

MPB 2016/17 – Nov 3, 2016

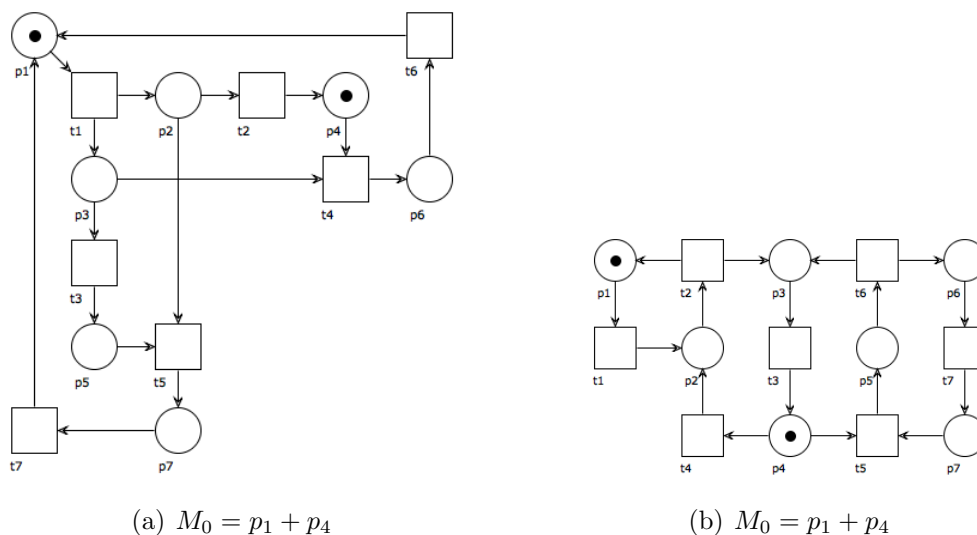


Figure 1: Two net systems

[Ex. 1] Describe the aim and role of the **Validation** activity inside the *Design & Analysis* phase of the Business Process Lifecycle.

[Ex. 2] Describe the communication protocol between service requestor, service registry and service provider in the Service-Oriented Architecture.

[Ex. 3] Give an example of business strategy.

[Ex. 4] Consider the net system in Figure 1(a).

- (i) Is it a free-choice system? (explain)
- (ii) Exhibit an S-invariant that proves the system is bounded. (explain)
- (iii) Prove that the marking $M = p_6 + p_7$ is not reachable. (explain)
- (iv) Give a firing sequence that starts in M_0 and reaches a deadlock marking.
- (v) Is the system live? (explain)

[Ex. 5] Consider the net system in Figure 1(b).

- (i) Exhibit a firing sequence that proves the system is unbounded. (explain)
- (ii) Exhibit an S-invariant that proves the system is not live. (explain)
- (iii) Exploit the Marking Equation Lemma to prove that the sequence $\sigma = t_1 t_4 t_2 t_3 t_2 t_1 t_3 t_4 t_2 t_4 t_4 t_3 t_4$ is not fireable.

[Ex. 6, **Optional**] Draw the complete reachability graph for the net system in Figure 1(a) (12 nodes, 20 arcs) and check the findings of Ex. 4 (ii-v).