Sequential Circuits

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Sequential Circuits

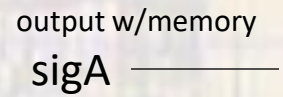
- Combinatorial Circuits
  - Any circuit whose outputs are only dependent on the current inputs
    - ANDS, NORS, MUXs, Decoders, ALU
    - Combinations of all of these

Sequential Circuits

- Sequential Circuits
  - Any circuit whose outputs are dependent on the current inputs AND previous outputs
    - Implies that there is some sort of memory involved
    - Latches, Flip-Flops, memories
    - Combinations of all of these and any combinatorial logic
  - 2 types
    - Synchronous
      - Output changes occur only at specific clock intervals
    - Asynchronous
      - Outputs change occur based on input changes without a clock

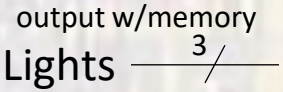
Sequential Circuits

- States
  - Since sequential circuits are dependent on inputs and previous output values, the inputs are not sufficient to describe the behavior of the circuit
  - Define a state to be each possible combination of all output values held in some sort of memory
  - Define a state variable as the combination of states for each defined output
    - Defined outputs can be individual signals or collections of signals



States: 0, 1

State Variable: sigA



States: 0 - 7

State Variable: Lights

