

Homework till the 31th of May

- 1 Let (D, \preceq) denote a *finite* complete partially ordered set and assume that $f : D \rightarrow D$ is monotonic. Show that f is continuous.
- 2 Find a complete partially ordered set (D, \preceq) and a function $f : D \rightarrow D$ which is monotonic but not continuous.
- 3 Calculate the final state of $\mathcal{C} \llbracket x := \mathbf{read}; \mathbf{output} \ x \rrbracket \langle 1, nil, mem \rangle$. (Note: the definition of $\mathcal{C} \llbracket x := e \rrbracket$ was updated in the script.)
- 4 Give, *without* formal calculation, the least fixed point of

$\Theta_w \mapsto \lambda \sigma. \text{let } (\mathcal{E} \llbracket x > 0 \rrbracket \sigma) \text{ be } \langle v, \sigma' \rangle \text{ in}$

$v \rightarrow \Theta_w(\mathcal{C} \llbracket y := \mathbf{read}; \mathbf{output} \ y; x := x - 1 \rrbracket \sigma'), \sigma'$