



Theoretical Foundations of the UML SS 2016

— Series 9 —

Hand in until July 14 before the exercise class.

Exercise 1 (New Logical Conjunctions)

(1+2 Points)

1. Express the logical conjunction \leftrightarrow of local formulas with semantics

$$M, e \models \varphi_1 \leftrightarrow \varphi_2 \quad \text{iff} \quad M, e \models \varphi_1 \quad \text{if and only if} \quad M, e \models \varphi_2$$

in terms of a pure local formula, i.e. not using derived operators.

2. Express the fact that “all backward paths satisfying α reach an event satisfying φ and at least one such backward path exists” as a pure local formula.

Exercise 2 (Closure of PDL under Negation)

(1 Points)

Prove that PDL is closed under negation.

Exercise 3 (Modeling with Formulas)

(1+1+2+2 Points)

Express the properties on Slide 5 from the lecture as PDL formulas.