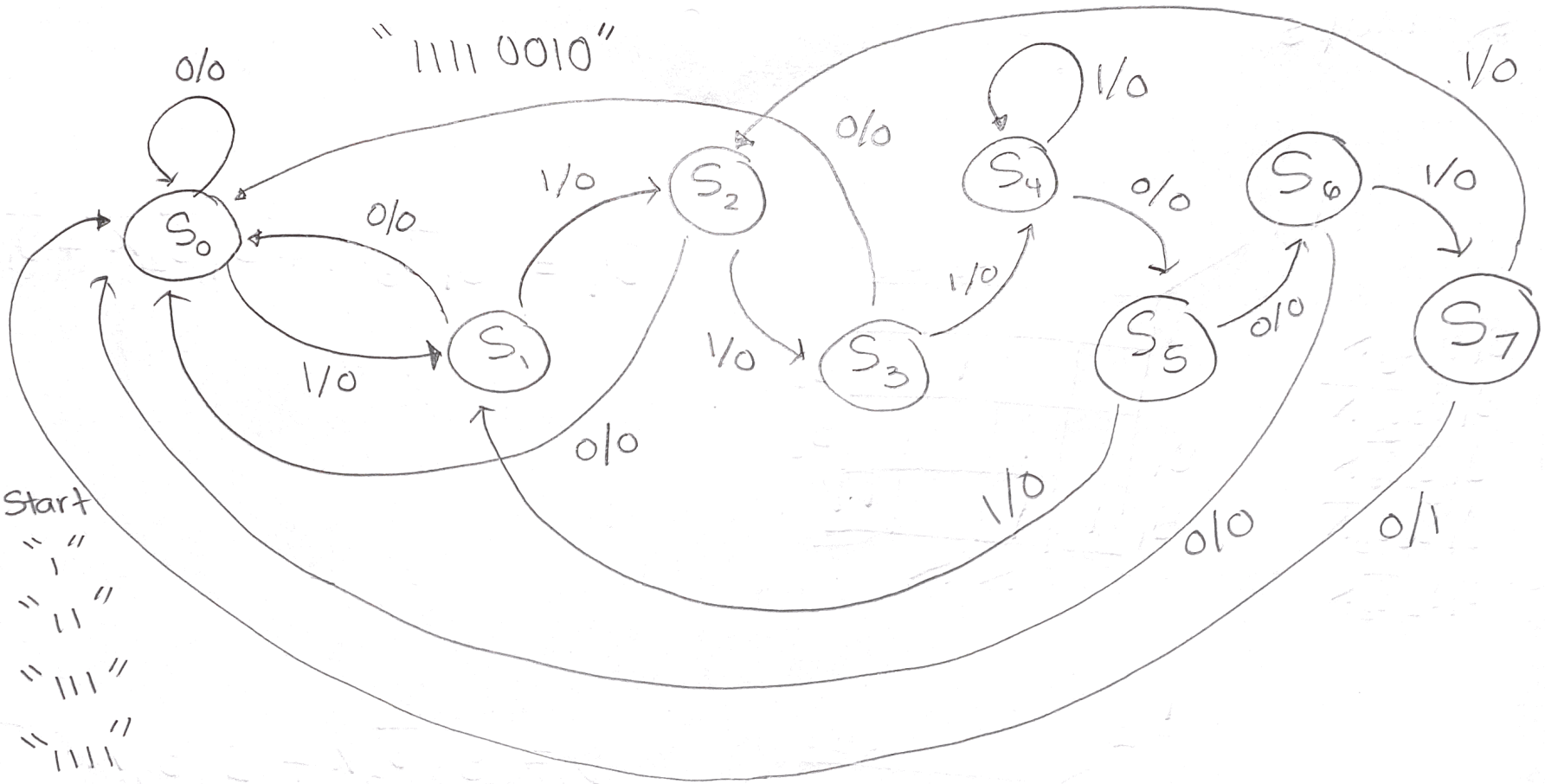


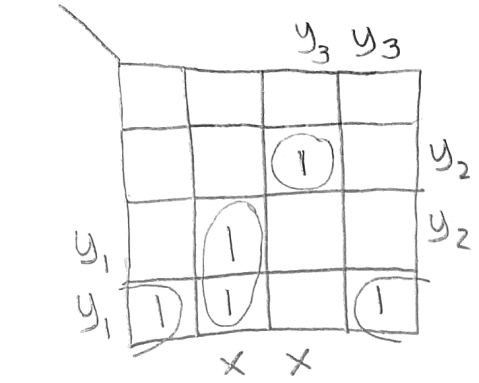
S_0 : Start
S_1 : "1"
S_2 : "11"
S_3 : "111"
S_4 : "1111"
S_5 : "11110"
S_6 : "11100"
S_7 : "1111001"

Present	Next x=0	Next x=1	Output x=0	Output x=1
S_0	S_0	S_1	0	0
S_1	S_0	S_2	0	0
S_2	S_0	S_3	0	0
S_3	S_0	S_4	0	0
S_4	S_5	S_4	0	0
S_5	S_6	S_1	0	0
S_6	S_0	S_7	0	0
S_7	S_0	S_2	1	0

State Assignment

S_0 : 000
S_1 : 001
S_2 : 010
S_3 : 011
S_4 : 100
S_5 : 101
S_6 : 110
S_7 : 111

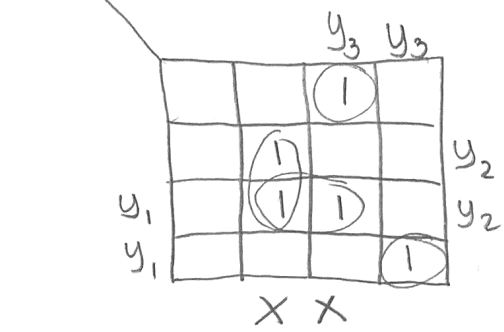
D_1



$$\begin{cases} \overline{y_1} y_2 y_3 x \\ y_1 \overline{y_2} \overline{y_3} \overline{x} \\ y_1 \overline{y_2} \overline{y_3} x \\ y_1 \overline{y_2} y_3 \overline{x} \\ y_1 y_2 \overline{y_3} x \end{cases}$$

$$D_1 = y_1 \overline{y_3} x + y_1 \overline{y_2} \overline{x} + \overline{y_1} y_2 y_3 x$$

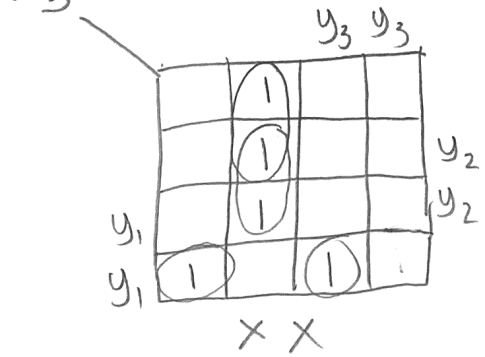
D_2



$$\begin{cases} \overline{y_1} \overline{y_2} y_3 x \checkmark \\ \overline{y_1} y_2 \overline{y_3} x \checkmark \\ y_1 \overline{y_2} y_3 \overline{x} \checkmark \\ y_1 y_2 \overline{y_3} x \checkmark \\ y_1 y_2 y_3 x \end{cases}$$

$$D_2 = y_2 \overline{y_3} x + y_1 y_2 x + \overline{y_1} \overline{y_2} y_3 x + y_1 \overline{y_2} y_3 \overline{x}$$

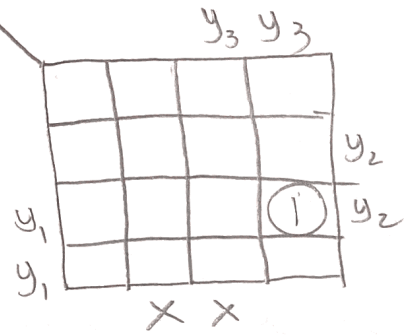
D_3



$$\begin{cases} \overline{y_1} \overline{y_2} \overline{y_3} x \checkmark \\ \overline{y_1} y_2 \overline{y_3} x \checkmark \\ y_1 \overline{y_2} \overline{y_3} \overline{x} \checkmark \\ y_1 \overline{y_2} y_3 x \checkmark \\ y_1 y_2 \overline{y_3} x \end{cases}$$

$$D_3 = \overline{y_1}\,\overline{y_3} x + y_2 \overline{y_3} x + y_1 \overline{y_2} \overline{y_3} \overline{x} + y_1 \overline{y_2} y_3 x$$

Output



Output = $y_1 y_2 y_3 \overline{x}$