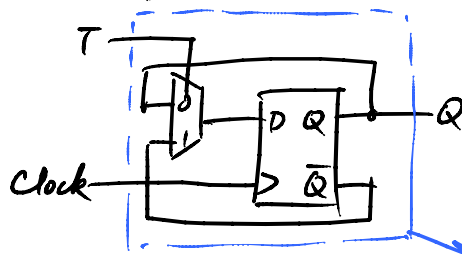


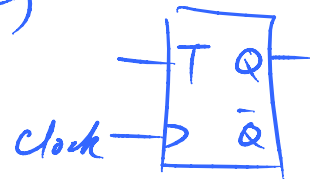
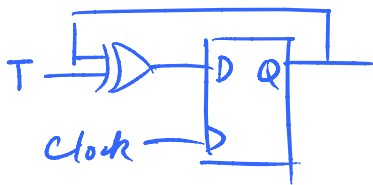
Circuit that counts (in binary)



T	Q(t+1)
0	Q(t) (no change)
1	$\bar{Q}(t)$ (toggle)

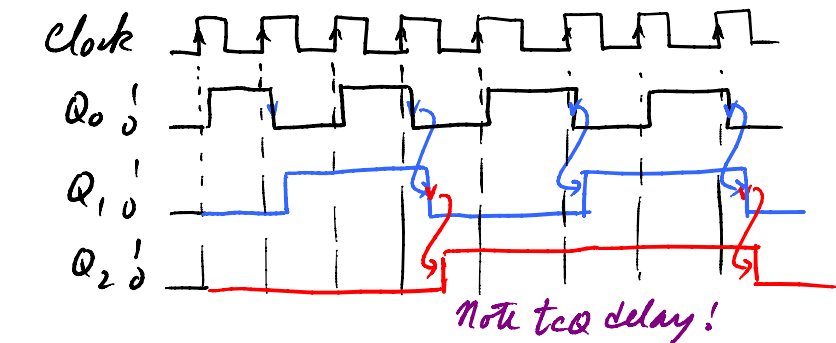
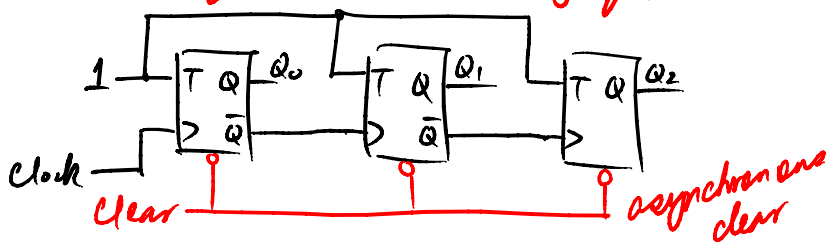
T-flip flop (toggle ff)

Another way of building this



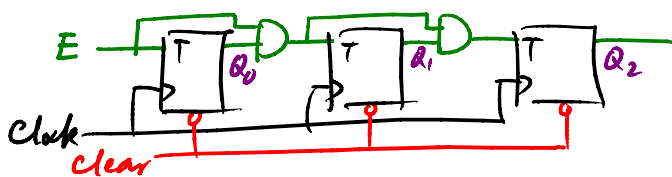
make a counter (3-bits)

asynchronous counting up.



$Q_2 Q_1 Q_0$ 000 001 010 011 100 101 110 111 000 ...

Add an Enable (E) input to the Synchronous counter

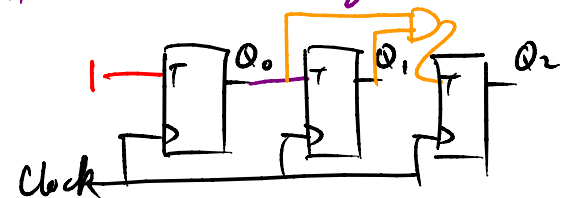


A synchronous counter

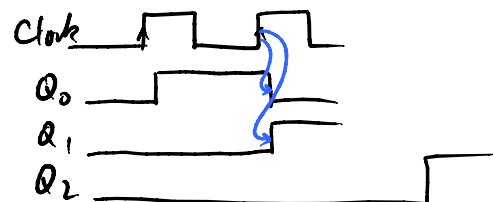
Clock cycle Count ($Q_2 Q_1 Q_0$)

0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111
8	000

Q_0 Toggles on every clock cycle
 Q_1 ... when Q_0 is high

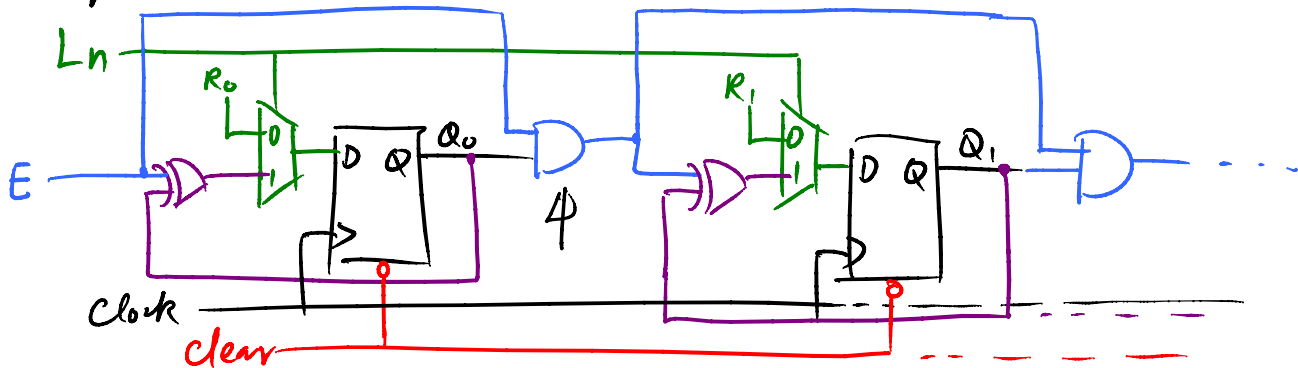


Q_2 Toggles when both Q_0 & Q_1 are '1'



Adding a parallel load (L_n) input

→ for convenience it is better to show D-FFs



useful for labs + project.

