# Topics in Concurrency: Problem sheet 3

Given any Petri net, there is a transition system in which states correspond to reachable markings of the net from the drawn initial marking and transitions are given by the token game.

1. Draw the transition system of the following *basic* Petri net, explicitly writing down its set of states (recall that in a basic Petri net, all conditions implicitly have capacity 1).
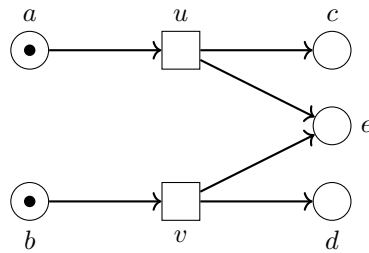


2. Draw the transition system of the following general Petri net, explicitly writing down its set of states (i.e. markings, which are multisets: these can be written as e.g. $\{x, x, y\}$ for the multiset in which $x$ occurs twice).
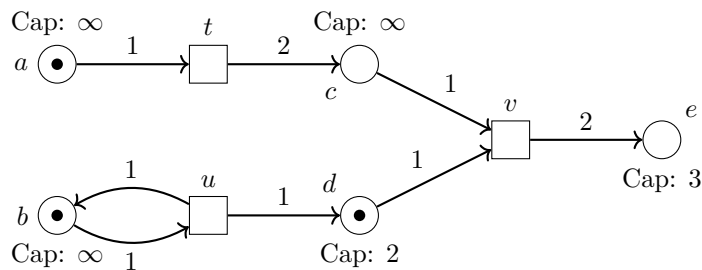


3. Why in general do we not allow the multiset of pre-conditions of any transition to be an $\infty$-multiset?

4. Draw a net *with one persistent condition* that has the following transition system (note: transitions are labelled with events that generate them, so your net must have precisely three events).

$e_3$

$e_1$ $e_2$

$e_2$ $e_3$

$e_1$

$e_2$ $e_1$

$e_3$
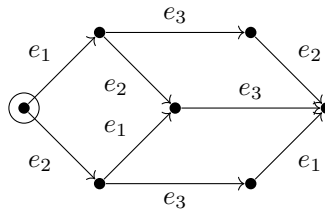
5. Attempt the following two past exam questions: 2013 Paper 8 Question 14 and 2010 Paper 8 Question 14