

COL215L: Digital Logic & System Design

Lecture 16: Sequential Circuits



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Sequential Circuits

- Combinational Circuits

- Inputs -> Outputs

- Sequential Circuits

- (Inputs, Present State) -> (Outputs, Next State)

- Asynchronous Sequential Circuits

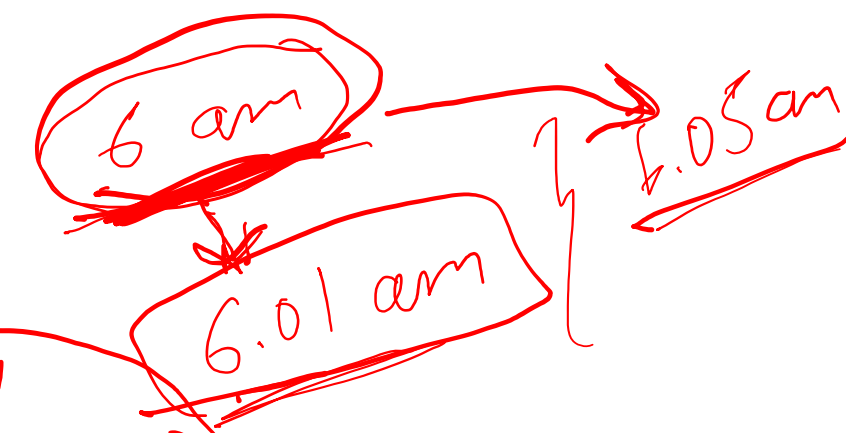
- Change in input signal values

- Synchronous Sequential Circuits

- Signal values at discrete time instants

Memory

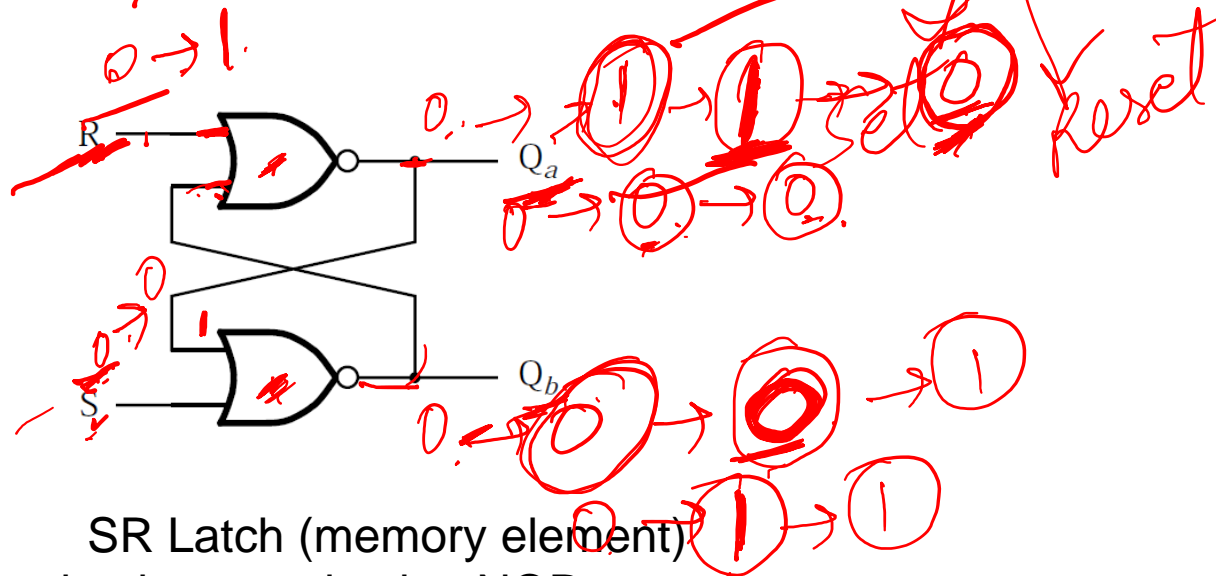
Alarm clock



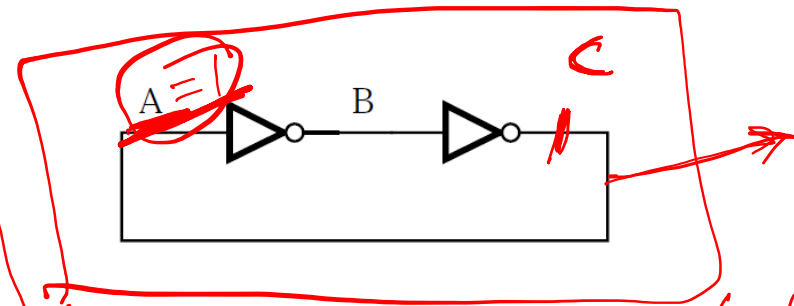
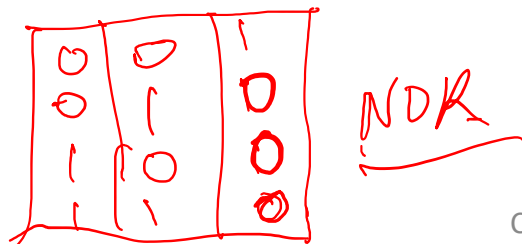
combinational with feedback

Storing State – SR Latch

- Example
 - Alarm clock



SR Latch (memory element)
implemented using NOR gates



S	R	Q_a	Q_b	
0	0	0/1	1/0	(no change)
0	1	0	1	
1	0	1	0	
1	1	0	0	

Characteristic table

0	1	1	0
0	1	1	0

Limitation of a Basic SR Latch

- Oscillation

