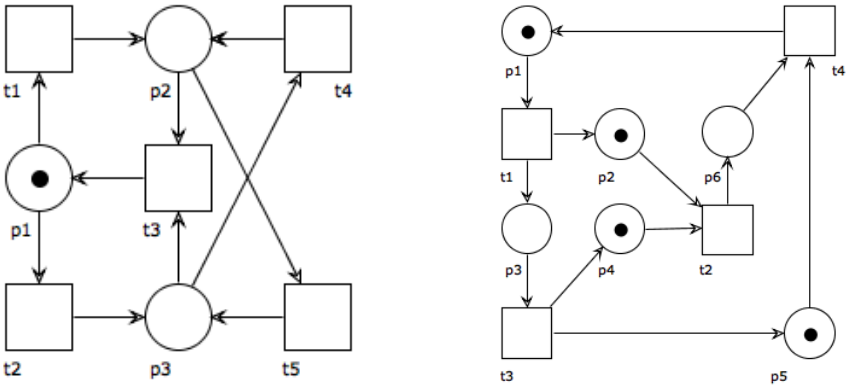
MPB 2018/19 – Oct 31, 2018



(a) $M_0 = p_1$ (b) $M_0 = p_1 + p_2 + p_4 + p_5$

Figura 1: Two net systems

[**Ex. 1**] Define the roles of a principal and a contractor. Can a principal be also a contractor?

[**Ex. 2**] What is the difference between a business process and a business process instance?

[**Ex. 3**] Consider a net system (P, T, F, M_0). Formalize the statement "*the place p_1 is not safe*".

[**Ex. 4**] Consider the system in Figure 1(a).
(i) Draw the reachability graph G.
(ii) By looking at G, is the system live? (explain)
(iii) By looking at G, is the system deadlock free? (explain)
(iv) By looking at G, is the system bounded? (explain)
(v) By looking at G, is the system safe? (explain)
(vi) By looking at G, is the system cyclic? (explain)

[**Ex. 5**] Consider the system in Fig. 1(b). Exploit the Marking Eq. Lemma:
(i) to find the marking reached after having fired the sequence

$$\sigma = t_2\ t_1\ t_4\ t_1\ t_3\ t_2\ t_4\ t_3\ t_1\ t_3;$$

(ii) to prove that the sequence

$$\sigma' = t_1\ t_2\ t_4\ t_1\ t_3\ t_2\ t_3\ t_2\ t_1$$

is not fireable from M_0.

[**Ex. 6**] Consider the system in Figure 1(b).
(i) Is it a T-system?
(ii) Find a positive S-invariant.
(iii) How many tokens can be found at most in place p_1 at any time?