

Practica 2 Flip-Flops

Conversion de Flip-Flop

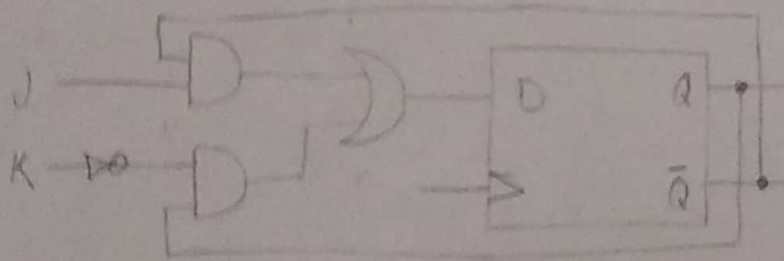
Quiero JK Tengo D

J	K	Q(t)	Q(t+1)	D
0	0	0	0	0
0	0	1	1	1
0	1	0	0	0
0	1	1	0	0
1	0	0	1	1
1	0	1	1	1
1	1	0	1	1
1	1	1	0	0

D

J/K	00	01	11	10
Q	0	1	1	1
Q	1	1	1	1

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



Quiero T Tengo D

T	Q(t)	Q(t+1)	D
0	0	0	0
0	1	1	1
1	0	1	1
1	1	0	0

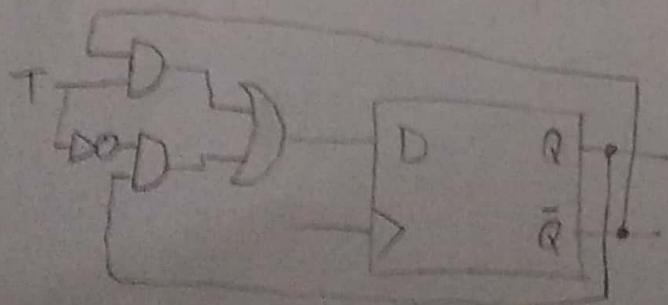
Q(t) Q(t+1) D

T	Q	00	01	11	10
Q	0	0	1	1	1
Q	1	1	1	1	1

TQ

T	Q	00	01	11	10
Q	0	0	1	1	1
Q	1	1	1	1	1

$$D = \bar{T}Q + T\bar{Q}$$



Quiero SR Tengo D

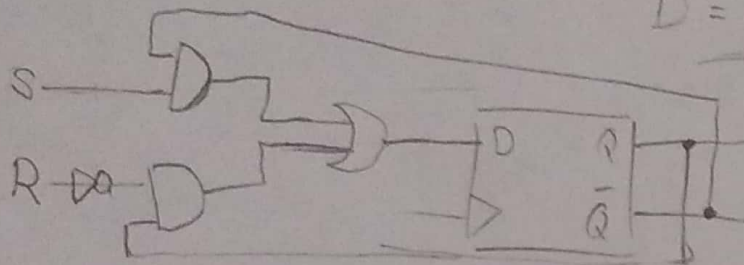
$$Q(t) = Q(t+1) \quad D$$

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

S	R	$Q(t)$	$Q(t+1)$	D
0	0	0	0	0
0	0	1	1	1
0	1	0	0	0
0	1	1	0	0
1	0	0	1	1
1	0	1	1	1
1	1	0	NV	X
1	1	1	NV	X

S/RQ	00	01	11	10
Q		1		
\bar{Q}	1	1	X	X

$$D = \bar{R}Q + S$$



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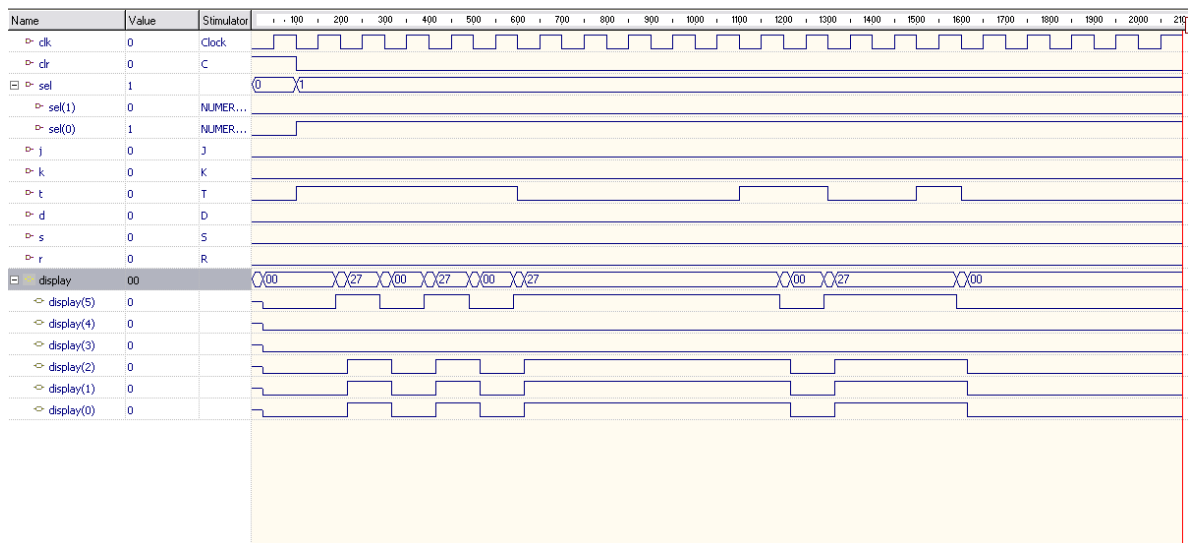
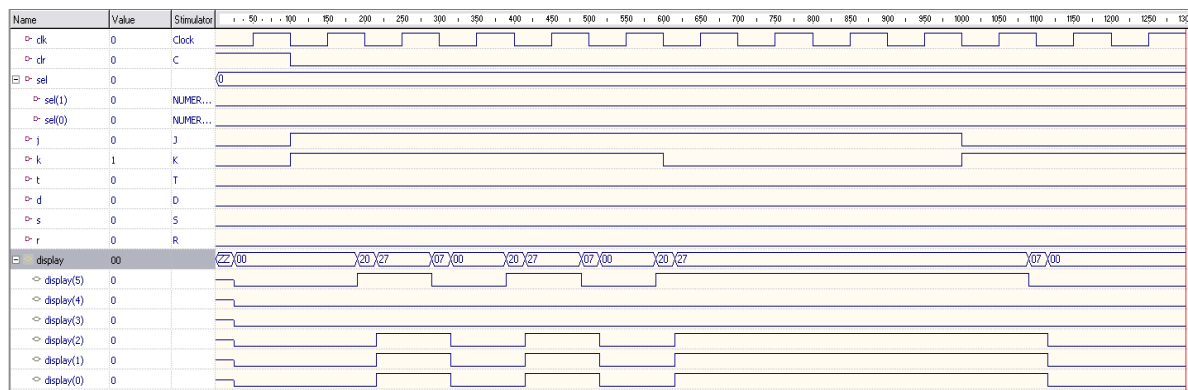
Practica 2

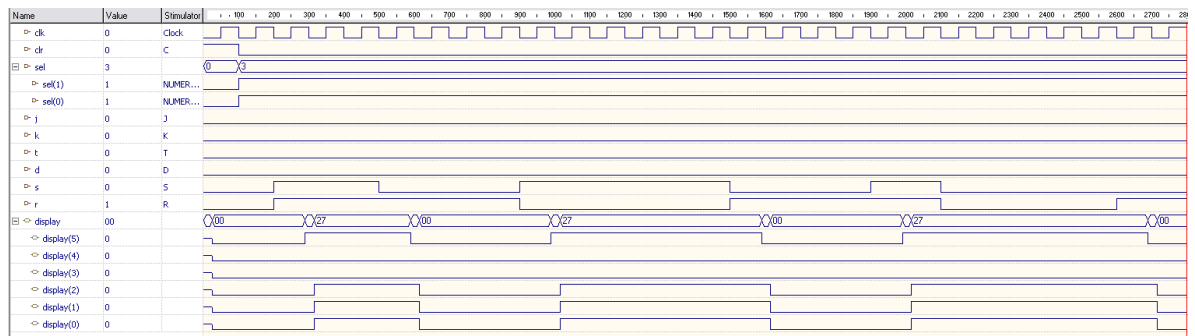
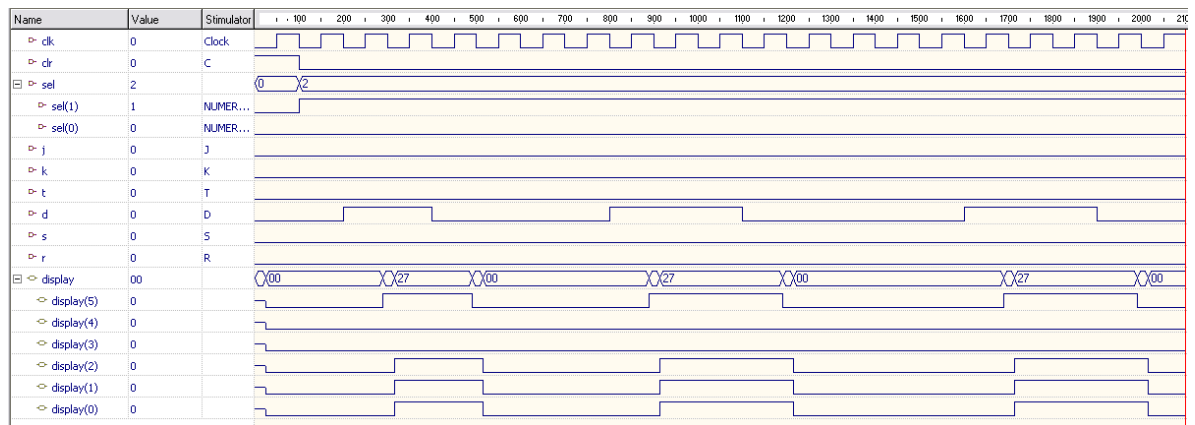
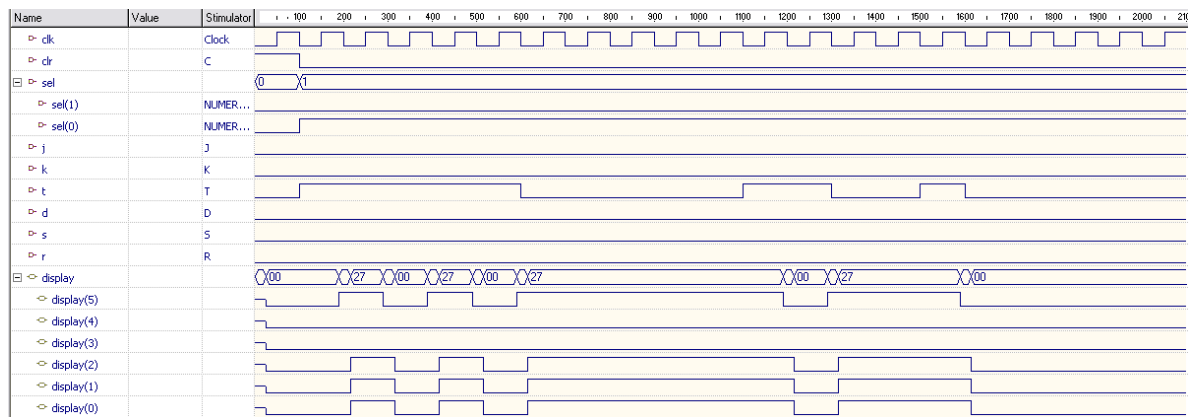
```
1 library ieee;
2 use ieee.std_logic_1164.all;
3
4 entity Practica2 is port
5 (
6     j, k , t, d, s, r, clk, clr : in std_logic;
7     sel : in std_logic_vector(1 downto 0);
8     display : out std_logic_vector(5 downto 0)
9 );
10 end Practica2;
11
12 architecture APractica2 of Practica2 is
13 signal q, jk, tsalida, sr, mux : std_logic;
14 begin
15 process(clk,clr)
16 begin
17 --reset, señal de control asicrona
18     if (clr = '1') then
19         q <= '0';
20         jk <= '0';
21         tsalida <= '0';
22         sr <= '0';
23     elsif (clk'event and clk = '1') then
24         q <= d;
25         jk <= ((not(k))and(jk))or((j)and (not(jk)));
26         tsalida <= ((not(t))and(tsalida))or((not(tsalida))and(t));
27         sr <= ((not(r))and(sr))or(s);
28     end if;
29 end process;
30 --Mux
31 mux <= jk when(sel = "00") else
32     tsalida when (sel = "01") else
33     q when (sel = "10") else
34     sr;
35 --Display
36 display <= "100111" when (mux = '1') else
37     "000000";
38 end APractica2;
```

C22V10

clk =	1	24	* not used
t =	2	23	= (tsalida)
s =	3	22	= (jk)
r =	4	21	= display(4)
sel(1) =	5	20	= display(2)
sel(0) =	6	19	= display(0)
k =	7	18	= display(1)
j =	8	17	= display(3)
d =	9	16	= (q)
clr =	10	15	= (sr)
not used *	11	14	= display(5)
not used *	12	13	* not used

Simulación en Galaxy





Simulación en proteus

