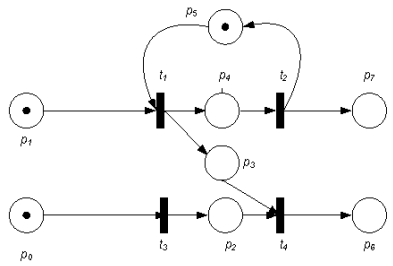
Discrete and Continuous Dynamical Systems – tutorial
Analysis of Petri net models

1 Analysis of Petri net models

Let us given the following Petri net with its graphical description



The following tasks should be carried out

1. Construct the reachability graph from the marking vector μ_0 (shown in the figure) as an initial state.

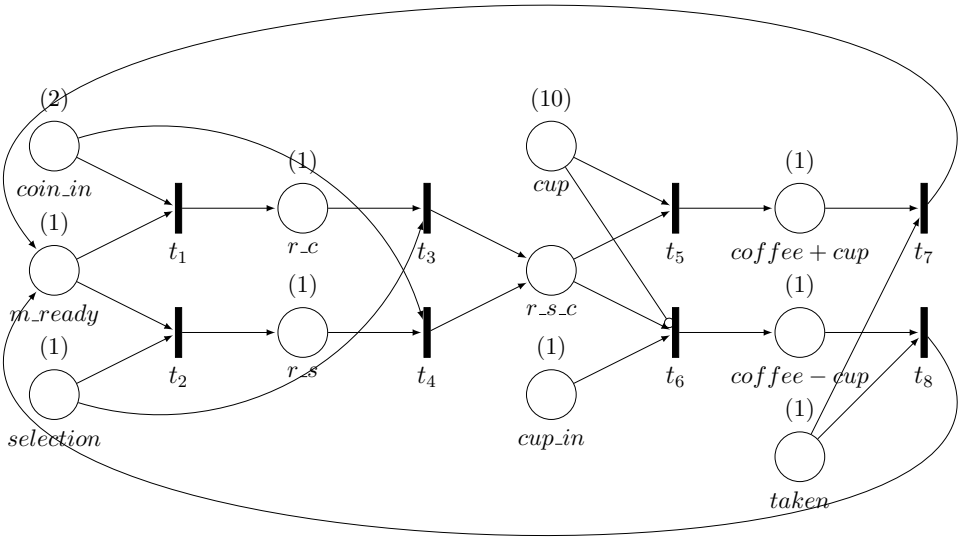
2. Determine the input and output places from the net. Consider the set of final states those states that have a token on all of their output places.

3. Answer the following questions related to the behavioural properties of the Petri net:

   - Are the final states reachable from the initial state?
   - Is there any deadlock? If yes, give the deadlock.
   - Is the Petri net bounded/safe? If yes, give the bound, if not give the non-bounded place.

2 Analysis of the Petri net model of the coffee making automaton

Consider the Petri net model of the simple coffee making automaton developed before with its meaningful initial and final states.



Check the properties of the model:

1. boundedness, conservation;
2. reachability of the final states,
3. possible deadlock states.

3 Homework:

(a) Consider the graphical description of your Petri net given by the eps file named after your Neptun ID.

   1. Construct the reachability graph from the marking vector μ_0 as an initial state.

2. Determine the input and output places from the net. Consider the set of final states those states that have a token on all of their output places.
3. Answer the following questions related to the behavioural properties of the Petri net:
   - Are the final states reachable from the initial state?
   - Is there any deadlock? If yes, give the deadlock.
   - Is the Petri net bounded/safe? If yes, give the bound, if not give the non-bounded place.

(*) **(Supplementary)**
Consider your Petri net that describes the action sequence which is necessary to operate a lift in a two-storied building with its initial states and possible final states. Check the properties of the model:

1. boundedness, conservation;
2. reachability of the final states,
3. possible deadlock states.

Deadline of submission: 2019.05.15. 8am
(Submit your homework as an email attachment (`hangos.katalin@virt.uni-pannon.hu`, subject: DCDS) in a hand written scanned pdf format! Please, write your name and neptun ID on the paper!)