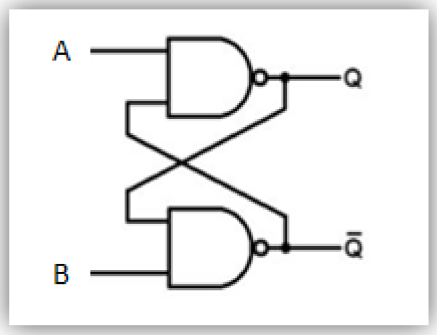
Course Name: A Level
Topic: Flip-Flop

Subject: CO
Date: 19-03-20

Latch: A Latch is a circuit that incorporates two basic NOR or NAND gates in a CROSS-COUPLED connection. This peculiar connection is necessary because the aim is to create a locking system that will be able to lock a single bit in it. A simple NAND latch is given here:



A	B	Q	Q'	
0	0	1	1	→ Race Condition
0	1	1	0	→ Set
1	0	0	1	→ Reset
1	1	0	1	→ No Change

Flip-Flop: A Flip-Flop is a basic electronic circuit that is designed to store a single bit either it is a “0” or a “1”. Thus we can say that a Flip-Flop is the smallest unit of an Electronic Memory.

A Flip-Flop is nothing but a clocked Latch circuit. Since we use a clock input signal, this circuit becomes able to generate different outputs in different clock periods.

Normally a clock input is either “0” or “1”, hence the Flip-Flop is often called as a TWO STATE MULTIVIBRATOR or BISTABLE MULTIVIBRATOR.

Depending upon design, usage and technology, Flip-Flops are categorized into several types. Some of these are listed here:

1. SR (Set-Reset) Flip-Flop
2. D (Delay) Flip-Flop
3. JK (Jack Kilby) Flip-Flop
4. T (Toggling) Flip-Flop

Exercise:

1. What is a Latch? Describe a NAND latch with Truth Table.
2. What is a flip-flop? Why is it called BISTABLE MULTIVIBRATOR?