Universität Koblenz-Landau

FB 4 Informatik

Prof. Dr. Viorica Sofronie-Stokkermans   **January, 22 2019**

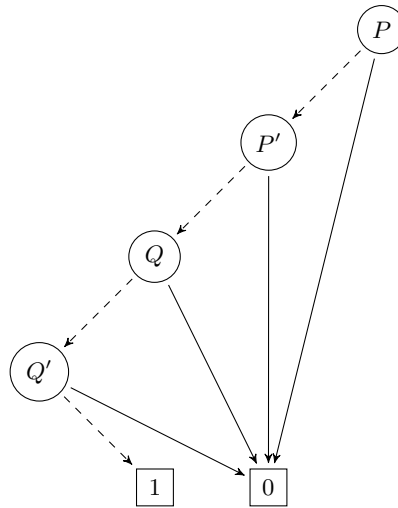<div align="center">

Exercises for "Formal Specification and Verification"
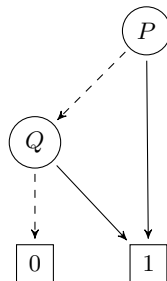**Exercise sheet 12**

</div>

Exercise 12.1:

Let $\Pi = \{P, Q\}$ be a set of propositional variables and let $T = (S, \rightarrow, L)$ be a transition system with a finite state of states S and labelling function L.

Assume that the transition relation of the transition system is described by the following OBDD $B_{\rightarrow}$

and the set X of states is described by the following OBDD B_X:

The dotted lines are marked with 0 and the solid lines are marked with 1.

Compute the OBDD for $Pre_{\exists}(X)$. Briefly explain the steps in your computation.

Exercise 12.2:

Show that the following formulae are valid in propositional dynamic logic (i.e. true in all PDL Kripke models) :

(1) $[\alpha](A \wedge B) \leftrightarrow [\alpha]A \wedge [\alpha]B$

(2) $[\alpha; \beta]A \leftrightarrow [\alpha][\beta]A$

(3) $[\alpha \cup \beta]A \leftrightarrow [\alpha]A \wedge [\beta]A$

(4) $[A?]B \leftrightarrow (A \rightarrow B)$

(5) $[\alpha^*]A \leftrightarrow A \wedge [\alpha][\alpha^*]A$

(6) $[\alpha^*](A \rightarrow [\alpha]A) \rightarrow (A \rightarrow [\alpha^*]A)$

Please submit your solution until Sunday, January 27, 2019 at 20:00. Please do not forget to write your name on your solution.

Submission possibilities:

- By e-mail to `sofronie@uni-koblenz.de` with the keyword "Homework FSV" in the subject.

- Drop it in the box in front of Room B224.