Tutorial 5

1. For every $m > 0$ construct a Petri net of size $O(n + m)$ that is bounded but not by a value smaller than $F_m(n)$, where

   - $F_1(n) = 2n$,
   - $F_{m+1}(n) = F_m^n(1) = F_m(F_m(\ldots (F_m(1)) \ldots))$.

2. Reachability for VASS with negative semantic belongs to NP.

3. Using the insights from the previous problem's solution present a way to check condition Θ_1: for every $m \geq 1$ there exists a run $(q, v) \dashrightarrow^* (q', v')$ using every transition $\geq m$ times.

Homework (not mandatory)

1. Structural unboundedness for general Petri nets belongs to NP.