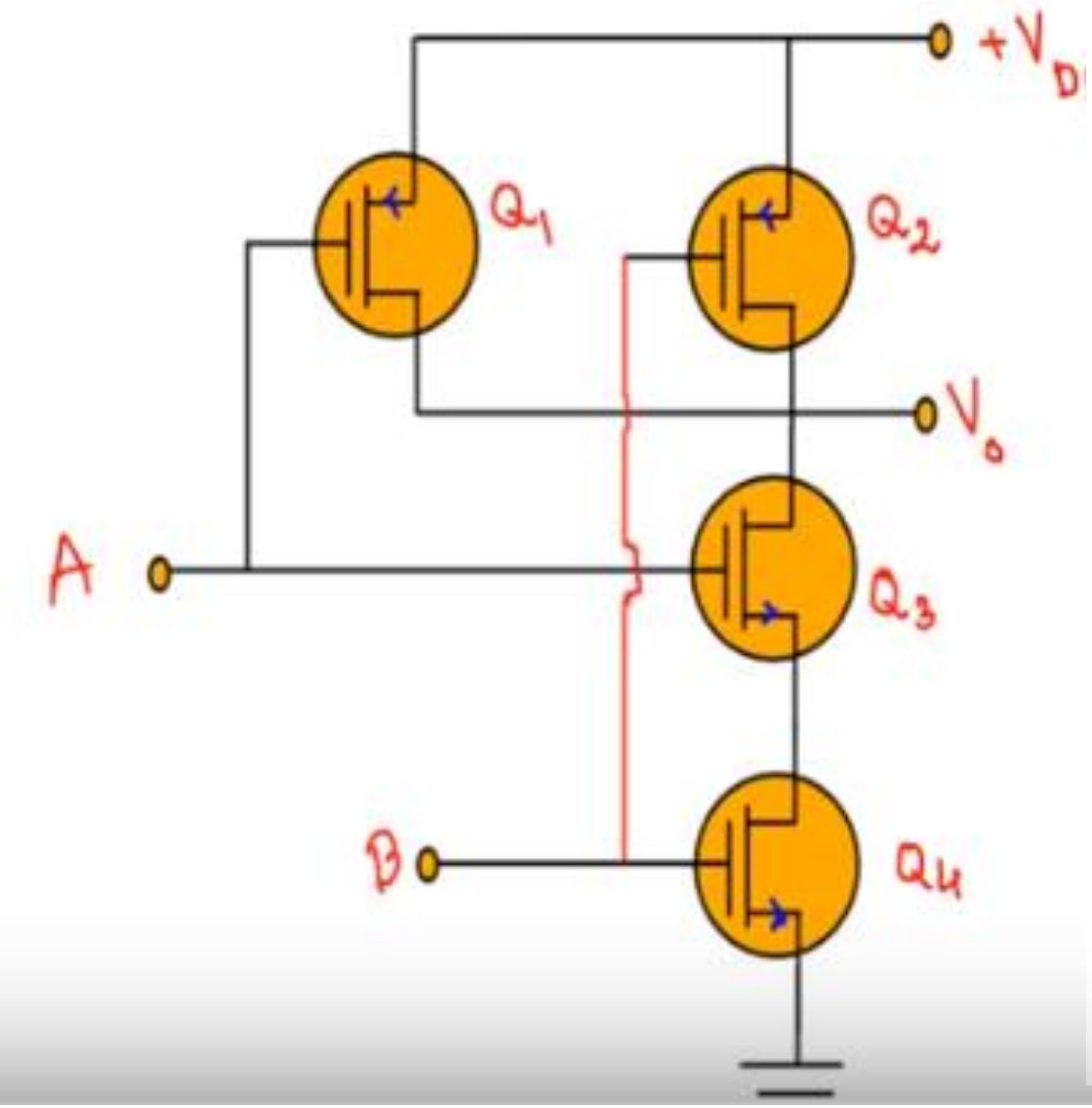
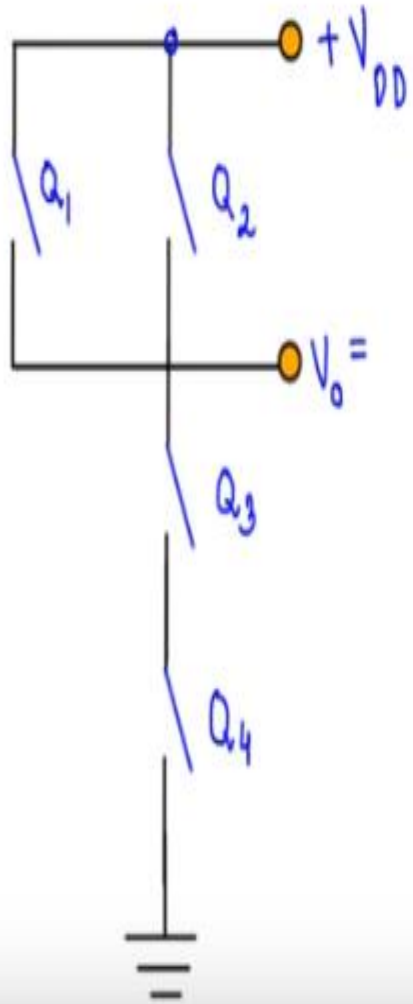
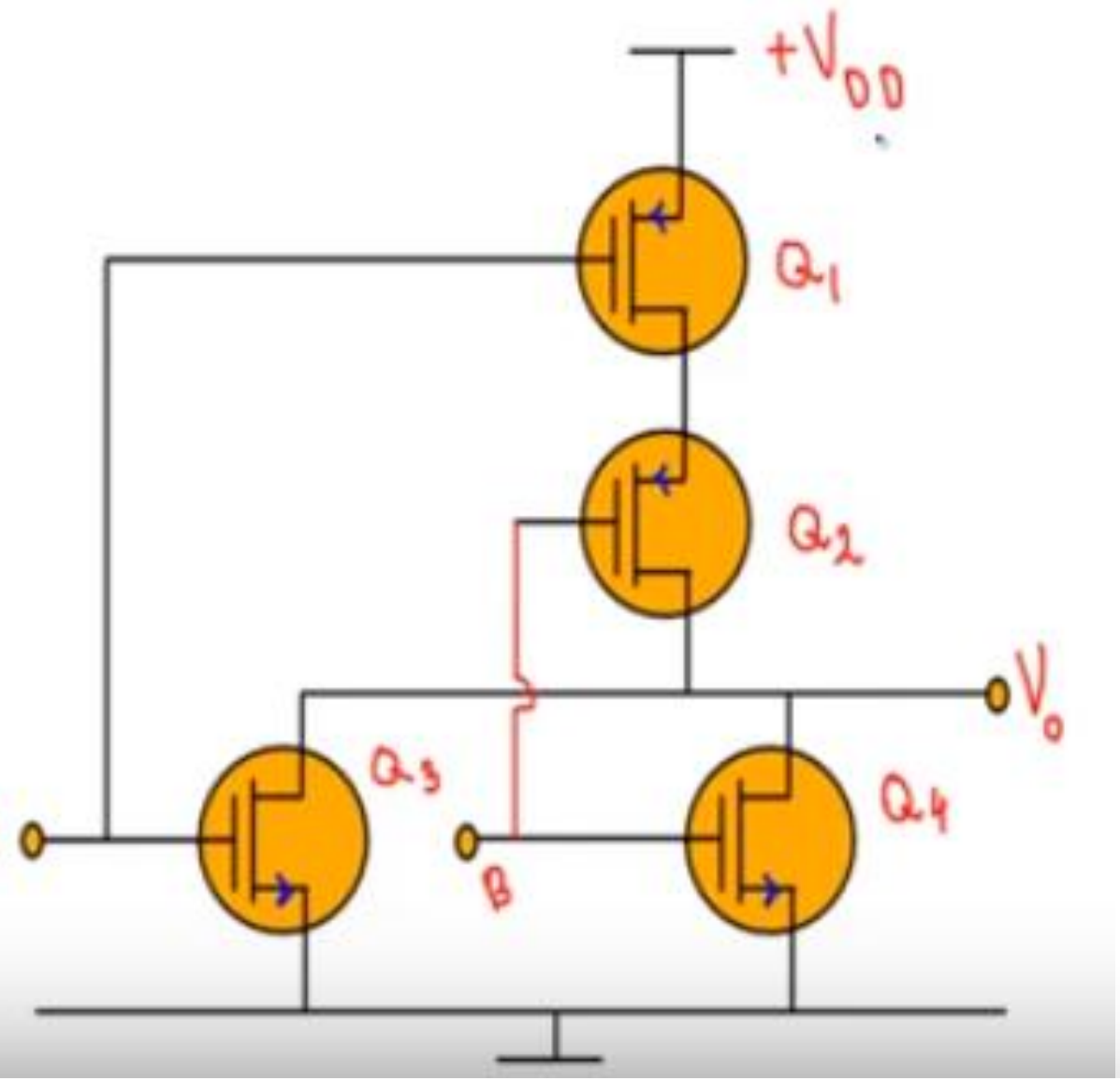
CMOS NAND

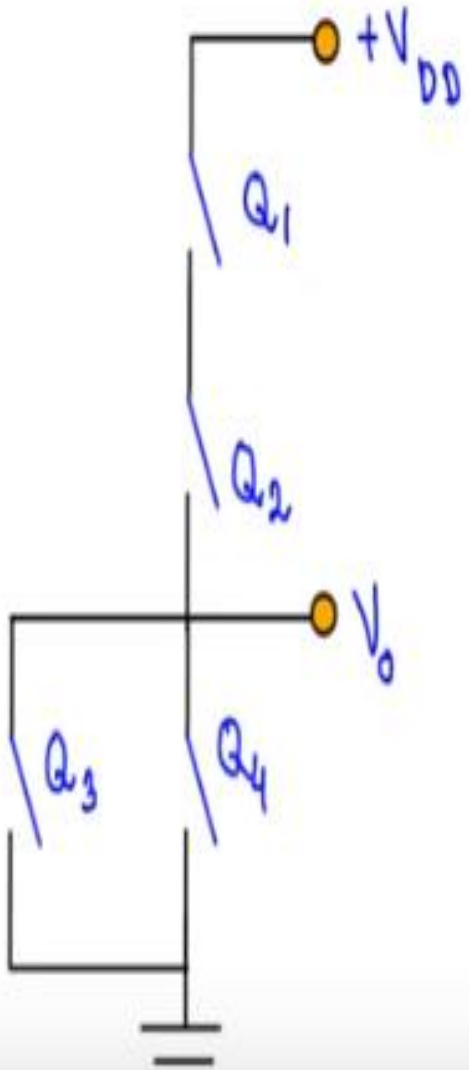




A	B	Q_1	Q_2	Q_3	Q_4	V_o
0	0	on	on	off	off	1
0	1	on	off	off	on	1
1	0	off	on	on	off	1
1	1	off	off	on	on	0

CMOS NOR GATE





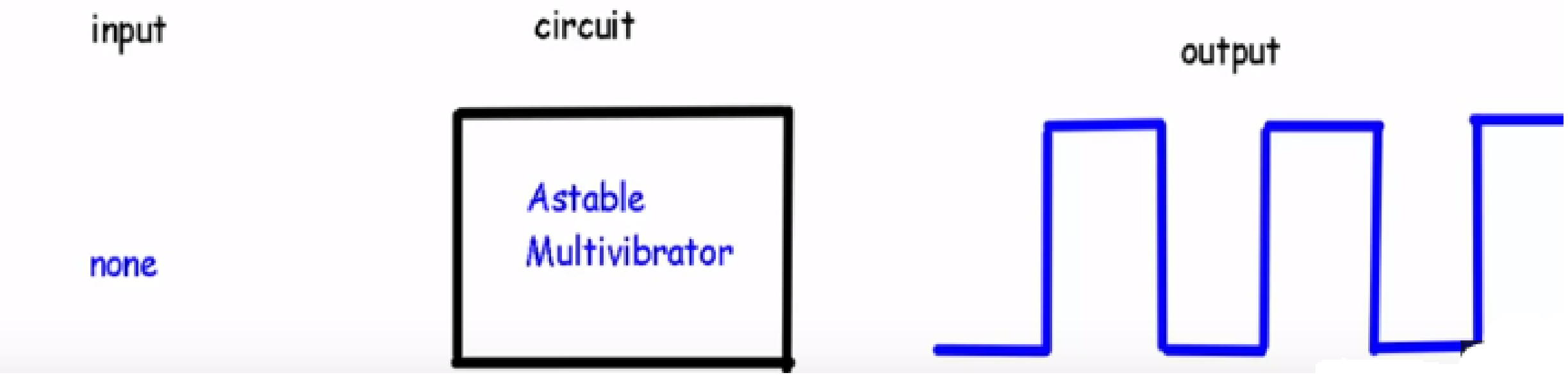
A	B	Q_1	Q_2	Q_3	Q_4	V_o
0	0	on	on	off	off	1
0	1	on	off	off	on	0
1	0	off	on	on	off	0
1	1	off	off	on	on	0

Multivibrators

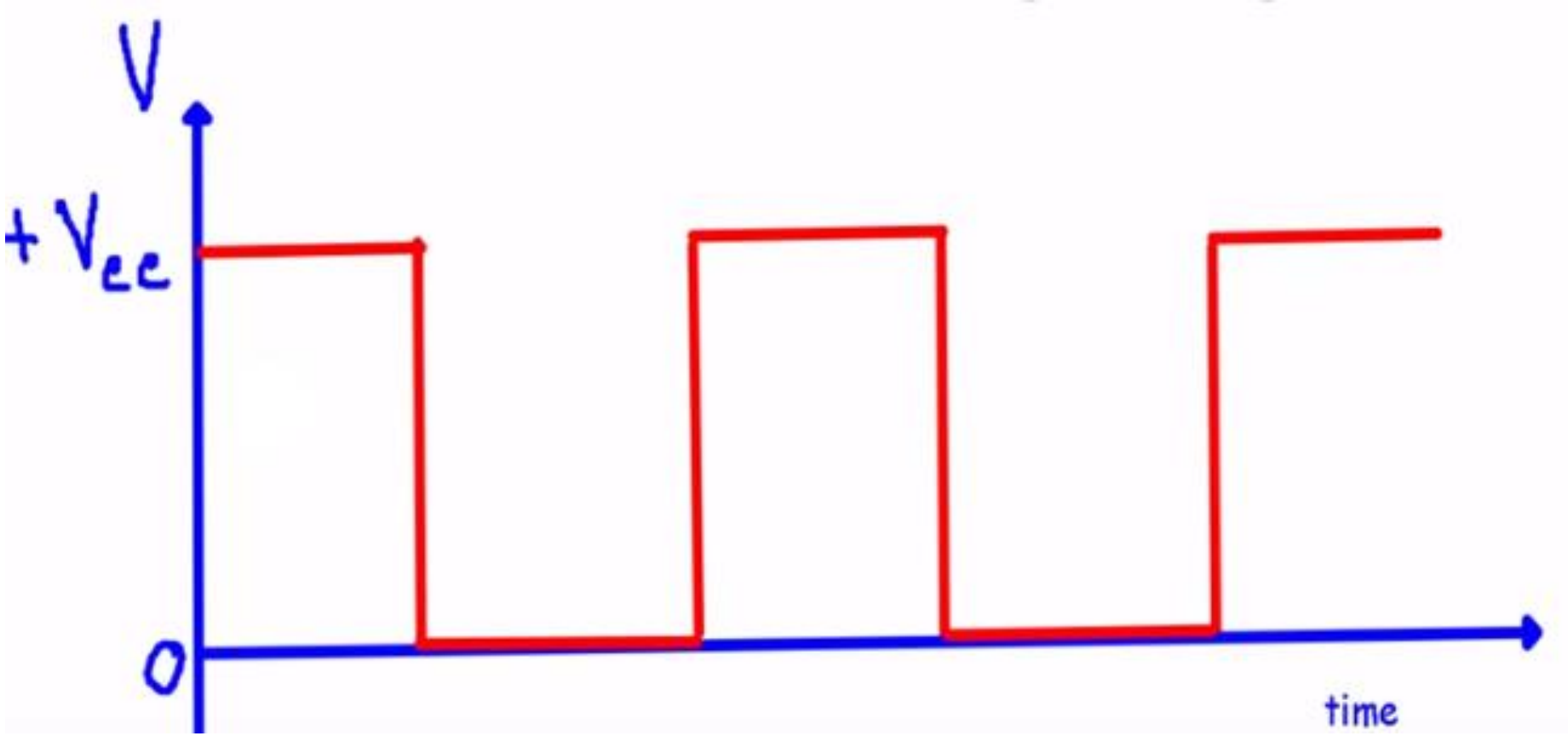
- A multivibrator is used to implement simple **two-state systems** such as oscillators, timers and flip-flops.
- Three types:
  - **Astable** – neither state is stable.
    Applications: oscillator, etc.
  - **Monostable** - one of the states is stable, but the other is not;
    Applications: timer, etc.
  - **Bistable** – it remains in either state indefinitely.
    Applications: flip-flop, etc.

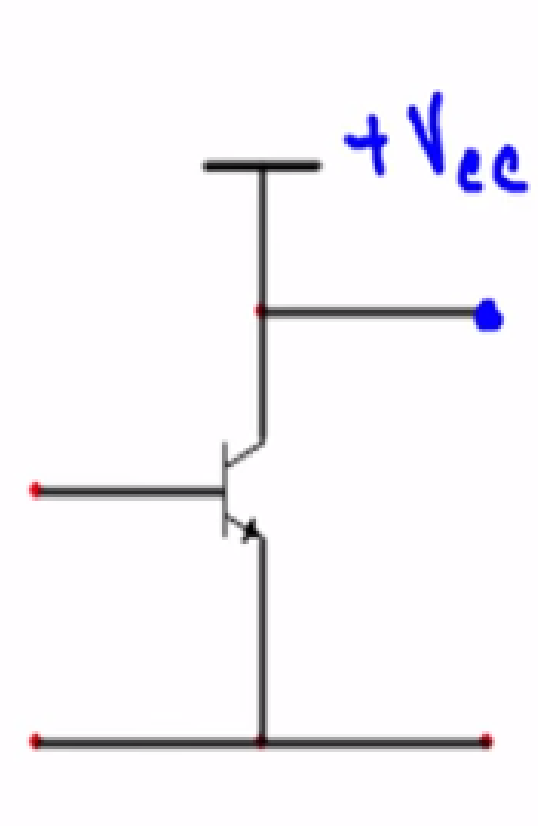
Astable Multivibrator:

A multivibrator that generates square waveform without using any external triggering pulse is known as astable or free running multivibrator.

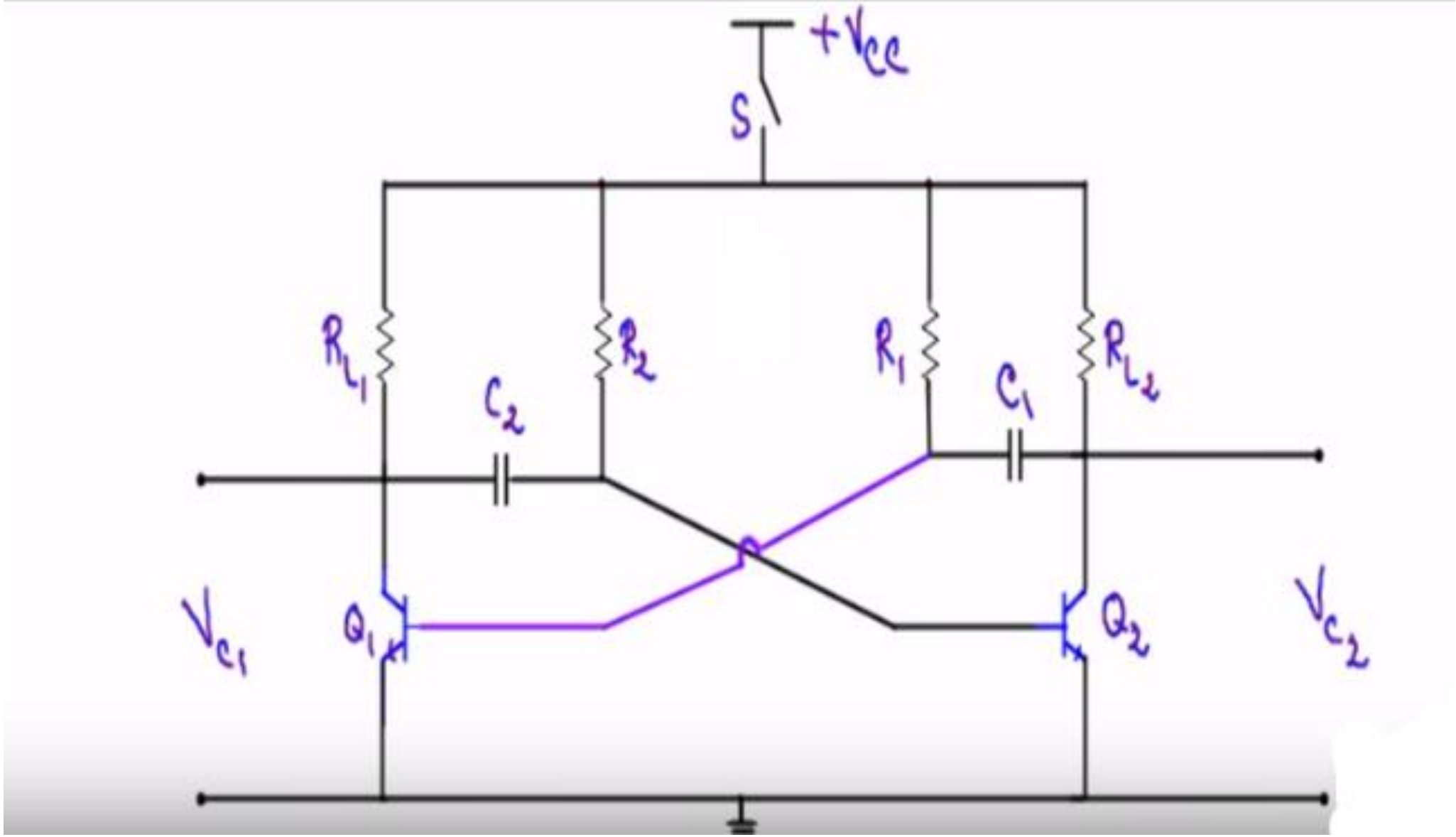


Astable Multivibrator





Astable Multivibrator



Astable Multivibrator