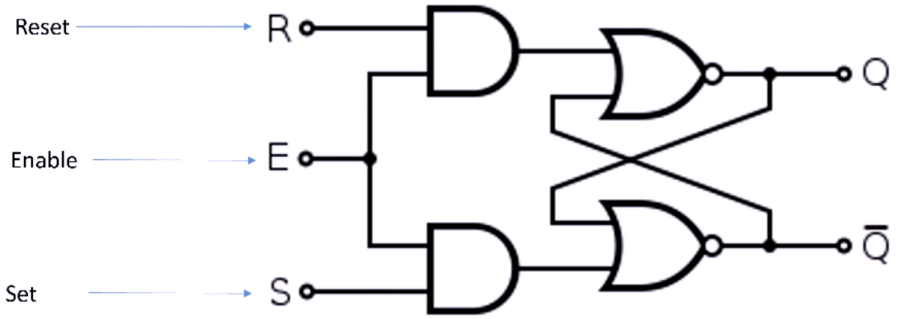
Motivation

- [[Combinational Circuits]] are not capable of storing data
  - changes to input lead to change at output
- storage by creating a feedback loop

Set-Reset Latch - NOR Version



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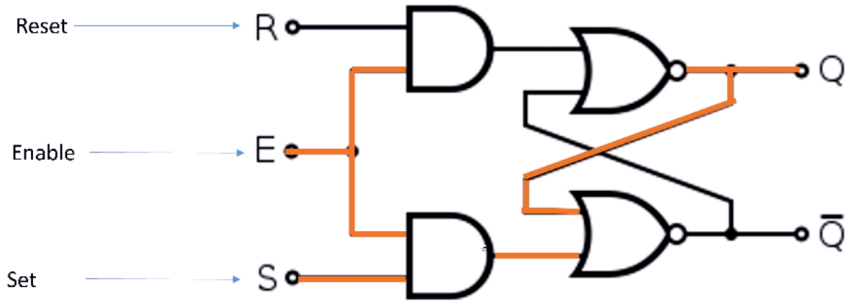
- set



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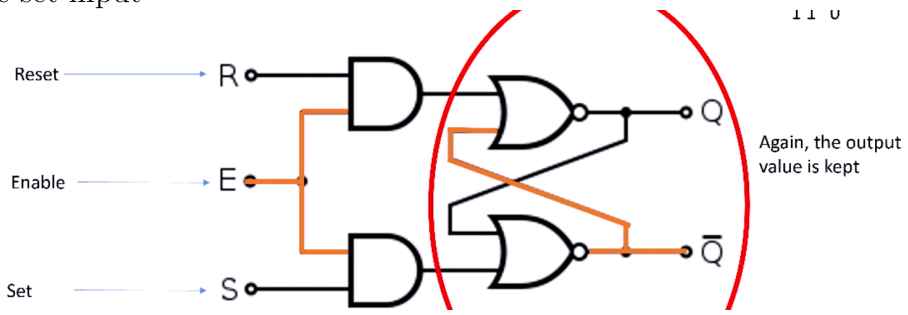
- release set input



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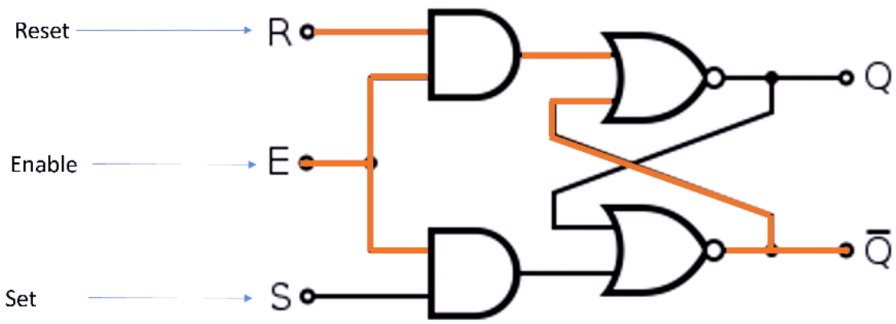
- reset



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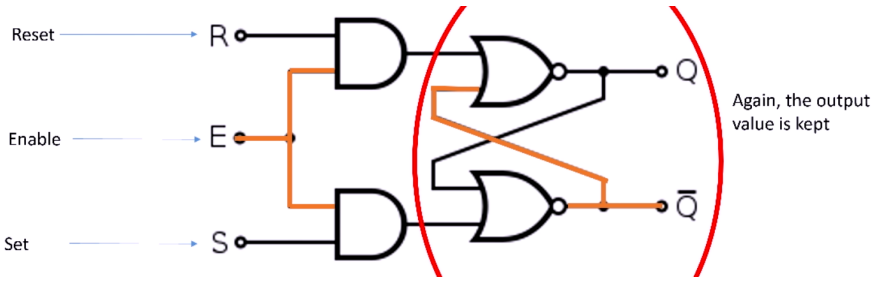
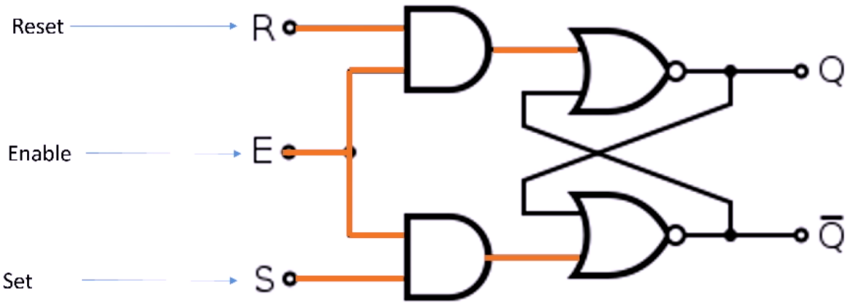
- release reset

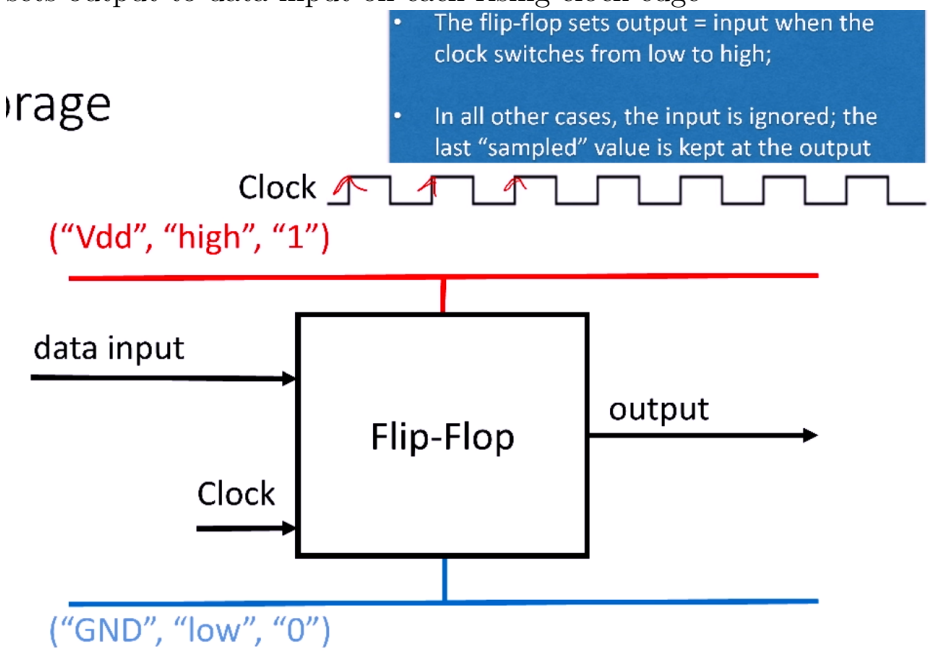


- illegal action



(A)synchronous circuits

- synchronous circuits with global clock signal
  - most commonly used
  - no latches as storage
  - instead uses flip-flops or registers
    - sets output to data input on each rising clock edge



    - 1-bit storage - flip-flop
    - n-bit storage - register
- asychronous circuits

- very rare

Combination of Registers and [[Combinational Circuits]]