Prob.4.4 Find two different Petri nets where one is live and the other is not live, but their coverability graphs are the same. Your nets must be different from those given in the text. [Wang]

Prob.4.5 For the net shown in Fig.2.4, find the A and B_f matrices. Verify Theorem 4.1 with a reachable marking, $M_{d1} = (0\ 0\ 0\ 0\ 1)^T$, and verify Corollary 4.1 with an unreachable marking, $M_{d2} = M_0 + B_f^T z$, for $z = (1\ 1)^T$.

Prob.4.6 For the net shown in Fig.3.4(d), find the A and B_f matrices. Verify Theorem 4.1 with a reachable marking, $M_{d1} = (0\ 0\ 0\ 1)^T$, and verify Corollary 4.1 with an unreachable marking, $M_{d2} = M_0 + B_f^T z$, for $z = 1$. [Meng].

Prob.4.7 Find an example showing that the converse of Theorem 4.1 is not true, i.e. find an example that satisfies (4-9) but M_d is not reachable from M_0. [Notomi]

Prob.4.8 Reduce the three nets shown in Fig.3.4 (c), (e) and (g) as much as possible by the transformation rules shown in Fig.4.6. Find which properties are preserved, and which properties are not preserved in your reductions. [Notomi] [Meng]

Prob.4.9 From the coverability tree or graph of an unbounded Petri net, can you determine if a transition in the net is dead, strictly L1-live, strictly L2-live, or strictly L3-live? If yes, state your algorithms. If no, state why not.

Prob.4.10 A pure Petri net with $M_0 = (2\ 0\ 0)^T$ has the following incidence matrix:

$$A = \begin{array}{c} \\ t_1 \\ t_2 \\ t_3 \end{array} \begin{array}{c} \begin{array}{ccc} p_1 & p_2 & p_3 \end{array} \\ \begin{bmatrix} -1 & 1 & 2 \\ -1 & 0 & 1 \\ 2 & -1 & -3 \end{bmatrix} \end{array}$$