

Podstawy Inżynierii Wiedzy - Semantic Web

Sprawozdanie 5

Andrzej Kiełtyka, Aleksandra Sikora

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1 Reasoning on the Semantic Web

1.1 OWL Reasoning - Class Inference

```
1 <?xml version="1.0"?>
2 <!DOCTYPE rdf:RDF [
3   <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
4   <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
5   <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
6   <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
7   <!ENTITY Ontology1338379973741 "http://www.semanticweb.org/ontologies/2012/4/
8     Ontology1338379973741.owl#" >
9 ]>
10 <rdf:RDF xmlns="http://www.semanticweb.org/ontologies/2012/4/Ontology1338379973741.owl#"
11   xml:base="http://www.semanticweb.org/ontologies/2012/4/Ontology1338379973741.owl"
12   xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
13   xmlns:Ontology1338379973741="http://www.semanticweb.org/ontologies/2012/4/
14     Ontology1338379973741.owl#"
15   xmlns:owl="http://www.w3.org/2002/07/owl#"
16   xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
17   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
18   <owl:Ontology rdf:about="http://www.semanticweb.org/ontologies/2012/4/
19     Ontology1338379973741.owl" />
20   //////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
21   //
22   // Object Properties
23   //
24   //////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
25   →
26
27   <!-- http://www.semanticweb.org/ontologies/2012/4/Ontology1338379973741.owl#drives
28     →
29   <owl:ObjectProperty rdf:about="&Ontology1338379973741; drives">
30     <rdfs:subPropertyOf rdf:resource="&owl;topObjectProperty"/>
31   </owl:ObjectProperty>
32
33   <!-- http://www.w3.org/2002/07/owl#topObjectProperty →
34
35   <owl:ObjectProperty rdf:about="&owl;topObjectProperty"/>
36
37   <!--
38   //////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
39   //
40   // Classes
41   //
42   //////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
43   →
```

```

44 <!-- http://www.semanticweb.org/ontologies/2012/4/Ontology1338379973741.owl#Bus -->
45
46 <owl:Class rdf:about="&Ontology1338379973741;Bus">
47   <rdfs:subClassOf rdf:resource="&Ontology1338379973741;Vehicle"/>
48 </owl:Class>
49
50 <!-- http://www.semanticweb.org/ontologies/2012/4/Ontology1338379973741.owl#
51   BusDriver -->
52
53 <owl:Class rdf:about="&Ontology1338379973741;BusDriver">
54   <owl:equivalentClass>
55     <owl:Class>
56       <owl:intersectionOf rdf:parseType="Collection">
57         <rdf:Description rdf:about="&Ontology1338379973741;Person"/>
58         <owl:Restriction>
59           <owl:onProperty rdf:resource="&Ontology1338379973741;drives"/>
60           <owl:someValuesFrom rdf:resource="&Ontology1338379973741;Bus"/>
61         </owl:Restriction>
62       </owl:intersectionOf>
63     </owl:Class>
64   </owl:equivalentClass>
65 </owl:Class>
66
67 <!-- http://www.semanticweb.org/ontologies/2012/4/Ontology1338379973741.owl#Driver
68   -->
69
70 <owl:Class rdf:about="&Ontology1338379973741;Driver">
71   <owl:equivalentClass>
72     <owl:Class>
73       <owl:intersectionOf rdf:parseType="Collection">
74         <rdf:Description rdf:about="&Ontology1338379973741;Person"/>
75         <owl:Restriction>
76           <owl:onProperty rdf:resource="&Ontology1338379973741;drives"/>
77           <owl:someValuesFrom rdf:resource="&Ontology1338379973741;Vehicle
78             "/>
79         </owl:Restriction>
80       </owl:intersectionOf>
81     </owl:Class>
82   </owl:equivalentClass>
83 </owl:Class>
84
85 <!-- http://www.semanticweb.org/ontologies/2012/4/Ontology1338379973741.owl#Person
86   -->
87
88 <owl:Class rdf:about="&Ontology1338379973741;Person"/>
89
90 <!-- http://www.semanticweb.org/ontologies/2012/4/Ontology1338379973741.owl#Vehicle
91   -->
92
93 <owl:Class rdf:about="&Ontology1338379973741;Vehicle"/>
94 </rdf:RDF>
95 <!-- Generated by the OWL API (version 3.0.0.1413) http://owlapi.sourceforge.net -->

```

- Skoro Kierowca jest odpowiednikiem Osoby, która jeździ jakimś Pojazdem, to jest tym samym podklasą Osoby (klasa bardziej ogólna).
- Skoro Kierowca Autobusu jest odpowiednikiem Osoby, która jeździ Autobusem, a Autobus jest podklasą Pojazdu, to Kierowca Autobusu jest podklasą Kierowcy, ponieważ Kierowca jest Osobą, która jeździ dowolnym Pojazdem.

1.2 OWL Reasoning - Instance Inferences

```
1 <?xml version="1.0"?>
2 <!DOCTYPE rdf:RDF [
3   <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
4   <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
5   <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
6   <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
7 ]>
8
9 <rdf:RDF xmlns="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#"
10   xml:base="http://owl.cs.manchester.ac.uk/2009/07/sssw/people"
11   xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
12   xmlns:owl="http://www.w3.org/2002/07/owl#"
13   xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
14   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
15 <owl:Ontology rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people"/>
16
17 <!--
18 ////////////////////////////////////////////////////////////////////
19 //
20 // Annotation properties
21 //
22 ////////////////////////////////////////////////////////////////////
23 -->
24
25 <owl:AnnotationProperty rdf:about="&rdfs;label"/>
26 <owl:AnnotationProperty rdf:about="&rdfs;comment"/>
27
28 <!--
29 ////////////////////////////////////////////////////////////////////
30 //
31 // Object Properties
32 //
33 ////////////////////////////////////////////////////////////////////
34 -->
35
36 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives -->
37
38 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
39   drives">
40   <rdfs:label rdf:datatype="&xsd:string">drives</rdfs:label>
41   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
42 </owl:ObjectProperty>
43
44 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eaten_by -->
45
46 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
47   eaten_by">
48   <rdfs:label rdf:datatype="&xsd:string">eaten_by</rdfs:label>
49   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
50 </owl:ObjectProperty>
51
52 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats -->
53
54 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
55   eats">
56   <rdfs:label rdf:datatype="&xsd:string">eats</rdfs:label>
57   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
58   <rdfs:domain rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
59   animal"/>
60   <owl:inverseOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
61   eaten_by"/>
62 </owl:ObjectProperty>
63
64 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_child -->
```

```

60
61 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
62   has_child">
63   <rdfs:label rdf:datatype="&xsd:string">has_child</rdfs:label>
64   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
65 </owl:ObjectProperty>
66 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_father -->
67
68 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
69   has_father">
70   <rdfs:label rdf:datatype="&xsd:string">has_father</rdfs:label>
71   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
72   <rdfs:subPropertyOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
73     people#has_parent"/>
74   <rdfs:range rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#man
75     "/>
76 </owl:ObjectProperty>
77 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_mother -->
78
79 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
80   has_mother">
81   <rdfs:label rdf:datatype="&xsd:string">has_mother</rdfs:label>
82   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
83   <rdfs:subPropertyOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
84     people#has_parent"/>
85   <rdfs:range rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
86     woman"/>
87 </owl:ObjectProperty>
88 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_parent -->
89
90 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
91   has_parent">
92   <rdfs:label rdf:datatype="&xsd:string">has_parent</rdfs:label>
93   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
94 </owl:ObjectProperty>
95 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_part -->
96
97 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
98   has_part">
99   <rdfs:label rdf:datatype="&xsd:string">has_part</rdfs:label>
100  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
101  <owl:inverseOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
102    part_of"/>
103 </owl:ObjectProperty>
104 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet -->
105
106 <owl:ObjectProperty rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
107   has_pet">
108   <rdfs:label rdf:datatype="&xsd:string">has_pet</rdfs:label>
109   <rdfs:comment rdf:datatype="&xsd:string">Anyone that has a pet must like that
110     pet.</rdfs:comment>
111   <rdfs:range rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
112     animal"/>
113   <owl:inverseOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
114     is_pet_of"/>
115   <rdfs:subPropertyOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
116     people#likes"/>
117   <rdfs:domain rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
118     person"/>
119 </owl:ObjectProperty>

```



```

168         <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
169             sssw/people#eats"/>
170         <owl:someValuesFrom rdf:resource="&owl;Thing"/>
171     </owl:Restriction>
172 </rdfs:subClassOf>
173 <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
174 </owl:Class>
175 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal_lover -->
176
177 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
178     animal_lover">
179     <rdfs:label rdf:datatype="&xsd:string">animal_lover</rdfs:label>
180     <owl:equivalentClass>
181         <owl:Class>
182             <owl:intersectionOf rdf:parseType="Collection">
183                 <rdfs:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
184                     sssw/people#person"/>
185                 <owl:Restriction>
186                     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
187                         /2009/07/sssw/people#has_pet"/>
188                     <owl:minCardinality rdf:datatype="&xsd;nonNegativeInteger">3</
189                         owl:minCardinality>
190                 </owl:Restriction>
191             </owl:intersectionOf>
192         </owl:Class>
193     </owl:equivalentClass>
194     <rdfs:comment rdf:datatype="&xsd:string">Someone who really likes animals</
195         rdfs:comment>
196 </owl:Class>
197 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bicycle -->
198
199 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bicycle">
200     <rdfs:label rdf:datatype="&xsd:string">bicycle</rdfs:label>
201     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
202         people#vehicle"/>
203     <rdfs:comment rdf:datatype="&xsd:string">A human propelled vehicle, with two
204         wheels</rdfs:comment>
205 </owl:Class>
206 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bone -->
207
208 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bone">
209     <rdfs:label rdf:datatype="&xsd:string">bone</rdfs:label>
210     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
211 </owl:Class>
212 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#brain -->
213
214 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#brain">
215     <rdfs:label rdf:datatype="&xsd:string">brain</rdfs:label>
216     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
217 </owl:Class>
218 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#broadsheet -->
219
220 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#broadsheet">
221     <rdfs:label rdf:datatype="&xsd:string">broadsheet</rdfs:label>
222     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
223         people#newspaper"/>
224     <owl:disjointWith rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
225         people#tabloid"/>
226     <rdfs:comment rdf:datatype="&xsd:string">A newspaper. Broadsheets are usually
227         considered to be more &quot;high-brow&quot; than tabloids.</rdfs:comment>

```

```

222 </owl:Class>
223
224 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus -->
225
226 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus">
227   <rdfs:label rdf:datatype="&xsd:string">bus</rdfs:label>
228   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
229     people#vehicle"/>
230   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
231 </owl:Class>
232
233 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus_company -->
234
235 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus_company
236   ">
237   <rdfs:label rdf:datatype="&xsd:string">bus company</rdfs:label>
238   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
239     people#company"/>
240   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
241 </owl:Class>
242
243 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus_driver -->
244
245 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus_driver "
246   >
247   <rdfs:label rdf:datatype="&xsd:string">bus driver</rdfs:label>
248   <owl:equivalentClass>
249     <owl:Class>
250       <owl:intersectionOf rdf:parseType="Collection">
251         <rdfs:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
252           sssw/people#person"/>
253         <owl:Restriction>
254           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
255             /2009/07/sssw/people#drives"/>
256           <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
257             /2009/07/sssw/people#bus"/>
258         </owl:Restriction>
259       </owl:intersectionOf>
260     </owl:Class>
261   </owl:equivalentClass>
262   <rdfs:comment rdf:datatype="&xsd:string">Someone who drives a bus.</rdfs:comment
263   >
264 </owl:Class>
265
266 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#car -->
267
268 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#car">
269   <rdfs:label rdf:datatype="&xsd:string">car</rdfs:label>
270   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
271     people#vehicle"/>
272   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
273 </owl:Class>
274
275 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat -->
276
277 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat">
278   <rdfs:label rdf:datatype="&xsd:string">cat</rdfs:label>
279   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
280     people#animal"/>
281   <owl:disjointWith rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
282     people#dog"/>
283   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
284 </owl:Class>
285
286 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat_liker -->

```

```

277 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat_liker">
278   <rdfs:label rdf:datatype="&xsd:string">cat_liker</rdfs:label>
279   <owl:equivalentClass>
280     <owl:Class>
281       <owl:intersectionOf rdf:parseType="Collection">
282         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
                ssw/people#person"/>
283         <owl:Restriction>
284           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
                /2009/07/sssw/people#likes"/>
285           <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
                /2009/07/sssw/people#cat"/>
286         </owl:Restriction>
287       </owl:intersectionOf>
288     </owl:Class>
289   </owl:equivalentClass>
290   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
291 </owl:Class>
292
293 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat_owner -->
294
295 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat_owner">
296   <rdfs:label rdf:datatype="&xsd:string">cat_owner</rdfs:label>
297   <owl:equivalentClass>
298     <owl:Class>
299       <owl:intersectionOf rdf:parseType="Collection">
300         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
                ssw/people#person"/>
301         <owl:Restriction>
302           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
                /2009/07/sssw/people#has_pet"/>
303           <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
                /2009/07/sssw/people#cat"/>
304         </owl:Restriction>
305       </owl:intersectionOf>
306     </owl:Class>
307   </owl:equivalentClass>
308   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
309 </owl:Class>
310
311 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#company -->
312
313 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#company">
314   <rdfs:label rdf:datatype="&xsd:string">company</rdfs:label>
315   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
316 </owl:Class>
317
318 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cow -->
319
320 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cow">
321   <rdfs:label rdf:datatype="&xsd:string">cow</rdfs:label>
322   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
                people#vegetarian"/>
323   <rdfs:comment rdf:datatype="&xsd:string">Cows are naturally vegetarians.</
                rdfs:comment>
324 </owl:Class>
325
326 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog -->
327
328 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog">
329   <rdfs:label rdf:datatype="&xsd:string">dog</rdfs:label>
330   <rdfs:subClassOf>
331     <owl:Restriction>
332       <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
                ssw/people#eats"/>

```



```

333         <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
334             /2009/07/sssw/people#bone"/>
335     </owl:Restriction>
336 </rdfs:subClassOf>
337 <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
338 </owl:Class>
339 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog_liker -->
340
341 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog_liker">
342     <rdfs:label rdf:datatype="&xsd:string">dog liker</rdfs:label>
343     <owl:equivalentClass>
344         <owl:Class>
345             <owl:intersectionOf rdf:parseType="Collection">
346                 <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
347                     sssw/people#person"/>
348                 <owl:Restriction>
349                     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
350                         /2009/07/sssw/people#likes"/>
351                     <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
352                         /2009/07/sssw/people#dog"/>
353                 </owl:Restriction>
354             </owl:intersectionOf>
355         </owl:Class>
356     </owl:equivalentClass>
357 <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
358 </owl:Class>
359 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog_owner -->
360
361 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog_owner">
362     <rdfs:label rdf:datatype="&xsd:string">dog owner</rdfs:label>
363     <owl:equivalentClass>
364         <owl:Class>
365             <owl:intersectionOf rdf:parseType="Collection">
366                 <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
367                     sssw/people#person"/>
368                 <owl:Restriction>
369                     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
370                         /2009/07/sssw/people#has_pet"/>
371                     <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
372                         /2009/07/sssw/people#dog"/>
373                 </owl:Restriction>
374             </owl:intersectionOf>
375         </owl:Class>
376     </owl:equivalentClass>
377 <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
378 </owl:Class>
379 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#driver -->
380
381 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#driver">
382     <rdfs:label rdf:datatype="&xsd:string">driver</rdfs:label>
383     <owl:equivalentClass>
384         <owl:Class>
385             <owl:intersectionOf rdf:parseType="Collection">
386                 <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
387                     sssw/people#person"/>
388                 <owl:Restriction>
389                     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
390                         /2009/07/sssw/people#drives"/>
391                     <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
392                         /2009/07/sssw/people#vehicle"/>
393                 </owl:Restriction>
394             </owl:intersectionOf>
395         </owl:Class>

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389     </owl:equivalentClass>
390     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
      people#adult"/>
391     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
392 </owl:Class>
393
394 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck -->
395
396 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck">
397     <rdfs:label rdf:datatype="&xsd:string">duck</rdfs:label>
398     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
      people#animal"/>
399     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
400 </owl:Class>
401
402 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#elderly -->
403
404 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#elderly">
405     <rdfs:label rdf:datatype="&xsd:string">elderly</rdfs:label>
406     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
      people#adult"/>
407     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
408 </owl:Class>
409
410 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#female -->
411
412 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#female">
413     <rdfs:label rdf:datatype="&xsd:string">female</rdfs:label>
414     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
415 </owl:Class>
416
417 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#giraffe -->
418
419 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#giraffe">
420     <rdfs:label rdf:datatype="&xsd:string">giraffe</rdfs:label>
421     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
      people#animal"/>
422     <rdfs:subClassOf>
423         <owl:Restriction>
424             <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
              sssw/people#eats"/>
425             <owl:allValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
              sssw/people#leaf"/>
426         </owl:Restriction>
427     </rdfs:subClassOf>
428     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
429 </owl:Class>
430
431 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grass -->
432
433 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grass">
434     <rdfs:label rdf:datatype="&xsd:string">grass</rdfs:label>
435     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
      people#plant"/>
436     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
437 </owl:Class>
438
439 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grownup -->
440
441 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grownup">
442     <rdfs:label rdf:datatype="&xsd:string">grownup</rdfs:label>
443     <owl:equivalentClass>
444         <owl:Class>
445             <owl:intersectionOf rdf:parseType="Collection">
446                 <rdfs:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
                  sssw/people#adult"/>

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447         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
448             sssw/people#person"/>
449     </owl:intersectionOf>
450 </owl:Class>
451 </owl:equivalentClass>
452 <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
453 </owl:Class>
454 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_company -->
455
456 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
457     haulage_company">
458     <rdfs:label rdf:datatype="&xsd:string">haulage_company</rdfs:label>
459     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
460         people#company"/>
461     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
462 </owl:Class>
463
464 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_truck_driver -->
465
466 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
467     haulage_truck_driver">
468     <rdfs:label rdf:datatype="&xsd:string">haulage truck driver</rdfs:label>
469     <owl:equivalentClass>
470         <owl:Class>
471             <owl:intersectionOf rdf:parseType="Collection">
472                 <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
473                     sssw/people#person"/>
474                 <owl:Restriction>
475                     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
476                         /2009/07/sssw/people#drives"/>
477                     <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
478                         /2009/07/sssw/people#truck"/>
479                 </owl:Restriction>
480                 <owl:Restriction>
481                     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
482                         /2009/07/sssw/people#works_for"/>
483                     <owl:someValuesFrom>
484                         <owl:Restriction>
485                             <owl:onProperty rdf:resource="http://owl.cs.manchester.
486                                 ac.uk/2009/07/sssw/people#part_of"/>
487                             <owl:someValuesFrom rdf:resource="http://owl.cs.
488                                 manchester.ac.uk/2009/07/sssw/people#haulage_company
489                                 "/>
490                         </owl:Restriction>
491                     </owl:someValuesFrom>
492                 </owl:Restriction>
493             </owl:intersectionOf>
494         </owl:Class>
495     </owl:equivalentClass>
496     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
497 </owl:Class>
498 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_worker -->
499
500 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
501     haulage_worker">
502     <rdfs:label rdf:datatype="&xsd:string">haulage worker</rdfs:label>
503     <owl:equivalentClass>
504         <owl:Restriction>
505             <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
506                 sssw/people#works_for"/>
507             <owl:someValuesFrom>
508                 <owl:Class>
509                     <owl:unionOf rdf:parseType="Collection">

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499         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk
500           /2009/07/sssw/people#haulage_company"/>
501         <owl:Restriction>
502           <owl:onProperty rdf:resource="http://owl.cs.manchester.
503             ac.uk/2009/07/sssw/people#part_of"/>
504           <owl:someValuesFrom rdf:resource="http://owl.cs.
505             manchester.ac.uk/2009/07/sssw/people#haulage_company
506             "/>
507         </owl:Restriction>
508       </owl:unionOf>
509     </owl:Class>
510   </owl:someValuesFrom>
511 </owl:Restriction>
512 </owl:equivalentClass>
513 <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
514 </owl:Class>
515 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#kid -->
516 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#kid">
517   <rdfs:label rdf:datatype="&xsd:string">kid</rdfs:label>
518   <owl:equivalentClass>
519     <owl:Class>
520       <owl:intersectionOf rdf:parseType="Collection">
521         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
522           sssw/people#person"/>
523         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
524           sssw/people#young"/>
525       </owl:intersectionOf>
526     </owl:Class>
527   </owl:equivalentClass>
528   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
529 </owl:Class>
530 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#leaf -->
531 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#leaf">
532   <rdfs:label rdf:datatype="&xsd:string">leaf</rdfs:label>
533   <rdfs:subClassOf>
534     <owl:Restriction>
535       <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
536         sssw/people#part_of"/>
537       <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
538         /2009/07/sssw/people#tree"/>
539     </owl:Restriction>
540   </rdfs:subClassOf>
541   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
542 </owl:Class>
543 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#lorry -->
544 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#lorry">
545   <rdfs:label rdf:datatype="&xsd:string">lorry</rdfs:label>
546   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
547     people#vehicle"/>
548   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
549 </owl:Class>
550 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#lorry_driver -->
551 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
552   lorry_driver">
553   <rdfs:label rdf:datatype="&xsd:string">lorry_driver</rdfs:label>
554   <owl:equivalentClass>
555     <owl:Class>
556       <owl:intersectionOf rdf:parseType="Collection">

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555         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
556             sssw/people#person"/>
557         <owl:Restriction>
558             <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
559                 /2009/07/sssww/people#drives"/>
560             <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
561                 /2009/07/sssww/people#lorry"/>
562         </owl:Restriction>
563     </owl:intersectionOf>
564 </owl:Class>
565 </owl:equivalentClass>
566 <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
567 </owl:Class>
568 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssww/people#mad_cow -->
569 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssww/people#mad_cow">
570     <rdfs:label rdf:datatype="&xsd:string">mad cow</rdfs:label>
571     <owl:equivalentClass>
572         <owl:Class>
573             <owl:intersectionOf rdf:parseType="Collection">
574                 <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
575                     sssww/people#cow"/>
576                 <owl:Restriction>
577                     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
578                         /2009/07/sssww/people#eats"/>
579                     <owl:someValuesFrom>
580                         <owl:Class>
581                             <owl:intersectionOf rdf:parseType="Collection">
582                                 <rdf:Description rdf:about="http://owl.cs.manchester
583                                     .ac.uk/2009/07/sssww/people#brain"/>
584                                 <owl:Restriction>
585                                     <owl:onProperty rdf:resource="http://owl.cs.
586                                         manchester.ac.uk/2009/07/sssww/people#part_of
587                                             "/>
588                                     <owl:someValuesFrom rdf:resource="http://owl.cs.
589                                         manchester.ac.uk/2009/07/sssww/people#sheep"/
590                                     >
591                                 </owl:Restriction>
592                             </owl:intersectionOf>
593                         </owl:Class>
594                     </owl:someValuesFrom>
595                 </owl:Restriction>
596             </owl:intersectionOf>
597         </owl:Class>
598     </owl:equivalentClass>
599     <rdfs:comment rdf:datatype="&xsd:string">A mad cow is a cow that has been eating
600         the brains of sheep.</rdfs:comment>
601 </owl:Class>
602 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssww/people#magazine -->
603 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssww/people#magazine">
604     <rdfs:label rdf:datatype="&xsd:string">magazine</rdfs:label>
605     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssww/
606         people#publication"/>
607     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
608 </owl:Class>
609 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssww/people#male -->
610 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssww/people#male">
611     <rdfs:label rdf:datatype="&xsd:string">male</rdfs:label>
612     <rdfs:comment rdf:datatype="&xsd:string">The class of all male things.</
613         rdfs:comment>
614 </owl:Class>

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608
609 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#man -->
610
611 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#man">
612   <rdfs:label rdf:datatype="&xsd:string">man</rdfs:label>
613   <owl:equivalentClass>
614     <owl:Class>
615       <owl:intersectionOf rdf:parseType="Collection">
616         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
617           sssw/people#adult"/>
618         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
619           sssw/people#male"/>
620         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
621           sssw/people#person"/>
622       </owl:intersectionOf>
623     </owl:Class>
624   </owl:equivalentClass>
625   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
626 </owl:Class>
627
628 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#newspaper -->
629
630 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#newspaper">
631   <rdfs:label rdf:datatype="&xsd:string">newspaper</rdfs:label>
632   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
633     people#publication"/>
634   <rdfs:subClassOf>
635     <owl:Class>
636       <owl:unionOf rdf:parseType="Collection">
637         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
638           sssw/people#broadsheet"/>
639         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
640           sssw/people#tabloid"/>
641       </owl:unionOf>
642     </owl:Class>
643   </rdfs:subClassOf>
644   <rdfs:comment rdf:datatype="&xsd:string">All newspapers are either broadsheets
645     or tabloids.</rdfs:comment>
646 </owl:Class>
647
648 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#old_lady -->
649
650 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#old_lady">
651   <rdfs:label rdf:datatype="&xsd:string">old_lady</rdfs:label>
652   <owl:equivalentClass>
653     <owl:Class>
654       <owl:intersectionOf rdf:parseType="Collection">
655         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
656           sssw/people#elderly"/>
657         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
658           sssw/people#female"/>
659         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
660           sssw/people#person"/>
661       </owl:intersectionOf>
662     </owl:Class>
663   </owl:equivalentClass>
664   <rdfs:subClassOf>
665     <owl:Class>
666       <owl:intersectionOf rdf:parseType="Collection">
667         <owl:Restriction>
668           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
669             /2009/07/sssw/people#has_pet"/>
670           <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
671             /2009/07/sssw/people#animal"/>
672         </owl:Restriction>
673       </owl:Restriction>

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662         <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
663           /2009/07/sssw/people#has_pet"/>
664         <owl:allValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
665           /2009/07/sssw/people#cat"/>
666       </owl:Restriction>
667     </owl:intersectionOf>
668   </owl:Class>
669   </rdfs:subClassOf>
670   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
671 </owl:Class>
672 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person -->
673 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person">
674   <rdfs:label rdf:datatype="&xsd:string">person</rdfs:label>
675   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
676     people#animal"/>
677   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
678 </owl:Class>
679 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#pet -->
680 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#pet">
681   <rdfs:label rdf:datatype="&xsd:string">pet</rdfs:label>
682   <owl:equivalentClass>
683     <owl:Restriction>
684       <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
685         sssw/people#is_pet_of"/>
686       <owl:someValuesFrom rdf:resource="&owl;Thing"/>
687     </owl:Restriction>
688   </owl:equivalentClass>
689   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
690 </owl:Class>
691 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#pet_owner -->
692 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#pet_owner">
693   <rdfs:label rdf:datatype="&xsd:string">pet_owner</rdfs:label>
694   <owl:equivalentClass>
695     <owl:Class>
696       <owl:intersectionOf rdf:parseType="Collection">
697         <rdfs:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
698           sssw/people#person"/>
699         <owl:Restriction>
700           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
701             /2009/07/sssw/people#has_pet"/>
702           <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
703             /2009/07/sssw/people#animal"/>
704         </owl:Restriction>
705       </owl:intersectionOf>
706     </owl:Class>
707   </owl:equivalentClass>
708   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
709 </owl:Class>
710 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#plant -->
711 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#plant">
712   <rdfs:label rdf:datatype="&xsd:string">plant</rdfs:label>
713   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
714 </owl:Class>
715 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#publication -->
716 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#publication
717   ">

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720     <rdfs:label rdf:datatype="&xsd:string">publication</rdfs:label>
721     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
722 </owl:Class>
723
724 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#quality_broadsheet -->
725
726 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
727     quality_broadsheet">
728     <rdfs:label rdf:datatype="&xsd:string">quality_broadsheet</rdfs:label>
729     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
730     people#broadsheet"/>
731     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
732 </owl:Class>
733
734 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#red_top -->
735
736 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#red_top">
737     <rdfs:label rdf:datatype="&xsd:string">red_top</rdfs:label>
738     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
739     people#tabloid"/>
740     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
741 </owl:Class>
742
743 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#sheep -->
744
745 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#sheep">
746     <rdfs:label rdf:datatype="&xsd:string">sheep</rdfs:label>
747     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
748     people#animal"/>
749     <rdfs:subClassOf>
750     <owl:Restriction>
751     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
752     sssw/people#eats"/>
753     <owl:allValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
754     sssw/people#grass"/>
755     </owl:Restriction>
756 </rdfs:subClassOf>
757     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
758 </owl:Class>
759
760 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tabloid -->
761
762 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tabloid">
763     <rdfs:label rdf:datatype="&xsd:string">tabloid</rdfs:label>
764     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
765     people#newspaper"/>
766     <rdfs:comment rdf:datatype="&xsd:string">A newspaper. Tabloids are usually
767     thought of as more "down-market" than broadsheets.</rdfs:comment>
768 </owl:Class>
769
770 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tiger -->
771
772 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tiger">
773     <rdfs:label rdf:datatype="&xsd:string">tiger</rdfs:label>
774     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
775     people#animal"/>
776     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
777 </owl:Class>
778
779 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tree -->
780
781 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tree">
782     <rdfs:label rdf:datatype="&xsd:string">tree</rdfs:label>
783     <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
784     people#plant"/>
785     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>

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776 </owl:Class>
777
778 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#truck -->
779
780 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#truck">
781   <rdfs:label rdf:datatype="&xsd:string">truck</rdfs:label>
782   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
783     people#vehicle"/>
784   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
785 </owl:Class>
786
787 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van -->
788
789 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van">
790   <rdfs:label rdf:datatype="&xsd:string">van</rdfs:label>
791   <rdfs:subClassOf rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/
792     people#vehicle"/>
793   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
794 </owl:Class>
795
796 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van_driver -->
797
798 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van_driver"
799   >
800   <rdfs:label rdf:datatype="&xsd:string">van_driver</rdfs:label>
801   <owl:equivalentClass>
802     <owl:Class>
803       <owl:intersectionOf rdf:parseType="Collection">
804         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
805           sssw/people#person"/>
806         <owl:Restriction>
807           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
808             /2009/07/sssw/people#drives"/>
809           <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
810             /2009/07/sssw/people#van"/>
811         </owl:Restriction>
812       </owl:intersectionOf>
813     </owl:Class>
814   </owl:equivalentClass>
815   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
816 </owl:Class>
817
818 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vegetarian -->
819
820 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vegetarian"
821   >
822   <rdfs:label rdf:datatype="&xsd:string">vegetarian</rdfs:label>
823   <owl:equivalentClass>
824     <owl:Class>
825       <owl:intersectionOf rdf:parseType="Collection">
826         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
827           sssw/people#animal"/>
828         <owl:Restriction>
829           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
830             /2009/07/sssw/people#eats"/>
831           <owl:allValuesFrom>
832             <owl:Class>
833               <owl:complementOf rdf:resource="http://owl.cs.manchester
834                 .ac.uk/2009/07/sssw/people#animal"/>
835             </owl:Class>
836           </owl:allValuesFrom>
837         </owl:Restriction>
838         <owl:Restriction>
839           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
840             /2009/07/sssw/people#eats"/>
841           <owl:allValuesFrom>

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831         <owl:Class>
832             <owl:complementOf>
833                 <owl:Restriction>
834                     <owl:onProperty rdf:resource="http://owl.cs.
                        manchester.ac.uk/2009/07/sssw/people#part_of
                        "/>
835                     <owl:someValuesFrom rdf:resource="http://owl.cs.
                        manchester.ac.uk/2009/07/sssw/people#animal"
                        />
836                 </owl:Restriction>
837             </owl:complementOf>
838         </owl:Class>
839     </owl:allValuesFrom>
840 </owl:Restriction>
841 </owl:intersectionOf>
842 </owl:Class>
843 </owl:equivalentClass>
844 <rdfs:comment rdf:datatype="&xsd:string">A vegetarian is defined as an animal
    that eats no other animals, or parts of animals.</rdfs:comment>
845 </owl:Class>
846
847 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle -->
848
849 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle">
850     <rdfs:label rdf:datatype="&xsd:string">vehicle</rdfs:label>
851     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
852 </owl:Class>
853
854 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#white_thing -->
855
856 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#white_thing
    ">
857     <rdfs:label rdf:datatype="&xsd:string">white_thing</rdfs:label>
858     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
859 </owl:Class>
860
861 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#white_van_man -->
862
863 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
    white_van_man">
864     <owl:equivalentClass>
865         <owl:Class>
866             <owl:intersectionOf rdf:parseType="Collection">
867                 <rdfs:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
                    sssw/people#man"/>
868                 <owl:Restriction>
869                     <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
                        /2009/07/sssw/people#drives"/>
870                     <owl:someValuesFrom>
871                         <owl:Class>
872                             <owl:intersectionOf rdf:parseType="Collection">
873                                 <rdfs:Description rdf:about="http://owl.cs.manchester
                                    .ac.uk/2009/07/sssw/people#van"/>
874                                 <rdfs:Description rdf:about="http://owl.cs.manchester
                                    .ac.uk/2009/07/sssw/people#white_thing"/>
875                             </owl:intersectionOf>
876                         </owl:Class>
877                     </owl:someValuesFrom>
878                 </owl:Restriction>
879             </owl:intersectionOf>
880         </owl:Class>
881     </owl:equivalentClass>
882 <rdfs:subClassOf>
883     <owl:Restriction>
884         <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
                    sssw/people#reads"/>

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885         <owl:allValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
            sssw/people#tabloid"/>
886     </owl:Restriction>
887 </rdfs:subClassOf>
888 </owl:Class>
889
890 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#woman -->
891
892 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#woman">
893     <rdfs:label rdf:datatype="&xsd:string">woman</rdfs:label>
894     <owl:equivalentClass>
895         <owl:Class>
896             <owl:intersectionOf rdf:parseType="Collection">
897                 <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
                    sssw/people#adult"/>
898                 <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
                    sssw/people#female"/>
899                 <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
                    sssw/people#person"/>
900             </owl:intersectionOf>
901         </owl:Class>
902     </owl:equivalentClass>
903     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
904 </owl:Class>
905
906 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#young -->
907
908 <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#young">
909     <rdfs:label rdf:datatype="&xsd:string">young</rdfs:label>
910     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
911 </owl:Class>
912
913 <!-- http://www.w3.org/2002/07/owl#Thing -->
914
915 <owl:Class rdf:about="&owl;Thing"/>
916
917 <!--
918 ////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
919 //
920 // Individuals
921 //
922 ////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
923 -->
924
925 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#DailyMirror -->
926
927 <owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#DailyMirror
">
928     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van"/
>
929     <rdf:type rdf:resource="&owl;NamedIndividual"/>
930 </owl:Thing>
931
932 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Dewey -->
933
934 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
Dewey">
935     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck"
/>
936     <rdfs:label rdf:datatype="&xsd:string">Dewey</rdfs:label>
937     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
938 </owl:NamedIndividual>
939
940 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fido -->
941

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942 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
      Fido">
943   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog"/
      >
944   <rdfs:label rdf:datatype="xsd:string">Fido</rdfs:label>
945   <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
946 </owl:NamedIndividual>
947
948 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Flossie -->
949
950 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
      Flossie">
951   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cow"/
      >
952   <rdfs:label rdf:datatype="xsd:string">Flossie</rdfs:label>
953   <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
954 </owl:NamedIndividual>
955
956 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fluffy -->
957
958 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
      Fluffy">
959   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tiger
      "/>
960   <rdfs:label rdf:datatype="xsd:string">Fluffy</rdfs:label>
961   <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
962 </owl:NamedIndividual>
963
964 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fred -->
965
966 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
      Fred">
967   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
      person"/>
968   <rdfs:label rdf:datatype="xsd:string">Fred</rdfs:label>
969   <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
970   <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tibbs"
      />
971 </owl:NamedIndividual>
972
973 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Huey -->
974
975 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
      Huey">
976   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck"
      />
977   <rdfs:label rdf:datatype="xsd:string">Huey</rdfs:label>
978   <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
979 </owl:NamedIndividual>
980
981 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Joe -->
982
983 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
      Joe">
984   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
      person"/>
985   <rdf:type>
986     <owl:Restriction>
987       <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
      sssw/people#has_pet"/>
988       <owl:maxCardinality rdf:datatype="xsd:nonNegativeInteger">1</
      owl:maxCardinality>
989     </owl:Restriction>
990   </rdf:type>
991   <rdfs:label rdf:datatype="xsd:string">Joe</rdfs:label>
992   <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>

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993     <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fido"/
994     >
995 </owl:NamedIndividual>
996 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Kevin -->
997
998 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
999     Kevin">
1000   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1001     person"/>
1002   <rdfs:label rdf:datatype="&xsd:string">Kevin</rdfs:label>
1003   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1004   <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1005     Flossie"/>
1006   <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fluffy
1007     "/>
1008 </owl:NamedIndividual>
1009 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Louie -->
1010
1011 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1012     Louie">
1013   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck"
1014     />
1015   <rdfs:label rdf:datatype="&xsd:string">Louie</rdfs:label>
1016   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1017 </owl:NamedIndividual>
1018 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Mick -->
1019
1020 <owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Mick">
1021   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#man"/
1022     >
1023   <rdf:type rdf:resource="&owl;NamedIndividual"/>
1024   <reads rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1025     DailyMirror"/>
1026   <drives rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Q123ABC
1027     "/>
1028 </owl:Thing>
1029 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Minnie -->
1030
1031 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1032     Minnie">
1033   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1034     elderly"/>
1035   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1036     female"/>
1037   <rdfs:label rdf:datatype="&xsd:string">Minnie</rdfs:label>
1038   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1039   <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tom"/>
1040 </owl:NamedIndividual>
1041 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Pete -->
1042
1043 <owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Pete">
1044   <rdf:type rdf:resource="&owl;NamedIndividual"/>
1045   <rdfs:label rdf:datatype="&xsd:string">Pete</rdfs:label>
1046   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1047 </owl:Thing>
1048 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Q123ABC -->
1049
1050 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1051     Q123ABC">

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1044     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van"/
1045     >
1046     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1047     white_thing"/>
1048     <rdfs:label rdf:datatype="&xsd:string">Q123 ABC</rdfs:label>
1049     <rdfs:comment rdf:datatype="&xsd:string">A white van</rdfs:comment>
1050 </owl:NamedIndividual>
1051 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Rex -->
1052 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1053 Rex">
1054     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog"/
1055     >
1056     <rdfs:label rdf:datatype="&xsd:string">Rex</rdfs:label>
1057     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1058 </owl:NamedIndividual>
1059 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Spike -->
1060 <owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Spike">
1061     <rdf:type rdf:resource="&owl;NamedIndividual"/>
1062     <rdfs:label rdf:datatype="&xsd:string">Spike</rdfs:label>
1063     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1064     <is_pet_of rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Pete
1065     "/>
1066 </owl:Thing>
1067 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheGuardian -->
1068 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1069 TheGuardian">
1070     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1071     broadsheet"/>
1072     <rdfs:label rdf:datatype="&xsd:string">The Guardian</rdfs:label>
1073     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1074 </owl:NamedIndividual>
1075 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheSun -->
1076 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1077 TheSun">
1078     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1079     tabloid"/>
1080     <rdfs:label rdf:datatype="&xsd:string">The Sun</rdfs:label>
1081     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1082 </owl:NamedIndividual>
1083 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheTimes -->
1084 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1085 TheTimes">
1086     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1087     broadsheet"/>
1088     <rdfs:label rdf:datatype="&xsd:string">The Times</rdfs:label>
1089     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1090 </owl:NamedIndividual>
1091 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tibbs -->
1092 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1093 Tibbs">
1094     <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat"/
1095     >
1096     <rdfs:label rdf:datatype="&xsd:string">Tibbs</rdfs:label>
1097     <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>

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1097 </owl:NamedIndividual>
1098
1099 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tom -->
1100
1101 <owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tom">
1102   <rdf:type rdf:resource="&owl;NamedIndividual"/>
1103   <rdfs:label rdf:datatype="&xsd:string">Tom</rdfs:label>
1104   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1105 </owl:Thing>
1106
1107 <!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Walt -->
1108
1109 <owl:NamedIndividual rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1110   Walt">
1111   <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#
1112     person"/>
1113   <rdfs:label rdf:datatype="&xsd:string">Walt</rdfs:label>
1114   <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
1115   <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Dewey"
1116     />
1117   <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Huey"
1118     />
1119   <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Louie"
1120     />
1121 </owl:NamedIndividual>
1122
1123 <!--
1124 //////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
1125 //
1126 // General axioms
1127 //
1128 //////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
1129 -->
1130
1131 <owl:Class>
1132   <owl:disjointWith>
1133     <owl:Class>
1134       <owl:unionOf rdf:parseType="Collection">
1135         <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/
1136           ssw/people#plant"/>
1137         <owl:Restriction>
1138           <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk
1139             /2009/07/sssw/people#part_of"/>
1140           <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
1141             /2009/07/sssw/people#plant"/>
1142         </owl:Restriction>
1143       </owl:unionOf>
1144     </owl:Class>
1145   </owl:disjointWith>
1146   <owl:unionOf rdf:parseType="Collection">
1147     <rdf:Description rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/
1148       people#animal"/>
1149     <owl:Restriction>
1150       <owl:onProperty rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/
1151         ssw/people#part_of"/>
1152       <owl:someValuesFrom rdf:resource="http://owl.cs.manchester.ac.uk
1153         /2009/07/sssw/people#animal"/>
1154     </owl:Restriction>
1155   </owl:unionOf>
1156 </owl:Class>
1157 </rdf:RDF>
1158 <!-- Generated by the OWL API (version 3.0.0.1413) http://owlapi.sourceforge.net -->

```

- Wściekła Krowa to odpowiednik Krowy, która zjada Mózgi oraz różne części Owiec. Krowa jest podklasą Wegetarianina, który jest odpowiednikiem Zwierzęcia, które nie je innych Zwierząt ani żadnych części innych Zwierząt. Owca jest podklasą Zwierzęcia, zatem mamy sprzeczność, stąd Wściekła Krowa jest zakwalifikowana jako Nic (owl:Nothing).
- Mick jest Mężczyzną, czyli odpowiednikiem Dorosłego, Osobnika Męskiego i Osoby, zatem w szczególności jest Dorosłym (klasa bardziej ogólna).
- Starsza Pani jest odpowiednikiem Osoby Starszej, Osobnika Żeńskiego i Osoby, zatem w szczególności jest Osobą Starszą (klasa bardziej ogólna).
- Kierowca Ciężarówki jest odpowiednikiem Osoby, która jeździ Ciężarówką, a Ciężarówka jest podklasą Pojazdu, zatem Kierowca Ciężarówki jest podklasą Kierowcy, tj. Osoby, która jeździ dowolnym Pojazdem.
- Pupilek jest obiektem własności „jest pupilkiem” w stosunku do jakiejś Rzeczy. Własność „posiada pupilka” jest odwrotnością „jest pupilkiem” oraz jej zakresem są Zwierzęta, zatem Pupilek jest podklasą Zwierzęcia.
- Kierowca Tira jest odpowiednikiem Osoby, która jeździ Ciężarówką i pracuje dla Firmy Przewozowej. Ciężarówka jest podklasą Pojazdu, a Kierowca to Osoba jeżdżąca Pojazdami, zatem Kierowca Tira jest podklasą Kierowcy.
- Posiadanie Zwierzęcia jest podwłasnością Lubienia. Właściciel Psa jako Osoba, która posiada Psa, jest w szczególności Miłośnikiem Psów.
- Starsza Pani jest odpowiednikiem Osoby Starszej, Osobnika Żeńskiego i Osoby. Osoba Starsza jest podklasą Dorosłego, a Kobieta to odpowiednik Dorosłego, Osobnika Żeńskiego i Osoby, stąd wynika, że Starsza Pani jest Kobieta.
- Dziecko jest odpowiednikiem Osoby i Młodzieży, zatem w szczególności jest także podklasą zarówno Osoby, jak i Młodzieży (klasy bardziej ogólne).
- Mężczyzna jest odpowiednikiem Dorosłego, Osobnika Męskiego i Osoby. Osoba Pełnoletnia to odpowiednik Dorosłego i Osoby, zatem Mężczyzna jest także Osobą Pełnoletnią.
- itd.

1.3 OWL Reasoning - Reasoners

- `pellet.sh classify semweb2012_lab4_Sikora_Kieltyka.owl results:`

```

1 owl:Thing
2   semweb2012_lab4_Sikora_Kieltyka:Artist
3   semweb2012_lab4_Sikora_Kieltyka:Author
4   semweb2012_lab4_Sikora_Kieltyka:BookGenre
5     semweb2012_lab4_Sikora_Kieltyka:FantasyBookGenre
6     semweb2012_lab4_Sikora_Kieltyka:HorrorBookGenre
7     semweb2012_lab4_Sikora_Kieltyka:SciFiBookGenre
8   semweb2012_lab4_Sikora_Kieltyka:ComputerGame
9     semweb2012_lab4_Sikora_Kieltyka:FPSComputerGame
10    semweb2012_lab4_Sikora_Kieltyka:RPGComputerGame
11    semweb2012_lab4_Sikora_Kieltyka:RTSComputerGame
12   semweb2012_lab4_Sikora_Kieltyka:Movie
13   semweb2012_lab4_Sikora_Kieltyka:MusicForm
14   semweb2012_lab4_Sikora_Kieltyka:MusicGenre
15     semweb2012_lab4_Sikora_Kieltyka:BaroqueMusicGenre
16   semweb2012_lab4_Sikora_Kieltyka:MusicInstrument
17     semweb2012_lab4_Sikora_Kieltyka:GuitarInstrument
18       semweb2012_lab4_Sikora_Kieltyka:AcousticGuitarInstrument
19       semweb2012_lab4_Sikora_Kieltyka:ClassicGuitarInstrument
20       semweb2012_lab4_Sikora_Kieltyka:ElectricGuitarInstrument

```



```

21     semweb2012_lab4_Sikora_Kieltyka:OrganInstrument
22     semweb2012_lab4_Sikora_Kieltyka:PianoInstrument
23     semweb2012_lab4_Sikora_Kieltyka:Music
24     semweb2012_lab4_Sikora_Kieltyka:ACapellaMusic
25         semweb2012_lab4_Sikora_Kieltyka:GregorianChoral
26         semweb2012_lab4_Sikora_Kieltyka:JewishCantillation
27         semweb2012_lab4_Sikora_Kieltyka:MuslimAnaseheed
28     semweb2012_lab4_Sikora_Kieltyka:Publisher
29     semweb2012_lab4_Sikora_Kieltyka:ACapellaMixMusicCD =
        semweb2012_lab4_Sikora_Kieltyka:ACapellaMusicCD =
        semweb2012_lab4_Sikora_Kieltyka:BaroqueOrganMusicCD =
        semweb2012_lab4_Sikora_Kieltyka:Book = semweb2012_lab4_Sikora_Kieltyka:
        ClassicalMusicCD = semweb2012_lab4_Sikora_Kieltyka:FantasyBook =
        semweb2012_lab4_Sikora_Kieltyka:GuitarMusicCD =
        semweb2012_lab4_Sikora_Kieltyka:HorrorBook = semweb2012_lab4_Sikora_Kieltyka:
        JazzMusicCD = semweb2012_lab4_Sikora_Kieltyka:JimiHendrixMusicCD =
        semweb2012_lab4_Sikora_Kieltyka:MetalMusicCD = semweb2012_lab4_Sikora_Kieltyka
        :MusicCD = semweb2012_lab4_Sikora_Kieltyka:PolishMusicCD =
        semweb2012_lab4_Sikora_Kieltyka:ProgressiveRockMusicCD =
        semweb2012_lab4_Sikora_Kieltyka:RiversideBandMusicCD =
        semweb2012_lab4_Sikora_Kieltyka:RockMusicCD = semweb2012_lab4_Sikora_Kieltyka:
        SciFiBook = owl:Nothing

```

• pellet.sh classify people+pets.owl results:

```

1 owl:Thing
2     people:adult
3         people:elderly
4             old:lady
5         people:grownup
6             people:driver
7                 bus:driver
8                 truck:driver
9                 lorry:driver
10                van:driver
11                    van0:man
12                people:man
13                    van0:man
14                people:woman
15                    old:lady
16     people:animal
17         people:cat
18         people:dog
19         people:duck
20         people:person
21             cat:liker
22                 cat:owner
23                     old:lady
24             dog:liker
25                 dog:owner
26         people:grownup
27             people:driver
28                 bus:driver
29                 truck:driver
30                 lorry:driver
31                 van:driver
32                     van0:man
33             people:man
34                 van0:man
35             people:woman
36                 old:lady
37         people:kid
38         pet:owner
39             animal:lover
40             cat:owner
41                 old:lady

```

```

42         dog:owner
43     people:pet
44     people:tiger
45     people:vegetarian
46         people:cow
47         people:giraffe
48         people:sheep
49     people:bone
50     people:brain
51     people:company
52         bus:company
53         haulage:company
54     people:female
55         people:woman
56         old:lady
57     haulage:worker
58         truck:driver
59     people:leaf
60     people:male
61         people:man
62         van0:man
63     people:plant
64         people:grass
65         people:tree
66     people:publication
67         people:magazine
68         people:newspaper
69         people:broadsheet
70             quality:broadsheet
71         people:tabloid
72             red:top
73     people:vehicle
74         people:bicycle
75         people:bus
76         people:car
77         people:lorry
78         people:truck
79         people:van
80     white:thing
81     people:young
82         people:kid
83     mad:cow = owl:Nothing

```

- All inconsistencies of the example ontologies:
Przełądarka OwlSight nie jest dostępna i wykonanie ćwiczenia było niemożliwe.
- How could one repair the ontologies?
Przełądarka OwlSight nie jest dostępna i wykonanie ćwiczenia było niemożliwe.

1.4 Semantic Web Rule Languages

Aplikacja do tworzenia drzew genealogicznych wraz z możliwością eksportu danych do plików napisanych w języku Prolog (oraz importu danych z takich plików, o ile byłyby zgodne z przyjętym zestawem reguł).

1.5 Mapping ontologies with SWRL Rules

Pomimo wykonania mapowania zgodnie z instrukcjami na wiki przedmiotu, wygenerowanie podglądu reguł SWRL nie było możliwe (aplikacja zgłaszała błąd w grafie, jednak nie było wiadome, o co dokładnie chodzi). Poniżej znajduje się treść utworzonego pliku *.sng.

```

1 <project>
2   <prefix label="rdf" namespaceUri="http://www.w3.org/1999/02/22-rdf-syntax-ns#" />
3   <prefix label="rdfs" namespaceUri="http://www.w3.org/2000/01/rdf-schema#" />
4   <prefix label="owl" namespaceUri="http://www.w3.org/2002/07/owl#" />

```

```

5 <prefix label="xsd" namespaceUri="http://www.w3.org/2001/XMLSchema#" />
6 <prefix label="ns0" namespaceUri="http://cohse.semanticweb.org/ontologies/people#" />
7 <prefix label="daml" namespaceUri="http://www.daml.org/2001/03/daml+oil#" />
8 <prefix label="dc" namespaceUri="http://purl.org/dc/elements/1.1/" />
9 <prefix label="wot" namespaceUri="http://xmlns.com/wot/0.1/" />
10 <prefix label="foaf" namespaceUri="http://xmlns.com/foaf/0.1/" />
11 <prefix label="vs" namespaceUri="http://www.w3.org/2003/06/sw-vocab-status/ns#" />
12 <ontologyGroup name="From Ontology" >
13   <url>http://www.cs.man.ac.uk/~horrocks/ISWC2003/Tutorial/people+pets.owl.rdf</url>
14 </ontologyGroup>
15 <ontologyGroup name="To Ontology" >
16   <url>http://xmlns.com/foaf/spec/index.rdf</url>
17 </ontologyGroup>
18 <rule label="Rule 1" >
19   <canvas>
20     <noloc>
21     </noloc>
22     <body>
23       <node id="1" type="snoggle.gui.model.node.VariableNode" x="101.0" y="63.0" h="
24         35.0" w="120.0">
25         <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
26           dataValued="false" />
27         <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
28           element_order="10" />
29         <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
30           location="BODY" />
31         <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
32           autogen="true" varname="person1" locked="false" />
33         <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp" <<Class
34           name="http://cohse.semanticweb.org/ontologies/people#person" />>/
35           Property>
36       </node>
37       <node id="2" type="snoggle.gui.model.node.VariableNode" x="98.0" y="384.0" h="
38         35.0" w="120.0">
39         <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
40           dataValued="false" />
41         <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
42           element_order="10" />
43         <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
44           location="BODY" />
45         <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
46           autogen="false" varname="var1" locked="false" />
47         <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp" <</
48           Property>
49       </node>
50       <node id="3" type="snoggle.gui.model.node.VariableNode" x="99.0" y="250.0" h="
51         35.0" w="120.0">
52         <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
53           dataValued="false" />
54         <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
55           element_order="10" />
56         <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
57           location="BODY" />
58         <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
59           autogen="true" varname="elderly1" locked="false" />
60         <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp" <<Class
61           name="http://cohse.semanticweb.org/ontologies/people#elderly" />>/
62           Property>
63       </node>
64     </body>
65   </canvas>
66 </rule>

```

```

49     element_order="10" />
50     <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
51       location="HEAD" />
52     <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
53       autogen="false" varname="var1" locked="false" />
54     <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"></
55       Property>
56   </node>
57   <node id="5" type="snoggle.gui.model.node.VariableNode" x="366.0" y="62.0" h="
58     35.0" w="120.0">
59     <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
60       dataValued="false" />
61     <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
62       element_order="10" />
63     <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
64       location="HEAD" />
65     <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
66       autogen="true" varname="http://xmlns.com/foaf/0.1/Person1" locked="true"
67       lockedName="person1" />
68     <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"><Class
69       name="http://xmlns.com/foaf/0.1/Person" /></Property>
70   </node>
71   <node id="6" type="snoggle.gui.model.node.VariableNode" x="368.0" y="381.0" h="
72     35.0" w="120.0">
73     <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
74       dataValued="true" />
75     <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
76       element_order="10" />
77     <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
78       location="HEAD" />
79     <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
80       autogen="false" varname="PetLady" locked="false" />
81     <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"></
82       Property>
83   </node>
84   <node id="7" type="snoggle.gui.model.node.VariableNode" x="369.0" y="252.0" h="
85     35.0" w="120.0">
86     <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
87       dataValued="false" />
88     <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
89       element_order="10" />
90     <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
91       location="HEAD" />
92     <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
93       autogen="true" varname="http://xmlns.com/foaf/0.1/Person2" locked="true"
94       lockedName="elderly1" />
95     <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"><Class
96       name="http://xmlns.com/foaf/0.1/Person" /></Property>
97   </node>
98   <node id="8" type="snoggle.gui.model.node.LiteralNode" x="369.0" y="155.0" h="
99     35.0" w="120.0">
100    <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
101      location="HEAD" />
102    <Property type="snoggle.gui.widgets.canvas.persistence.LiteralProp" dataType
103      ="string" >Female</Property>
104  </node>
105 </head>
106 <edges>
107   <edge from="7" to="8" type="snoggle.gui.model.edge.SnoggleEdge" >
108     <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
109       edgeType="PROPERTY" />
110     <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
111       element_order="10" />
112     <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty" uri="
113       http://xmlns.com/foaf/0.1/gender" />
114     <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"

```

```

      propertyType="DATA_VALUED" />
85 </edge>
86 <edge from="3" to="7" type="snoggle.gui.model.edge.SnoggleEdge" >
87   <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
      edgeType="CROSS_RULE_MAP" />
88   <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
      propertyType="REFERENCE" />
89 </edge>
90 <edge from="7" to="4" type="snoggle.gui.model.edge.SnoggleEdge" >
91   <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
      edgeType="PROPERTY" />
92   <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty" uri="
      http://xmlns.com/foaf/0.1/interest" />
93   <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
      propertyType="REFERENCE" />
94 </edge>
95 <edge from="1" to="5" type="snoggle.gui.model.edge.SnoggleEdge" >
96   <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
      edgeType="CROSS_RULE_MAP" />
97   <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
      propertyType="REFERENCE" />
98 </edge>
99 <edge from="7" to="6" type="snoggle.gui.model.edge.SnoggleEdge" >
100   <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
      edgeType="PROPERTY" />
101   <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
      element_order="10" />
102   <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty" uri="
      http://xmlns.com/foaf/0.1/nick" />
103   <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
      propertyType="DATA_VALUED" />
104 </edge>
105 <edge from="3" to="2" type="snoggle.gui.model.edge.SnoggleEdge" >
106   <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
      edgeType="PROPERTY" />
107   <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty" uri="
      http://cohse.semanticweb.org/ontologies/people#has_pet" />
108   <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
      propertyType="REFERENCE" />
109 </edge>
110 </edges>
111 </canvas>
112 </rule>
113 </project>

```