

Homework Assignment #1

Note

This assignment is due 2:20PM Wednesday, September 25, 2019. Please write or type your answers on A4 (or similar size) paper. Late submission will be penalized by 20% for each working day overdue. You may discuss the problems with others, but copying answers is strictly forbidden.

Problems

- (50 points) Give a first-order representation of the following concurrent program.

$$P = m : \mathbf{cobegin} P_0 \parallel P_1 \mathbf{coend} m'$$

$P_0 =$ $l_0 : \mathbf{while} \textit{true} \mathbf{do}$ $T_0: Q_0 := \textit{true};$ $W_0: \mathbf{wait} \neg Q_1;$ $C_0: Q_0 := \textit{false};$ $\mathbf{od};$ l'_0	$P_1 =$ $l_1 : \mathbf{while} \textit{true} \mathbf{do}$ $T_1: Q_1 := \textit{true};$ $W_1: \mathbf{wait} \neg Q_0;$ $C_1: Q_1 := \textit{false};$ $\mathbf{od};$ l'_1
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- (50 points) Consider again the program in the previous problem. Give a Kripke structure, in the form of a diagram, representing the program. You may assume that the initial values of Q_0 and Q_1 are both *false*. You may also omit states that are not reachable.