Exercises for
Knowledge Representation for the Semantic Web

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Exercise 3.1 Translate the following axioms into RDF Turtle syntax.

1. Person ⊑ ¬Movie
2. Mother ⊑ Woman ⊓ ∃hasChild.⊤
3. GrandParent ⊑ ∃hasChild.∃hasChild.⊤
4. PersonCommittingSuicide ⊑ ∃kills.Self
5. Fictitions ⊓ Animal ⊑ ⊥

Exercise 3.2 Consider the knowledge base consisting of the axioms A ⊑ B ⊓ C and C ⊑ D. Show by using the tableaux algorithm that A ⊑ D is a logical consequence of this knowledge base.

Exercise 3.3 Consider the knowledge base consisting of the two axioms Homo ⊑ Primate and ∃speaksWith.⊤ ⊑ Homo. Show by using the tableaux algorithm that ∃speaksWith.⊤ ⊑ Primate is a logical consequence of this knowledge base.

Exercise 3.4 Consider the knowledge base consisting of the three axioms Unicorn ⊑ Animal, Unicorn ⊑ Fictitious and Fictitions ⊓ Animal ⊑ ⊥. Show by using the tableaux algorithm that this knowledge base is satisfiable.

Exercise 3.5 Consider the knowledge base consisting of the five axioms RRated ⊑ CatMovie, CatMovie ⊑ Movie, RRated ≡ (∃hasScript.ThrillerScript) ⊓ (∀hasViolenceLevel.High), Person ⊑ ¬Movie and ∃hasViolenceLevel.⊤ ⊑ Movie.

Show by using the tableaux algorithm that Person ⊑ ⊥ is a logical consequence of this knowledge base.