

Exercise 4

To be returned on Monday, May 24, 2004

Assignment 4.1

Find 2-literal invariants for the problem instance $\langle P, I, O, G \rangle$ where

1. $P = \{a, b, c\}$,
2. $I \models a \wedge b \wedge c$,
3. $O = \{o_1, o_2, o_3\}$ where
 - (a) $o_1 = \langle c, \neg b \wedge \neg c \rangle$
 - (b) $o_2 = \langle a \wedge \neg c, \neg a \wedge b \rangle$
 - (c) $o_3 = \langle \neg a, a \wedge c \rangle$
4. $G = a \vee b \vee c$.

Use the algorithm presented in the lecture. Explain which calls to the procedure *simplepreserved* are made (it suffices to consider only those calls that correspond to applicable operators.)

Assignment 4.2

Construct, by using existential abstraction, the formula that represents the product of the 4×4 matrices represented by the following formulae.

$$\begin{aligned}\phi_1 &= A \leftrightarrow A' \\ \phi_2 &= (\neg A \leftrightarrow A') \wedge (\neg B \leftrightarrow B')\end{aligned}$$

Also give the matrices in the conventional tabular form.

*You may work on these assignments and submit your results **in groups of two students**. Make sure to clearly indicate both names on your work. **You may write your answers in English or German.***