

## Tutorial 13

1. Design a polynomial algorithm that computes the simulation equivalence for finite-state processes.
2. Prove that finding the first long-step approximant of strong bisimulation ( $\sim_1^w$ ) is PSPACE-complete.
3. Define a game for two players, Prover and Spoiler, that takes as an input a process  $P$  and some modal formula  $\phi$  to check. It should work in such a way that Prover has a winning strategy iff  $P \models \phi$ .
4. Show an example of processes for which modal logic equivalence doesn't imply bisimulation equivalence.
5. Characterize simulation equivalence using modal logic.

### Homework (not mandatory)

1. Prove that finding the  $k$ -th long-step approximant of strong bisimulation ( $\sim_k^w$ ) is PSPACE-complete for  $k > 1$ .