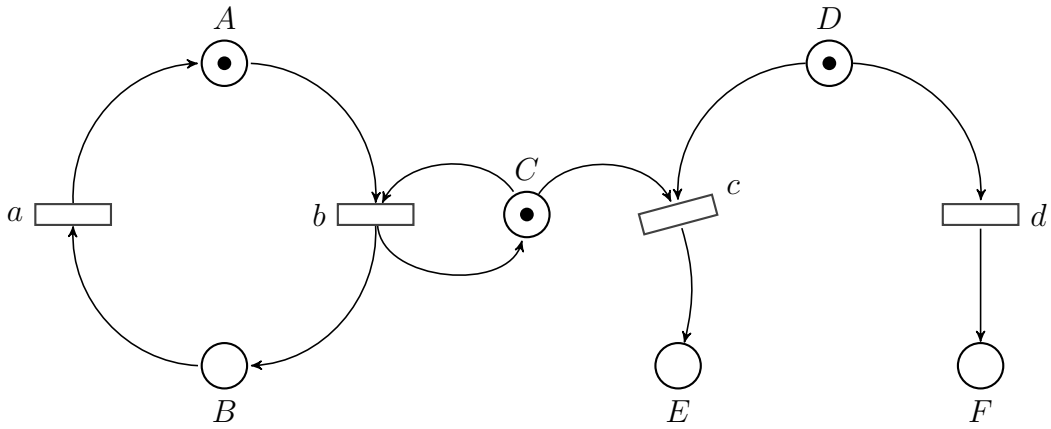
Concurrency Theory WS 2013/2014

— Series 11 —

Hand in until January 28th before the exercise class.

Exercise 1 (Distributed Runs) (1+1+1+1+1+1+1 = 7 Points)

Consider the following Petri net P:



(a) Determine the number of sequential runs and the number of distributed runs of P!

(b) Give a distributed run of P in which the transitions a, b and d occur exactly once!

(c) Does there exist a distributed run of P in which all transitions occur exactly once? Justify your answer!

(d) Is the distributed run you obtained in **(b)** a complete distributed run? If yes, justify your answer! If no, describe how you could complete it!

(e) Give a finite completed distributed run of P. Now give a completed distributed run of the distributed run you have just obtained! What do you observe?

(f) Give a branching process of P in which the transitions b, c and d occur exactly once!

(g) Compute the McMillan prefix of P!

Exercise 2 (Preservation of Approximations by Isomorphisms) (3 Points)

Let B_1, B_1', B_2 and B_2' be branching processes and let $g_i \colon B_i \to B_i'$ for $i \in 1, 2$ be an isomorphism. Furthermore let $B_1 \sqsubseteq B_2$. Prove that $B_1' \sqsubseteq B_2'$!