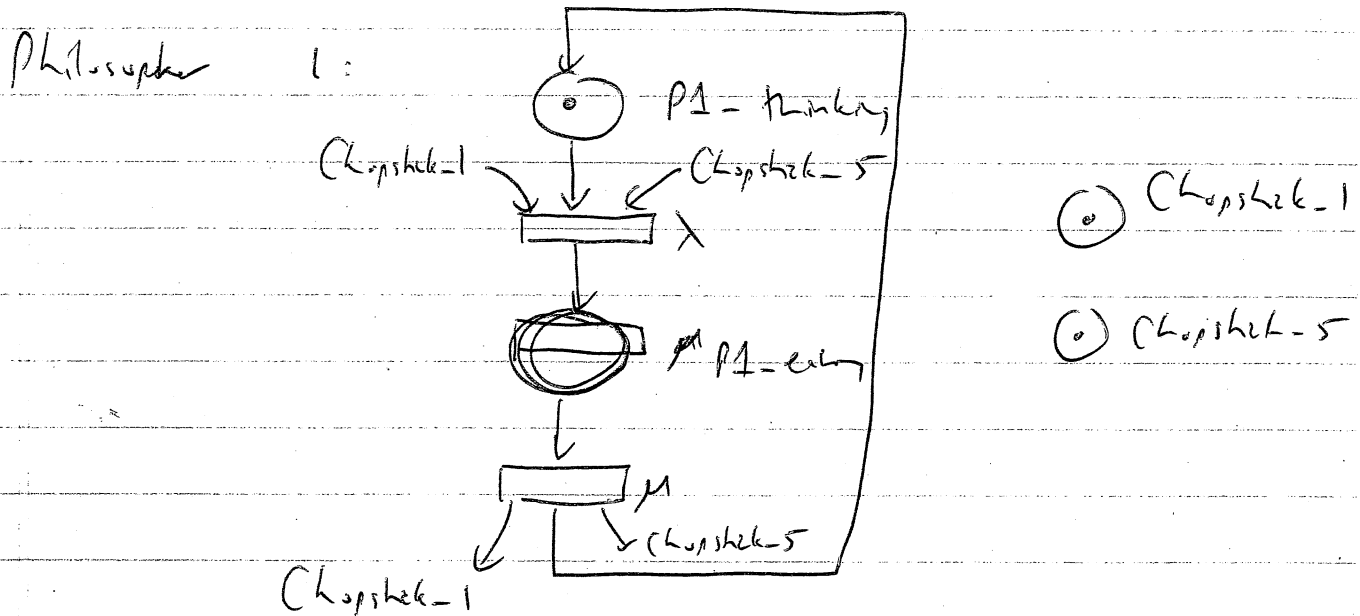


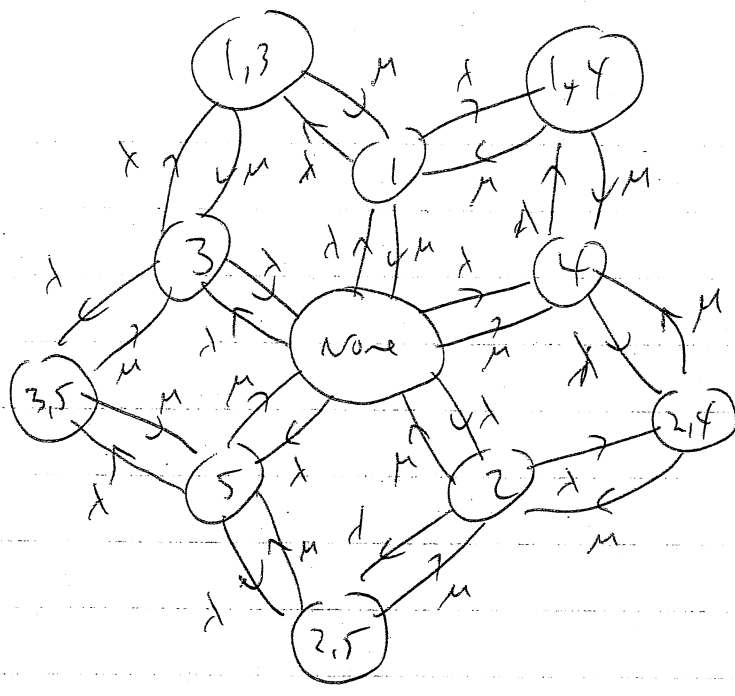
COMP SCI / SWER ENG 4/603 - Solutions for Assignment 11

① (a) One possibility is:

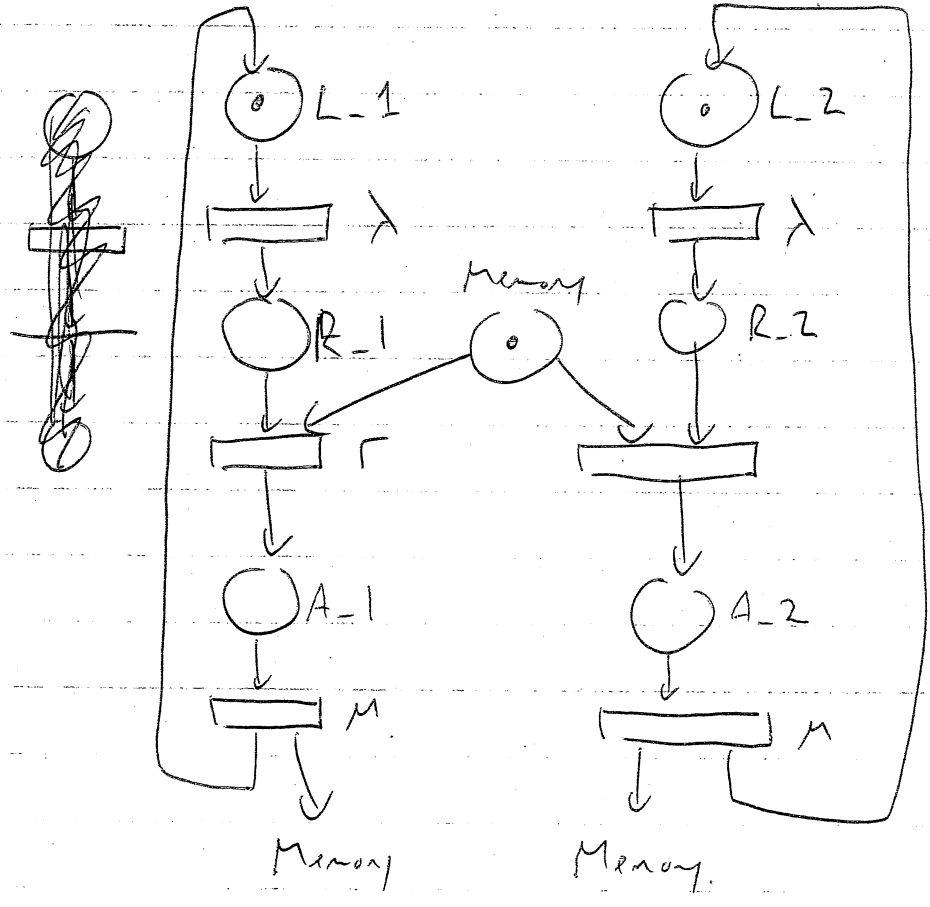


There is a similar diagram for the remaining 4 philosophers. Note that this is somewhat different than described, as philosophers are only allowed to think when chopsticks are free. If they think, then wait for the chopsticks, the implementation is somewhat more complicated.

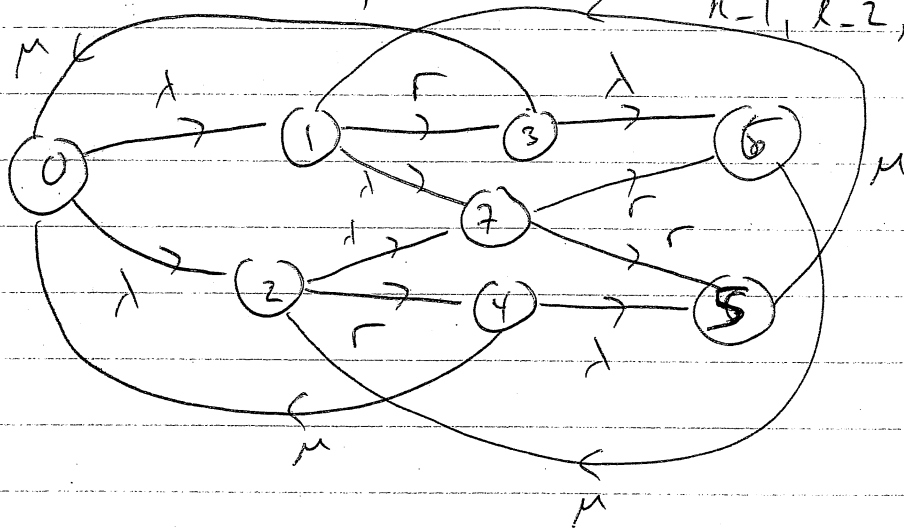
② (b) If we let the states be defined as the philosophers that are eating, we have:



② (a)



State	0	1	2	3	4	5	6	7
Tokens	0	1	1	1	1	1	1	1
Resources		L-1, L-2, Memory	R-1, L-2, Memory	L-1, R-2, Memory	A-1, L-2	L-1, A-2	R-1, A-2	A-1, R-2
								R-1, L-2, M



Solve:

$$\begin{aligned} 2\lambda p_0 &= \mu p_3 + \mu p_4 \\ (\gamma + \lambda) p_1 &= \mu p_7 + \lambda p_0 p_0 \\ (\gamma + \lambda) p_2 &= \lambda p_0 + \mu p_6 \\ (\mu + \lambda) p_3 &= \gamma p_1 \\ (\mu + \lambda) p_4 &= \gamma p_2 \\ \mu p_5 &= \gamma p_7 + \lambda p_4 \\ \mu p_6 &= \gamma p_7 + \lambda p_3 \\ 2\gamma p_7 &= \lambda (p_1 + p_2) \end{aligned}$$

Delete one equation, replace with $p_0 + p_1 + p_2 + p_3 + p_4 + p_5 + p_6 + p_7 = 1$

\Rightarrow Probability memory not accessed is $p_0 + p_1 + p_2 + p_7 = 0.244$