

Concurrency theory

Exercise sheet 12

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Due: January 30

Submit your solutions until Tuesday, January 30, during the lecture.

This is the final exercise sheet.

Exercise 1: The one and only

Consider again the following program.

$\ell_1 : h \leftarrow \text{mem}[g]; \text{goto } \ell_2$	$\ell_9 : h \leftarrow \text{mem}[g]; \text{goto } \ell_{10}$
$\ell_2 : \text{mem}[g] \leftarrow h + 1; \text{goto } \ell_3$	$\ell_{10} : \text{mem}[g] \leftarrow h + 1; \text{goto } \ell_{11}$
$\ell_3 : \text{mem}[x] \leftarrow 42; \text{goto } \ell_4$	$\ell_{11} : \text{mem}[x] \leftarrow 43; \text{goto } \ell_{12}$
$\ell_4 : \text{mem}[g] \leftarrow h + 2; \text{goto } \ell_5$	$\ell_{12} : \text{mem}[g] \leftarrow h + 2;$
$\ell_5 : r \leftarrow \text{mem}[g]; \text{goto } \ell_6$	
$\ell_6 : v \leftarrow \text{mem}[x]; \text{goto } \ell_7$	
$\ell_7 : s \leftarrow \text{mem}[g]; \text{goto } \ell_8$	
$\ell_8 : \text{assert } r \neq s \vee r \text{ is odd}; \text{goto } \ell_5$	
$\ell_8 : \text{assert } r = s \wedge r \text{ is even};$	

Note that there are two instructions labeled by ℓ_8 . Assume that when executing $\text{goto } \ell_8$, the execution non-deterministically jumps to any of them.

Check whether the following attacks are feasible:

- $A_1 = (t_1, \ell_4, \ell_5)$,
- $A_2 = (t_2, \ell_{11}, \ell_6)$.