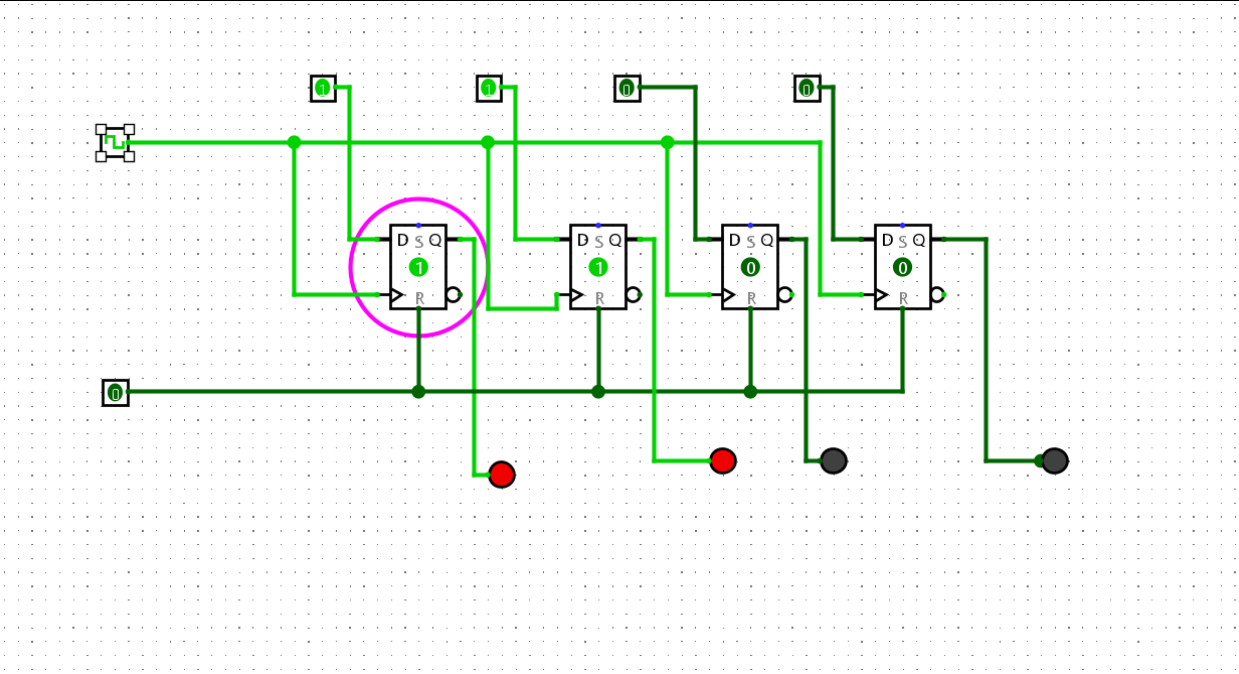
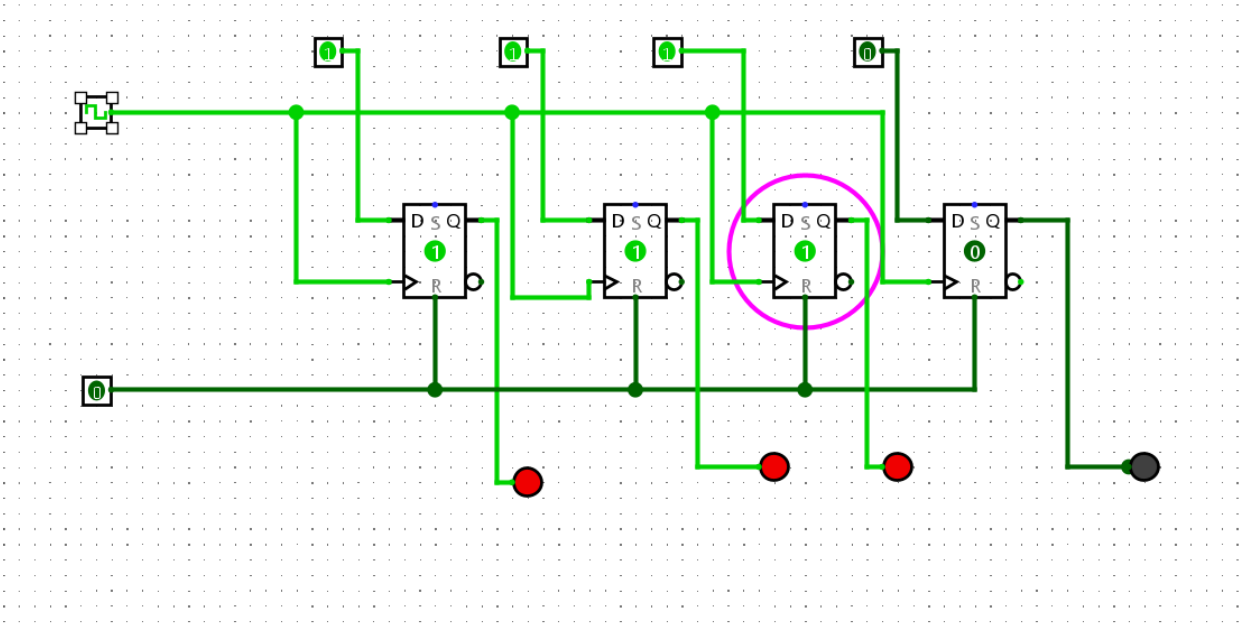
4 Bits Registers

ox	Input	Output
0	0000	0000
1	0001	0001
2	0010	0010
3	0011	0011
5	0101	0101
A	1010	1010
B	1011	1011
C	1100	1100
D	1101	1101
E	1110	1110
F	1111	1111





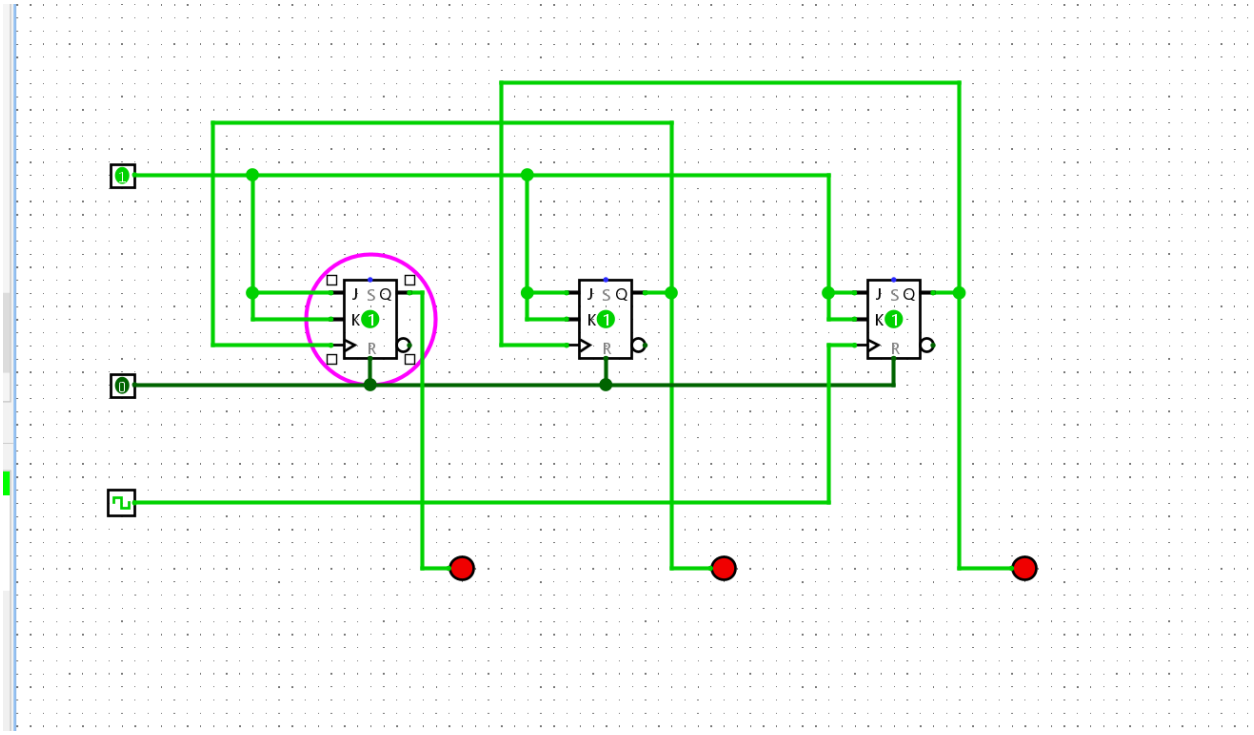
7.1: Crucial role (hardware) counters play in modern computing architectures

Hardware counters are a set of special-purpose registers which was designed and built into modern microprocessors

7.2: Describe in a few sentences how a ripple counter works. How does the "ripple" occur

A ripple counter is an asynchronous counter

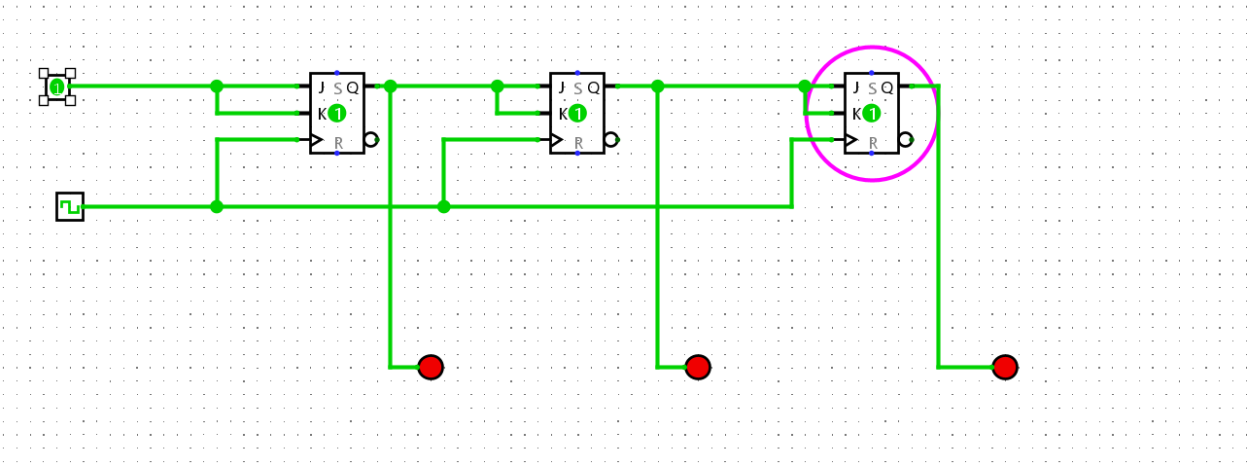
JK Ripple Counter



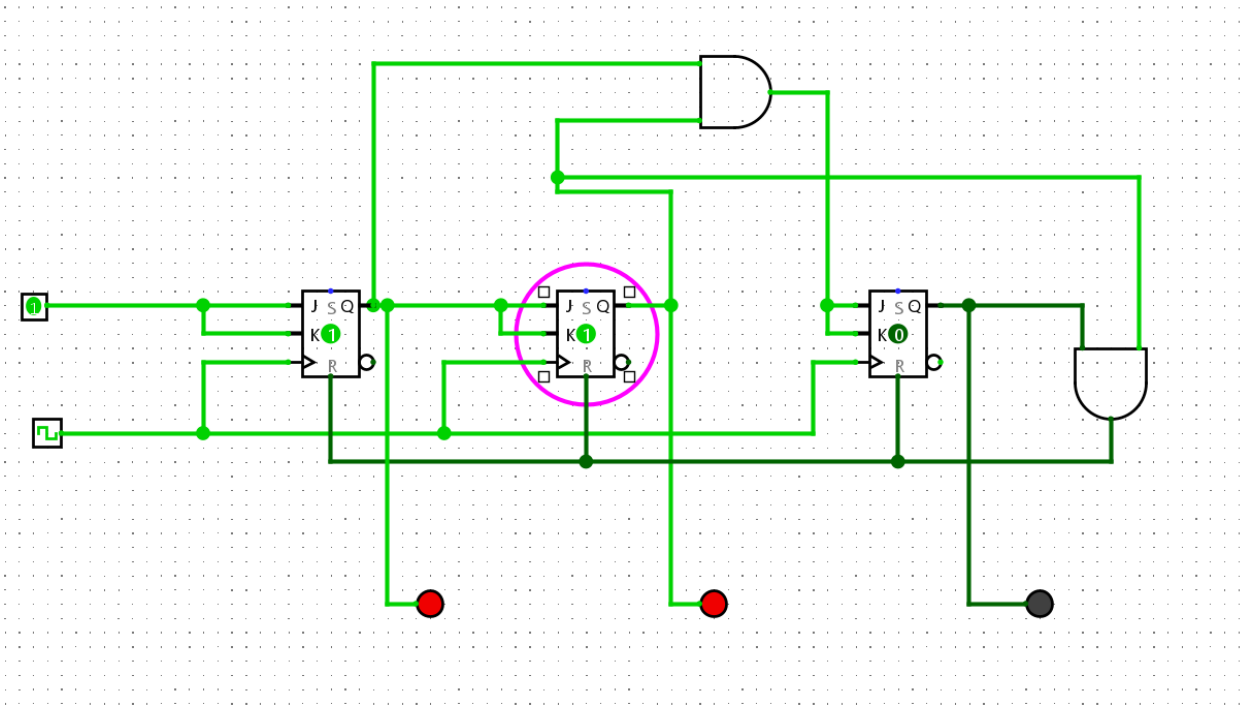
The countdown counter and the count counter have the same connection.

But the way that they execute flip-flop are different. The countdown counter will be rising edge, while the count counter will be falling edge

JK Counter with common clock



Mode 6 Counter


1
J S Q
K 1
R
J S Q
K 1
R
J S Q
K 0
R