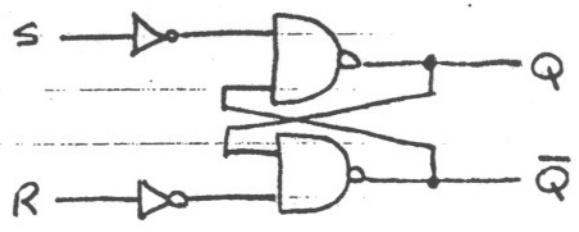
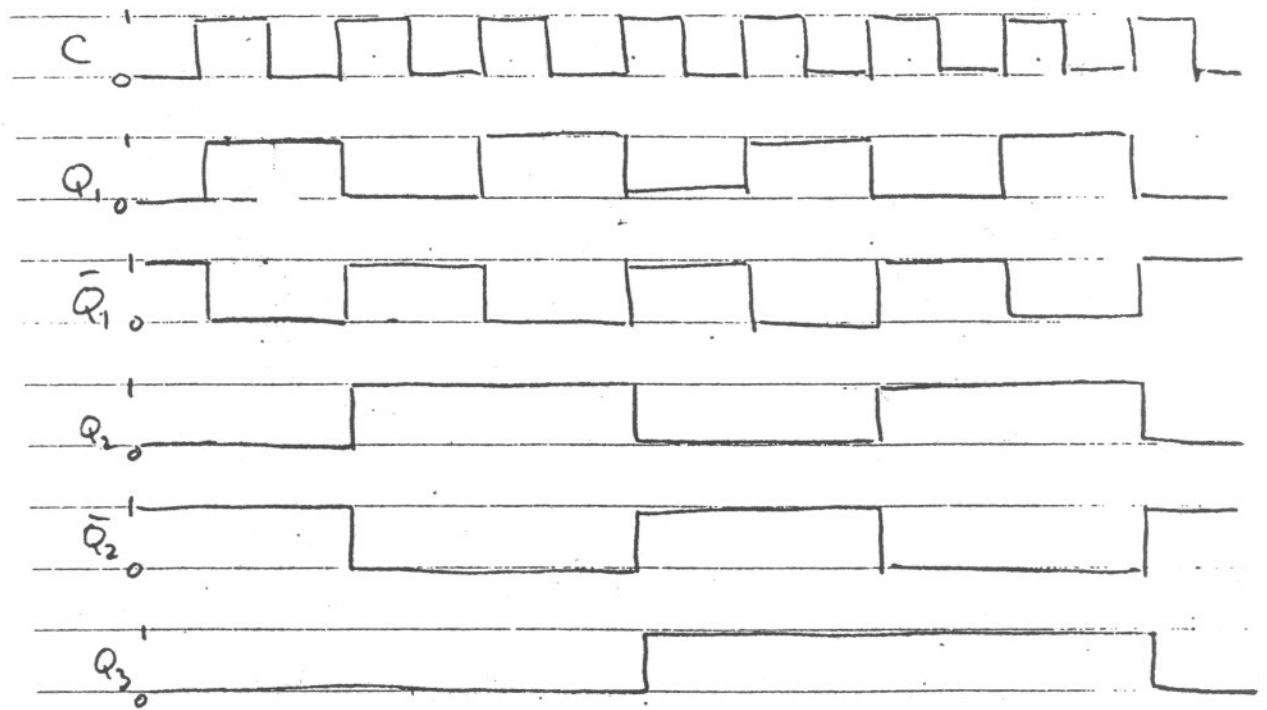
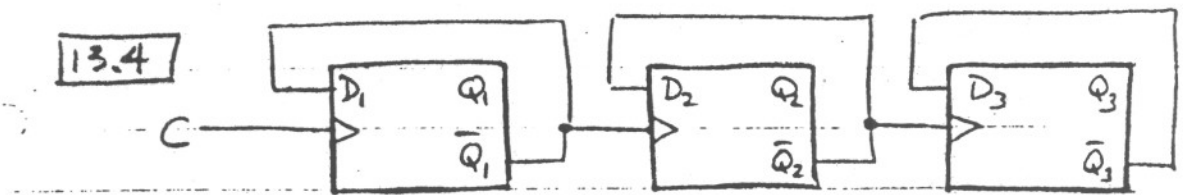


12.26



S	R	Q	Q(t+1)
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	DOES NOT	
1	1	OCCUR	

This circuit is an SR flip-flop.

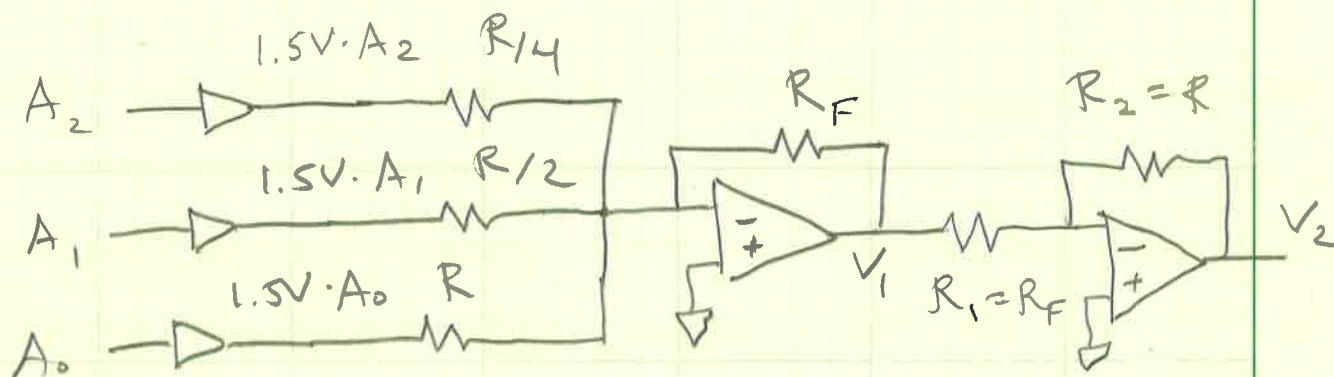


$(Q_3, Q_2, Q_1)_{10} = 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 0$

This is a 3-bit counter that
counts $0 \rightarrow 7, 0 \rightarrow 7, 0 \rightarrow 7, \dots$

if output = Q_3, Q_2, Q_1

13.28 - Following lecture



KCL

$$\frac{V_1}{R_F} + \frac{1.5V A_2}{R/4} + \frac{1.5V \cdot A_1}{R/2} + \frac{1.5V \cdot A_0}{R} = 0$$

$$\Rightarrow V_1 = -1.5V (4A_2 + 2A_1 + A_0) \cdot \frac{R_F}{R}$$

$$V_2 = -\frac{R_2}{R_1} V_1 = -\frac{R}{R_F} V_1$$

$$\Rightarrow V_2 = \left(-\frac{R}{R_F}\right) (-1.5V) \cdot (4A_2 + 2A_1 + A_0) \frac{R_F}{R}$$

$$= 1.5V (4A_2 + 2A_1 + A_0)$$

A_2	A_1	A_0	V_2
0	0	0	0V
0	0	1	1.5V
0	1	0	3V
0	1	1	4.5V
1	0	0	6V
1	0	1	7.5V
1	1	0	9V
1	1	1	10.5V