

Exercise 1

Our ontology O consists of two axioms:

- `ClassAssertion(ex:Manager ex:Mackenzie)`
- `ObjectPropertyAssertion(ex:manages ex:Mackenzie ex:NBDD)`

- a) Write down an interpretation that satisfies O (is a model of O).
- b) Write down an interpretation that does not satisfy O .

Solution 1a

Vocabulary $V = \{\text{Mackenzie, NBDD, Manager, manages}\}$

Domain $D = \{a,b,c\}$

Interpretation function:

$\text{Mackenzie}^I = a$

$\text{NBDD}^I = c$

$\text{Manager}^I = \{a,b\}$

$\text{manages}^I = \{(a,c),(b,c)\}$

Solution 1b

Vocabulary $V = \{\text{Mackenzie, NBDD, Manager, manages}\}$

Domain $D = \{a,b,c\}$

Interpretation function:

$\text{Mackenzie}^I = a$

$\text{NBDD}^I = c$

$\text{Manager}^I = \{a,b\}$

$\text{manages}^I = \{(b,c)\}$

Exercise 2

An ontology O consists of the following axioms:

- $\text{SubClassOf}(\text{ex:SpaceSuit } \text{ex:Product})$
- $\text{SubClassOf}(\text{ex:SpaceAccessory } \text{ex:Product})$

Is the following interpretation I a model of O or not?

$$D = \{a,b,c,d,e\}$$

$$\text{SpaceSuite}^I = \{a,b,c\}$$

$$\text{SpaceAccessory}^I = \{b,c,d\}$$

$$\text{Product}^I = \{a,c,d\}$$

If not, how could you change I so that it satisfies O ?

Solution 2

I is not a model of O because

- SpaceSuite^I is not a subset of Product^I
- SpaceAccessory^I is not a subset of Product^I

I could be changed to become a model of I for instance by adding „b“ to the interpretation of Product:

$$\text{Product}^I = \{a,b,c,d\}$$