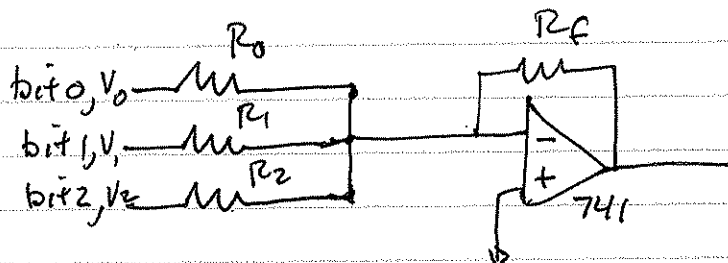


Lab 3 DAC and ADC

1. Digital to analog conversion (DAC)

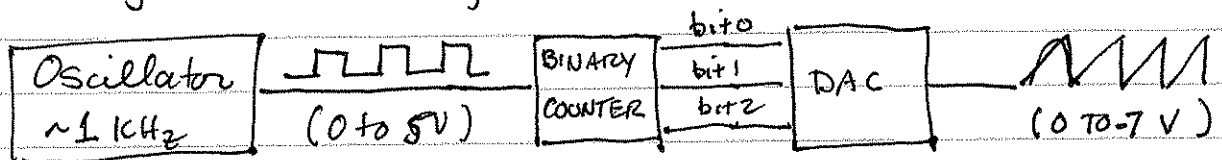
Build this circuit



$$V_{out} = -\frac{R_f}{R_0} V_0 - \frac{R_f}{R_1} V_1 - \frac{R_f}{R_2} V_2$$

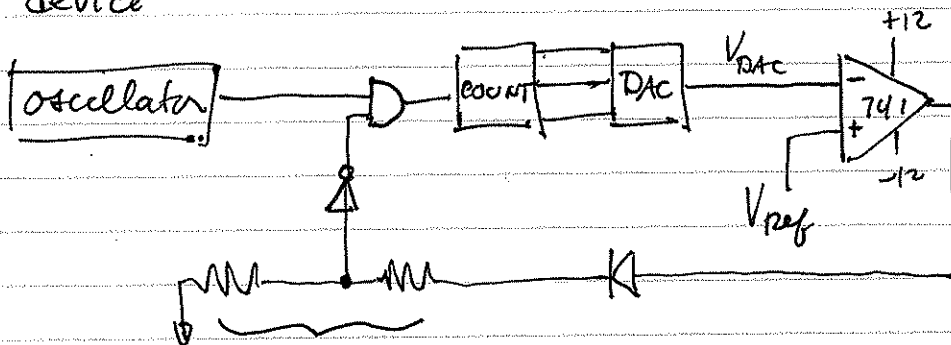
Choose $\{R_0, R_1, R_2, R_f\}$ such that $V_{out} = -N$ in volts
 where $N = \text{binary number} = (\text{bit}_2, \text{bit}_1, \text{bit}_0)$
 $0 \leq N \leq 7$

2. Analog oscillator using the DAC



3. ~~For~~ Analog to Digital conversion

To the circuit above, add a comparator and a counter-enable device



Reduce 12V to 5

The digital value of the input signal V_{ref} is the output of the counter when it stops counting.

Since $0 \geq V_{DAC} \geq -7V$, use $0 \geq V_{ref} \geq -6V$.