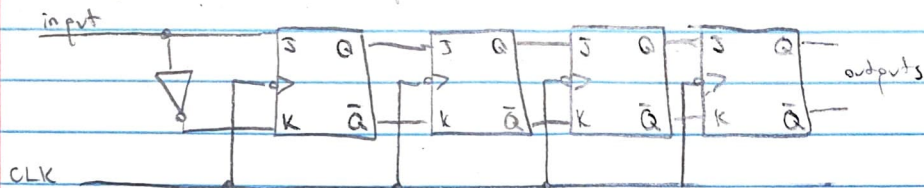


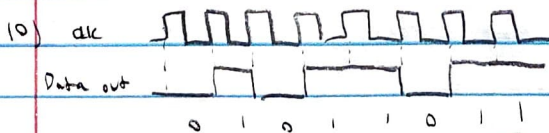
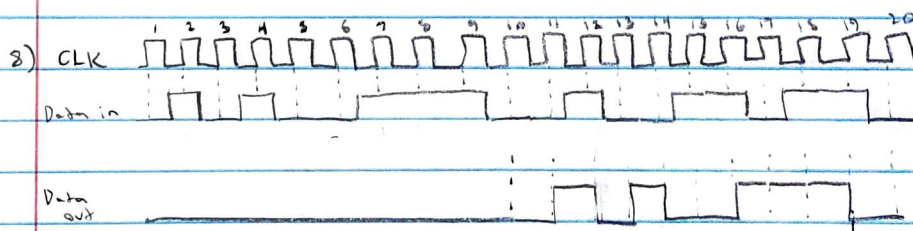
HW #6 #6, 8, 10, 14, 21, 28

NIKASHA KALPORS

6) Shift register from J-K flip-flops.

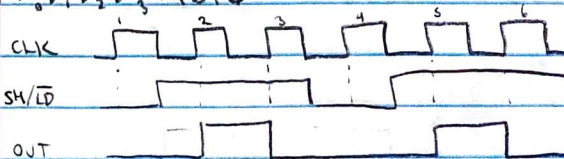


S and K start with opposite inputs because of the NOT gate. There are 4 flip flops so it can store 4 bits. One bit is entered at a time. When $J=1$ and $K=0$, the flip flop sets on the positive clock edge, when $J=0$ and $K=1$ the flip flop resets on the positive clock edge. The other states aren't relevant here because J and K are always the inverse of each other here.



The number stored is 11011010

14) $D_0, D_1, D_2, D_3 = 1010$



only shifts when high

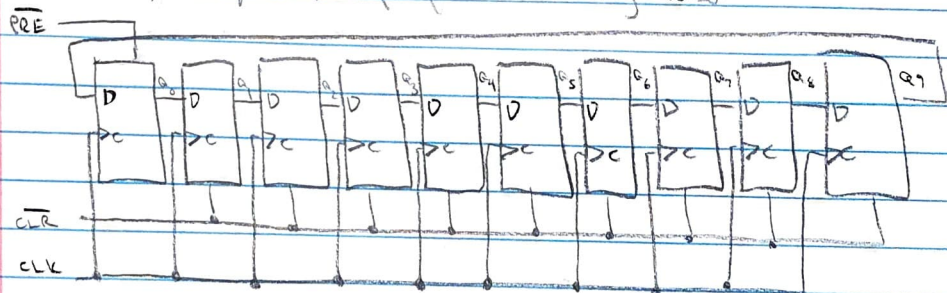
SH/LD	CLK	D_0	D_1	D_2	D_3
0	1	1	0	1	0
1	2	0	1	0	1
1	3	0	0	1	0
0	4	0	0	1	0
1	5	0	0	0	1
1	6	0	0	0	0

$D_3 = \text{out}$

21) $76_{10} = 01001100$

CLK 1	left	10011000	6	left	01001100
2	right	01001100	7	right	00100110
3	right	00100110	8	left	01001100
4	right	00010011	9	right	00100110
5	left	00100110	10	left	01001100
			11	left	10011000

23) Q_0 to Q_7 requires 10 flip flops for the ring counter



Q_0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0
Q_1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0
" 2	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1
3	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
4	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0
5	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
6	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1
7	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
9	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0

Shift Q_9 left

- Given

Must be preset at $Q_0 = 00100000010001000$