In electronics, a flip flop circuit is used to hold two stable states and can be used to store state information (saving bits).
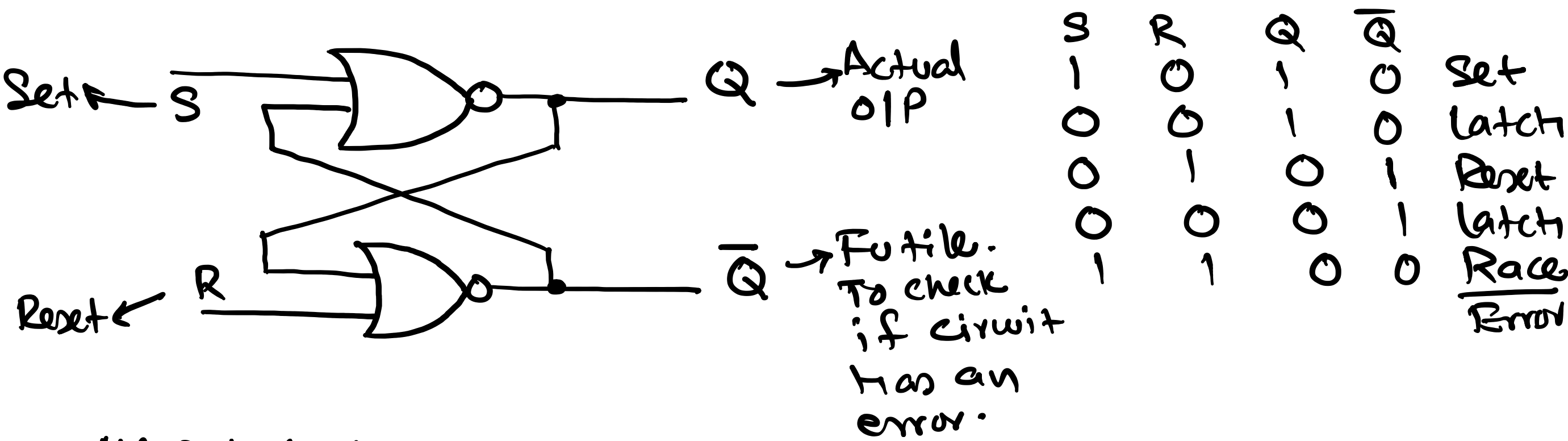
A circuit can be made to change state by applied control input and will have one or two outputs.

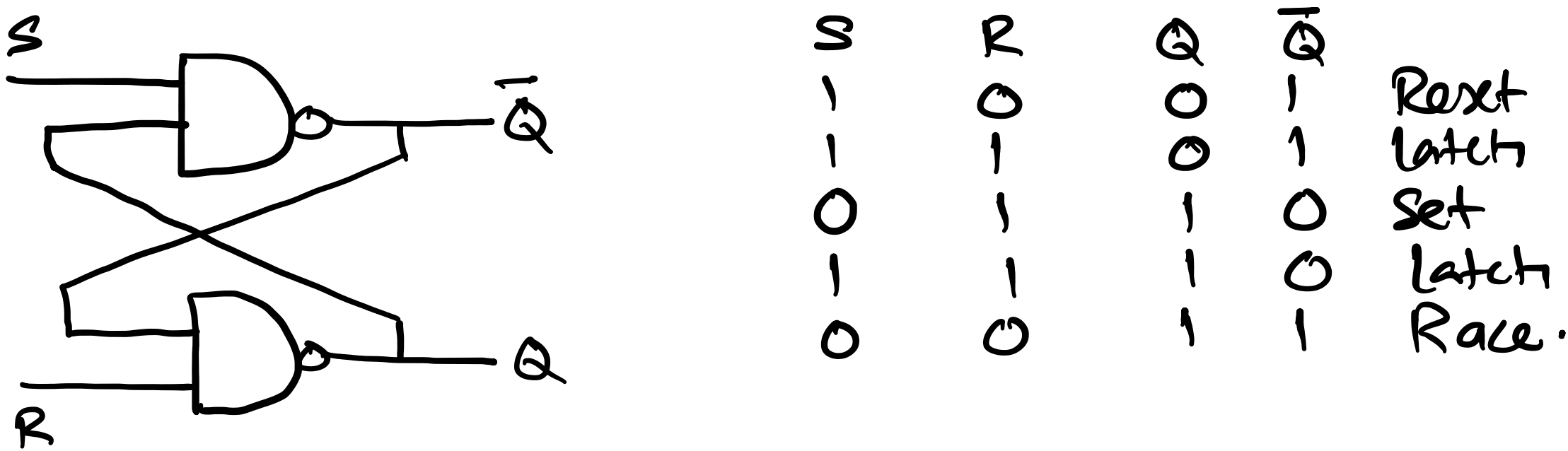It is basic storage element in sequential Logic.

There are many types and we study only two: SR & JK.

S-R flip flops:

NOR LOGIC:

S	R	Q	$\bar{Q}$	
1	0	1	0	Set
0	0	1	0	latch
0	1	0	1	Reset
0	0	0	1	latch
1	1	0	0	Race Error

Q → Actual O/P

$\bar{Q}$ → Futile. To check if circuit has an error.

NAND LOGIC:

S	R	Q	$\bar{Q}$	
1	0	0	1	Reset
1	1	0	1	latch
0	1	1	0	Set
1	1	1	0	latch
0	0	1	1	Race.

Weaknesses of SR flip flop Circuits:

1. Two values (Both S & R) can't be changed together
2. States cannot be flipped.
3. It has error sometimes.

To overcome these weaknesses JK flipflop circuits are used.

S = J   Jack
R = k   Kilby

		System			
J	K	Clock	Q	$\bar{Q}$	
1	0	↑	1	0	Set
0	0	↑	1	0	latch
0	1	↑	0	1	Reset
1	1	↑	1	0	flip

Nothing Happens to protect from error.

System Clock Cycle

Time →

↑↓↑ → High

↑↓ → Low