

Exercises for FFL, Fall 2014, sheet 9

Return Wednesday Nov 12, in class.

Exercise 1. Let $S = \{<\}$, where $<$ is a binary relation symbol. Characterize in plain English the class of all S -structures \mathcal{A} which are models of

$$\varphi = \forall x_1 \forall x_2 \forall x_3 (((\neg x_1 = x_2 \wedge \neg x_2 = x_3) \wedge \neg x_1 = x_3) \wedge x_1 < x_2 \wedge x_2 < x_3) \rightarrow \neg x_3 < x_1)$$

and give two concrete S -structures, one of which is a model of φ and the other isn't. Present your structures (i) in an intuitive graph-like representation, (ii) formally as sets. How many non-isomorphic models does φ have? [Two S -structures $(A, <^A)$ and $(B, <^B)$ are called *isomorphic* if there is a bijective map $\beta: A \rightarrow B$ such that $a <^A a'$ iff $\beta(a) <^B \beta(a')$.]