Chapter 12

Exercise 1.

(a) $\quad P_1 = 4, \quad P_2 = 6. \quad e_1 = 1$
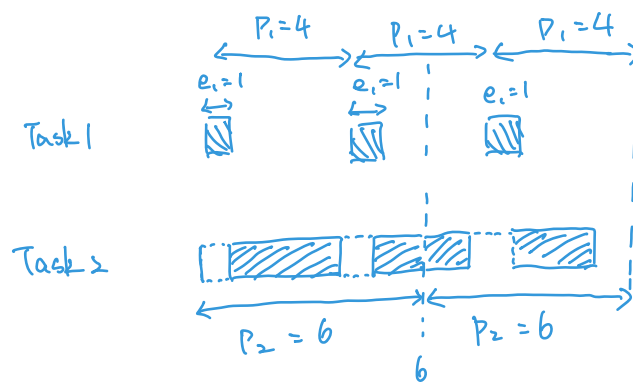
$$\begin{cases} 2e_1 + e_2 \leq P_2 \\ \\ e_1 + e_2 \leq P_2 \end{cases} \quad \Rightarrow \quad e_2 \leq 4$$
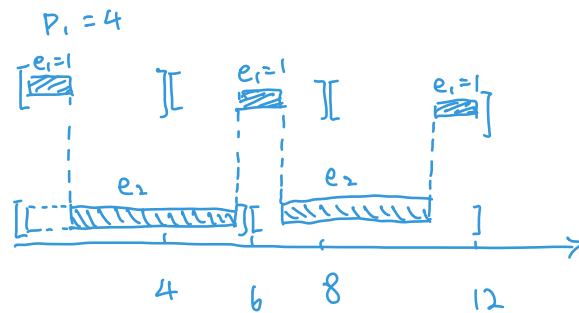
The maximum value for e_2 is 4

(b) For non-RMS that is feasible,

$$e_1 + e_2 \leq P_1$$

$$e_2 \leq P_1 - e_1 = 4 - 1 = 3$$

the maximum value of e_2 for non-RMS is 3.

Exercise 2.

$P_1 = 4$

(a)

$$\begin{cases} e_1 + e_2 \leq 6 \\ 3e_1 + 2e_2 \leq 12 \end{cases} \implies e_2 \leq 4.5$$

The maximum value for e_2 is 4.5

(b) within period of 12,

RM has three preemption.

EDF has only 1 preemption.

$\mu_{RM} = \frac{1}{4} + \frac{4}{6} \approx 0.92$

$\mu_{EDF} = \frac{1}{4} + \frac{4.5}{6} = 1$

So. EDF has less preemption and butter utilization.

Chapter 13:

Exercise 2:

(a) True

(b) False. If input sequence is (x, absent), the system will stay in C and no output will appear.
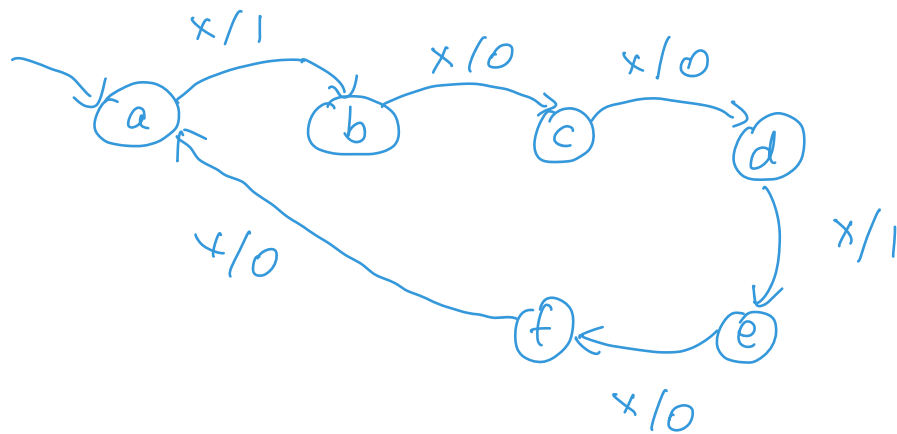
(c) True

(d) True

(e) True

(f) False, The system can not be in state b and state C at the same time.

(g) False. If the system is in state a, even x is absense, it will not go into state C.

Chapter 14

Exercise 7.

(a) input: x: pure, output: $y: \{0, 1\}$.

(b)

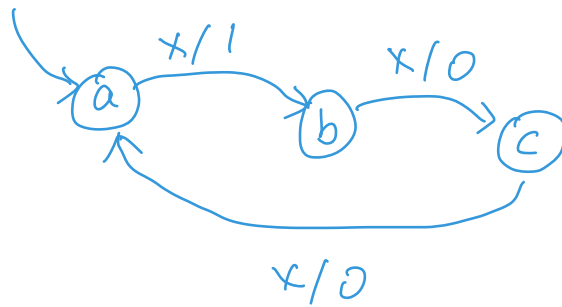without stuttering, the input will be

$$x = (p, p, p, p \cdots),$$

Therefore, the output will be in periodically

$$y = (1, 0, 0, 1, 0, 0, \cdots).$$

(c)   Input: x: pure

Output: $\{0, 1\}$

bisimulation relation:

$$\{(a, a), (b, b), (c, c), (d, a)$$
$$(e, b), (f, c)\}.$$