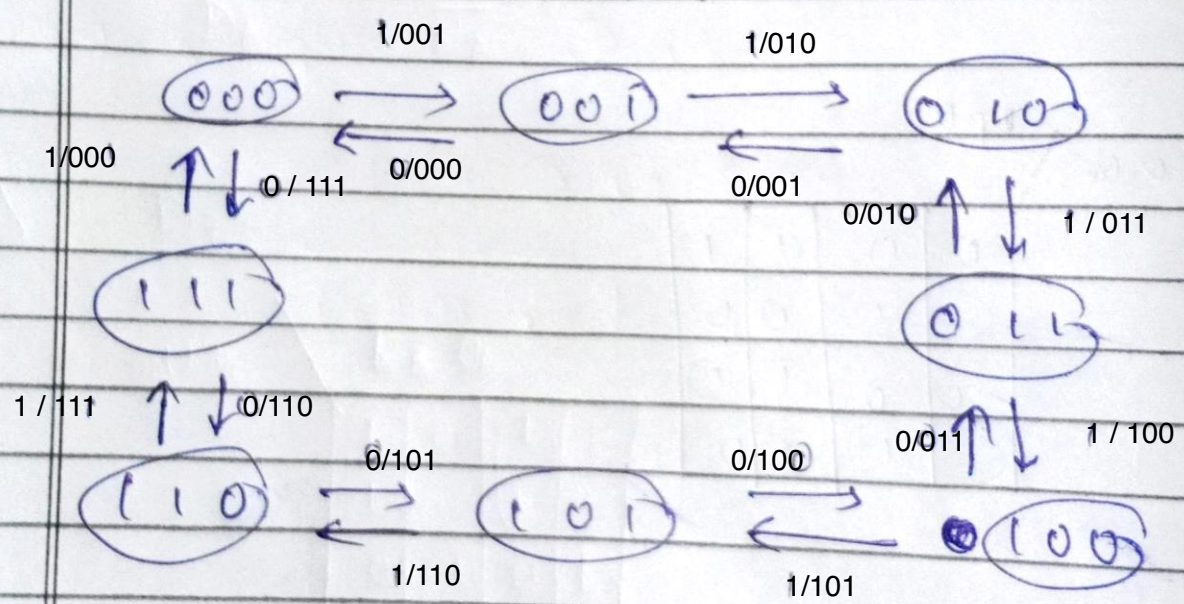


$U_p = 1 : 0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 0$   
 $U_p = 0 : 0 \rightarrow 7 \rightarrow 6 \rightarrow 5 \rightarrow 4 \rightarrow 3 \rightarrow 2 \rightarrow 1 \rightarrow 0$



$Q_i$	$Q_{i+1}$	$D$
0	0	0
0	1	1
1	0	0
1	1	1



$V$	$Q_c^+$	$Q_B^+$	$Q_A$	$Q_c^+$	$Q_B^+$	$Q_A^+$	$D_c$	$D_B$	$D_A$
0	0	0	0	1	1	1	1	1	1
0	0	0	1	0	0	0	0	0	0
0	0	1	0	0	0	1	0	0	1
0	0	1	1	0	1	0	0	1	0
0	1	0	0	0	1	1	0	1	1
0	1	0	1	1	0	0	1	0	0
0	1	1	0	1	0	1	1	0	1
0	1	1	1	1	1	0	1	1	0
1	0	0	0	0	0	1	0	0	1
1	0	0	1	0	1	0	0	1	0
1	0	1	0	0	1	1	0	1	1
1	0	1	1	1	0	0	1	0	0
1	1	0	0	1	0	1	1	0	1
1	1	0	1	1	1	0	1	1	0
1	1	1	0	1	1	1	1	1	1
1	1	1	1	0	0	0	0	0	0



$D_A:$

1)

$U Q_c$

$Q_B Q_A$

1	0	0	1
1	0	0	1
1	0	0	1
1	0	0	1

$$D_A = \overline{Q_A}$$

11)

$D_B:$

$U Q_c$

$Q_B Q_A$

1	0	1	0
1	0	1	0
0	1	0	1
0	1	0	1

$$D_B = \overline{U}(\overline{Q_A} \overline{Q_B} + Q_A Q_B) + U(\overline{Q_A} Q_B + Q_A \overline{Q_B})$$

$$= \overline{U}(\overline{Q_A \oplus Q_B}) + U(Q_A \oplus Q_B)$$



111)

		$Q_B Q_A$			
		00	01	11	10
$Q_C$	00	1	0	0	0
	01	0	1	1	1
	11	1	1	0	1
	10	0	0	1	0

$$D_c = \bar{U} \bar{Q}_c \bar{Q}_B \bar{Q}_A + \bar{U} Q_c Q_A + \cancel{Q_c Q_B \bar{Q}_A} + Q_c Q_B \bar{Q}_A + U Q_c \bar{Q}_B + \cancel{U \bar{Q}_c Q_A Q_B}$$

$$= \bar{U} \bar{Q}_A \bar{Q}_B \bar{Q}_c + \bar{U} Q_A Q_c$$

$$+ U Q_c \bar{Q}_B + U Q_A Q_B \bar{Q}_c$$

$$+ Q_c Q_B \bar{Q}_A$$