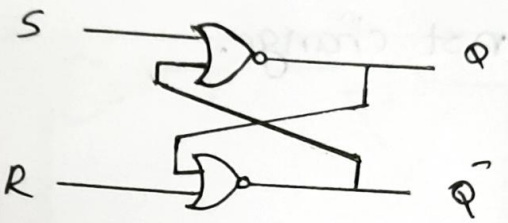
(2) Sequential logic circuits are digital circuits whose outputs depend not only on their current inputs but also on the past sequence of outputs. ~~Inputs~~.

Example of sequential logic ckt,

SR Latch,



S	R	Q	Q̄
0	0	memory	
0	1	0	1
1	0	1	0
1	1	Invalid	

As shown above,

the output Q and Q̄ are given ~~with~~ as Inputs of NOR gate with current Input S and R. So, the output depends on current input as well as past outputs.

(3)

A flip-flop is a sequential digital electronic circuit having two stable states that can be used to store 1 bit of information. They are the fundamental building blocks of all memory devices.

The operation of Flip Flop's depend on Input and clock. So, the output is changed only when you give an active clock signal. Otherwise, even if the S or R is active the data will not change.

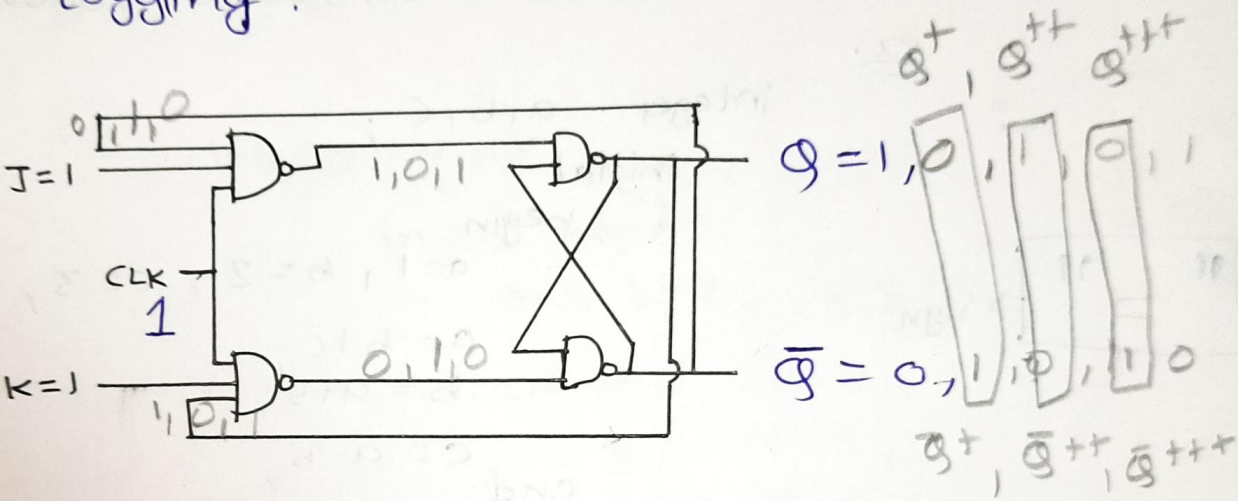
Types of Flip Flops,

1. S-R Flip Flop (Set-Reset FF).
2. D Flip Flop (Data FF)
3. T Flip Flop (Toggle FF)
4. J-K Flip Flop

Race around

In JK FF if J = K = 1 and CLK = 1 for long period or time, then Q output will toggle as long as CLK is High, which makes the output of the flip-flop is unstable. this is called Race around in JK FF.

In simple words Race around is Uncontrolled toggling.



assume Q = 1,

If we give J = K = 1, Q = 0, Q̄ = 1,

Q & Q̄ are inputs to the nand gate which makes output as first nand gate to 0,1 which goes to the SR Latch, which gives output as 1,0. similary for next interval,

So, we are getting Q as

$$Q = \uparrow, 0, 1, 0, 1, 0$$

as long as clk is high