

Lab 5: Reasoning

1. OWL Reasoning – Class Inference

```
<?xml version="1.0"?>
<!DOCTYPE rdf:RDF [
  <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
  <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
  <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
  <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
]>
<rdf:RDF xmlns="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#"
  xml:base="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:owl="http://www.w3.org/2002/07/owl#"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
  <owl:Ontology rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3"/>
  <!--
  ////////////////////////////////////////////////////
  //
  // Object Properties
  //
  ////////////////////////////////////////////////////
  -->
  <!-- http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#drives
  -->

  <owl:ObjectProperty
rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#drives"/>
  <!--
  ////////////////////////////////////////////////////
  //
  // Classes
  //
  ////////////////////////////////////////////////////
  -->
  <!-- http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#bus -->
```

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    <owl:Class rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#bus">
      <rdfs:subClassOf
rdf:resource="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#vehicle"/>
    </owl:Class>

    <!-- http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#bus_driver -->

    <owl:Class rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#bus_driver">
      <owl:equivalentClass>
        <owl:Class>
          <owl:intersectionOf rdf:parseType="Collection">
            <rdf:Description
rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#person"/>
              <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#drives"/>
                  <owl:someValuesFrom
rdf:resource="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#bus"/>
                </owl:Restriction>
              </owl:intersectionOf>
            </owl:Class>
          </owl:equivalentClass>
        </owl:Class>

    <!-- http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#driver -->

    <owl:Class rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#driver">
      <owl:equivalentClass>
        <owl:Class>
          <owl:intersectionOf rdf:parseType="Collection">
            <rdf:Description
rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#person"/>
              <owl:Restriction>
                <owl:onProperty
rdf:resource="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#drives"/>
                  <owl:someValuesFrom
rdf:resource="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#vehicle"/>
                </owl:Restriction>
              </owl:intersectionOf>
            </owl:Class>
          </owl:equivalentClass>
        </owl:Class>

```

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        </owl:intersectionOf>
    </owl:Class>
    </owl:equivalentClass>
</owl:Class>

<!-- http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#person
-->

    <owl:Class rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#person"/>

    <!-- http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#vehicle
-->

    <owl:Class rdf:about="http://www.semanticweb.org/artnowo/ontologies/2012/5/untitled-ontology-3#vehicle"/>
</rdf:RDF>

```

Zdefiniowałem klasę kierowcy jako coś, co jest osobą i prowadzi jakiś pojazd, klasę autobusu jako podklasę pojazdu, a klasę kierowcy autobusu jako coś, co jest osobą i prowadzi jakiś autobus. Program wywnioskował, że kierowca autobusu jest podklasą kierowcy.

2. OWL Reasoning – Instance Inferences

```

<?xml version="1.0"?>

<!DOCTYPE rdf:RDF [
    <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
    <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
    <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
    <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
]>

<rdf:RDF xmlns="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#"
    xml:base="http://owl.cs.manchester.ac.uk/2009/07/sssw/people"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
    <owl:Ontology rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people"/>

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

```

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////////////////////////////////////
-->
<!--
////////////////////////////////////
//
// Datatypes
//
////////////////////////////////////
-->
<!--
////////////////////////////////////
//
// Object Properties
//
////////////////////////////////////
-->
<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives">
  <rdfs:label rdf:datatype="&xsd:string">drives</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eaten_by -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eaten_by">
  <rdfs:label rdf:datatype="&xsd:string">eaten_by</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats">
  <rdfs:label rdf:datatype="&xsd:string">eats</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  <rdfs:domain
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
  <owl:inverseOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eaten_by"/>
  </owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_child -->

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<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_child">
  <rdfs:label rdf:datatype="xsd:string">has_child</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_father -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_father">
  <rdfs:label rdf:datatype="xsd:string">has_father</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
  <rdfs:subPropertyOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_parent"/>
  <rdfs:range rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#man"/>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_mother -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_mother">
  <rdfs:label rdf:datatype="xsd:string">has_mother</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
  <rdfs:subPropertyOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_parent"/>
  <rdfs:range
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#woman"/>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_parent -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_parent">
  <rdfs:label rdf:datatype="xsd:string">has_parent</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_part -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_part">
  <rdfs:label rdf:datatype="xsd:string">has_part</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
  <owl:inverseOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of"/>
</owl:ObjectProperty>

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<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet">
  <rdfs:label rdf:datatype="&xsd:string">has_pet</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string">Anyone that has a pet must like that
pet.</rdfs:comment>
  <rdfs:range
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
  <owl:inverseOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#is_pet_of"/>
  <rdfs:subPropertyOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#likes"/>
  <rdfs:domain
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#is_pet_of -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#is_pet_of">
  <rdfs:label rdf:datatype="&xsd:string">is_pet_of</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#likes -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#likes">
  <rdfs:label rdf:datatype="&xsd:string">likes</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of">
  <rdfs:label rdf:datatype="&xsd:string">part_of</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#reads -->

<owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#reads">
  <rdfs:label rdf:datatype="&xsd:string">reads</rdfs:label>

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    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
    <rdfs:range
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#publication"/>
    </owl:ObjectProperty>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#works_for -->

    <owl:ObjectProperty
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#works_for">
        <rdfs:label rdf:datatype="&xsd:string">works_for</rdfs:label>
        <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
    </owl:ObjectProperty>
<!--
////////////////////////////////////
//
// Classes
//
////////////////////////////////////
-->
<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#adult -->

    <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#adult">
        <rdfs:label rdf:datatype="&xsd:string">adult</rdfs:label>
        <owl:disjointWith
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#young"/>
        <rdfs:comment rdf:datatype="&xsd:string">Things that are adult.</rdfs:comment>
    </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal -->

    <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal">
        <rdfs:label rdf:datatype="&xsd:string">animal</rdfs:label>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats"/>
                <owl:someValuesFrom rdf:resource="&owl;Thing"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
    </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal_lover -->

    <owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal_lover">

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<rdfs:label rdf:datatype="xsd:string">animal lover</rdfs:label>
<owl:equivalentClass>
  <owl:Class>
    <owl:intersectionOf rdf:parseType="Collection">
      <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet"/>
        <owl:minCardinality
rdf:datatype="xsd:nonNegativeInteger">3</owl:minCardinality>
      </owl:Restriction>
    </owl:intersectionOf>
  </owl:Class>
</owl:equivalentClass>
  <rdfs:comment rdf:datatype="xsd:string">Someone who really likes
animals</rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bicycle -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bicycle">
  <rdfs:label rdf:datatype="xsd:string">bicycle</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle"/>
  <rdfs:comment rdf:datatype="xsd:string">A human propelled vehicle, with two
wheels</rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bone -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bone">
  <rdfs:label rdf:datatype="xsd:string">bone</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#brain -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#brain">
  <rdfs:label rdf:datatype="xsd:string">brain</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#broadsheet -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#broadsheet">

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    <rdfs:label rdfs:datatype="xsd:string">broadsheet</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#newspaper"/>
    <owl:disjointWith
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tabloid"/>
    <rdfs:comment rdfs:datatype="xsd:string">A newspaper. Broadsheets are usually
considered to be more &quot;high-brow&quot;; than tabloids.</rdfs:comment>
    </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus -->

<owl:Class rdfs:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus">
    <rdfs:label rdfs:datatype="xsd:string">bus</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle"/>
    <rdfs:comment rdfs:datatype="xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus_company -->

<owl:Class rdfs:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus_company">
    <rdfs:label rdfs:datatype="xsd:string">bus company</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#company"/>
    <rdfs:comment rdfs:datatype="xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus_driver -->

<owl:Class rdfs:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus_driver">
    <rdfs:label rdfs:datatype="xsd:string">bus driver</rdfs:label>
    <owl:equivalentClass>
        <owl:Class>
            <owl:intersectionOf rdfs:parseType="Collection">
                <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
                <owl:Restriction>
                    <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives"/>
                    <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bus"/>
                </owl:Restriction>
            </owl:intersectionOf>
        </owl:Class>
    </owl:equivalentClass>
    <rdfs:comment rdfs:datatype="xsd:string">Someone who drives a bus.</rdfs:comment>

```

```

</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#car -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#car">
  <rdfs:label rdf:datatype="&xsd:string">car</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle"/>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat">
  <rdfs:label rdf:datatype="&xsd:string">cat</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
  <owl:disjointWith
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog"/>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat_liker -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat_liker">
  <rdfs:label rdf:datatype="&xsd:string">cat liker</rdfs:label>
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdfs:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
        <owl:Restriction>
          <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#likes"/>
          <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat"/>
        </owl:Restriction>
      </owl:intersectionOf>
    </owl:Class>
  </owl:equivalentClass>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat_owner -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat_owner">

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<rdfs:label rdf:datatype="&xsd:string">cat owner</rdfs:label>
<owl:equivalentClass>
  <owl:Class>
    <owl:intersectionOf rdf:parseType="Collection">
      <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
      <owl:Restriction>
        <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet"/>
        <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat"/>
      </owl:Restriction>
    </owl:intersectionOf>
  </owl:Class>
</owl:equivalentClass>
<rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#company -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#company">
  <rdfs:label rdf:datatype="&xsd:string">company</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cow -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cow">
  <rdfs:label rdf:datatype="&xsd:string">cow</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vegetarian"/>
  <rdfs:comment rdf:datatype="&xsd:string">Cows are naturally
vegetarians.</rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog">
  <rdfs:label rdf:datatype="&xsd:string">dog</rdfs:label>
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats"/>
      <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#bone"/>
    </owl:Restriction>
  </rdfs:subClassOf>
</owl:Class>

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```

    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog_liker -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog_liker">
  <rdfs:label rdf:datatype="&xsd:string">dog liker</rdfs:label>
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
          <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#likes"/>
              <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog"/>
            </owl:Restriction>
          </owl:intersectionOf>
        </owl:Class>
      </owl:equivalentClass>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog_owner -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog_owner">
  <rdfs:label rdf:datatype="&xsd:string">dog owner</rdfs:label>
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
          <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet"/>
              <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog"/>
            </owl:Restriction>
          </owl:intersectionOf>
        </owl:Class>
      </owl:equivalentClass>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  </owl:Class>

```

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<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#driver -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#driver">
  <rdfs:label rdf:datatype="&xsd:string">driver</rdfs:label>
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdfs:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
          <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives"/>
              <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle"/>
                </owl:Restriction>
              </owl:intersectionOf>
            </owl:Class>
          </owl:equivalentClass>
        <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#adult"/>
          <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
        </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck">
  <rdfs:label rdf:datatype="&xsd:string">duck</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#elderly -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#elderly">
  <rdfs:label rdf:datatype="&xsd:string">elderly</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#adult"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#female -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#female">
  <rdfs:label rdf:datatype="&xsd:string">female</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>

```

```

</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#giraffe -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#giraffe">
  <rdfs:label rdf:datatype="&xsd:string">giraffe</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats"/>
      <owl:allValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#leaf"/>
    </owl:Restriction>
  </rdfs:subClassOf>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grass -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grass">
  <rdfs:label rdf:datatype="&xsd:string">grass</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#plant"/>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grownup -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grownup">
  <rdfs:label rdf:datatype="&xsd:string">grownup</rdfs:label>
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#adult"/>
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
      </owl:intersectionOf>
    </owl:Class>
  </owl:equivalentClass>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_company -->

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```

    <owl:Class
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_company">
      <rdfs:label rdf:datatype="xsd:string">haulage company</rdfs:label>
      <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#company"/>
      <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
    </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_truck_driver -->

    <owl:Class
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_truck_driver">
      <rdfs:label rdf:datatype="xsd:string">haulage truck driver</rdfs:label>
      <owl:equivalentClass>
        <owl:Class>
          <owl:intersectionOf rdf:parseType="Collection">
            <rdfs:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
            <owl:Restriction>
              <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives"/>
              <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#truck"/>
            </owl:Restriction>
            <owl:Restriction>
              <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#works_for"/>
              <owl:someValuesFrom>
                <owl:Restriction>
                  <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of"/>
                  <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_company"/>
                </owl:Restriction>
              </owl:someValuesFrom>
            </owl:Restriction>
          </owl:intersectionOf>
        </owl:Class>
      </owl:equivalentClass>
      <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
    </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_worker -->

    <owl:Class
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_worker">

```

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<rdfs:label rdf:datatype="&xsd:string">haulage worker</rdfs:label>
<owl:equivalentClass>
  <owl:Restriction>
    <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#works_for"/>
    <owl:someValuesFrom>
      <owl:Class>
        <owl:unionOf rdf:parseType="Collection">
          <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_company"/>
          <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of"/>
            <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#haulage_company"/>
            </owl:Restriction>
          </owl:unionOf>
        </owl:Class>
      </owl:someValuesFrom>
    </owl:Restriction>
  </owl:equivalentClass>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#kid -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#kid">
  <rdfs:label rdf:datatype="&xsd:string">kid</rdfs:label>
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#young"/>
      </owl:intersectionOf>
    </owl:Class>
  </owl:equivalentClass>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#leaf -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#leaf">
  <rdfs:label rdf:datatype="&xsd:string">leaf</rdfs:label>
  <rdfs:subClassOf>

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        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of"/>
            <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tree"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#lorry -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#lorry">
    <rdfs:label rdf:datatype="&xsd:string">lorry</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#lorry_driver -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#lorry_driver">
    <rdfs:label rdf:datatype="&xsd:string">lorry driver</rdfs:label>
    <owl:equivalentClass>
        <owl:Class>
            <owl:intersectionOf rdf:parseType="Collection">
                <rdfs:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
                <owl:Restriction>
                    <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives"/>
                    <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#lorry"/>
                </owl:Restriction>
            </owl:intersectionOf>
        </owl:Class>
    </owl:equivalentClass>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#mad_cow -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#mad_cow">
    <rdfs:label rdf:datatype="&xsd:string">mad cow</rdfs:label>
    <owl:equivalentClass>
        <owl:Class>

```

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    <owl:intersectionOf rdf:parseType="Collection">
      <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cow"/>
        <owl:Restriction>
          <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats"/>
            <owl:someValuesFrom>
              <owl:Class>
                <owl:intersectionOf rdf:parseType="Collection">
                  <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#brain"/>
                    <owl:Restriction>
                      <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of"/>
                        <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#sheep"/>
                          </owl:Restriction>
                        </owl:intersectionOf>
                      </owl:Class>
                    </owl:someValuesFrom>
                  </owl:Restriction>
                </owl:intersectionOf>
              </owl:Class>
            </owl:equivalentClass>
          <rdfs:comment rdf:datatype="&xsd:string">A mad cow is a cow that has been eating
the brains of sheep.</rdfs:comment>
        </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#magazine -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#magazine">
  <rdfs:label rdf:datatype="&xsd:string">magazine</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#publication"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#male -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#male">
  <rdfs:label rdf:datatype="&xsd:string">male</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string">The class of all male
things.</rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#man -->

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```

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sss/people#man">
  <rdfs:label rdf:datatype="xsd:string">man</rdfs:label>
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sss/people#adult"/>
          <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sss/people#male"/>
            <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sss/people#person"/>
              </owl:intersectionOf>
            </owl:Class>
          </owl:equivalentClass>
        <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
      </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sss/people#newspaper -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sss/people#newspaper">
  <rdfs:label rdf:datatype="xsd:string">newspaper</rdfs:label>
  <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sss/people#publication"/>
  <rdfs:subClassOf>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sss/people#broadsheet"/>
          <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sss/people#tabloid"/>
            </owl:unionOf>
          </owl:Class>
        </rdfs:subClassOf>
      <rdfs:comment rdf:datatype="xsd:string">All newspapers are either broadsheets or
tabloids.</rdfs:comment>
    </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sss/people#old_lady -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sss/people#old_lady">
  <rdfs:label rdf:datatype="xsd:string">old_lady</rdfs:label>
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdf:Description

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rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#elderly"/>
    <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#female"/>
    <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
    </owl:intersectionOf>
    </owl:Class>
</owl:equivalentClass>
<rdfs:subClassOf>
    <owl:Class>
        <owl:intersectionOf rdf:parseType="Collection">
            <owl:Restriction>
                <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet"/>
                <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
                </owl:Restriction>
                <owl:Restriction>
                    <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet"/>
                    <owl:allValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat"/>
                    </owl:Restriction>
                </owl:intersectionOf>
            </owl:Class>
        </rdfs:subClassOf>
        <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
    </owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person">
    <rdfs:label rdf:datatype="&xsd:string">person</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#pet -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#pet">
    <rdfs:label rdf:datatype="&xsd:string">pet</rdfs:label>
    <owl:equivalentClass>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#is_pet_of"/>

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        <owl:someValuesFrom rdf:resource="&owl;Thing"/>
    </owl:Restriction>
</owl:equivalentClass>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#pet_owner -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#pet_owner">
    <rdfs:label rdf:datatype="&xsd:string">pet owner</rdfs:label>
    <owl:equivalentClass>
        <owl:Class>
            <owl:intersectionOf rdf:parseType="Collection">
                <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
                <owl:Restriction>
                    <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet"/>
                    <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
                </owl:Restriction>
            </owl:intersectionOf>
        </owl:Class>
    </owl:equivalentClass>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#plant -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#plant">
    <rdfs:label rdf:datatype="&xsd:string">plant</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#publication -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#publication">
    <rdfs:label rdf:datatype="&xsd:string">publication</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#quality_broadsheet -->

<owl:Class
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#quality_broadsheet">

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    <rdfs:label rdf:datatype="&xsd:string">quality broadsheet</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#broadsheet"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#red_top -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#red_top">
    <rdfs:label rdf:datatype="&xsd:string">red top</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tabloid"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#sheep -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#sheep">
    <rdfs:label rdf:datatype="&xsd:string">sheep</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
    <rdfs:subClassOf>
        <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats"/>
            <owl:allValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#grass"/>
        </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tabloid -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tabloid">
    <rdfs:label rdf:datatype="&xsd:string">tabloid</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#newspaper"/>
    <rdfs:comment rdf:datatype="&xsd:string">A newspaper. Tabloids are usually thought
of as more &quot;down-market&quot; than broadsheets.</rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tiger -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tiger">
    <rdfs:label rdf:datatype="&xsd:string">tiger</rdfs:label>

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    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tree -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tree">
    <rdfs:label rdf:datatype="&xsd:string">tree</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#plant"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#truck -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#truck">
    <rdfs:label rdf:datatype="&xsd:string">truck</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van">
    <rdfs:label rdf:datatype="&xsd:string">van</rdfs:label>
    <rdfs:subClassOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle"/>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van_driver -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van_driver">
    <rdfs:label rdf:datatype="&xsd:string">van driver</rdfs:label>
    <owl:equivalentClass>
        <owl:Class>
            <owl:intersectionOf rdf:parseType="Collection">
                <rdfs:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
                <owl:Restriction>
                    <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives"/>
                    <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van"/>

```

```

        </owl:Restriction>
    </owl:intersectionOf>
</owl:Class>
</owl:equivalentClass>
<rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vegetarian -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vegetarian">
    <rdfs:label rdf:datatype="&xsd:string">vegetarian</rdfs:label>
    <owl:equivalentClass>
        <owl:Class>
            <owl:intersectionOf rdf:parseType="Collection">
                <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
                <owl:Restriction>
                    <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats"/>
                    <owl:allValuesFrom>
                        <owl:Class>
                            <owl:complementOf
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
                            </owl:Class>
                        </owl:allValuesFrom>
                    </owl:Restriction>
                    <owl:Restriction>
                        <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#eats"/>
                        <owl:allValuesFrom>
                            <owl:Class>
                                <owl:complementOf>
                                    <owl:Restriction>
                                        <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of"/>
                                        <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
                                        </owl:Restriction>
                                    </owl:complementOf>
                                </owl:Class>
                            </owl:allValuesFrom>
                        </owl:Restriction>
                    </owl:intersectionOf>
                </owl:Class>
            </owl:equivalentClass>
            <rdfs:comment rdf:datatype="&xsd:string">A vegetarian is defined as an animal that

```



```

eats no other animals, or parts of animals.</rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#vehicle">
  <rdfs:label rdf:datatype="xsd:string">vehicle</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#white_thing -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#white_thing">
  <rdfs:label rdf:datatype="xsd:string">white thing</rdfs:label>
  <rdfs:comment rdf:datatype="xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#white_van_man -->

<owl:Class
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#white_van_man">
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#man"/>
          <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#drives"/>
              <owl:someValuesFrom>
                <owl:Class>
                  <owl:intersectionOf rdf:parseType="Collection">
                    <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van"/>
                      <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#white_thing"/>
                        </owl:intersectionOf>
                      </owl:Class>
                    </owl:someValuesFrom>
                  </owl:Restriction>
                </owl:intersectionOf>
              </owl:Class>
            </owl:equivalentClass>
          <rdfs:subClassOf>
            <owl:Restriction>

```

```

        <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#reads"/>
        <owl:allValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tabloid"/>
        </owl:Restriction>
    </rdfs:subClassOf>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#woman -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#woman">
    <rdfs:label rdf:datatype="&xsd:string">woman</rdfs:label>
    <owl:equivalentClass>
        <owl:Class>
            <owl:intersectionOf rdf:parseType="Collection">
                <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#adult"/>
                <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#female"/>
                <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
            </owl:intersectionOf>
        </owl:Class>
    </owl:equivalentClass>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#young -->

<owl:Class rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#young">
    <rdfs:label rdf:datatype="&xsd:string">young</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Class>

<!-- http://www.w3.org/2002/07/owl#Thing -->

<owl:Class rdf:about="&owl;Thing"/>

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

```

```

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Daily_Mirror -->

<owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Daily_Mirror">
  <rdf:type rdf:resource="&owl;NamedIndividual"/>
</owl:Thing>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Dewey -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Dewey">
  <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck"/>
  <rdfs:label rdf:datatype="&xsd:string">Dewey</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fido -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fido">
  <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog"/>
  <rdfs:label rdf:datatype="&xsd:string">Fido</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Flossie -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Flossie">
  <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cow"/>
  <rdfs:label rdf:datatype="&xsd:string">Flossie</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fluffy -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fluffy">
  <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tiger"/>
  <rdfs:label rdf:datatype="&xsd:string">Fluffy</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fred -->

<owl:NamedIndividual

```

```

rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fred">
  <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
  <rdfs:label rdf:datatype="&xsd:string">Fred</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tibbs"/>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Huey -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Huey">
  <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck"/>
  <rdfs:label rdf:datatype="&xsd:string">Huey</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Joe -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Joe">
  <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
  <rdf:type>
    <owl:Restriction>
      <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#has_pet"/>
      <owl:maxCardinality
rdf:datatype="&xsd:nonNegativeInteger">1</owl:maxCardinality>
    </owl:Restriction>
  </rdf:type>
  <rdfs:label rdf:datatype="&xsd:string">Joe</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fido"/>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Kevin -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Kevin">
  <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
  <rdfs:label rdf:datatype="&xsd:string">Kevin</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  <has_pet
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Flossie"/>
  <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Fluffy"/>

```

```

</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Louie -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Louie">
  <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#duck"/>
  <rdfs:label rdf:datatype="&xsd:string">Louie</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Mick -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Mick">
  <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#male"/>
  <reads
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Daily_Mirror"/>
  <drives rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Q123ABC"/>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Minnie -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Minnie">
  <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#elderly"/>
  <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#female"/>
  <rdfs:label rdf:datatype="&xsd:string">Minnie</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
  <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tom"/>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Pete -->

<owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Pete">
  <rdf:type rdf:resource="&owl;NamedIndividual"/>
  <rdfs:label rdf:datatype="&xsd:string">Pete</rdfs:label>
  <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Thing>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Q123ABC -->

<owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Q123ABC">

```

```

    <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#van"/>
    <rdfs:label rdf:datatype="&xsd:string">Q123 ABC</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string">A white van</rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Rex -->

    <owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Rex">
    <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#dog"/>
    <rdfs:label rdf:datatype="&xsd:string">Rex</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Spike -->

<owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Spike">
    <rdf:type rdf:resource="&owl;NamedIndividual"/>
    <rdfs:label rdf:datatype="&xsd:string">Spike</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
    <is_pet_of rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Pete"/>
</owl:Thing>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheGuardian -->

    <owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheGuardian">
    <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#broadsheet"/>
    <rdfs:label rdf:datatype="&xsd:string">The Guardian</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheSun -->

    <owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheSun">
    <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#tabloid"/>
    <rdfs:label rdf:datatype="&xsd:string">The Sun</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheTimes -->

```

```

    <owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#TheTimes">
    <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#broadsheet"/>
    <rdfs:label rdf:datatype="&xsd:string">The Times</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tibbs -->

    <owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tibbs">
    <rdf:type rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#cat"/>
    <rdfs:label rdf:datatype="&xsd:string">Tibbs</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:NamedIndividual>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tom -->

<owl:Thing rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Tom">
    <rdf:type rdf:resource="&owl;NamedIndividual"/>
    <rdfs:label rdf:datatype="&xsd:string">Tom</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
</owl:Thing>

<!-- http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Walt -->

    <owl:NamedIndividual
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Walt">
    <rdf:type
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#person"/>
    <rdfs:label rdf:datatype="&xsd:string">Walt</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd:string"></rdfs:comment>
    <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Dewey"/>
    <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Huey"/>
    <has_pet rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#Louie"/>
</owl:NamedIndividual>

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

```

```

<owl:Class>
  <owl:disjointWith>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#plant"/>
          <owl:Restriction>
            <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of"/>
              <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#plant"/>
                </owl:Restriction>
              </owl:unionOf>
            </owl:Class>
          </owl:disjointWith>
        <owl:unionOf rdf:parseType="Collection">
          <rdf:Description
rdf:about="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
            <owl:Restriction>
              <owl:onProperty
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#part_of"/>
                <owl:someValuesFrom
rdf:resource="http://owl.cs.manchester.ac.uk/2009/07/sssw/people#animal"/>
                  </owl:Restriction>
                </owl:unionOf>
              </owl:Class>
            </rdf:RDF>

```

Wnioski (wybrane) płynące z podanej ontologii:

- Kierowca Autobusu to Osoba, która prowadzi jakiś Autobus. Jest podklasą Kierowcy, zatem jest też Osobą, czyli szczególną podklasą Zwierzęcia, prowadzącą jakiś Pojazd. Kierowca Autobusu ze Zwierzęcia dziedziczy to, że może jeść jakieś Rzeczy.
- Facet Z Białego Dostawczaka to Mężczyzna, który prowadzi coś, co jest jednocześnie Vanem i Białą Rzeczą. Oprócz tego, Facet z Białego Dostawczaka czyta tylko Tabloid i jest szczególną klasą Kierowcy Vana.
- Właściciel Pupilka to Osoba, która ma pupilka, a rzeczony Pupilka jest Zwierzęciem.
- Właściciel Kota to ktoś, kto lubi Koty i jednocześnie ma Pupilka, który jest Kotem.
- Szczególnym przypadkiem Właściciela Kota jest Starsza Dama, czyli Osoba, która jest Właścicielem Kota, nie ma innych Pupilków oraz jest dojrzała i jest kobietą.
- Kaczka jest podklasą Zwierzęcia.
- Trawa jest podklasą Rośliny.
- Mózg jest podklasą Rzeczy.

3. OWL Reasoning – Reasoners

```
$ ./pellet.sh consistency semweb2012_lab4_nowosielski.owl
```


Consistent: Yes

```
$ ./pellet.sh classify semweb2012_lab4_nowosielski.owl
```

Classifying 45 elements

Classifying: 100% complete in 00:00

Classifying finished in 00:00

owl:Thing

- ontology1337775027627:Artist

- ontology1337775027627:Book

- ontology1337775027627:ComputerGame

- ontology1337775027627:Movie

- ontology1337775027627:MusicCD

 - ontology1337775027627:ACappellaMusicCD

 - ontology1337775027627:ACappellaMixMusicCD

 - ontology1337775027627:BaroqueOrganMusicCD

 - ontology1337775027627:ClassicalMusicCD

 - ontology1337775027627:DubstepMusicCD

 - ontology1337775027627:FolkMusicCD

 - ontology1337775027627:FolkMetalMusicCD

 - ontology1337775027627:GuitarMusicCD

 - ontology1337775027627:JimiHendrixMusicCD

 - ontology1337775027627:JazzMusicCD

 - ontology1337775027627:MetalMusicCD

 - ontology1337775027627:FolkMetalMusicCD

 - ontology1337775027627:PolishMusicCD

 - ontology1337775027627:RiversideBandMusicCD

 - ontology1337775027627:ReggaeMusicCD

 - ontology1337775027627:RockMusicCD

 - ontology1337775027627:HardRockMusicCD

 - ontology1337775027627:ProgressiveRockMusicCD

 - ontology1337775027627:RiversideBandMusicCD

 - ontology1337775027627:SoftRockMusicCD

- ontology1337775027627:MusicGenre

 - ontology1337775027627:BaroqueMusicGenre

 - ontology1337775027627:FolkMusicGenre

 - ontology1337775027627:MetalMusicGenre

 - ontology1337775027627:ReggaeMusicGenre

 - ontology1337775027627:RockMusicGenre

- ontology1337775027627:MusicInstrument

 - ontology1337775027627:Drums

 - ontology1337775027627:Guitar

 - ontology1337775027627:AcousticGuitar

 - ontology1337775027627:ClassicGuitar

```
ontology1337775027627:ElectricGuitar
ontology1337775027627:Organ
ontology1337775027627:BaroqueOrgan
ontology1337775027627:Music
ontology1337775027627:ACappellaMusic
ontology1337775027627:GregorianChoral
ontology1337775027627:JewishCantillation
ontology1337775027627:MuslimAnaseheed
ontology1337775027627:InstrumentalMusic
```

```
$ ./pellet.sh consistency examples/data/people+pets.owl
```

```
Consistent: Yes
```

```
$ ./pellet.sh classify examples/data/people+pets.owl
```

```
Classifying 61 elements
```

```
Classifying: 100% complete in 00:00
```

```
Classifying finished in 00:00
```

```
owl:Thing
```

```
people:adult
```

```
people:elderly
```

```
old:lady
```

```
people:grownup
```

```
people:driver
```

```
bus:driver
```

```
truck:driver
```

```
lorry:driver
```

```
van:driver
```

```
van0:man
```

```
people:man
```

```
van0:man
```

```
people:woman
```

```
old:lady
```

```
people:animal
```

```
people:cat
```

```
people:dog
```

```
people:duck
```

```
people:person
```

```
cat:liker
```

```
cat:owner
```

```
old:lady
```

```
dog:liker
```

```
dog:owner
```

```
people:grownup
```

people:driver
 bus:driver
 truck:driver
 lorry:driver
 van:driver
 van0:man
people:man
 van0:man
people:woman
 old:lady
people:kid
pet:owner
 animal:lover
 cat:owner
 old:lady
 dog:owner
people:pet
people:tiger
people:vegetarian
 people:cow
 people:giraffe
 people:sheep
people:bone
people:brain
people:company
 bus:company
 haulage:company
people:female
 people:woman
 old:lady
haulage:worker
 truck:driver
people:leaf
people:male
 people:man
 van0:man
people:plant
 people:grass
 people:tree
people:publication
 people:magazine
 people:newspaper
 people:broadsheet

```

    quality:broadsheet
    people:tabloid
    red:top
people:vehicle
    people:bicycle
    people:bus
    people:car
    people:lorry
    people:truck
    people:van
white:thing
    people:young
    people:kid
mad:cow = owl:Nothing
$

```

Aplikacja OWLSight nie działa, co uniemożliwia wykonanie pozostałych zadań.

4. Semantic Web Rule Languages

Aplikacja wykorzystująca taki zestaw reguł mogłaby wspomagać rozmieszczanie gości na miejscach przy stołach w trakcie dużych imprez rodzinnych. Po wczytaniu ontologii opisującej poszczególnych członków rodziny oraz relacje między nimi i reguł usadzania gości (wynikających np. z przyjętego w danej kulturze obyczaju oraz dodatkowych reguł podanych przez użytkownika wynikających np. z poglądów politycznych lub zaszłości historycznych) aplikacja mogłaby automatycznie rozmieścić gości przy stołach minimalizując np. ryzyko powstania awantury.

5. Mapping ontologies with SWRL Rules

Niestety nie udało się wygenerować podglądu:

```
ERROR [AWT-EventQueue-0] (Application.java:433) - Can not preview the canvas because the graph contains an error
```

```
955972 [AWT-EventQueue-0] ERROR snoggle.gui.Application - Can not preview the canvas because the graph contains an error
```

Zawartość pliku .sng wygenerowanego przez aplikację:

```

<project>
<prefix label="rdf" namespaceUri="http://www.w3.org/1999/02/22-rdf-syntax-ns#" />
<prefix label="rdfs" namespaceUri="http://www.w3.org/2000/01/rdf-schema#" />
<prefix label="owl" namespaceUri="http://www.w3.org/2002/07/owl#" />
<prefix label="xsd" namespaceUri="http://www.w3.org/2001/XMLSchema#" />
<prefix label="ns0" namespaceUri="http://cohse.semanticweb.org/ontologies/people#" />
<prefix label="daml" namespaceUri="http://www.daml.org/2001/03/daml+oil#" />
<prefix label="dc" namespaceUri="http://purl.org/dc/elements/1.1/" />
<prefix label="wot" namespaceUri="http://xmlns.com/wot/0.1/" />
<prefix label="foaf" namespaceUri="http://xmlns.com/foaf/0.1/" />
<prefix label="vs" namespaceUri="http://www.w3.org/2003/06/sw-vocab-status/ns#" />
<ontologyGroup name="From Ontology" >

```

```

    <url>file:///home/artnowo/Pobrane/pellet-2.3.0/examples/data/people+pets.owl</url>
</ontologyGroup>
<ontologyGroup name="To Ontology" >
    <url>http://xmlns.com/foaf/spec/index.rdf</url></ontologyGroup><rule label="Rule 1" >
<canvas>
<noloc>
</noloc>
<body>
    <node id="1" type="snoggle.gui.model.node.VariableNode" x="55.0" y="473.0" h="35.0"
w="120.0">
        <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"></Property>
        <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
element_order="10" />
        <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
location="BODY" />
        <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
autogen="false" varname="var1" locked="false" />
        <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
dataValued="false" />
    </node>
    <node id="2" type="snoggle.gui.model.node.VariableNode" x="47.0" y="351.0" h="35.0"
w="120.0">
        <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"><Class
name="http://cohse.semanticweb.org/ontologies/people#elderly" /></Property>
        <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
element_order="10" />
        <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
location="BODY" />
        <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
autogen="true" varname="elderly1" locked="false" />
        <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
dataValued="false" />
    </node>
    <node id="3" type="snoggle.gui.model.node.VariableNode" x="52.0" y="64.0" h="35.0"
w="120.0">
        <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"><Class
name="http://cohse.semanticweb.org/ontologies/people#person" /></Property>
        <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
location="BODY" />
        <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
autogen="true" varname="person2" locked="false" />
        <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
dataValued="false" />
    </node>
</body>
<head>
    <node id="4" type="snoggle.gui.model.node.VariableNode" x="498.0" y="182.0" h="35.0"
w="120.0">
        <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"></Property>
        <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"

```

```

element_order="10" />
    <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
location="HEAD" />
    <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
autogen="false" varname="var1" locked="false" />
    <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
dataValued="false" />
</node>
<node id="5" type="snoggle.gui.model.node.VariableNode" x="540.0" y="61.0" h="35.0"
w="120.0">
    <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"><Class
name="http://xmlns.com/foaf/0.1/Person" /></Property>
    <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
element_order="10" />
    <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
location="HEAD" />
    <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
autogen="true" varname="http://xmlns.com/foaf/0.1/Person2" locked="true"
lockedName="person2" />
    <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
dataValued="false" />
</node>
<node id="6" type="snoggle.gui.model.node.VariableNode" x="520.0" y="323.0" h="35.0"
w="120.0">
    <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"><Class
name="http://xmlns.com/foaf/0.1/Person" /></Property>
    <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
element_order="10" />
    <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
location="HEAD" />
    <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
autogen="true" varname="http://xmlns.com/foaf/0.1/Person3" locked="true"
lockedName="elderly1" />
    <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
dataValued="false" />
</node>
<node id="7" type="snoggle.gui.model.node.VariableNode" x="529.0" y="458.0" h="35.0"
w="120.0">
    <Property type="snoggle.gui.widgets.canvas.persistence.ClassTypeProp"></Property>
    <Property type="snoggle.gui.widgets.canvas.persistence.ElementOrderProp"
element_order="10" />
    <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
location="HEAD" />
    <Property type="snoggle.gui.widgets.canvas.persistence.VariableNameProp"
autogen="false" varname="PetLady" locked="false" />
    <Property type="snoggle.gui.widgets.canvas.persistence.VariableTypeProp"
dataValued="true" />
</node>
<node id="8" type="snoggle.gui.model.node.LiteralNode" x="379.0" y="505.0" h="35.0"
w="120.0">
    <Property type="snoggle.gui.widgets.canvas.persistence.LiteralProp" dataType="string"
>Female</Property>

```

```

    <Property type="snoggle.gui.widgets.canvas.persistence.AtomLocationProp"
location="HEAD" />
  </node>
</head>
<edges>
  <edge from="6" to="4" type="snoggle.gui.model.edge.SnoggleEdge" >
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
edgeType="PROPERTY" />
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty"
uri="http://xmlns.com/foaf/0.1/interest" />
    <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
propertyType="REFERENCE" />
  </edge>
  <edge from="2" to="6" type="snoggle.gui.model.edge.SnoggleEdge" >
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
edgeType="CROSS_RULE_MAP" />
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty" uri="null" />
    <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
propertyType="REFERENCE" />
  </edge>
  <edge from="3" to="5" type="snoggle.gui.model.edge.SnoggleEdge" >
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
edgeType="CROSS_RULE_MAP" />
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty" uri="null" />
    <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
propertyType="REFERENCE" />
  </edge>
  <edge from="6" to="7" type="snoggle.gui.model.edge.SnoggleEdge" >
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
edgeType="PROPERTY" />
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty"
uri="http://xmlns.com/foaf/0.1/nick" />
    <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
propertyType="DATA_VALUED" />
  </edge>
  <edge from="2" to="1" type="snoggle.gui.model.edge.SnoggleEdge" >
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
edgeType="PROPERTY" />
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty"
uri="http://cohse.semanticweb.org/ontologies/people#has_part" />
    <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
propertyType="REFERENCE" />
  </edge>
  <edge from="6" to="8" type="snoggle.gui.model.edge.SnoggleEdge" >
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeTypeProp"
edgeType="PROPERTY" />
    <Property type="snoggle.gui.widgets.canvas.persistence.EdgeProperty"
uri="http://xmlns.com/foaf/0.1/gender" />
    <Property type="snoggle.gui.widgets.canvas.persistence.PropertyTypeProp"
propertyType="DATA_VALUED" />

```

```
</edge>  
</edges>  
</canvas>  
</rule>  
</project>
```