

Tutorial 1

1. Use elementary Petri nets (EPN) to model classical concurrency problems: producer/consumer and mutual exclusion.
2. How to eliminate tight loops (i.e. situations when place and transition are connected in both ways) from a Petri net (PN)? Can every PN be transformed to a one with all arc weights equal one? In both cases discuss which properties does the transformation preserve.
3. Prove that EPNs have the same expression power as 1-bounded PNs.
4. Construct a PN that is live but not bounded.
5. Construct a PN that is bounded but not live.
6. Is deadlock-freedom monotone (i.e. if it holds for some initial configuration M then it holds for all $M' \geq M$)?

Homework (not mandatory)

1. Is liveness monotone (for general PNs)?