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Semantic web
Social network ontology

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Përmbajtja

Problemi i përgjithshëm

Qëllimi i këtij punimi është zhvillimi i ontologjive duke përdorur profilet e rrjeteve sociale të ndryshme per organizimin dhe rekomandimin sa më të mirë të përmbajtjes. Rrjetet sociale te diskutuara në këtë punim jane Twitter dhe Instagram.

Ontologjitë e zhvilluara kanë për qëllim përfshirjen sa më të gjerë të rrjeteve të lartëpërmendura duke përfshirë postimet, ndjekësit, pëlqimet si dhe lidhjet mes tyre.

Numri i instancave të krijuara është modest në krahasim me rrjetet të cilat tentohen të studiohen.

1 Teknologjia

1.1 Gjuhët programuese

Në vijim janë paraqitur gjuhët programuese të përdorura dhe arsyet përdorimit:
- Owl 2 – përdorur për zhvillimin e ontologjive
- Java – përdorur për zhvillimin e aplikacionit që ekzekuton SPARQL dhe SWRL pyetësor.
- SPARQL – përdorur për testim të ontologjisë.
- SWRL – përdorur për te ofruara aftesi rezonuese me te fuqishme.

1.2 Veglat

Në vijim janë paraqitur veglat e përdorura dhe arsyet përdorimit:
- Protege me reasoner Fact ++ – përdorur për zhvillimin e ontologjive

2 Shpjegimi i ontologjisë Twitter

Ontologjia twitter përshkruan përdoruesit, postimet, mesazhet, komentet, njoftimet si dhe lidhjet mes tyre.

2.1 Entitetet

Entitet kryesore të ontologjisë Twitter janë: llogaria e përdoruesit (UserAccount), postimi (Post), mesazhi (Message), komenti (Comment) dhe lajmërimi (Notification).
Entiteti UserAccount specializohet më tujte në klasën TwitterAccount ndërsa entiteti Post specializohet në klasat Tweet, retweet dhe Quote. Në vijim është paraqitur diagrami që demonstron relacionet mes entiteve.
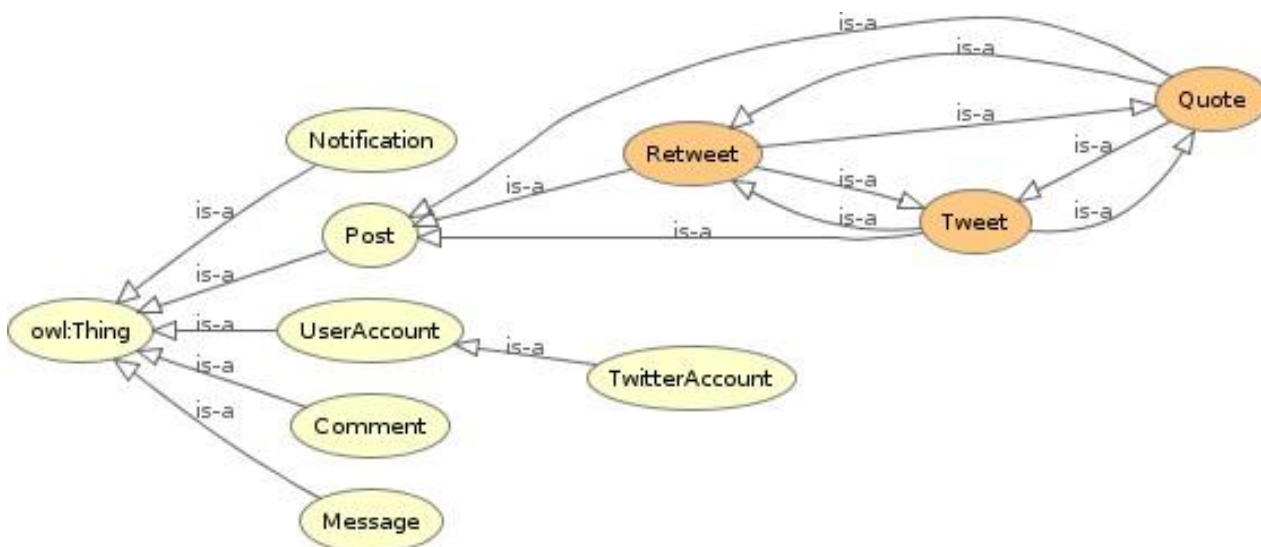
Figura 1 - Entitetet e ontologjisë twitter

2.2 Vetitë

Entiteti TwitterAccount ka të definuara këto veti:
- bookmarked – përshkruan "bookmarking" e një postimi nga përdoruesi.
- commented – përshkruan komentimin në një postim nga përdoruesi.
- followed – përshkruan krijimin e lidhjes më një përdorues tjetër.
- followed_by – përshkruan krijimin e lidhjes nga një përdorues tjetër.
- liked – përshkruan pëlqimin e një postimi nga përdoruesi.
- received – përshkruan pranimin e një mesazhi ose lajmërimin nga përdoruesi,
- retweeted – përshkruan "retweet" të një postimin nga përdoruesi,
- sent – përshkruan dërgimin e një mesazhi nga përdoruesi,
- tweeted – përshkruan krijimin e një postimi në emër të përdoruesit,
- first_name – përshkruan emrin e përdoruesit,
- last_name – përshkruan mbiemrin e përdoruesit,
- username – përshkruan username e përdoruesit,
- email – përshkruan email e përdoruesit,
- image – përshkruan foton e profilit të përdoruesit
- birth_date – përshkruan datën e lindjes të përdoruesit,
- created_at – përshkruan datën e krijimit të profilit të përdoruesit

Entiteti Tweet ka këto veti:
- tweeted_by – përshkruan përdoruesin që ka krijuar postimin,
- bookmarked_by – pershkruan përdoruesin që ka "bookmark" postimin,
- liked_by – përshkruan përdoruesin që ka pëlqyer postimin,
- retweeted_by – përshkruan përdoruesin që ka "retweet" postimin,
- created_at – përshkruan datën e krijimit të postimit,
- content – përshkruan përmbajtejn e postimit,
- media – përshkruan foto/video që mund të përmbajë postimi,
- commented_by – përshkruan përdoruesin që ka komentuar në postim

Entiteti Quote ka këto veti:
- tweeted_by – përshkruan përdoruesin që ka krijuar postimin,
- bookmarked_by – pershkruan përdoruesin që ka "bookmark" postimin,
- liked_by – përshkruan përdoruesin që ka pëlqyer postimin,
- retweeted_by – përshkruan përdoruesin që ka "retweet" postimin,
- commented_by – përshkruan përdoruesin që ka komentuar në postim,
- created_at – përshkruan datën e krijimit të postimit,
- content – përshkruan përmbajtejn e postimit

Entiteti Retweet ka këto veti:
- tweeted_by – përshkruan përdoruesin që ka krijuar postimin,
- bookmarked_by – pershkruan përdoruesin që ka "bookmark" postimin,
- liked_by – përshkruan përdoruesin që ka pëlqyer postimin,
- retweeted_by – përshkruan përdoruesin që ka "retweet" postimin,
- commented_by – përshkruan përdoruesin që ka komentuar në postim,
- created_at – përshkruan datën e krijimit të postimit

Entiteti Message ka këto veti:
- belongs_to – përshkruan lidhjen me përdoruesin që e pranon/dërgon.
- content – përshkruan përmbajtejn e mesazhit.
- created_at – përshkruan datën e krijimit të mesazhit.

Entiteti Notification ka këto veti:
- belongs_to – përshkruan lidhjen me përdoruesin që e pranon.
- content – përshkruan përmbajtejn e lajmërimit.
- created_at – përshkruan datën e krijimit të lajmërimit.

Entiteti Comment ka këto veti:
- belongs_to – përshkruan lidhjen me përdoruesin që e ka krijuar.
- content – përshkruan përmbajtejn e komentit.
- created_at – përshkruan datën e krijimit të komentit.

2.3 SQWRL pytesoret

Në shembujt në vijim do të sqarojmë sqwrl pyetesoret e përdorura për të ndërtuar relacionet mes instancave të entiteteve.

2.3.1   Perdoruesi dhe postimet e krijuara

Qëllimi i ketije pyetesori është gjetja e postimeve te perdoruesit te caktuar.

SQWRL pyetesori:

```
tweeted(User1, ?tweet) -> sqwrl:select(?tweet);
```

2.3.2　Perdoruesi dhe postimet e pelqyera

Qëllimi i ketije pyetesori është gjetja e postimeve te pelqyera nga perdoruesi.

SQWRL pyetesori:

```
liked(User1, ?tweet) -> sqwrl:select(?tweet);
```

2.3.3　Perdoruesi dhe retweets

Qëllimi i ketije pyetesori është gjetja e perdoruesve dhe retweets te tij.

SQWRL pyetesori:

```
retweeted(User1, ?tweet) -> sqwrl:select(?tweet);
```

2.3.4　Perdoruesi dhe bookmarks

Qëllimi i ketije pyetesori është gjetja e perdoruesve dhe bookmarks te tij.

SQWRL pyetesori:

```
bookmarked(User1, ?tweet) -> sqwrl:select(?tweet);
```

2.4 SWRL rregullat

Përmes swrl rregullave gjenerohen të gjitha relacionet mes instancave përkatëse. Në shembujt në vijim do të sqarojmë swrl rregullat e përdorura për të ndërtuar relacionet mes instancave të entiteteve.

2.4.1　Perdoruesi dhe postimet e krijuara

Qëllimi i kësaj rregulle është gjetja e postimeve te perdoruesit te caktuar.

SWRL rregulla:

```
UserAccount(?user) ^ tweeted(?user, ?tweet) -> tweeted_by(?tweet, ?user);
```

2.4.2　Perdoruesi dhe postimet e pelqyera

Qëllimi i kësaj rregulle është gjetja e postimeve te pelqyera nga pwrdoruesi.

SWRL rregulla:

```
UserAccount(?user) ^ liked(?user, ?tweet) -> liked_by(?tweet, ?user);
```

2.4.3　Perdoruesi dhe perdoruesit e ndjekur

Qëllimi i kësaj rregulle është gjetja e perdoruesave te ndjekur nga perdoruesi.

SWRL rregulla:

```
UserAccount(?user) ^ followed(?user, ?followed) -> followed_by(?followed, ?user);
```

2.4.4   Perdoruesi dhe retweets

Qëllimi i kësaj rregulle është gjetja e retweets te perdoruesit.

SWRL rregulla:

```
UserAccount(?user) ^ retweeted(?user, ?tweet) -> retweeted_by(?tweet, ?user);
```

2.4.5   Perdoruesi dhe bookmarks

Qëllimi i kësaj rregulle është gjetja e bookmarks te perdoruesit..

SWRL rregulla:

```
UserAccount(?user) ^ bookmarked(?user, ?tweet) -> bookmarked_by(?tweet, ?user);
```

2.5 SPARQL pyetësorët

Përmes SPARQL pyetësorëve në seksionet në vijim vërtetojmë shfrytëzueshmërin e ontologjisë twitter.

Shembulli 1 – followers të një përdoruesi të caktuar

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX twitter: <http://www.socialnetwork.edu/twitter#>
SELECT ?users
WHERE {
     ?person twitter:username ?name.
     ?person twitter:followed_by ?users.
     FILTER(?name = "visarbuza"^^xsd:string)
}
```

Shembulli 2 – following të një përdoruesi të caktuar

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX twitter: <http://www.socialnetwork.edu/twitter#>
SELECT ?users
WHERE {
     ?person twitter:username ?name.
     ?person twitter:followed ?users.
     FILTER(?name = "visarbuza"^^xsd:string)
}
```

Shembulli 3 – Postimet e pëlqyera nga një përdorues

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX twitter: <http://www.socialnetwork.edu/twitter#>
SELECT ?posts
WHERE {
     ?person twitter:username ?name.
     ?person twitter:liked ?posts
     FILTER(?name = "visarbuza"^^xsd:string)
}
```

Shembulli 4 – Postimet e komentuara nga një përdorues

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX twitter: <http://www.socialnetwork.edu/twitter#>
SELECT ?posts
WHERE {
     ?person twitter:username ?name.
     ?person twitter:commented ?posts
     FILTER(?name = "visarbuza"^^xsd:string)
}
```

Shembulli 5 – Numri i followers sipas përdoruesve

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX twitter: <http://www.socialnetwork.edu/twitter#>
SELECT ?username (COUNT(*) as ?total)
WHERE {
     ?person twitter:followed_by ?users.
     ?person twitter:username ?username.
}
GROUP BY ?username
ORDER BY DESC(?total)
```

Shembulli 6 – Numri i following sipas përdoruesve

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX twitter: <http://www.socialnetwork.edu/twitter#>
SELECT ?username (COUNT(*) as ?total)
WHERE {
        ?person twitter:followed ?users.
        ?person twitter:username ?username.
}
GROUP BY ?username
ORDER BY DESC(?total)
```

Shembulli 7 – Përdoruesit pa followers

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX twitter: <http://www.socialnetwork.edu/twitter#>
SELECT ?username
WHERE {
      ?person twitter:username ?username.
          OPTIONAL {
      ?person twitter:followed_by ?users.
          }
          FILTER(!BOUND(?users))
}
```

3   Shpjegimi i ontologjisë Instagram

Ontologjia Instagram përshkruan përdoruesit, postimet, mesazhet, komentet, njoftimet, koleksionet, storjet si dhe lidhjet mes tyre.

3.1 Entitetet

Entitet kryesore të ontologjisë Instagram janë: llogaria e përdoruesit (UserAccount), postimi (Post), mesazhi (Message), komenti (Comment) , lajmërimi (Notification), koleksioni (Collection), storja (Story). Entiteti UserAccount specializohet më tujte në klasën InstagramAccount.
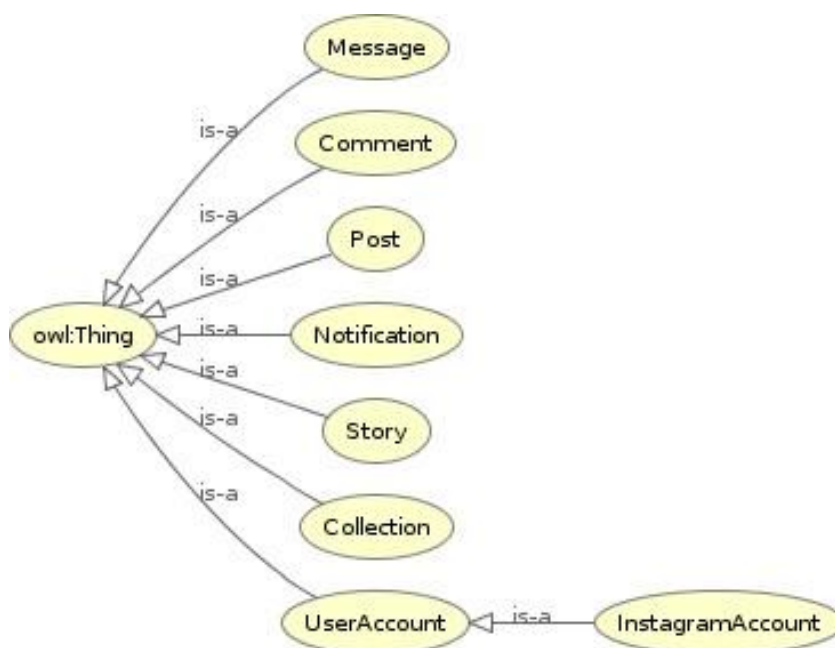
Figura 2 - Entitetet e ontologjisë Instagram

3.2 Vetitë

Entiteti InstagramAccount ka të definuara këto veti:
- blocked – përshkruan bllokimin e një përdoruesi.
- commented – përshkruan komentimin në një postim nga përdoruesi.
- created – përshkruan krijimin e një postimi në emër të përdoruesit.
- followed – përshkruan krijimin e lidhjes me një përdorues tjetër.
- followed_by – përshkruan krijimin e lidhjes nga një përdorues tjetër,
- lliked – përshkruan pëlqimin e një postimi nga përdoruesi,
- received – përshkruan pranimin e një mesazhi/lajmërimi nga përdoruesi,
- sent – përshkruan dërgimin e një mesazhi nga përdoruesi,
- tagged – përshkruan etiketimin e një përdoruesi në një postim,
- tagged_in – përshkruan etiketimin në një postim nga një përdorues,
- first_name – përshkruan emrin e përdoruesit,
- last_name – përshkruan mbiemrin e përdoruesit,
- username – përshkruan username e përdoruesit,
- email – përshkruan email e përdoruesit,
- image – përshkruan foton e profilit të përdoruesit
- birth_date – përshkruan datën e lindjes të përdoruesit,
- created_at – përshkruan datën e krijimit të profilit të përdoruesit

Entiteti Post ka këto veti:
- created_by – përshkruan përdoruesin që ka krijuar postimin,
- added_to – pershkruan shtimin e postimit në koleksion,
- commented_by– pershkruan komentimin e përdoruesit në postim,
- liked_by – përshkruan përdoruesin që ka pëlqyer postimin,
- created_at – përshkruan datën e krijimit të postimit,
- content – përshkruan përmbajtejn e postimit,
- media – përshkruan foto/video që mund të përmbajë postimi,

Entiteti Collection ka këto veti:
- belongs_to – përshkruan lidhjen me përdoruesin që i takon.
- has – përshkruan lidhjen me postimin që e përmban.

Entiteti Story ka këto veti:
- belongs_to – përshkruan lidhjen me përdoruesin që e ka krijuar.
- created_at – përshkruan datën e krijimit të storjes.
- media – përshkruan foto/video që mund të përmbajë storja.

Entiteti Message ka këto veti:
- belongs_to – përshkruan lidhjen me përdoruesin që e pranon/dërgon.
- content – përshkruan përmbajtejn e mesazhit.
- created_at – përshkruan datën e krijimit të mesazhit.

Entiteti Notification ka këto veti:
- belongs_to – përshkruan lidhjen me përdoruesin që e pranon.
- content – përshkruan përmbajtejn e lajmërimit.
- created_at – përshkruan datën e krijimit të lajmërimit.

Entiteti Comment ka këto veti:
- belongs_to – përshkruan lidhjen me përdoruesin që e ka krijuar.
- content – përshkruan përmbajtejn e komentit.
- created_at – përshkruan datën e krijimit të komentit.

3.3 SQWRL pytesoret

Në shembujt në vijim do të sqarojmë sqwrl pyetesoret e përdorura për të ndërtuar relacionet mes instancave të entiteteve.

3.3.1 Perdoruesi dhe postimet e krijuara

Qëllimi i ketije pyetesori është gjetja e postimeve te perdoruesit te caktuar.

SQWRL pyetesori:

```
created(User1, ?post) -> sqwrl:select(?post);
```

3.3.2 Perdoruesi dhe postimet e pelqyera

Qëllimi i ketije pyetesori është gjetja e postimeve te pelqyera nga perdoruesi.

SQWRL pyetesori:

```
liked(User1, ?post) -> sqwrl:select(?post);
```

3.3.3 Perdoruesi dhe followers

Qëllimi i ketije pyetesori është gjetja e perdoruesve te ndjekur nga perdoruesi.

SQWRL pyetesori:

```
followed(User1, ?user) -> sqwrl:select(?user);
```

3.4 SWRL rregullat

Përmes swrl rregullave gjenerohen të gjitha relacionet mes instancave përkatëse. Në shembujt në vijim do të sqarojmë swrl rregullat e përdorura për të ndërtuar relacionet mes instancave të entiteteve.

3.4.1 Perdoruesi dhe postimet e krijuara

Qëllimi i kësaj rregulle është gjetja e postimeve te perdoruesit te caktuar.

SWRL rregulla:

```
InstagramAccount(?user) ^ created(?user, ?post) -> created_by(?post, ?user);
```

3.4.2 Perdoruesi dhe postimet e pelqyera

Qëllimi i kësaj rregulle është gjetja e postimeve te pelqyera nga perdoruesi.

SWRL rregulla:

```
InstagramAccount(?user) ^ liked(?user, ?post) -> liked_by(?post, ?user);
```

3.4.3 Perdoruesi dhe followers

Qëllimi i kësaj rregulle është gjetja e perdoruesve te ndjekur nga perdoruesi.

SWRL rregulla:

```
InstagramAccount(?user) ^ followed(?user, ?followed) -> followed_by(?followed, ?
user)
```

3.5 SPARQL pyetësorët

Përmes SPARQL pyetësorëve në seksionet në vijim vërtetojmë shfrytëzueshmërin e ontologjisë Instagram.

Shembulli 1 – followers të një përdoruesi të caktuar

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX instagram: <http://www.socialnetwork.edu/instagram#>
SELECT ?users
WHERE {
     ?person instagram:username ?name.
     ?person instagram:followed_by ?users.
     FILTER(?name = "haxhicelaj"^^xsd:string)
}
```

Shembulli 2 – following të një përdoruesi të caktuar

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX instagram: <http://www.socialnetwork.edu/instagram#>
SELECT ?users
WHERE {
      ?person instagram:username ?name.
      ?person instagram:followed ?users.
      FILTER(?name = "haxhicelaj"^^xsd:string)
}
```

Shembulli 3 – Postimet e pëlqyera nga një përdorues

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX instagram: <http://www.socialnetwork.edu/instagram#>
SELECT ?posts
WHERE {
      ?person instagram:username ?name.
      ?person instagram:liked ?posts
      FILTER(?name = "haxhicelaj"^^xsd:string)
}
LIMIT 1
```

Shembulli 4 – Postimet e komentuara nga një përdorues

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX instagram: <http://www.socialnetwork.edu/instagram#>
SELECT ?posts
WHERE {
      ?person instagram:username ?name.
      ?person instagram:commented ?posts
      FILTER(?name = "haxhicelaj"^^xsd:string)
}
```

Shembulli 5 – Numri i followers sipas përdoruesve

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX instagram: <http://www.socialnetwork.edu/instagram#>
SELECT ?username (COUNT(*) as ?total)
WHERE {
        ?person instagram:followed_by ?users.
        ?person instagram:username ?username.
}
GROUP BY ?username
ORDER BY DESC(?total)
```

Shembulli 6 – Numri i following sipas përdoruesve

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX instagram: <http://www.socialnetwork.edu/instagram#>
SELECT ?username (COUNT(*) as ?total)
WHERE {
        ?person instagram:followed ?users.
        ?person instagram:username ?username.
}
GROUP BY ?username
ORDER BY DESC(?total)
```

Shembulli 7 – Përdoruesit pa followers

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX instagram: <http://www.socialnetwork.edu/instagram#>
SELECT ?username
WHERE {
    ?person instagram:username ?username.
        OPTIONAL {
    ?person instagram:followed_by ?users.
        }
        FILTER(!BOUND(?users))
}
```

4 Kontributi i studentëve

Studenti	Kontributi
Haxhi Celaj	Zhvillmi i ontologjise Instagram dhe pyetesoret perkates.
Visar Buza	Zhvillmi i ontologjise Twitter dhe pyetesoret perkates

5 Anekset

5.1 Twitter Ontology

```xml
<?xml version="1.0"?>
<rdf:RDF xmlns="http://www.socialnetwork.edu/twitter#"
    xml:base="http://www.socialnetwork.edu/twitter"

xmlns:twitter="http://www.semanticweb.org/visarbuza/ontologies/2022/6/twitter #"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:xml="http://www.w3.org/XML/1998/namespace"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
    <owl:Ontology rdf:about="http://www.socialnetwork.edu/twitter"/>




    <!--
    ///////////////////////////////////////////////////////////////////////////////
    //
    // Object Properties
    //
    ///////////////////////////////////////////////////////////////////////////////
     -->




    <!-- http://www.socialnetwork.edu/twitter#belongs_to -->

    <owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#belongs_to">
        <rdfs:comment xml:lang="en">Describes the nature of the
relations.</rdfs:comment>
        <rdfs:label xml:lang="en">belongs_to</rdfs:label>
    </owl:ObjectProperty>
```

```xml
<!-- http://www.socialnetwork.edu/twitter#blocked -->

<owl:ObjectProperty rdf:about="http://www.socialnetwork.edu/twitter#blocked">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#IrreflexiveProperty"/>
    <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
    <rdfs:range
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
    <rdfs:comment xml:lang="en">Used to block user.</rdfs:comment>
    <rdfs:label xml:lang="en">blocked</rdfs:label>
</owl:ObjectProperty>




<!-- http://www.socialnetwork.edu/twitter#bookmarked -->

<owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#bookmarked">
    <owl:inverseOf
rdf:resource="http://www.socialnetwork.edu/twitter#bookmarked_by"/>
    <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
    <rdfs:range rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
    <rdfs:comment xml:lang="en">User bookmarks a tweet.</rdfs:comment>
    <rdfs:label xml:lang="en">bookmarked</rdfs:label>
</owl:ObjectProperty>




<!-- http://www.socialnetwork.edu/twitter#bookmarked_by -->

<owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#bookmarked_by">
    <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
    <rdfs:range
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
    <rdfs:comment xml:lang="en">Tweet bookmarked by user.</rdfs:comment>
```

```
      <rdfs:label xml:lang="en">bookmarked_by</rdfs:label>
   </owl:ObjectProperty>




   <!-- http://www.socialnetwork.edu/twitter#commented -->


   <owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#commented">
      <owl:inverseOf
rdf:resource="http://www.socialnetwork.edu/twitter#commented_by"/>
      <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      <rdfs:range rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
      <rdfs:comment xml:lang="en">User comments on tweet.</rdfs:comment>
      <rdfs:label xml:lang="en">commented</rdfs:label>
   </owl:ObjectProperty>




   <!-- http://www.socialnetwork.edu/twitter#commented_by -->


   <owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#commented_by">
      <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
      <rdfs:range
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      <rdfs:comment xml:lang="en">Tweet commented by user.</rdfs:comment>
      <rdfs:label xml:lang="en">commented_by</rdfs:label>
   </owl:ObjectProperty>




   <!-- http://www.socialnetwork.edu/twitter#followed -->


   <owl:ObjectProperty rdf:about="http://www.socialnetwork.edu/twitter#followed">
      <owl:inverseOf
rdf:resource="http://www.socialnetwork.edu/twitter#followed_by"/>
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#IrreflexiveProperty"/>
```

```xml
        <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <rdfs:range
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <rdfs:comment xml:lang="en">User follows user.</rdfs:comment>
        <rdfs:label xml:lang="en">followed</rdfs:label>
    </owl:ObjectProperty>




    <!-- http://www.socialnetwork.edu/twitter#followed_by -->


    <owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#followed_by">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#IrreflexiveProperty"/>
        <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <rdfs:range
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <rdfs:comment xml:lang="en">User followed by user.</rdfs:comment>
        <rdfs:label xml:lang="en">followed_by</rdfs:label>
    </owl:ObjectProperty>




    <!-- http://www.socialnetwork.edu/twitter#liked -->


    <owl:ObjectProperty rdf:about="http://www.socialnetwork.edu/twitter#liked">
        <owl:inverseOf
rdf:resource="http://www.socialnetwork.edu/twitter#liked_by"/>
        <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <rdfs:range rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <rdfs:comment xml:lang="en">User likes tweet.</rdfs:comment>
        <rdfs:label xml:lang="en">liked</rdfs:label>
    </owl:ObjectProperty>
```

```
    <!-- http://www.socialnetwork.edu/twitter#liked_by -->


   <owl:ObjectProperty rdf:about="http://www.socialnetwork.edu/twitter#liked_by">
      <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
      <rdfs:range
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      <rdfs:comment xml:lang="en">Tweet liked by user.</rdfs:comment>
      <rdfs:label xml:lang="en">liked_by</rdfs:label>
   </owl:ObjectProperty>




    <!-- http://www.socialnetwork.edu/twitter#received -->


   <owl:ObjectProperty rdf:about="http://www.socialnetwork.edu/twitter#received">
      <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      <rdfs:comment xml:lang="en">User receives
message/notification.</rdfs:comment>
      <rdfs:label xml:lang="en">received</rdfs:label>
   </owl:ObjectProperty>




    <!-- http://www.socialnetwork.edu/twitter#retweeted -->


   <owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#retweeted">
      <owl:inverseOf
rdf:resource="http://www.socialnetwork.edu/twitter#retweeted_by"/>
      <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      <rdfs:range rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
      <rdfs:comment xml:lang="en">User can use the same tweet
(retweet).</rdfs:comment>
      <rdfs:label xml:lang="en">retweeted</rdfs:label>
   </owl:ObjectProperty>
```

```xml
<!-- http://www.socialnetwork.edu/twitter#retweeted_by -->

<owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#retweeted_by">
    <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
    <rdfs:range
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
    <rdfs:comment xml:lang="en">Tweet retweeted by user.</rdfs:comment>
    <rdfs:label xml:lang="en">retweeted_by</rdfs:label>
</owl:ObjectProperty>




<!-- http://www.socialnetwork.edu/twitter#sent -->

<owl:ObjectProperty rdf:about="http://www.socialnetwork.edu/twitter#sent">
    <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
    <rdfs:range>
      <owl:Class>
        <owl:intersectionOf rdf:parseType="Collection">
          <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Message"/>
          <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#message"/>
            <owl:minQualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:
minQualifiedCardinality>
            <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
          </owl:Restriction>
        </owl:intersectionOf>
      </owl:Class>
    </rdfs:range>
    <rdfs:comment xml:lang="en">User send message.</rdfs:comment>
    <rdfs:label xml:lang="en">sent</rdfs:label>
</owl:ObjectProperty>
```

```xml
<!-- http://www.socialnetwork.edu/twitter#tweeted -->

<owl:ObjectProperty rdf:about="http://www.socialnetwork.edu/twitter#tweeted">
    <owl:inverseOf rdf:resource="http://www.socialnetwork.edu/twitter#tweeted_by"/>
    <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
    <rdfs:range>
      <owl:Class>
        <owl:intersectionOf rdf:parseType="Collection">
          <rdf:Description rdf:about="http://www.socialnetwork.edu/twitter#Tweet"/>
          <owl:Restriction>
            <owl:onProperty rdf:resource="http://www.socialnetwork.edu/twitter#content"/>
            <owl:minQualifiedCardinality rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:minQualifiedCardinality>
            <owl:onDataRange rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
          </owl:Restriction>
          <owl:Restriction>
            <owl:onProperty rdf:resource="http://www.socialnetwork.edu/twitter#content"/>
            <owl:maxQualifiedCardinality rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">280</owl:maxQualifiedCardinality>
            <owl:onDataRange rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
          </owl:Restriction>
        </owl:intersectionOf>
      </owl:Class>
    </rdfs:range>
    <rdfs:comment xml:lang="en">User tweets tweet (post).</rdfs:comment>
    <rdfs:label xml:lang="en">tweeted</rdfs:label>
</owl:ObjectProperty>
```

```
    <!-- http://www.socialnetwork.edu/twitter#tweeted_by -->


    <owl:ObjectProperty
rdf:about="http://www.socialnetwork.edu/twitter#tweeted_by">
        <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <rdfs:range
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <rdfs:comment xml:lang="en">Tweet tweeted (posted) by
user.</rdfs:comment>
        <rdfs:label xml:lang="en">tweeted_by</rdfs:label>
    </owl:ObjectProperty>




    <!--
    ///////////////////////////////////////////////////////////////////////////////////
    //
    // Data properties
    //
    ///////////////////////////////////////////////////////////////////////////////////
     -->




    <!-- http://www.socialnetwork.edu/twitter#birth_date -->


    <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#birth_date">
        <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
        <rdfs:comment xml:lang="en">User&apos;s birth date.</rdfs:comment>
        <rdfs:label xml:lang="en">birth_date</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.socialnetwork.edu/twitter#comment -->
```

```
    <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#comment">
        <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        <rdfs:comment xml:lang="en">Comment of the user on post.</rdfs:comment>
        <rdfs:label xml:lang="en">comment</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.socialnetwork.edu/twitter#content -->


    <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#content">
        <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Post"/>
        <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        <rdfs:comment  xml:lang="en">Content  of  the  post.</rdfs:comment>
        <rdfs:label xml:lang="en">content</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.socialnetwork.edu/twitter#created_at -->


    <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#created_at">
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
        <rdfs:comment xml:lang="en">Creation date of
User/Post/Message/Notification/Comment.</rdfs:comment>
        <rdfs:label xml:lang="en">created_at</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.socialnetwork.edu/twitter#email -->


    <owl:DatatypeProperty rdf:about="http://www.socialnetwork.edu/twitter#email">
        <rdfs:domain
```

```
rdf:resource="http://www.socialnetwork.edu/twitter#UserAccount"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment xml:lang="en">User&apos;s email address.</rdfs:comment>
    <rdfs:label xml:lang="en">email</rdfs:label>
  </owl:DatatypeProperty>



  <!-- http://www.socialnetwork.edu/twitter#first_name -->


  <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#first_name">
    <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#UserAccount"/>
    <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment xml:lang="en">User&apos;s first name.</rdfs:comment>
    <rdfs:label xml:lang="en">first_name</rdfs:label>
  </owl:DatatypeProperty>



  <!-- http://www.socialnetwork.edu/twitter#image -->


  <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#image">
    <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
    <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment xml:lang="en">User&apos;s profile image.</rdfs:comment>
    <rdfs:label xml:lang="en">image</rdfs:label>
  </owl:DatatypeProperty>



  <!-- http://www.socialnetwork.edu/twitter#last_name -->


  <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#last_name">
    <rdfs:domain
```

```
rdf:resource="http://www.socialnetwork.edu/twitter#UserAccount"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment xml:lang="en">User&apos;s last name.</rdfs:comment>
    <rdfs:label xml:lang="en">last_name</rdfs:label>
  </owl:DatatypeProperty>




  <!-- http://www.socialnetwork.edu/twitter#media -->


  <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#media">
    <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Post"/>
    <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment xml:lang="en">Image/video of the post.</rdfs:comment>
    <rdfs:label xml:lang="en">media</rdfs:label>
  </owl:DatatypeProperty>




  <!-- http://www.socialnetwork.edu/twitter#message -->


  <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#message">
    <rdfs:domain rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
    <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment xml:lang="en">Message content.</rdfs:comment>
    <rdfs:label xml:lang="en">message</rdfs:label>
  </owl:DatatypeProperty>




  <!-- http://www.socialnetwork.edu/twitter#notification -->


  <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#notification">
    <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#Notification"/>
```

```
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment xml:lang="en">Content of notification.</rdfs:comment>
    <rdfs:label  xml:lang="en">notification</rdfs:label>
  </owl:DatatypeProperty>




  <!-- http://www.socialnetwork.edu/twitter#user_id -->


  <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#user_id">
      <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      <rdfs:comment xml:lang="en">Id of the user.</rdfs:comment>
      <rdfs:label xml:lang="en">user_id</rdfs:label>
  </owl:DatatypeProperty>




  <!-- http://www.socialnetwork.edu/twitter#username -->


  <owl:DatatypeProperty
rdf:about="http://www.socialnetwork.edu/twitter#username">
      <rdfs:domain
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      <rdfs:comment xml:lang="en">User&apos;s username.</rdfs:comment>
      <rdfs:label xml:lang="en">username</rdfs:label>
  </owl:DatatypeProperty>




  <!--
  ///////////////////////////////////////////////////////////////////////////////
  //
  // Classes
  //
  ///////////////////////////////////////////////////////////////////////////////
```

```
    -->



  <!-- http://www.socialnetwork.edu/twitter#Comment -->


  <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#Comment">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#belongs_to"/>
        <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
        <owl:onClass
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      </owl:Restriction>
    </rdfs:subClassOf>
  </owl:Class>




  <!-- http://www.socialnetwork.edu/twitter#Message -->


  <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#Message">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#belongs_to"/>
        <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
        <owl:onClass
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:label xml:lang="en">Message</rdfs:label>
  </owl:Class>
```

```xml
    <!-- http://www.socialnetwork.edu/twitter#Notification -->


    <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#Notification">
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#belongs_to"/>
                <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
                <owl:onClass
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
            </owl:Restriction>
        </rdfs:subClassOf>
    </owl:Class>




    <!-- http://www.socialnetwork.edu/twitter#Post -->


    <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#Post">
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#bookmarked_by"/>
                <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#commented_by"/>
                <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
```

```
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#liked_by"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:label xml:lang="en">Post</rdfs:label>
   </owl:Class>




   <!-- http://www.socialnetwork.edu/twitter#Quote -->


   <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#Quote">
      <owl:equivalentClass
rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
      <rdfs:subClassOf rdf:resource="http://www.socialnetwork.edu/twitter#Post"/>
      <rdfs:label xml:lang="en">Quote</rdfs:label>
   </owl:Class>




   <!-- http://www.socialnetwork.edu/twitter#Retweet -->


   <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#Retweet">
      <owl:equivalentClass
rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
      <rdfs:subClassOf rdf:resource="http://www.socialnetwork.edu/twitter#Post"/>
      <rdfs:label xml:lang="en">Retweet</rdfs:label>
   </owl:Class>




   <!-- http://www.socialnetwork.edu/twitter#Tweet -->


   <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#Tweet">
      <rdfs:subClassOf rdf:resource="http://www.socialnetwork.edu/twitter#Post"/>
```

```
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#retweeted_by"/>
          <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#tweeted_by"/>
          <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
          <owl:onClass
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#created_at"/>
          <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
          <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:label xml:lang="en">Tweet</rdfs:label>
  </owl:Class>



  <!-- http://www.socialnetwork.edu/twitter#TwitterAccount -->


  <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#TwitterAccount">
    <rdfs:subClassOf
rdf:resource="http://www.socialnetwork.edu/twitter#UserAccount"/>
    <rdfs:subClassOf>
```

```
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#blocked"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#bookmarked"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#commented"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#followed"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#followed_by"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
```

```
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#liked"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#received"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#received"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#Notification"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#retweeted"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#Retweet"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#sent"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
```

```
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#tweeted"/>
            <owl:someValuesFrom
rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:label xml:lang="en">TwitterAccount</rdfs:label>
  </owl:Class>




  <!-- http://www.socialnetwork.edu/twitter#UserAccount -->


  <owl:Class rdf:about="http://www.socialnetwork.edu/twitter#UserAccount">
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#email"/>
            <owl:minQualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">5</owl:
minQualifiedCardinality>
            <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#first_name"/>
            <owl:minQualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">3</owl:
minQualifiedCardinality>
            <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#last_name"/>
```

```
            <owl:minQualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">3</owl:
minQualifiedCardinality>
            <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.socialnetwork.edu/twitter#created_at"/>
            <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
            <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:label xml:lang="en">UserAccount</rdfs:label>
  </owl:Class>



  <!--
    ///////////////////////////////////////////////////////////////////////////////////////
    //
    //  Individuals
    //
    ///////////////////////////////////////////////////////////////////////////////////////
    -->



  <!-- http://www.socialnetwork.edu/twitter#Comment1 -->


  <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Comment1">
    <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
    <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User1"/>
```

```
      <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
1.</comment>
      <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
15T15:00:00</created_at>
   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#Comment2 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Comment2">
      <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
      <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User1"/>
      <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
2.</comment>
      <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
17T17:00:00</created_at>
   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#Comment3 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Comment3">
      <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
      <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User2"/>
      <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
3.</comment>
      <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
19T20:00:00</created_at>
   </owl:NamedIndividual>
```

```xml
    <!-- http://www.socialnetwork.edu/twitter#Comment4 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Comment4">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
        <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User3"/>
        <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
4.</comment>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
21T11:00:00</created_at>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Comment5 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Comment5">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
        <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User5"/>
        <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
5.</comment>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
22T15:30:00</created_at>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Comment6 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Comment6">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
        <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User5"/>
        <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
6.</comment>
        <created_at
```

```
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
24T15:00:00</created_at>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Comment7 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Comment7">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
        <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User8"/>
        <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
7.</comment>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
25T15:00:00</created_at>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Comment8 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Comment8">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
        <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User9"/>
        <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
8.</comment>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
28T15:00:00</created_at>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Comment9 -->


    <owl:NamedIndividual
```

```
rdf:about="http://www.socialnetwork.edu/twitter#Comment9">
     <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Comment"/>
     <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User9"/>
     <comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Comment
9.</comment>
     <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
30T15:00:00</created_at>
   </owl:NamedIndividual>



   <!-- http://www.socialnetwork.edu/twitter#Message1 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message1">
     <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
     <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User1"/>
     <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
21T10:30:00</created_at>
     <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
1.</message>
   </owl:NamedIndividual>



   <!-- http://www.socialnetwork.edu/twitter#Message2 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message2">
     <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
     <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User3"/>
     <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
23T11:30:00</created_at>
     <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
2.</message>
   </owl:NamedIndividual>
```

```xml
    <!-- http://www.socialnetwork.edu/twitter#Message3 -->

    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message3">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
        <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User3"/>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
24T11:30:00</created_at>
        <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
3.</message>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Message4 -->

    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message4">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
        <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User5"/>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
25T17:25:00</created_at>
        <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
4.</message>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Message5 -->

    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message5">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
        <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User6"/>
```

```
    <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
26T10:00:00</created_at>
    <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
5.</message>
  </owl:NamedIndividual>




  <!-- http://www.socialnetwork.edu/twitter#Message6 -->


  <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message6">
    <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
    <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User7"/>
    <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
28T11:30:00</created_at>
    <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
6.</message>
  </owl:NamedIndividual>




  <!-- http://www.socialnetwork.edu/twitter#Message7 -->


  <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message7">
    <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
    <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User8"/>
    <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
29T16:30:00</created_at>
    <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
7.</message>
  </owl:NamedIndividual>
```

```xml
<!-- http://www.socialnetwork.edu/twitter#Message8 -->


<owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message8">
    <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
    <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User9"/>
    <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
30T11:30:00</created_at>
    <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
8.</message>
  </owl:NamedIndividual>



  <!-- http://www.socialnetwork.edu/twitter#Message9 -->


  <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Message9">
    <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Message"/>
    <belongs_to rdf:resource="http://www.socialnetwork.edu/twitter#User10"/>
    <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-06-
04T20:30:00</created_at>
    <message
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Message
9.</message>
  </owl:NamedIndividual>



  <!-- http://www.socialnetwork.edu/twitter#Notification1 -->


  <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Notification1">
    <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Notification"/>
    <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
18T16:00:00</created_at>
    <notification
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Notification
```

```
1.</notification>

   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#Notification2 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Notification2">
       <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Notification"/>
       <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
20T16:00:00</created_at>
       <notification
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Notification
2.</notification>
   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#Notification3 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Notification3">
       <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Notification"/>
       <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
22T16:00:00</created_at>
       <notification
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Notification
3.</notification>
   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#Notification4 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Notification4">
       <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Notification"/>
       <created_at
```

```
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
24T16:00:00</created_at>
        <notification
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Notification
4.</notification>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Notification5 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Notification5">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Notification"/>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
26T16:00:00</created_at>
        <notification
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Notification
5.</notification>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Tweet1 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet1">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
1</content>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</created_at>
        <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image1</media>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Tweet10 -->
```

```
   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet10">
       <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
       <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
10.</content>
       <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-06-
05T12:00:00</created_at>
       <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image10</media>
   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#Tweet2 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet2">
       <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
       <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
2</content>
       <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
08T12:00:00</created_at>
       <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image2</media>
   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#Tweet3 -->


   <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet3">
       <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
       <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
3</content>
       <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
12T12:00:00</created_at>
       <media
```

```
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image3</media>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Tweet4 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet4">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
4</content>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
14T12:00:00</created_at>
        <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image4</media>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Tweet5 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet5">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
5</content>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
16T12:00:00</created_at>
        <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image5</media>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Tweet6 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet6">
```

```
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
6</content>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
18T12:00:00</created_at>
        <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image6</media>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Tweet7 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet7">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
7</content>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
20T12:30:00</created_at>
        <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image7</media>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#Tweet8 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet8">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
8</content>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
21T12:00:00</created_at>
        <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image8</media>
    </owl:NamedIndividual>
```

```
    <!-- http://www.socialnetwork.edu/twitter#Tweet9 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#Tweet9">
        <rdf:type rdf:resource="http://www.socialnetwork.edu/twitter#Tweet"/>
        <content rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweet
9</content>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
25T12:00:00</created_at>
        <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Image9</media>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#User1 -->


    <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User1">
        <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <commented rdf:resource="http://www.socialnetwork.edu/twitter#Tweet1"/>
        <liked rdf:resource="http://www.socialnetwork.edu/twitter#Tweet1"/>
        <sent rdf:resource="http://www.socialnetwork.edu/twitter#Message1"/>
        <tweeted rdf:resource="http://www.socialnetwork.edu/twitter#Tweet1"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</birth_date>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</created_at>
        <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
1</email>
        <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 1.</first_name>
        <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
1</image>
        <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 1</last_name>
        <user_id
```

```
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">1</user_id>
    </owl:NamedIndividual>



    <!-- http://www.socialnetwork.edu/twitter#User10 -->


    <owl:NamedIndividual
rdf:about="http://www.socialnetwork.edu/twitter#User10">
        <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">1990-05-
05T12:00:00</birth_date>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-06-
05T12:00:00</created_at>
        <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
10</email>
        <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 10.</first_name>
        <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
10</image>
        <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 10</last_name>
        <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">10</user_id>
    </owl:NamedIndividual>



    <!-- http://www.socialnetwork.edu/twitter#User2 -->


    <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User2">
        <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">1994-08-
15T12:00:00</birth_date>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
08T12:00:00</created_at>
        <email  rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
```

```
2</email>
      <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 2.</first_name>
      <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
2</image>
      <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 2</last_name>
      <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">2</user_id>
   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#User3 -->


   <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User3">
      <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
      <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</birth_date>
      <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</created_at>
      <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
3</email>
      <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 3.</first_name>
      <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
3</image>
      <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 3</last_name>
      <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">3</user_id>
   </owl:NamedIndividual>




   <!-- http://www.socialnetwork.edu/twitter#User4 -->


   <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User4">
      <rdf:type
```

```
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</birth_date>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</created_at>
        <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
4</email>
        <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 4.</first_name>
        <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
4</image>
        <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 4</last_name>
        <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">4</user_id>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#User5 -->


    <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User5">
        <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</birth_date>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-
05T12:00:00</created_at>
        <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
5</email>
        <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 5.</first_name>
        <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
5</image>
        <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 5</last_name>
        <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">5</user_id>
    </owl:NamedIndividual>
```

```xml
    <!-- http://www.socialnetwork.edu/twitter#User6 -->


    <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User6">
        <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
05T12:00:00</birth_date>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
05T12:00:00</created_at>
        <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
6</email>
        <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 6.</first_name>
        <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
6</image>
        <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 6</last_name>
        <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">6</user_id>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#User7 -->


    <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User7">
        <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
05T12:00:00</birth_date>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
05T12:00:00</created_at>
        <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
7</email>
        <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 7.</first_name>
```

```
        <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
7</image>
        <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 7</last_name>
        <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">7</user_id>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#User8 -->


    <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User8">
        <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
05T12:00:00</birth_date>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
05T12:00:00</created_at>
        <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
8</email>
        <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 8.</first_name>
        <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
8</image>
        <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 8</last_name>
        <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">8</user_id>
    </owl:NamedIndividual>




    <!-- http://www.socialnetwork.edu/twitter#User9 -->


    <owl:NamedIndividual rdf:about="http://www.socialnetwork.edu/twitter#User9">
        <rdf:type
rdf:resource="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
```

```
05T12:00:00</birth_date>
    <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
05T12:00:00</created_at>
    <email rdf:datatype="http://www.w3.org/2001/XMLSchema#string">email
9</email>
    <first_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
first name 9.</first_name>
    <image rdf:datatype="http://www.w3.org/2001/XMLSchema#string">image
9</image>
    <last_name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">User
last name 9</last_name>
    <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">9</user_id>
  </owl:NamedIndividual>



  <!--
  ///////////////////////////////////////////////////////////////////////////////////////
  //
  //  General  axioms
  //
  ///////////////////////////////////////////////////////////////////////////////////////
   -->

  <rdf:Description>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AllDisjointClasses"/>
    <owl:members rdf:parseType="Collection">
      <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Comment"/>
      <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Message"/>
      <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Notification"/>
      <rdf:Description rdf:about="http://www.socialnetwork.edu/twitter#Post"/>
      <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#UserAccount"/>
    </owl:members>
  </rdf:Description>
  <rdf:Description>
```

```xml
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AllDisjointClasses"/>
        <owl:members rdf:parseType="Collection">
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Comment"/>
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Message"/>
            <rdf:Description rdf:about="http://www.socialnetwork.edu/twitter#Post"/>
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#TwitterAccount"/>
        </owl:members>
    </rdf:Description>
    <rdf:Description>
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AllDisjointClasses"/>
        <owl:members rdf:parseType="Collection">
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Comment"/>
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Message"/>
            <rdf:Description rdf:about="http://www.socialnetwork.edu/twitter#Post"/>
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#UserAccount"/>
        </owl:members>
    </rdf:Description>
    <rdf:Description>
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AllDisjointClasses"/>
        <owl:members rdf:parseType="Collection">
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Comment"/>
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#Message"/>
            <rdf:Description rdf:about="http://www.socialnetwork.edu/twitter#Tweet"/>
            <rdf:Description
rdf:about="http://www.socialnetwork.edu/twitter#UserAccount"/>
        </owl:members>
    </rdf:Description>
</rdf:RDF>



<!-- Generated by the OWL API
```

```
https://github.com/owlcs/owlapi -->
```

5.2 Instagram Ontology

```xml
<?xml version="1.0"?>
<rdf:RDF xmlns="http://www.www.socialnetwork.edu/instagram#"
    xml:base="http://www.www.socialnetwork.edu/instagram"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:xml="http://www.w3.org/XML/1998/namespace"
    xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
    xmlns:swrl="http://www.w3.org/2003/11/swrl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:swrla="http://swrl.stanford.edu/ontologies/3.3/swrla.owl#">
    <owl:Ontology rdf:about="http://www.www.socialnetwork.edu/instagram"/>




    <!--
    ///////////////////////////////////////////////////////////////////////////////
    //
    // Annotation properties
    //
    ///////////////////////////////////////////////////////////////////////////////
     -->




    <!-- http://swrl.stanford.edu/ontologies/3.3/swrla.owl#isRuleEnabled -->

    <owl:AnnotationProperty
rdf:about="http://swrl.stanford.edu/ontologies/3.3/swrla.owl#isRuleEnabled"/>
```

```
<!--
////////////////////////////////////////////////////////////////////////////
//
// Object Properties
//
////////////////////////////////////////////////////////////////////////////
 -->



<!-- http://www.www.socialnetwork.edu/instagram#added_to -->


<owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#added_to">
    <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
    <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#Collection"/>
    <rdfs:comment xml:lang="en">Post added to collection.</rdfs:comment>
    <rdfs:label xml:lang="en">added_to</rdfs:label>
  </owl:ObjectProperty>



<!-- http://www.www.socialnetwork.edu/instagram#belongs_to -->


<owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#belongs_to">
    <rdfs:comment xml:lang="en">Describes the nature of the
relations.</rdfs:comment>
    <rdfs:label xml:lang="en">belongs_to</rdfs:label>
  </owl:ObjectProperty>



<!-- http://www.www.socialnetwork.edu/instagram#blocked -->
```

```
    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#blocked">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#IrreflexiveProperty"/>
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:comment xml:lang="en">Used to block user.</rdfs:comment>
        <rdfs:label xml:lang="en">blocked</rdfs:label>
    </owl:ObjectProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#commented -->


    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#commented">
        <owl:inverseOf
rdf:resource="http://www.www.socialnetwork.edu/instagram#commented_by"/>
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
        <rdfs:comment xml:lang="en">User comments on post.</rdfs:comment>
        <rdfs:label xml:lang="en">commented</rdfs:label>
    </owl:ObjectProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#commented_by -->


    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#commented_by">
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
        <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:comment xml:lang="en">Post commented by user.</rdfs:comment>
        <rdfs:label xml:lang="en">commented_by</rdfs:label>
```

```
    </owl:ObjectProperty>



    <!-- http://www.www.socialnetwork.edu/instagram#created -->


    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#created">
        <owl:inverseOf
rdf:resource="http://www.www.socialnetwork.edu/instagram#created_by"/>
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:comment xml:lang="en">User creates post.</rdfs:comment>
        <rdfs:label xml:lang="en">created</rdfs:label>
    </owl:ObjectProperty>



    <!-- http://www.www.socialnetwork.edu/instagram#created_by -->


    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#created_by">
        <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:comment xml:lang="en">Post created by user.</rdfs:comment>
        <rdfs:label xml:lang="en">created_by</rdfs:label>
    </owl:ObjectProperty>



    <!-- http://www.www.socialnetwork.edu/instagram#followed -->


    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#followed">
        <owl:inverseOf
rdf:resource="http://www.www.socialnetwork.edu/instagram#followed_by"/>
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#IrreflexiveProperty"/>
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:range
```

```
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:comment xml:lang="en">User follows user.</rdfs:comment>
        <rdfs:label xml:lang="en">followed</rdfs:label>
    </owl:ObjectProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#followed_by -->


    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#followed_by">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#IrreflexiveProperty"/>
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:comment xml:lang="en">User followed by user.</rdfs:comment>
        <rdfs:label xml:lang="en">followed_by</rdfs:label>
    </owl:ObjectProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#has -->


    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#has">
        <rdfs:comment xml:lang="en">Describes the nature of the
relations.</rdfs:comment>
        <rdfs:label xml:lang="en">has</rdfs:label>
    </owl:ObjectProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#liked -->


    <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#liked">
        <owl:inverseOf
rdf:resource="http://www.www.socialnetwork.edu/instagram#liked_by"/>
        <rdfs:domain
```

```
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
     <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
     <rdfs:comment xml:lang="en">User likes post.</rdfs:comment>
     <rdfs:label xml:lang="en">liked</rdfs:label>
   </owl:ObjectProperty>




   <!-- http://www.www.socialnetwork.edu/instagram#liked_by -->


   <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#liked_by">
     <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
     <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
     <rdfs:comment xml:lang="en">Post liked by user.</rdfs:comment>
     <rdfs:label xml:lang="en">liked_by</rdfs:label>
   </owl:ObjectProperty>




   <!-- http://www.www.socialnetwork.edu/instagram#received -->


   <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#received">
     <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
     <rdfs:comment xml:lang="en">User receives
message/notification.</rdfs:comment>
     <rdfs:label xml:lang="en">received</rdfs:label>
   </owl:ObjectProperty>




   <!-- http://www.www.socialnetwork.edu/instagram#sent -->


   <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#sent">
```

```xml
      <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#Message"/>
      <rdfs:comment xml:lang="en">User send message.</rdfs:comment>
      <rdfs:label xml:lang="en">sent</rdfs:label>
   </owl:ObjectProperty>



   <!-- http://www.www.socialnetwork.edu/instagram#tagged -->


   <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#tagged">
      <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      <rdfs:comment xml:lang="en">User tag a user.</rdfs:comment>
      <rdfs:label xml:lang="en">tagged</rdfs:label>
   </owl:ObjectProperty>



   <!-- http://www.www.socialnetwork.edu/instagram#tagged_in -->


   <owl:ObjectProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#tagged_in">
      <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      <rdfs:range
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
      <rdfs:comment xml:lang="en">User tagged in post.</rdfs:comment>
      <rdfs:label xml:lang="en">tagged_in</rdfs:label>
   </owl:ObjectProperty>



   <!--
   ///////////////////////////////////////////////////////////////////////////
```

```
    //
    //  Data  properties
    //
    ///////////////////////////////////////////////////////////////////////////

     -->




    <!-- http://www.www.socialnetwork.edu/instagram#birth_date -->


    <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#birth_date">
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#UserAccount"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
        <rdfs:comment xml:lang="en">User&apos;s birth date.</rdfs:comment>
        <rdfs:label xml:lang="en">birth_date</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#comment -->


    <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#comment">
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#Comment"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        <rdfs:comment xml:lang="en">Comment of the user on post.</rdfs:comment>
        <rdfs:label xml:lang="en">comment</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#created_at -->


    <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#created_at">
```

```xml
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
        <rdfs:comment xml:lang="en">Creation date of
User/Post/Message/Notification/Comment.</rdfs:comment>
        <rdfs:label xml:lang="en">created_at</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#email -->


    <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#email">
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        <rdfs:comment xml:lang="en">User&apos;s email address</rdfs:comment>
        <rdfs:label xml:lang="en">email</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#first_name -->


    <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#first_name">
        <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#UserAccount"/>
        <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        <rdfs:comment xml:lang="en">User&apos;s first name.</rdfs:comment>
        <rdfs:label xml:lang="en">first_name</rdfs:label>
    </owl:DatatypeProperty>




    <!-- http://www.www.socialnetwork.edu/instagram#last_name -->


    <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#last_name">
        <rdfs:domain
```

```
rdf:resource="http://www.www.socialnetwork.edu/instagram#UserAccount"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      <rdfs:comment xml:lang="en">User&apos;s last name.</rdfs:comment>
      <rdfs:label xml:lang="en">last_name</rdfs:label>
   </owl:DatatypeProperty>



   <!-- http://www.www.socialnetwork.edu/instagram#media -->


   <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#media">
      <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      <rdfs:comment xml:lang="en">Image/video of the post.</rdfs:comment>
      <rdfs:label xml:lang="en">media</rdfs:label>
   </owl:DatatypeProperty>



   <!-- http://www.www.socialnetwork.edu/instagram#message -->


   <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#message">
      <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#Message"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      <rdfs:comment xml:lang="en">Message content.</rdfs:comment>
      <rdfs:label xml:lang="en">message</rdfs:label>
   </owl:DatatypeProperty>



   <!-- http://www.www.socialnetwork.edu/instagram#notification -->


   <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#notification">
      <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#Notification"/>
      <rdfs:range  rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
```

```xml
      <rdfs:comment xml:lang="en">Content of notification.</rdfs:comment>
      <rdfs:label  xml:lang="en">notification</rdfs:label>
   </owl:DatatypeProperty>




   <!-- http://www.www.socialnetwork.edu/instagram#profile_image -->


   <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#profile_image">
      <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      <rdfs:comment xml:lang="en">User&apos;s profile image.</rdfs:comment>
      <rdfs:label xml:lang="en">profile_image</rdfs:label>
   </owl:DatatypeProperty>




   <!-- http://www.www.socialnetwork.edu/instagram#user_id -->


   <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#user_id">
      <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#integer"/>
      <rdfs:comment xml:lang="en">Id of the user.</rdfs:comment>
      <rdfs:label xml:lang="en">user_id</rdfs:label>
   </owl:DatatypeProperty>




   <!-- http://www.www.socialnetwork.edu/instagram#username -->


   <owl:DatatypeProperty
rdf:about="http://www.www.socialnetwork.edu/instagram#username">
      <rdfs:domain
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
```

```xml
    <rdfs:comment xml:lang="en">User&apos;s username.</rdfs:comment>
    <rdfs:label xml:lang="en">username</rdfs:label>
  </owl:DatatypeProperty>



  <!--
///////////////////////////////////////////////////////////////////////////////
//
// Classes
//
///////////////////////////////////////////////////////////////////////////////
  -->



  <!-- http://www.www.socialnetwork.edu/instagram#Collection -->


  <owl:Class
rdf:about="http://www.www.socialnetwork.edu/instagram#Collection">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#has"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#belongs_to"/>
        <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
        <owl:onClass
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      </owl:Restriction>
```

```xml
        </rdfs:subClassOf>
        <rdfs:label xml:lang="en">Collection</rdfs:label>
    </owl:Class>



    <!-- http://www.www.socialnetwork.edu/instagram#Comment -->


    <owl:Class
rdf:about="http://www.www.socialnetwork.edu/instagram#Comment">
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#belongs_to"/>
                <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
                <owl:onClass
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:label xml:lang="en">Comment</rdfs:label>
    </owl:Class>



    <!-- http://www.www.socialnetwork.edu/instagram#InstagramAccount -->


    <owl:Class
rdf:about="http://www.www.socialnetwork.edu/instagram#InstagramAccount">
        <rdfs:subClassOf
rdf:resource="http://www.www.socialnetwork.edu/instagram#UserAccount"/>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#blocked"/>
                <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
            </owl:Restriction>
        </rdfs:subClassOf>
```

```
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#commented"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#created"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#followed"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#followed_by"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#liked"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
      </owl:Restriction>
    </rdfs:subClassOf>
```

```
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#received"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#Message"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#received"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#Notification"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#sent"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#Message"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#tagged"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#tagged_in"/>
        <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
      </owl:Restriction>
    </rdfs:subClassOf>
```

```
      <rdfs:label xml:lang="en">InstagramAccount</rdfs:label>
   </owl:Class>




   <!-- http://www.www.socialnetwork.edu/instagram#Message -->


   <owl:Class rdf:about="http://www.www.socialnetwork.edu/instagram#Message">
      <rdfs:subClassOf>
         <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#belongs_to"/>
            <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
            <owl:onClass
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
         </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:label xml:lang="en">Message</rdfs:label>
   </owl:Class>




   <!-- http://www.www.socialnetwork.edu/instagram#Notification -->


   <owl:Class
rdf:about="http://www.www.socialnetwork.edu/instagram#Notification">
      <rdfs:subClassOf>
         <owl:Restriction>
            <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#belongs_to"/>
            <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
            <owl:onClass
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
         </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:label xml:lang="en">Notification</rdfs:label>
```

```
    </owl:Class>



    <!-- http://www.www.socialnetwork.edu/instagram#Post -->


    <owl:Class rdf:about="http://www.www.socialnetwork.edu/instagram#Post">
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#commented_by"/>
                <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#liked_by"/>
                <owl:someValuesFrom
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#added_to"/>
                <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
                <owl:onClass
rdf:resource="http://www.www.socialnetwork.edu/instagram#Collection"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#created_by"/>
                <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
```

```
            <owl:onClass
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:label xml:lang="en">Post</rdfs:label>
  </owl:Class>




  <!-- http://www.www.socialnetwork.edu/instagram#Story -->


  <owl:Class rdf:about="http://www.www.socialnetwork.edu/instagram#Story">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#belongs_to"/>
        <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
        <owl:onClass
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:label xml:lang="en">Story</rdfs:label>
  </owl:Class>




  <!-- http://www.www.socialnetwork.edu/instagram#UserAccount -->


  <owl:Class
rdf:about="http://www.www.socialnetwork.edu/instagram#UserAccount">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#email"/>
        <owl:minQualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">5</owl:
minQualifiedCardinality>
        <owl:onDataRange
```

```
rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#first_name"/>
          <owl:minQualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">3</owl:
minQualifiedCardinality>
          <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#last_name"/>
          <owl:minQualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">3</owl:
minQualifiedCardinality>
          <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty
rdf:resource="http://www.www.socialnetwork.edu/instagram#created_at"/>
          <owl:qualifiedCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">1</owl:q
ualifiedCardinality>
          <owl:onDataRange
rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:label xml:lang="en">UserAccount</rdfs:label>
   </owl:Class>
```

```
    <!--
    ///////////////////////////////////////////////////////////////////////////////
    //
    //  Individuals
    //
    ///////////////////////////////////////////////////////////////////////////////
     -->



    <!-- http://www.www.socialnetwork.edu/instagram#Post1 -->


    <owl:NamedIndividual
rdf:about="http://www.www.socialnetwork.edu/instagram#Post1">
        <rdf:type rdf:resource="http://www.www.socialnetwork.edu/instagram#Post"/>
        <created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2022-06-
05T12:50:00</created_at>
        <media
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Post1</media>
    </owl:NamedIndividual>




    <!-- http://www.www.socialnetwork.edu/instagram#User1 -->


    <owl:NamedIndividual
rdf:about="http://www.www.socialnetwork.edu/instagram#User1">
        <rdf:type
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
        <created
rdf:resource="http://www.www.socialnetwork.edu/instagram#Post1"/>
        <birth_date
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">1994-04-
27T00:00:00</birth_date>
        <email
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">haxhi.celaj@gmail.co
m</email>
        <first_name
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Haxhi</first_name>
```

```xml
    <last_name
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Celaj</last_name>
    <user_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#integer">1</user_id>
    <username
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">haxhicelaj</userna
me>
  </owl:NamedIndividual>




  <!--
  ///////////////////////////////////////////////////////////////////////////////////////
  //
  // General axioms
  //
  ///////////////////////////////////////////////////////////////////////////////////////
   -->


  <rdf:Description>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AllDisjointClasses"/>
    <owl:members rdf:parseType="Collection">
      <rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#Collection"/>
      <rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#Comment"/>
      <rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
      <rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#Message"/>
      <rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#Notification"/>
      <rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#Post"/>
      <rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#Story"/>
    </owl:members>
  </rdf:Description>
```

```xml
<!--
///////////////////////////////////////////////////////////////////////////////
//
// Rules
//
///////////////////////////////////////////////////////////////////////////////
 -->


<rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#user">
    <rdf:type rdf:resource="http://www.w3.org/2003/11/swrl#Variable"/>
</rdf:Description>
<rdf:Description
rdf:about="http://www.www.socialnetwork.edu/instagram#post">
    <rdf:type rdf:resource="http://www.w3.org/2003/11/swrl#Variable"/>
</rdf:Description>
<rdf:Description>
    <swrla:isRuleEnabled
rdf:datatype="http://www.w3.org/2001/XMLSchema#boolean">true</swrla:isRuleEnabled>
    <rdfs:comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"></rdfs:comment>
    <rdfs:label
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tweeted</rdfs:label>
    <rdf:type rdf:resource="http://www.w3.org/2003/11/swrl#Imp"/>
    <swrl:body>
      <rdf:Description>
          <rdf:type rdf:resource="http://www.w3.org/2003/11/swrl#AtomList"/>
          <rdf:first>
            <rdf:Description>
               <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#ClassAtom"/>
               <swrl:classPredicate
rdf:resource="http://www.www.socialnetwork.edu/instagram#InstagramAccount"/>
               <swrl:argument1
rdf:resource="http://www.www.socialnetwork.edu/instagram#user"/>
            </rdf:Description>
          </rdf:first>
          <rdf:rest>
            <rdf:Description>
```

```
                        <rdf:type rdf:resource="http://www.w3.org/2003/11/swrl#AtomList"/>
                        <rdf:first>
                          <rdf:Description>
                            <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
                            <swrl:propertyPredicate
rdf:resource="http://www.www.socialnetwork.edu/instagram#created"/>
                            <swrl:argument1
rdf:resource="http://www.www.socialnetwork.edu/instagram#user"/>
                            <swrl:argument2
rdf:resource="http://www.www.socialnetwork.edu/instagram#post"/>
                          </rdf:Description>
                        </rdf:first>
                        <rdf:rest  rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#nil"/>
                   </rdf:Description>
              </rdf:rest>
          </rdf:Description>
      </swrl:body>
      <swrl:head>
        <rdf:Description>
           <rdf:type rdf:resource="http://www.w3.org/2003/11/swrl#AtomList"/>
           <rdf:first>
              <rdf:Description>
                 <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
                 <swrl:propertyPredicate
rdf:resource="http://www.www.socialnetwork.edu/instagram#created_by"/>
                 <swrl:argument1
rdf:resource="http://www.www.socialnetwork.edu/instagram#post"/>
                 <swrl:argument2
rdf:resource="http://www.www.socialnetwork.edu/instagram#user"/>
              </rdf:Description>
           </rdf:first>
           <rdf:rest  rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#nil"/>
        </rdf:Description>
      </swrl:head>
   </rdf:Description>
</rdf:RDF>
```

Page /

```
<!-- Generated by the OWL API
https://github.com/owlcs/owlapi -->
```