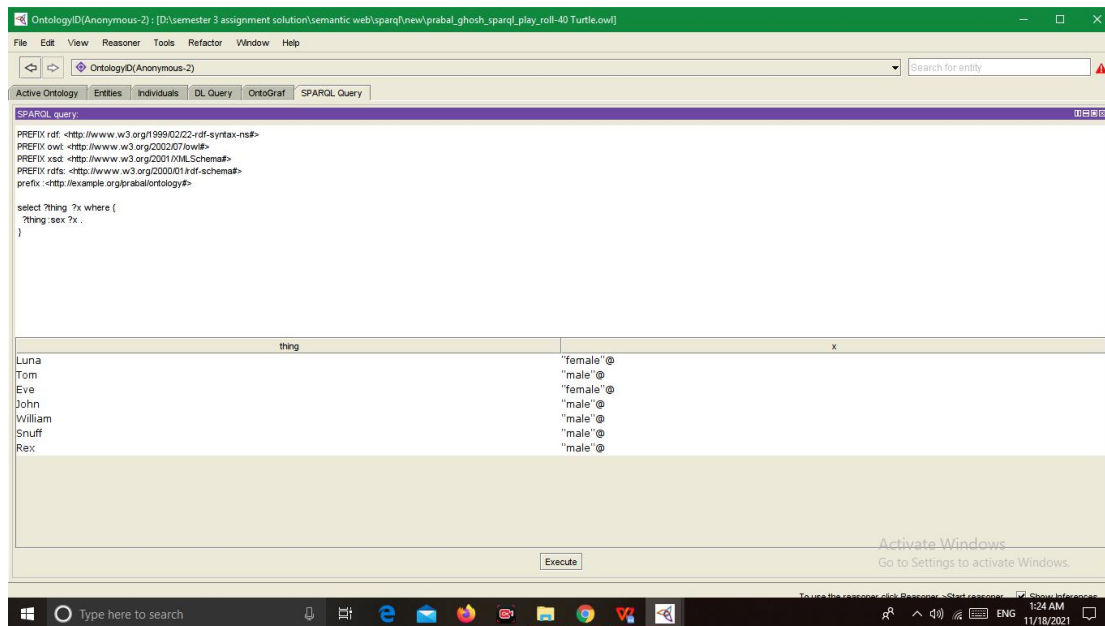
201)

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX : <http://example.org/prabal/ontology#>
select ?thing where {
    ?thing :sex "female"^^xsd:string .
}
```



201)

```
select ?thing ?x where {
    ?thing :sex ?x .
}
```

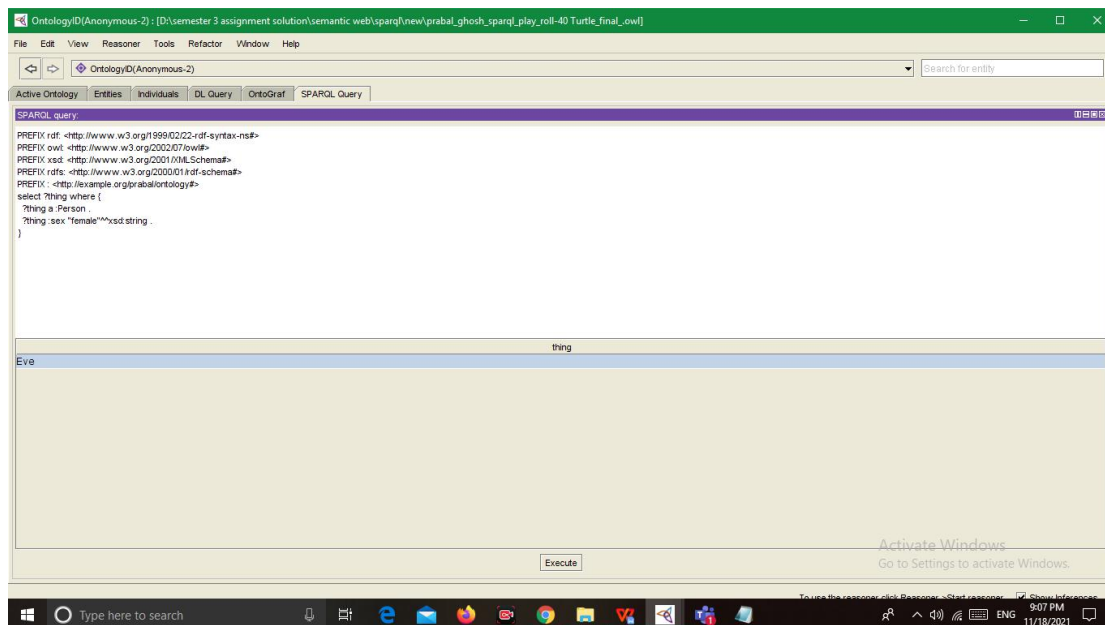


202)

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX : <http://example.org/prabal/ontology#>
select ?thing where {
  ?thing a :Person .
  ?thing :sex "female"^^xsd:string .
}

```



202)

```
select ?s ?x where {  
  ?s a :Person ;  
  :sex ?x  
}
```

The screenshot shows the Protege SPARQL query editor. The query is:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX owl: <http://www.w3.org/2002/07/owl#>  
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>  
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>  
PREFIX : <http://example.org/prabal/ontology#>  
  
select ?s ?x where {  
  ?s a :Person ;  
  :sex ?x  
}
```

The results table shows the following data:

s	x
John	"male"@
Eve	"female"@
William	"male"@

204)

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX owl: <http://www.w3.org/2002/07/owl#>  
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>  
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>  
PREFIX : <http://example.org/prabal/ontology#>  
select ?thing ?sex where {  
  ?thing :sex ?sex .  
}
```

The screenshot shows the Protege SPARQL query editor. The query is:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX owl: <http://www.w3.org/2002/07/owl#>  
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>  
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>  
PREFIX : <http://example.org/prabal/ontology#>  
  
select ?thing ?sex where {  
  ?thing :sex ?sex .  
}
```

The results table shows the following data:

thing	sex
John	"male"^^<http://www.w3.org/2001/XMLSchema#string>
Tom	"male"^^<http://www.w3.org/2001/XMLSchema#string>
Rex	"male"^^<http://www.w3.org/2001/XMLSchema#string>
Luna	"female"^^<http://www.w3.org/2001/XMLSchema#string>
William	"male"^^<http://www.w3.org/2001/XMLSchema#string>
Eve	"female"^^<http://www.w3.org/2001/XMLSchema#string>
Snuff	"male"^^<http://www.w3.org/2001/XMLSchema#string>



204)

```
select ?thing ?sex where {
  ?thing :sex ?sex .
}
```

The screenshot shows the Protege SPARQL query editor. The query is:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX : <http://example.org/prabal/ontology#>

select ?thing ?sex where {
  ?thing :sex ?sex .
}
```

The results table shows the following data:

thing	sex
Luna	"female"@
Tom	"male"@
Eve	"female"@
John	"male"@
William	"male"@
Snuff	"male"@
Rex	"male"@

206)

```
select ?person ?pet where {
  ?person rdf:type :Person ;
  :pet ?pet .
}
```

The screenshot shows the Protege SPARQL query editor. The query is:

```
select ?person ?pet where {
  ?person rdf:type :Person ;
  :pet ?pet .
}
```

The results table shows the following data:

person	pet
John	Luna
William	Rex
Eve	Snuff
John	Tom

207)

```
select ?person ?pet where {  
  ?person rdf:type :Person .  
  optional {?person :pet ?pet }.  
}
```

The screenshot shows the OntologyD(Anonymous-2) SPARQL query interface. The query is:

```
select ?person ?pet where {  
  ?person rdf:type :Person .  
  optional {?person :pet ?pet }.  
}
```

The results are displayed in a table with two columns: person and pet.

person	pet
John	Luna
John	Tom
Eve	Snuff
William	Rex

The interface includes a menu bar (File, Edit, View, Reasoner, Tools, Refactor, Window, Help), a toolbar, and a status bar at the bottom showing the Windows taskbar with the time 1:32 AM and date 11/18/2021.

208)

```
select ?person ?pet where {  
  ?person rdf:type :Person .  
  filter not exists {?person :pet ?pet }.  
}
```

The screenshot shows the OntologyD(Anonymous-2) SPARQL query interface. The query is:

```
select ?person ?pet where {  
  ?person rdf:type :Person .  
  filter not exists {?person :pet ?pet }.  
}
```

The results are displayed in a table with two columns: person and pet. The table is currently empty, indicating that no results were found for the given query.

person	pet
--------	-----

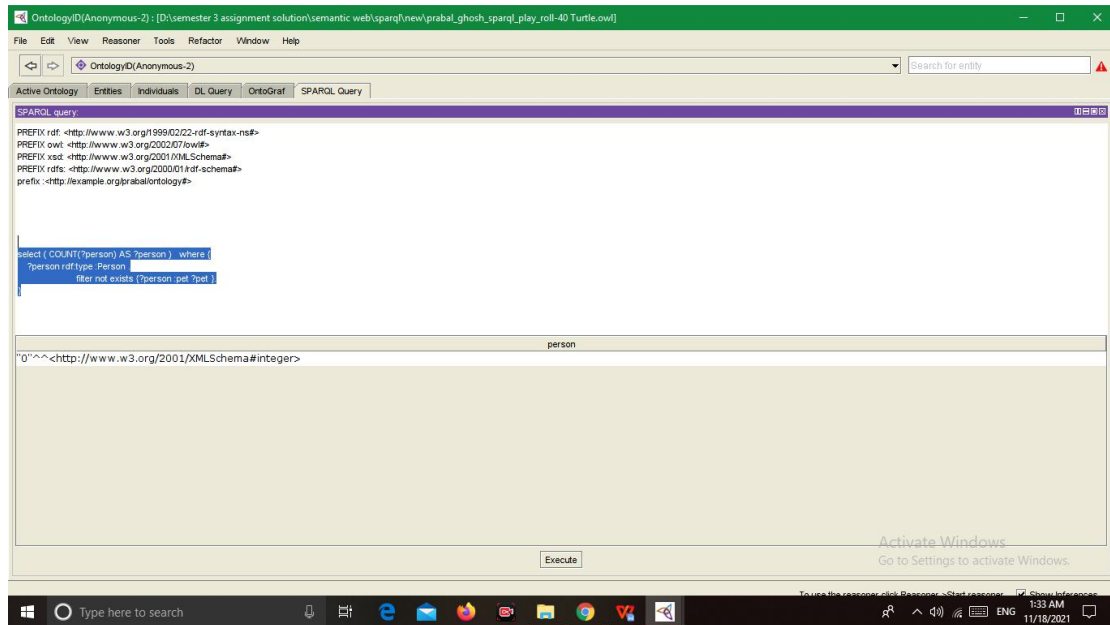
The interface includes a menu bar (File, Edit, View, Reasoner, Tools, Refactor, Window, Help), a toolbar, and a status bar at the bottom showing the Windows taskbar with the time 1:33 AM and date 11/18/2021.

208)

```

select ( COUNT(?person) AS ?person ) where {
    ?person rdf:type :Person .
    filter not exists {?person :pet ?pet }.
}

```

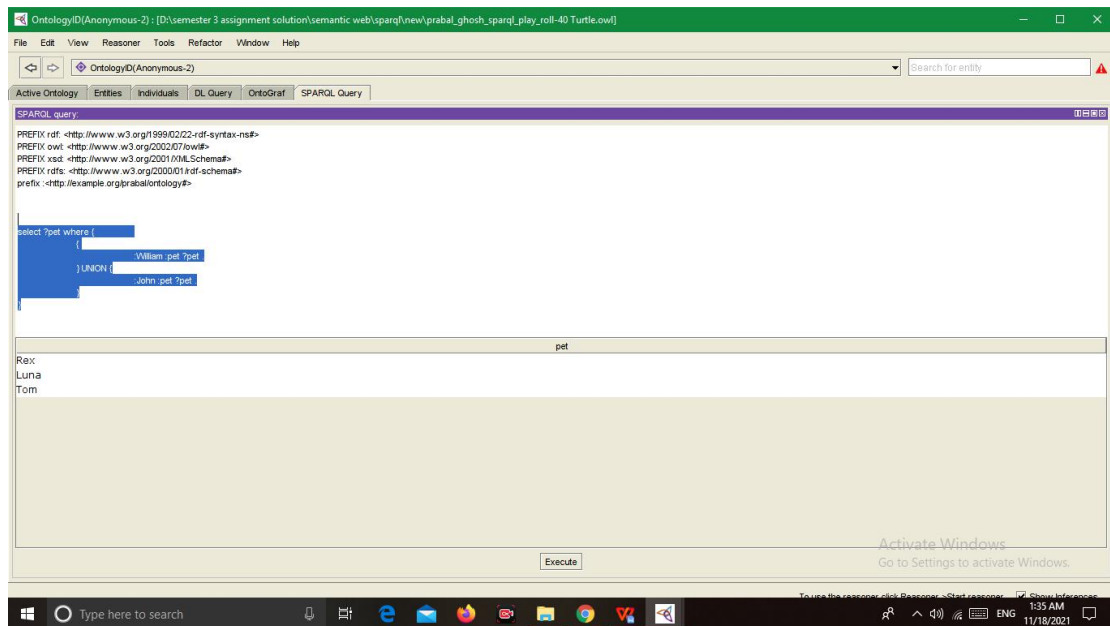


209)

```

select ?pet where {
    {
        :William :pet ?pet .
    } UNION {
        :John :pet ?pet .
    }
}

```

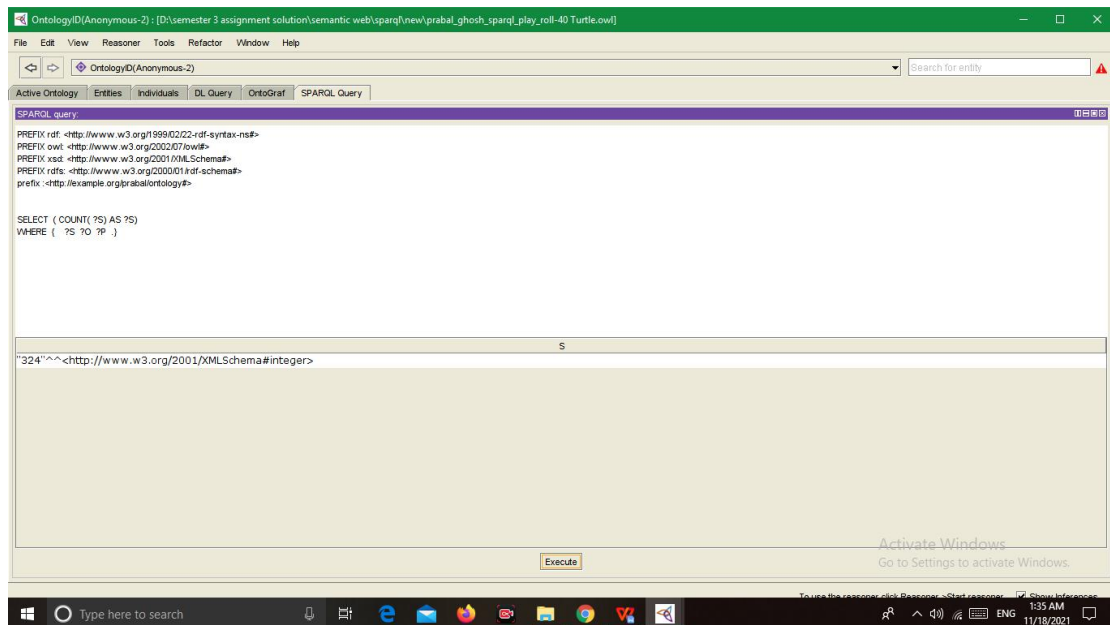


2) Write a SPARQL statement to find out: How many triplets are contained in the dataset? Take a screenshot of the SPARQL code box and the output and paste in the word file.

```

SELECT ( COUNT( ?S ) AS ?S )
WHERE { ?S ?O ?P . }

```

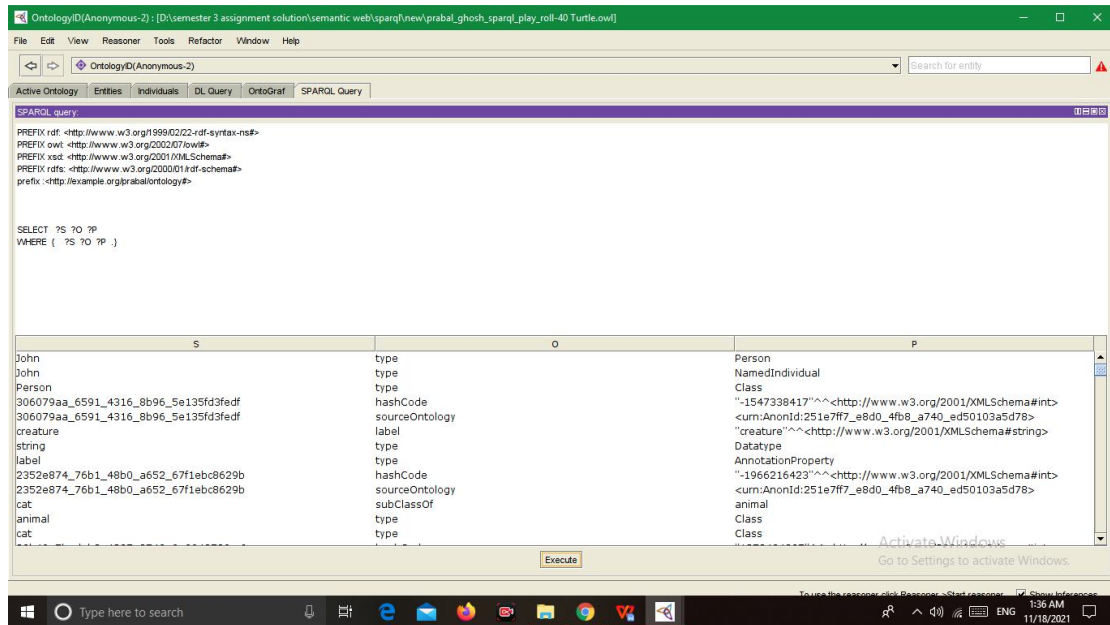


triplets are contained in the Dataset -----

```

SELECT ?S ?O ?P
WHERE { ?S ?O ?P . }

```



3.

Write a SPARQL statement to find out: How many instances of a “Animal” class are declared? Take a screenshot of the SPARQL code box and the output and paste below.

```
select ?x
where{
{?x rdf:type :Cat .
}
UNION
{ ?x rdf:type :Monkey.
}
UNION {?x rdf:type :Dog.
} }
```

OntologyID(Anonymous-2) : [D:\semester 3 assignment solution\semantic web\sparql\new\prabal\_ghosh\_sparql\_play\_toll-40 Turtle.owl]

File Edit View Reasoner Tools Refactor Window Help

OntologyID(Anonymous-2) Search for entity

Active Ontology Entities Individuals DL Query OntoGraf SPARQL Query

SPARQL query

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX : <http://example.org/prabal/ontology#>

select ?x
where {
  { ?x rdf:type :Cat .
  }
  UNION
  { ?x rdf:type :Monkey .
  }
  UNION { ?x rdf:type :Dog .
  }
}
```

x

Luna  
Tom  
Snuff  
Rex

Execute

Activate Windows  
Go to Settings to activate Windows.

Type here to search

1:36 AM  
11/18/2021