



7th Theoretical Assignment in Artificial Intelligence (SS 2005) Solutions

Exercise 7.1:

30 P

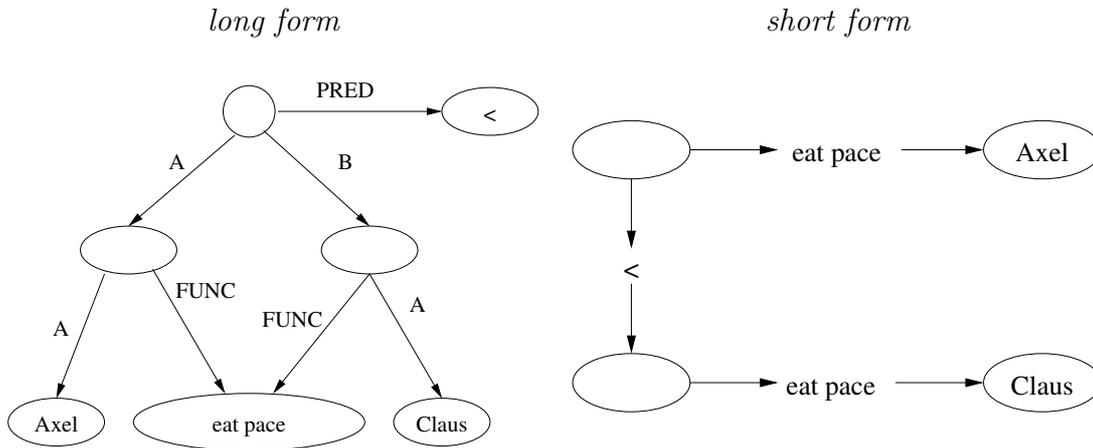
Express the following expressions as semantic nets

1. in long form (15 P)
2. and in short form (15 P)
 - Axel eats more slowly than Claus.
 - For a member of the VSE group, Axel eats slowly, but not for a member of the Omega group.
 - It is hardly to be assumed that Claus will ever eat as slowly as Axel.

Solution:

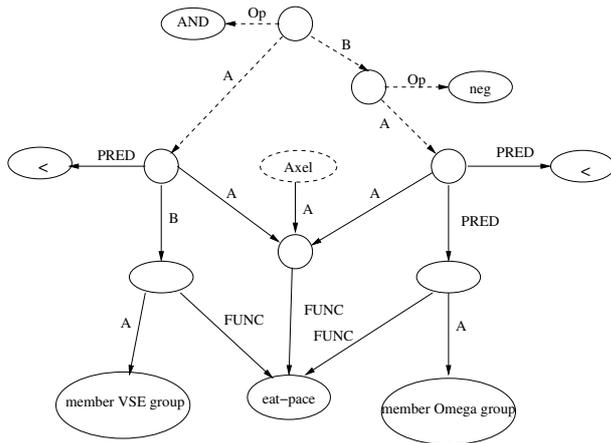
Propositional nodes are illustrated as circle, conceptual nodes as ovals

- “Axel eats more slowly than Claus.”

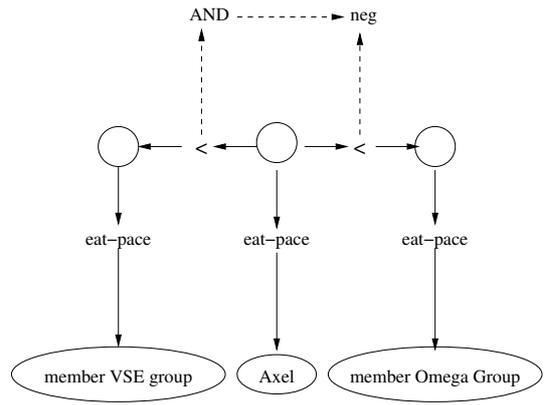


- “For a member of the VSE group, Axel eats slowly, but not for a member of the Omega group.”

long form

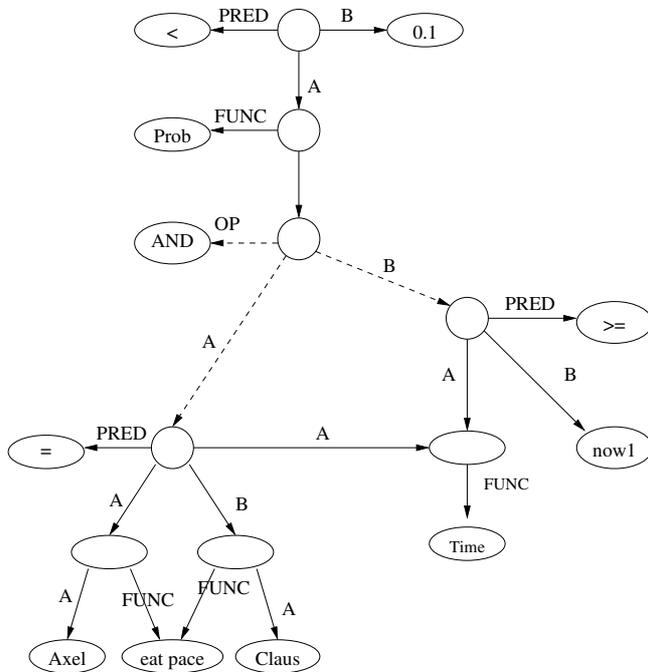


short form

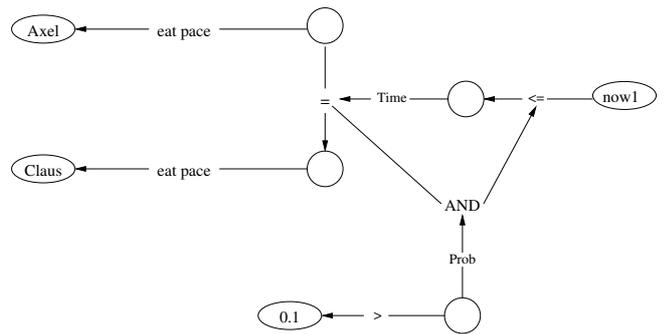


- “It is hardly to be assumed that Claus will ever eat as slowly as Axel.”

long form



short form



In this context, “hardly” is relatively fuzzy and is illustrated with probability 0.1, “ever” describes a relation of time.

Exercise 7.2:

50 P

Express the following information

1. in an appropriate logic, (10 P)
2. as a semantic net, (20 P)
3. and as frames: (20 P)

$$\begin{array}{c}
 \left[\begin{array}{l} I_2 \\ \text{Type} \quad : \text{Implication} \\ \text{Precondition} : c \\ \text{Conclusion} \quad : z \end{array} \right] \\
 \\
 \left[\begin{array}{l} c \\ \text{Type} \quad : \text{Conjunction} \\ \text{Conjunct}_1 : x' \\ \text{Conjunct}_2 : y \\ \text{Conjunct}_3 : d_2 \end{array} \right] \left[\begin{array}{l} x' \\ \text{Action} : \text{disallow} \\ \text{Agent} : u \\ \text{Object} : y \end{array} \right] \left[\begin{array}{l} y \\ \text{Agent} : v \end{array} \right] \left[\begin{array}{l} d_2 \\ \text{Type} \quad : \text{dependency} \\ \text{Subject} : v \\ \text{Ruler} \quad : u \end{array} \right] \\
 \\
 \left[\begin{array}{l} z \\ \text{Action} : \text{punish} \\ \text{Agent} : u \\ \text{Object} : v \end{array} \right]
 \end{array}$$

Exercise 7.3:

20 P

The following statements are given:

- a house is a (kind of) building
- a house has at least 1 storey (the number of storeys of a house is 1 or more)
- a house is used for living in
- a single-storey dwelling is a (kind of) house
- a single-storey dwelling has 1 storey
- my house is an instance of a single-storey dwelling
- my house has its roof colour red
- my house has its walls made of brick

Express these statements in a semantic net.

Solution:

