IN4060 - Oblig 4

1 Entailment

1.1

Yes, with the following derivation:

1. sim:Marge fam:hasSpouse sim:Homer – P
2. fam:hasSpouse rdfs:domain foaf:Person – P
3. sim:Marge rdf:type foaf:Person – rdfs2, 1,2

1.2

Yes, this is true because it is specified in the family.ttl in Exercise 1.7.

1.3

No, this cannot be proven.

We can derive using rdfs2 that sim:Marge is a foaf:Person, but we cannot say that sim:Marge is a fam:Woman because she is a foaf:Person.

1.4

Yes, with the derivation:

1. fam:hasBrother rdfs:range fam:Man – P
2. _:2 fam:hasBrother sim:Herb – P
3. sim:Herb rdf:type fam:Man – rdfs3, 1,2

1.5

Yes, with the derivation:

1. fam:hasFather rdfs:subPropertyOf fam:isRelativeOf – P
2. sim:Lisa fam:hasFather sim:homer – P
3. sim:Lisa fam:isRelativeOf sim:Homer – rdfs7, 1,2

1.6

No, this cannot be proven.

This is because there is no rule that can be applied where a conclusion of Lisa having Marge as mother can be met.

It can be believed that blank node 1 represents Marge and Lisa has Parent blank node 1, but this never specifies either if it is Lisa's mother or if it is actually Marge.

1.7

Yes, with the derivation:

1. fam:hasSister rdf:range fam:Woman – P
2. _:1 fam:hasSister sim:Patty – P
3. sim:Patty rdf:type fam:Woman – rdfs3, 1,2
4. fam:Woman rdfs:subClassOf foaf:Person – P
5. sim:Patty rdf:type foaf:Person – rdfs9, 4,3

1.8

Yes, with the derivation:

1. sim:Lisa fam:hasParent _:1 - P
2. _:1 fam:hasSister sim:Patty - P
3. _:a fam:hasParent _:1 - se2 on 1, _:a for sim:Lisa
4. _:a fam:hasParent _:b - se1 on 3, _:b for _:1
5. _:b fam:hasSister sim:Patty - se2 on 2, _:b for _:1

1.9

No, this cannot be proven.

It states that there exists a person (_:d) who has two different brothers, (_:e) and (_:f).

We only know one person with a brother (_:2), but (_:2) has only one brother (sim:Herb), and therefore it cannot be proven.