ONTOLOGY ANALYSIS PROJECT

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1. Axioms

The two ontologies in my project are
`http://colore.oor.net/bipartite_incidence/graphical_incidence.clif`
and
`http://colore.oor.net/bipartite_incidence/point_line.clif`
The Prover9 translations of the ontologies are in the files *graphical_incidence.in* and *point_line.in*.

2. Consistency

Each of the ontologies is consistent, since we are able to construct models for them using Mace4.

A model for *graphical_incidence.in* can be found in *graphical_incidence.model*, and a model for *point_line.in* can be found in *point_line.in*.

The two ontologies are mutually consistent; a model of the union of the two ontologies can be found in *combined_ontology.model*.

3. Entailment

Neither ontology entails the other, since we can construct models of one ontology that falsify the other ontology.

*nonentail*1.*model* is a model of *graphical_incidence.in* that falsifies the axiom

```
(all x all y
        ((line(x)
        & line(y)
        & (x != y))
        ->
        (exists z
                (point(z)
                & in(z,x)
                & -in(z,y)))))).
```

in *point_line.in*. (The input file is *nonentail1.in*).

On the other hand, *nonentail2.model* is a model of *point_line.in* that falsifies the axiom in *graphical_incidence.in*. (The input file is *nonentail2.in*)

```
(all x all y all z all l
        ((point(x)
        & point(y)
        & point(z)
```

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```
        & line(l)
        & in(x,l)
        & in(y,l)
        & in(z,l))
        ->
        ((z = x) | (z = y) | (x = y)))).
```

The axioms which are entailed by both ontologies can be found in *similarity.in*. Most of the axioms are common, but one additional axiom of *graphical_incidence.in* is also entailed by *point_line.in*:

```
(all l
        (line(l)
        ->
        (exists p
                (point(p)
                & in(p,l)))))).
```

The proof of this is found in *ontology2_entails_axiom06.proof* (The input file is *ontology2_entails_axiom06.in*).

4. Complete Listing of Files