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Date: 12/3/22

LAB REPORT - 11

Ring Counter, Johnson's counter, Modulo N

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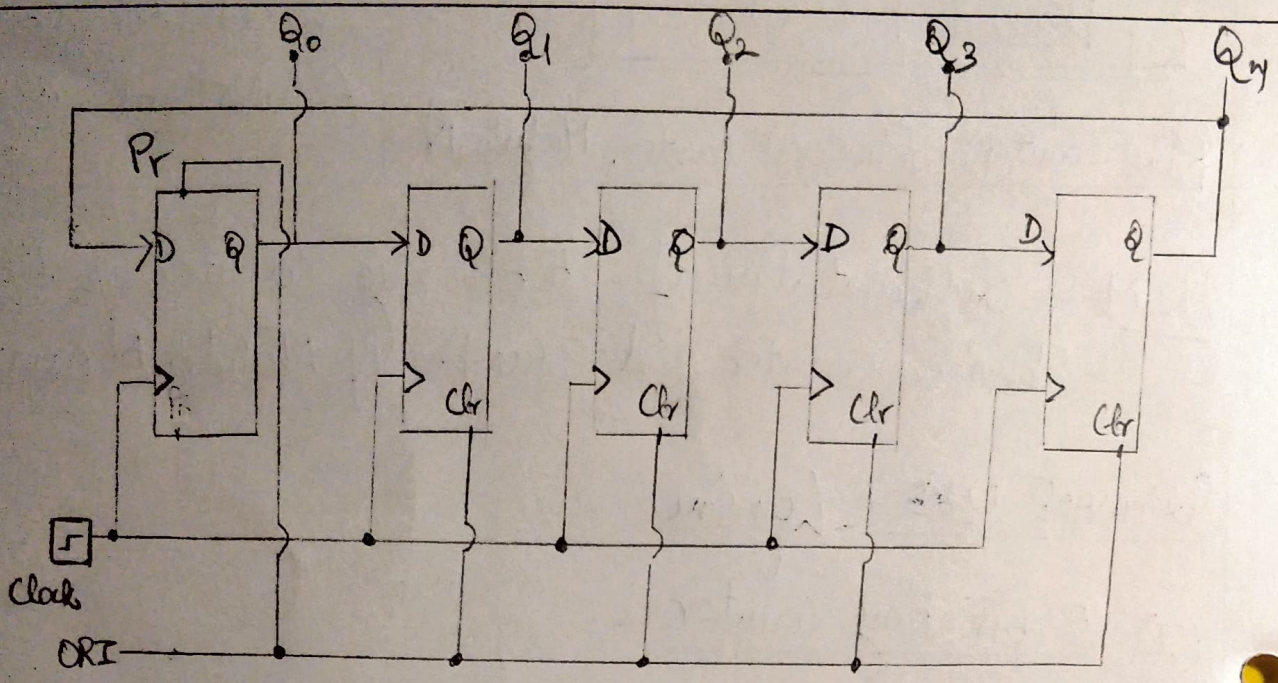
AIM → Implementation of 5 bit ring counter, 5 bit Johnson counter and examples of Modulo N counters.

SOFTWARE USED → Logisim

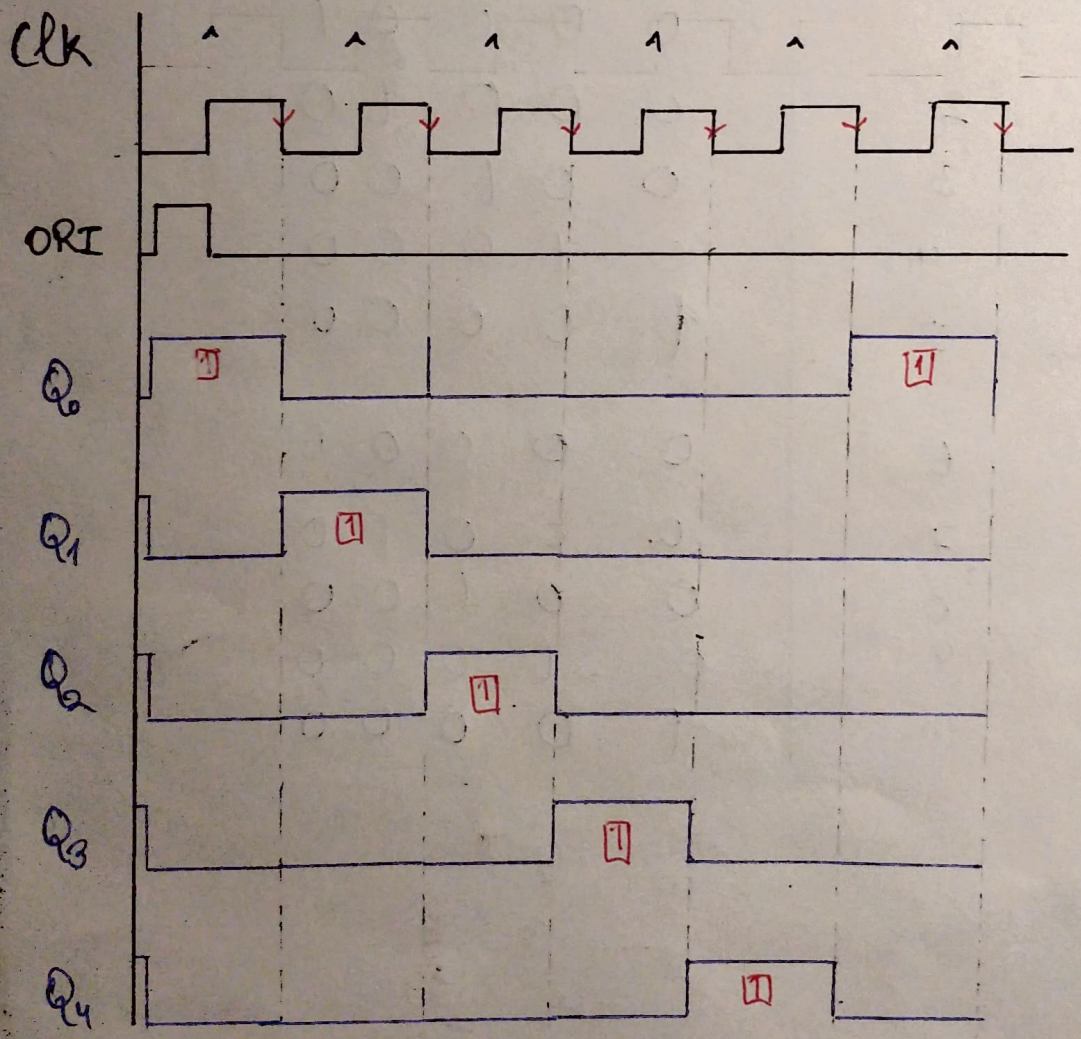
(I) 5 bit Ring Counter →

Clock input	Q_4	Q_3	Q_2	Q_1	Q_0
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	1	0	0
4	0	1	0	0	0
5	1	0	0	0	0
6	0	0	0	0	1
7	0	0	0	1	0
8	0	0	1	0	0
9	0	1	0	0	0
10	1	0	0	0	0

2/

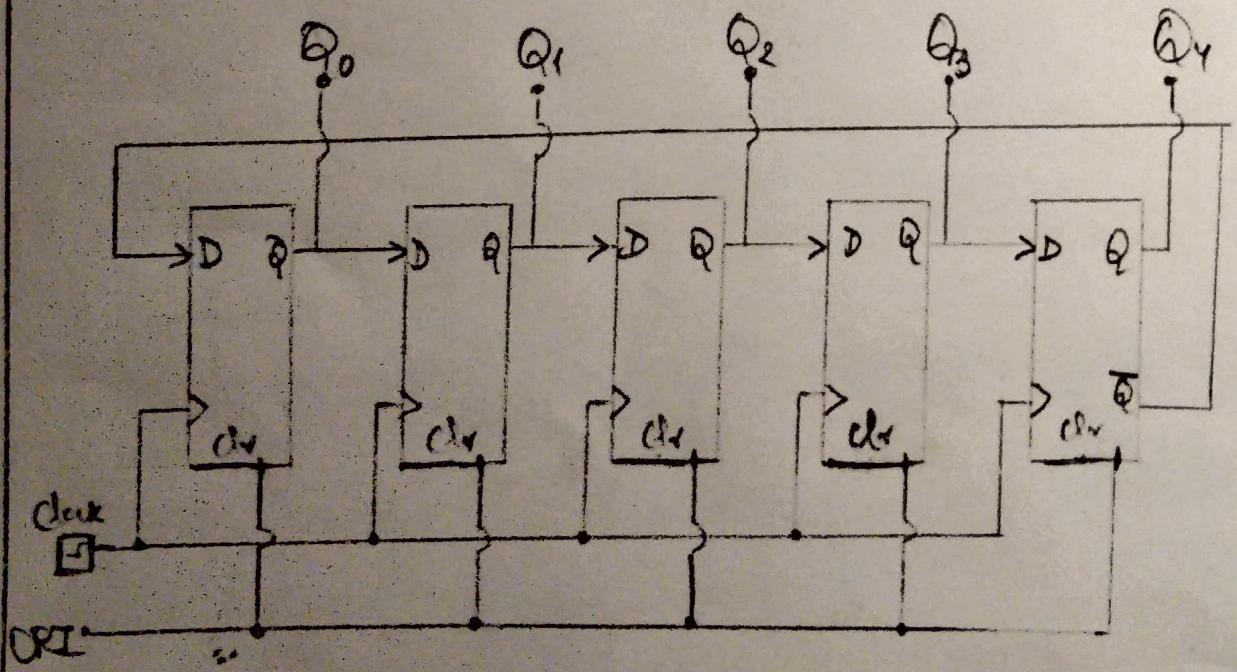


5 bit ring counter using D flip flops



(II) 5 bit Johnson Counter →

Clock input	Q_4	Q_3	Q_2	Q_1	Q_0
1	0	0	0	0	0
2	0	0	0	0	1
3	0	0	0	1	1
4	0	0	1	1	1
5	0	1	1	1	1
6	1	1	1	1	1
7	1	1	1	1	0
8	1	1	1	0	0
9	1	1	0	0	0
10	1	0	0	0	0
	0	0	0	0	0



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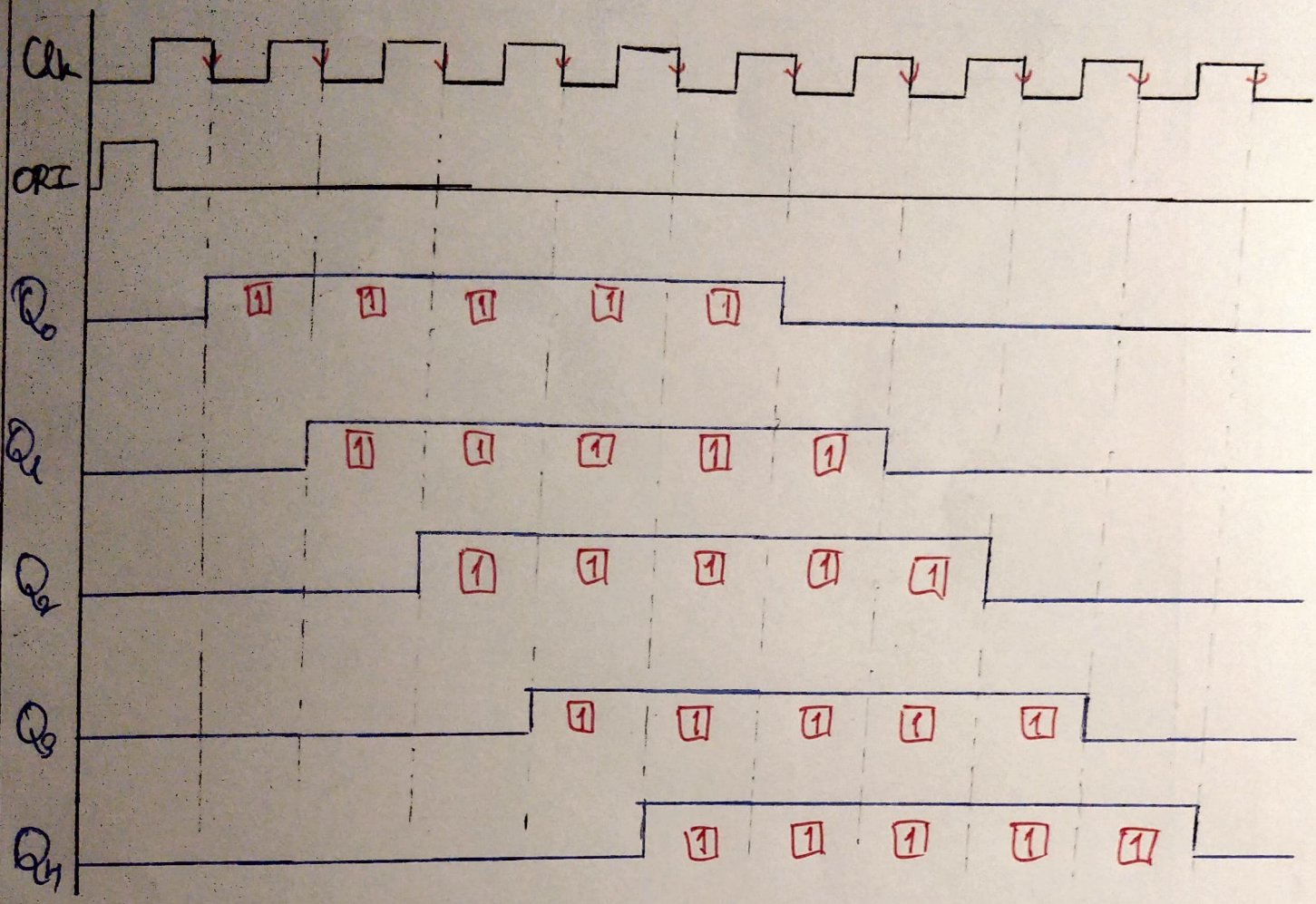
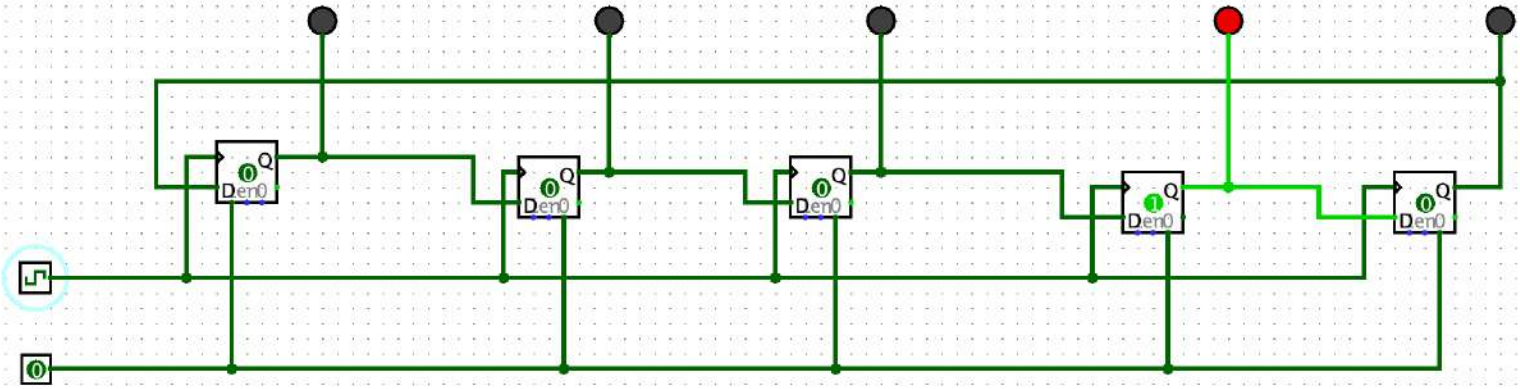
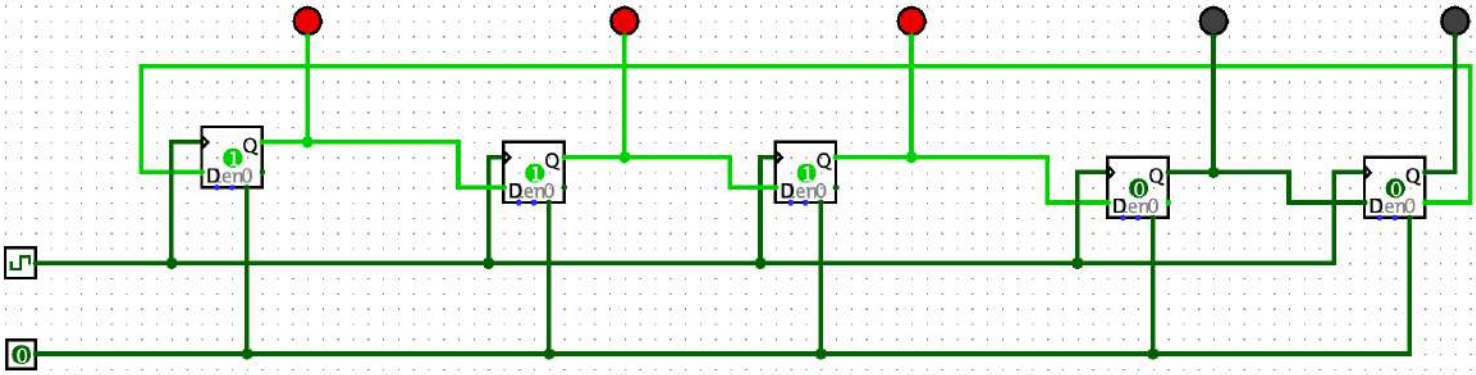


Ring counter

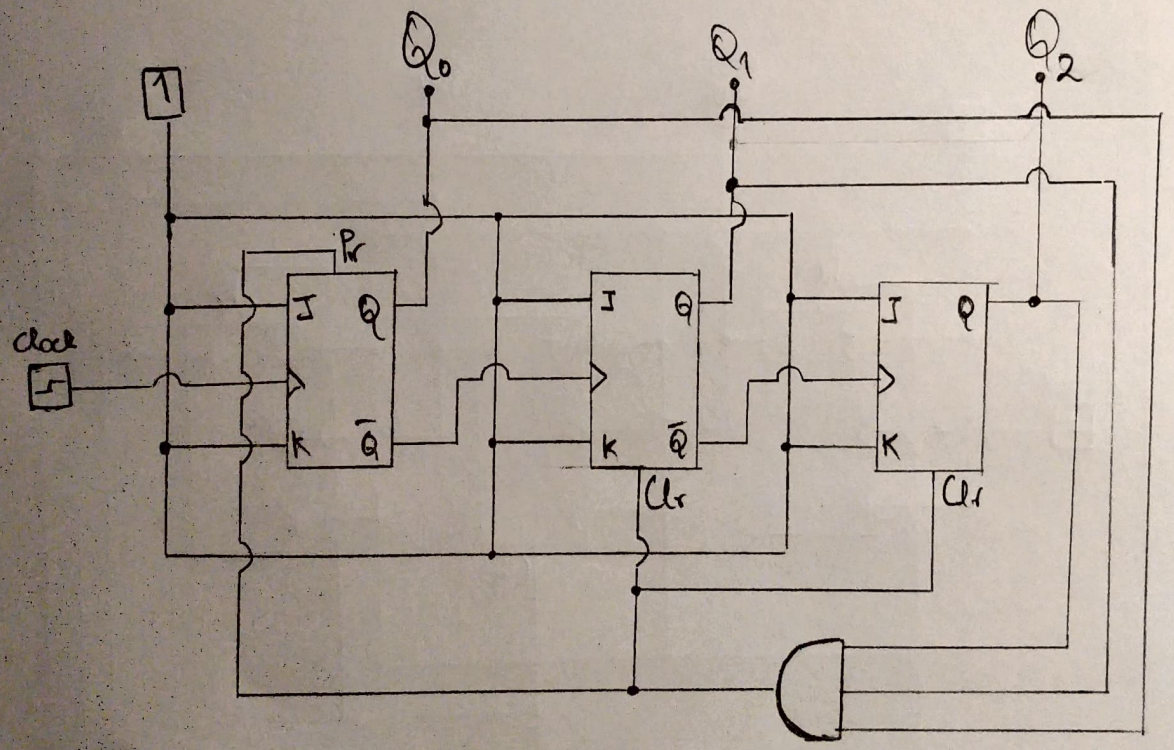


Johnson's counter



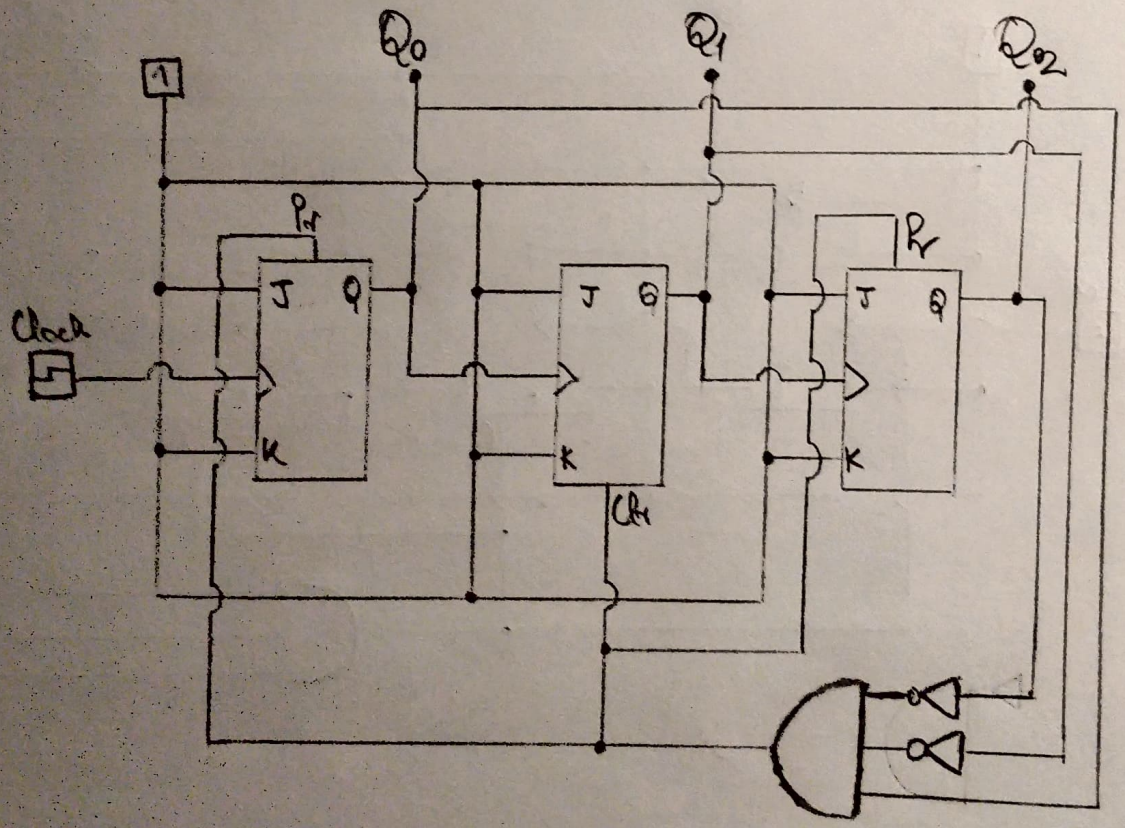
(III) 1-6 Counter →

Present state			Next-State		
Q_{n2}	Q_1	Q_0	Q_2^+	Q_1^+	Q_0^+
0	0	1	0	1	0
0	1	0	0	1	1
0	1	1	1	0	0
1	0	0	1	0	1
1	0	1	1	1	0
1	1	0	0	0	1

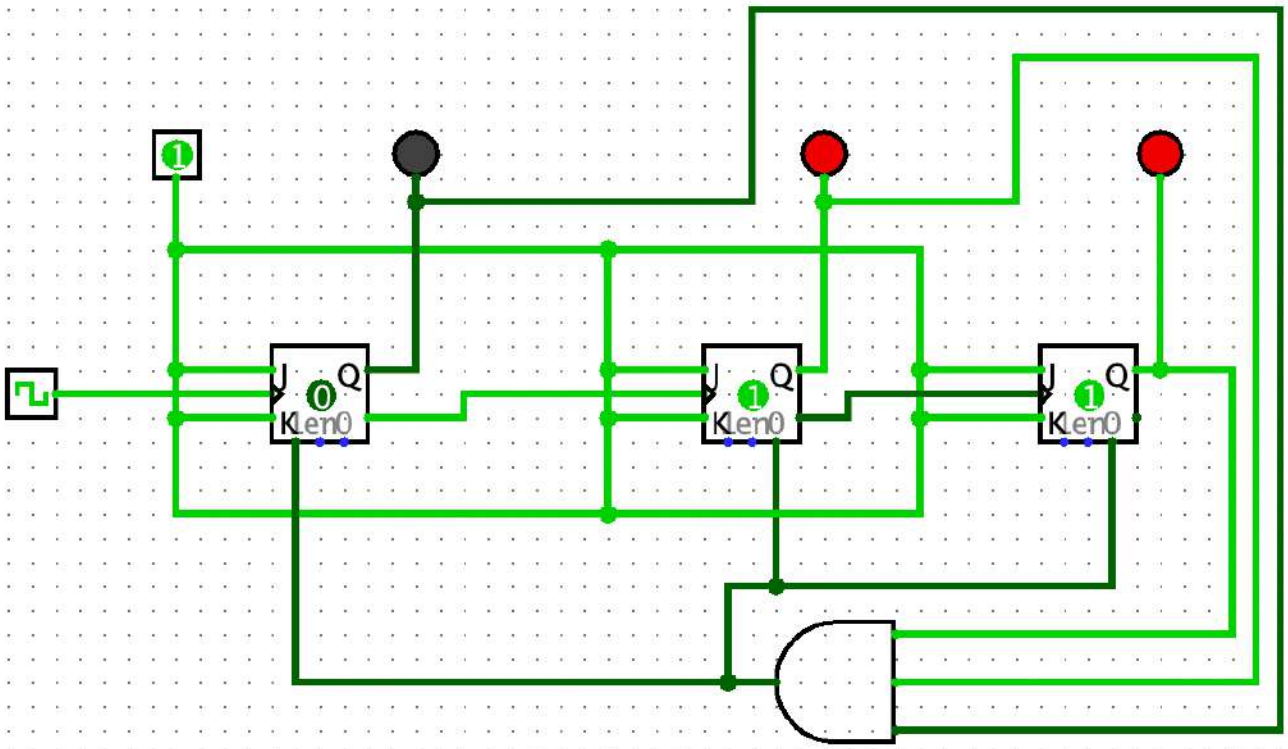


(IV) 5-2 down counter →

Present State Q_2 Q_1 Q_0	Next State Q_2^+ Q_1^+ Q_0^+
1 0 1	1 0 0
1 0 0	0 1 1
0 1 1	0 1 0
0 1 0	1 0 1



1-6 Counter



5-2 counter