

Present state

next state

Jk flip-flop

	$Q_3$	$Q_2$	$Q_1$	$Q_3^+$	$Q_2^+$	$Q_1^+$	$J_3$	$K_3$	$J_2$	$K_2$	$J_1$	$K_1$
7	1	1	1	1	1	0	x	0	x	0	x	1
6	1	1	0	1	0	1	x	0	x	1	1	x
5	1	0	1	1	0	0	x	0	0	x	x	1
4	1	0	0	0	1	1	x	1	1	x	1	x
3	0	1	1	0	1	0	0	x	x	0	x	1
2	0	1	0	0	0	1	0	x	x	1	1	x
1	0	0	1	0	0	0	0	x	0	x	x	1
0	0	0	0	1	1	1	1	x	1	x	1	x

Jk truth table

$Q$	$Q^+$	J	K
0	0	0	x
0	1	1	x
1	0	x	1
1	1	x	0

determine value of  $J_1$  &  $K_1$

$Q_3$	$Q_2$	$Q_1$	0	1
0	0		1	x
0	1		1	x
1	1		1	x
1	0		1	x

$$J_1 = 1$$

$Q_3$	$Q_2$	$Q_1$	0	1
0	0		x	1
0	1		x	1
1	1		x	1
1	0		x	1

$$K_1 = 1$$

determine value of  $J_2$   $K_2$

		$Q_1$	
$Q_3$	$Q_2$	0	1
		0 0	1 0
0	1	x	x
1	1	x	x
1	0	1	0

$$J_2 = \bar{Q}_1$$

		$Q_1$	
$Q_3$	$Q_2$	0	1
		0 0	x x
0	1	1	0
1	1	1	0
1	0	x	x

$$K_2 = \bar{Q}_1$$

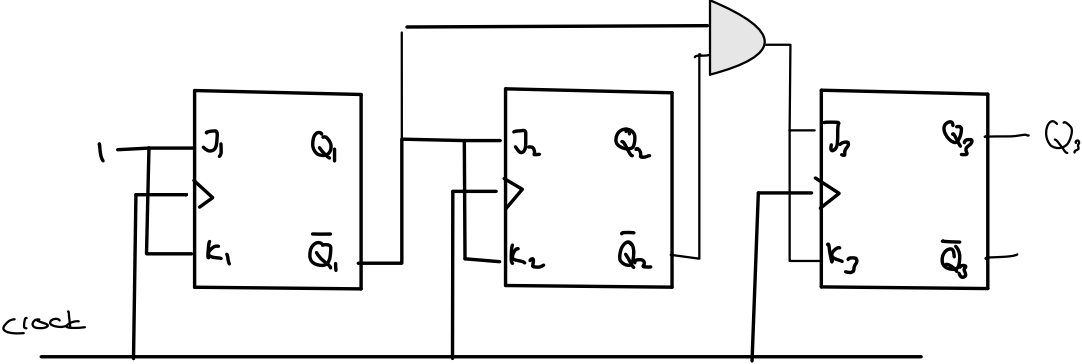
determine value of  $J_3$   $K_3$

		$Q_1$	
$Q_3$	$Q_2$	0	1
		0 0	1 0
0	1	0	0
1	1	x	x
1	0	x	x

$$J_3 = \bar{Q}_1 \bar{Q}_2$$

		$Q_1$	
$Q_3$	$Q_2$	0	1
		0 0	x x
0	1	x	x
1	1	0	0
1	0	1	0

$$K_3 = \bar{Q}_1 \bar{Q}_2$$



Present state

next state

D-flip-flop

	$Q_3$	$Q_2$	$Q_1$	$Q_3^+$	$Q_2^+$	$Q_1^+$	$D_3$	$D_2$	$D_1$
7	1	1	1	1	1	0	1	1	0
6	1	1	0	1	0	1	1	0	1
5	1	0	1	1	0	0	1	0	0
4	1	0	0	0	1	1	0	1	1
3	0	1	1	0	1	0	0	1	0
2	0	1	0	0	0	1	0	0	1
1	0	0	1	0	0	0	0	0	0
0	0	0	0	1	1	1	1	1	1

D flip-flop truth table

D	Q	Q <sup>+</sup>
0	0	1
1	1	0

$$Q_1 \text{ XOR } Q_2$$

$$D_3 = Q_1 \cdot Q_3 + Q_2 \cdot Q_2 + \overline{Q_1} \cdot \overline{Q_2} \cdot \overline{Q_3}$$

$$D_2 = Q_1 \cdot Q_2 + \overline{Q_1} \cdot \overline{Q_2}$$

$$D_1 = \overline{Q_1}$$

$Q_3$	$Q_2$	$Q_1$	$D_3$
0	0	0	1
0	1	0	0
1	1	0	1
1	0	0	1

$Q_3$	$Q_2$	$Q_1$	$D_2$
0	0	0	1
0	1	0	1
1	1	0	1
1	0	0	1

$Q_3$	$Q_2$	$Q_1$	$D_1$
0	0	0	1
0	1	0	1
1	1	0	1
1	0	0	1

