Solution of assignment 3

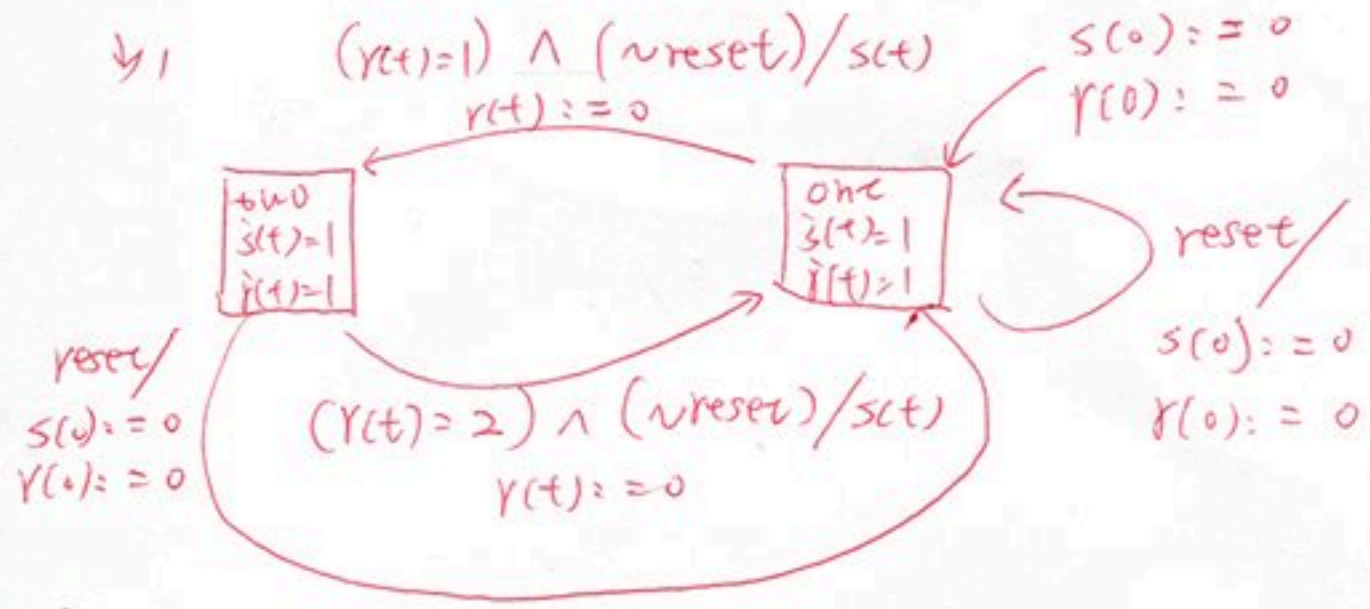
4.2

a)

$y = 1, 3, 4, 6, 7, 9, 10$

$$y(t) = \begin{cases} t & \text{if } t = 3k \text{ for } k \in \mathbb{N} \\ t & \text{if } t = 3k+1 \text{ for } k \in \mathbb{N} \cup \{0\} \\ \text{absent} & \text{otherwise} \end{cases}$$

b)



5.2

$States_C = States_A \times States_B$

$Inputs_C = Inputs_A \times Inputs_B$

$Outputs_C = Output_A \times Outputs_B$

$InitialState_C = (InitialState_A, InitialState_B)$

$updateFunction_C((s_A, s_B), (i_A, i_B)) = ((s_A', s_B'), (o_A', o_B'))$

$(s_A', o_A') = updateFunction_C(s_A, i_A)$ and $\begin{cases} s_B' = s_B \\ o_B' = \text{absent} \end{cases}$

$(s_B', o_B') = updateFunction_C(s_B, i_B)$ and $\begin{cases} s_A' = s_A \\ o_A' = \text{absent} \end{cases}$

for all $s_A \in States_A$

$s_B \in States_B$

$i_A \in Inputs_A$

$i_B \in Inputs_B$

5.3