

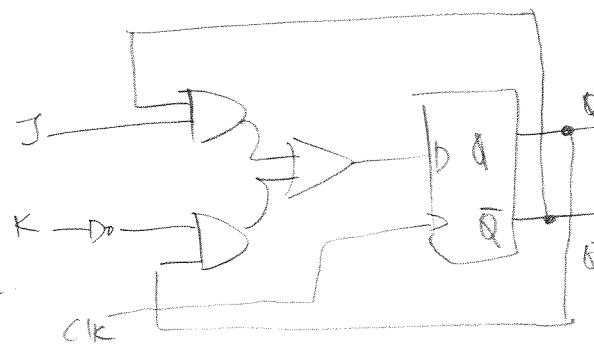
Design "100" using JK Flip-flop

Present State $y_1 y_0$	Next State		output (Z)
	$y_1 y_0$ $w=0$	$y_1 y_0$ $w=1$	
00	00	01	0
01	10	01	0
10	11	01	0
11	00	01	1

Review of JK Flip-flop

$$D = J\bar{Q} + \bar{K}Q$$

\nearrow Next state value
 \nwarrow Present state value



J	K	$Q(t+1)$
0	0	$Q(t)$
0	1	0
1	0	1
1	1	$\bar{Q}(t)$

current state = 0, stay at 0, $J=0$, $K=0$
 current state = 0, go to 1, $J=1$, $K=0$
 current state = 1, stay at 1, $J=0$, $K=0$
 current state = 1, go to 0, $J=0$, $K=1$

Present State $y_1 y_0$	Next state $w=0$			Next state $w=1$			output (z)
	$y_1 y_0$	$J_1 K_1$	$J_0 K_0$	$y_1 y_0$	$J_1 K_1$	$J_0 K_0$	
00	00	0d	0d	01	0d	1d	0
01	10	1d	d1	01	0d	d0	0
10	11	d0	1d	01	d1	1d	0
11	00	d1	d1	01	d1	d0	1

J_0

		w	
		0	1
y, y_0	00	0	1
	01	d	d
	11	d	d
	10	1	1

$$J_0 = w + y_1$$

K_0

		w	
		0	1
y, y_0	00	d	d
	01	1	0
	11	1	0
	10	d	d

$$K_0 = \bar{w}$$

J_1

		w	
		0	1
y, y_0	00	0	0
	01	1	0
	11	d	d
	10	d	d

$$J_1 = \bar{w} y_0$$

K_1

		w	
		0	1
y, y_0	00	d	d
	01	d	d
	11	1	1
	10	0	1

$$K_1 = w + y_0$$

$$Z = y_1 y_0$$