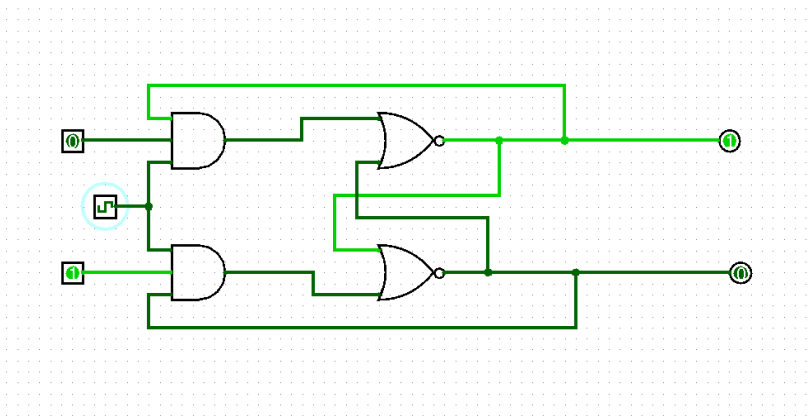


Diseño Esquemático

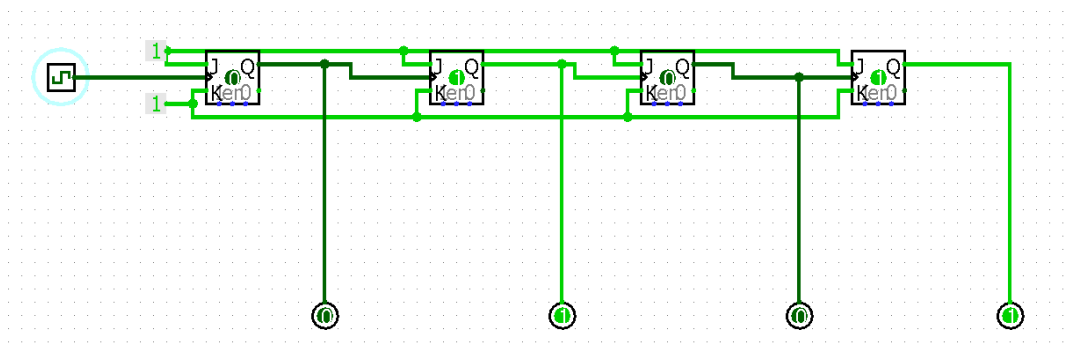
Flip-Flop JK



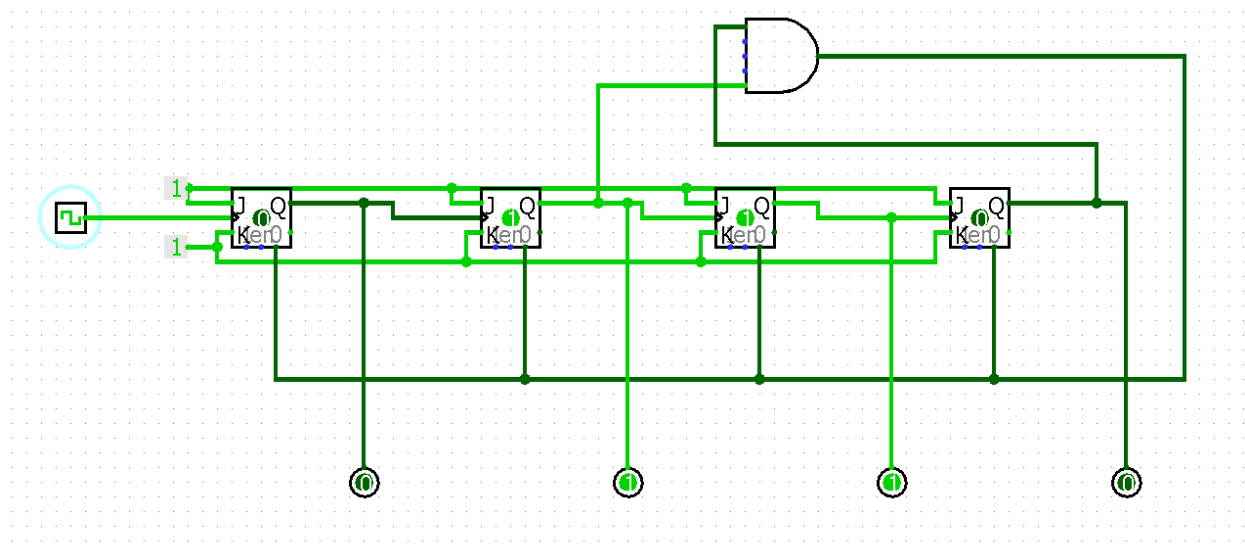
Truth Table

J	K	CLK	Q
0	0	↑	Q_0 (no change)
1	0	↑	1
0	1	↑	0
1	1	↑	$\overline{Q_0}$ (toggles)

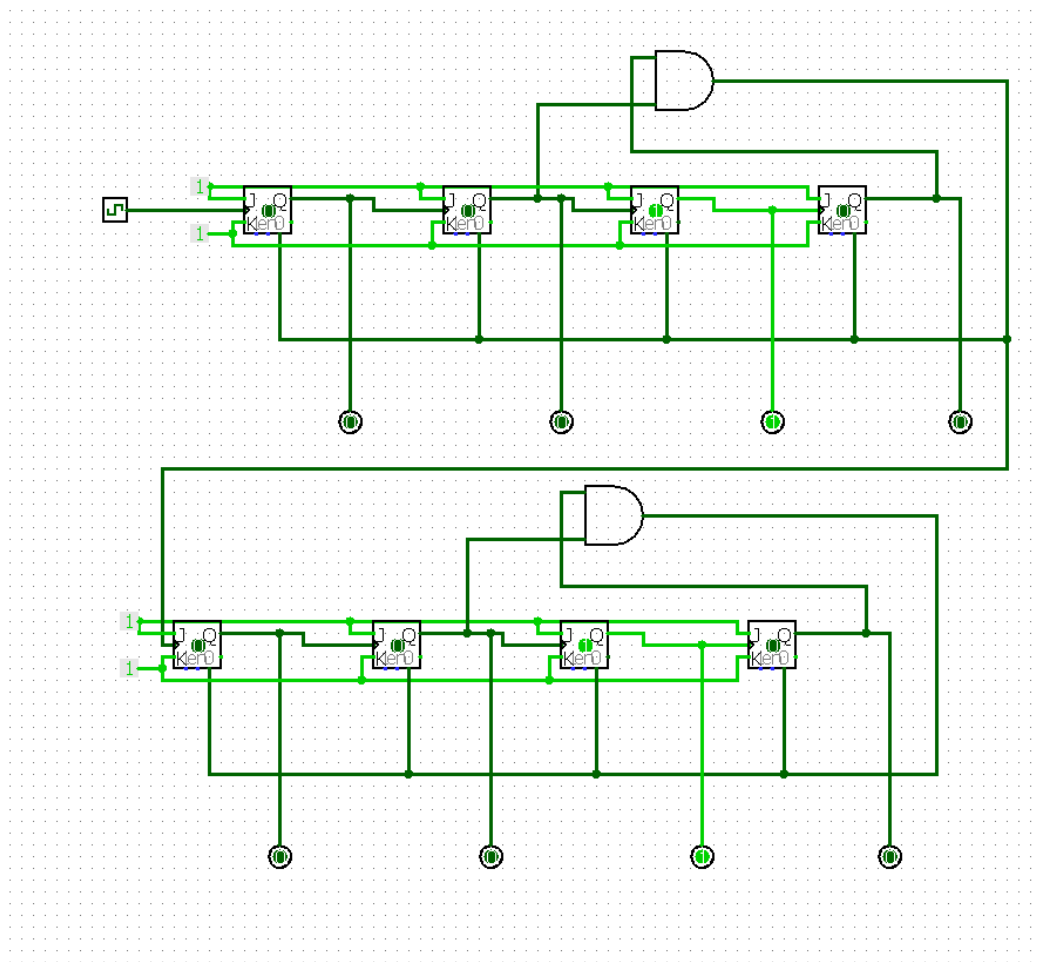
Contador con flip flops



Contador de década, se agrega condición para que se recete cuando llegue a 10



Contador a 99



Diseño Contador decimal ascendente y descendente

	X	Q3	Q2	Q1	Q0		Q3	Q2	Q1	Q0		J3	K3	J2	K2	J1	K1	J0	K0
0	0	0	0	0	0		0	0	0	1		0	X	0	X	0	X	1	X
1	0	0	0	0	1		0	0	1	0		0	X	0	X	1	X	X	1
2	0	0	0	1	0		0	0	1	1		0	X	0	X	X	0	1	X
3	0	0	0	1	1		0	1	0	0		0	X	1	X	X	1	X	1
4	0	0	1	0	0		0	1	0	1		0	X	X	0	0	X	1	X
5	0	0	1	0	1		0	1	1	0		0	X	X	0	1	X	X	1
6	0	0	1	1	0		0	1	1	1		0	X	X	0	X	0	1	X
7	0	0	1	1	1		1	0	0	0		1	X	X	1	X	1	X	1
8	0	1	0	0	0		1	0	0	1		X	0	0	X	0	X	1	X
9	0	1	0	0	1		0	0	0	0		X	1	0	X	0	X	X	1

16	1	0	0	0	0		1	0	0	1		1	X	0	X	0	X	1	X
17	1	0	0	0	1		0	0	0	0		0	X	0	X	0	X	X	1
18	1	0	0	1	0		0	0	0	1		0	X	0	X	X	1	1	X
19	1	0	0	1	1		0	0	1	0		0	X	0	X	X	0	X	1
20	1	0	1	0	0		0	0	1	1		0	X	X	1	1	X	1	X
21	1	0	1	0	1		0	1	0	0		0	X	X	0	0	X	X	1
22	1	0	1	1	0		0	1	0	1		0	X	X	0	X	1	1	X
23	1	0	1	1	1		0	1	1	0		0	X	X	0	X	0	X	1
24	1	1	0	0	0		0	1	1	1		X	1	1	X	1	X	1	X
25	1	1	0	0	1		1	0	0	0		X	0	0	X	0	X	X	1

$$J3 = X'Q1Q0Q2 + XQ2'Q1'Q0'$$

$$K3 = X'Q0 + XQ0'$$

$$J2 = X'Q1Q0 + XQ3Q0'$$

$$K2 = X'Q1Q0 + XQ1'Q0'$$

$$J1 = X'Q3'Q0 + XQ2Q0' + XQ3Q0'$$

$$K1 = X'Q0 + XQ0'$$

$$J0 = 1$$

$$K0 = 1$$

ENABLE DE DECIMAS

en <= (Q0 and Q1N AND Q2N AND Q3 and XN) OR (Q0N AND Q1N AND Q2N AND Q3N AND X);

Contador Final Ascendente y Descendente

