Specification Document

These are the specifications for a circuit to power an LED bike light. The bike light has four different settings: DIM, ON, BLINK, and OFF. A button click causes the bike light to change from one setting to the next.

Inputs: Button Click

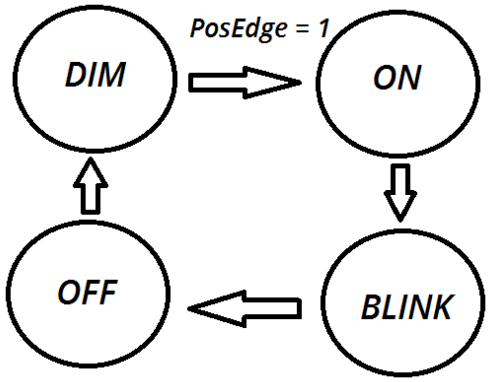
Outputs: Control signal for a single LED

Operational Modes: DIM: LED on at approximately half brightness

ON: LED on at full brightness

BLINKING: LED alternating between ON and OFF at a regular frequency

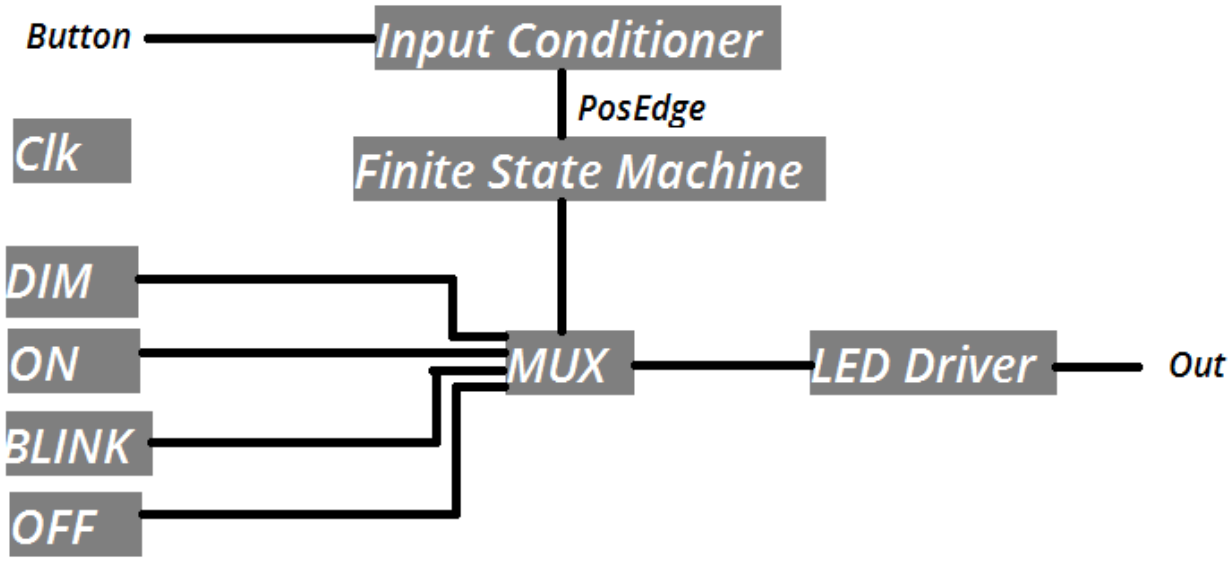
OFF: LED off



Measurements of relevant dimensions:

Frequency of BLINK: 0.5 Hz (1 second on, 1 second off)

Block Diagram:

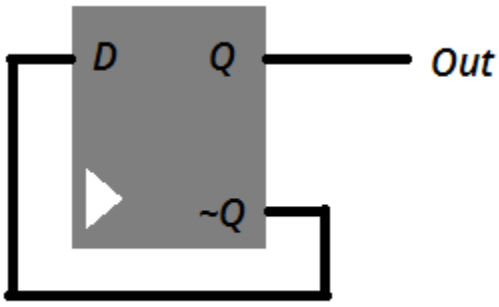


Schematic:

Here is each component of the block diagram on the gate or given component level.

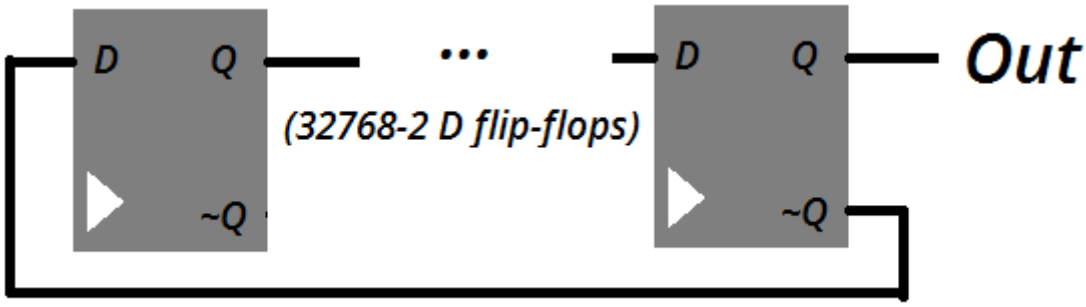
Clk: (given 32768 Hz Clk) size = 2

DIM: size = 13



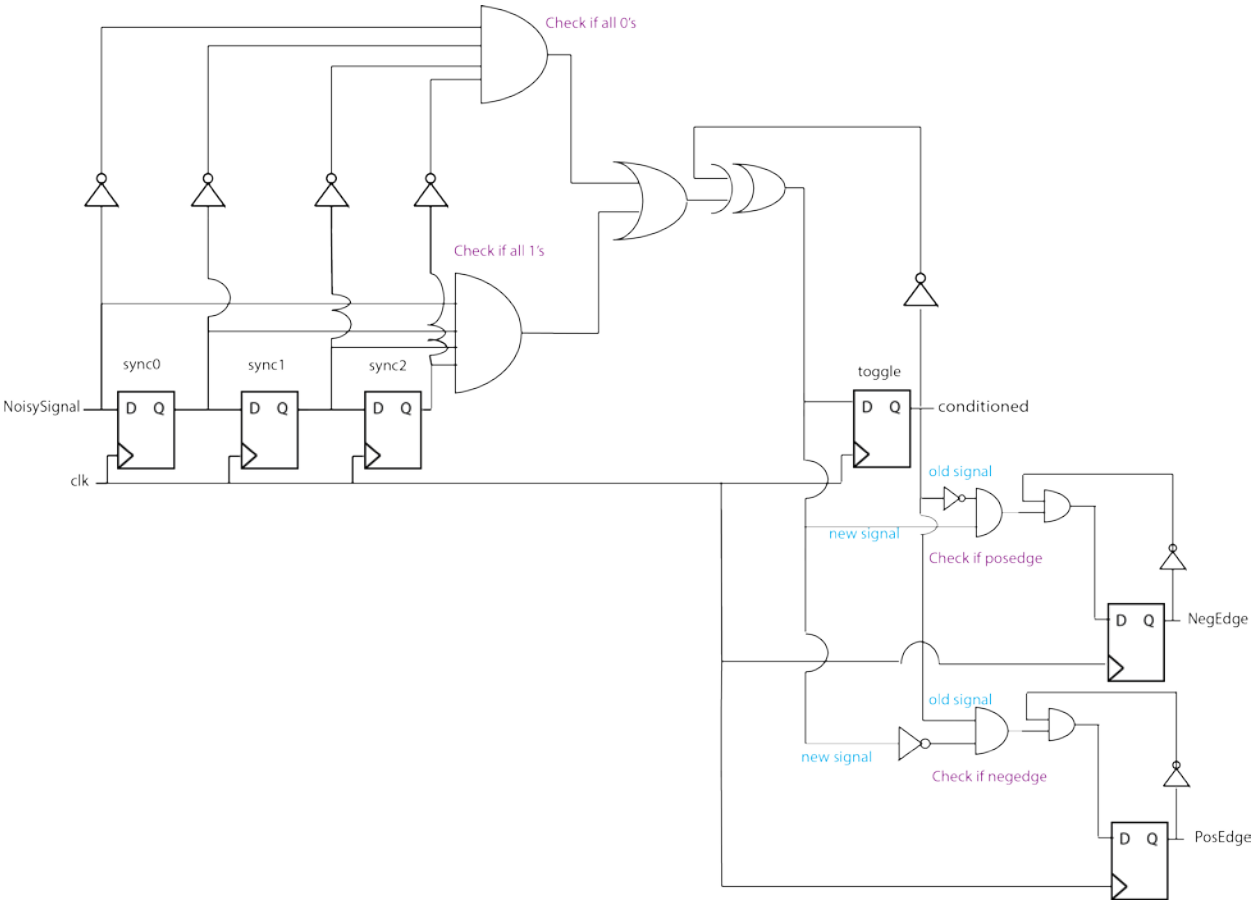
ON: (given wire to 1) size = 0

BLINK: size = 13*32768



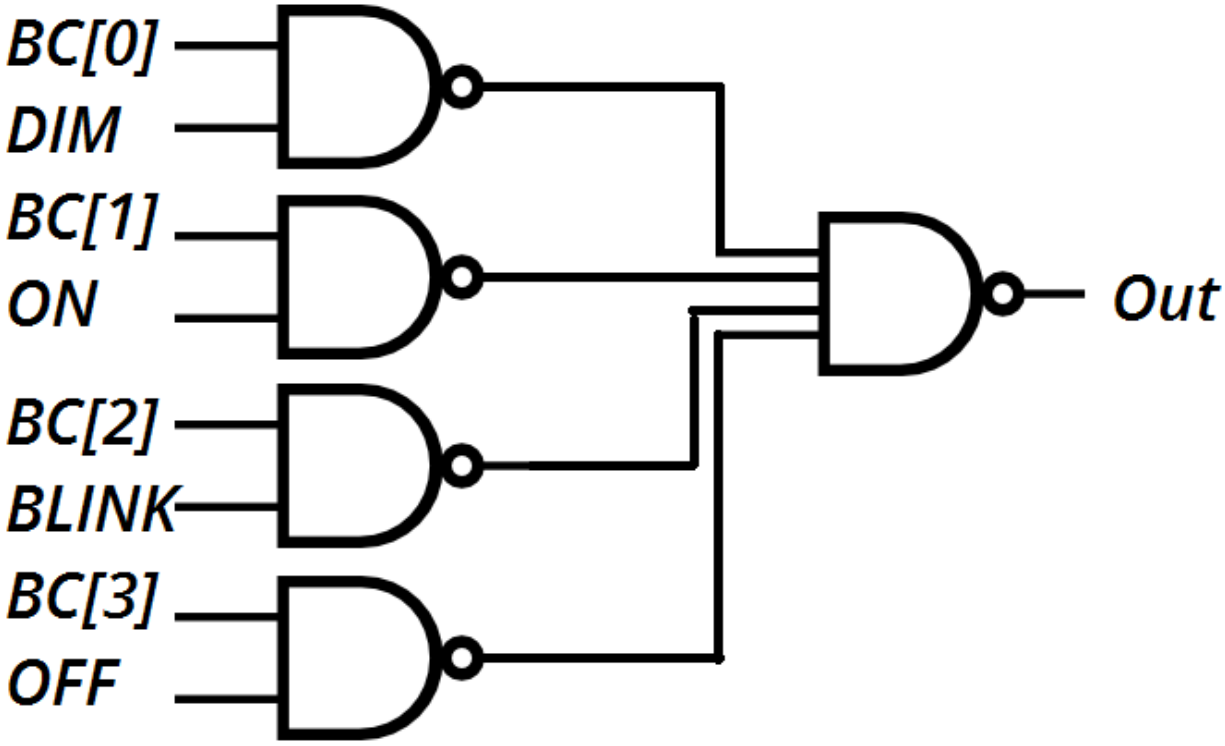
OFF: (given wire to ground) size = 0

Input Conditioner: size =



Finite State Machine: (given 4-stage ring counter) size = 83

MUX: size = 12



LED Driver: (given) size = 211

Cost Estimation model

Total size =