

## **Title of the Experiment:**

Monostable Multivibrator using Op-Amp

## **Theory:**

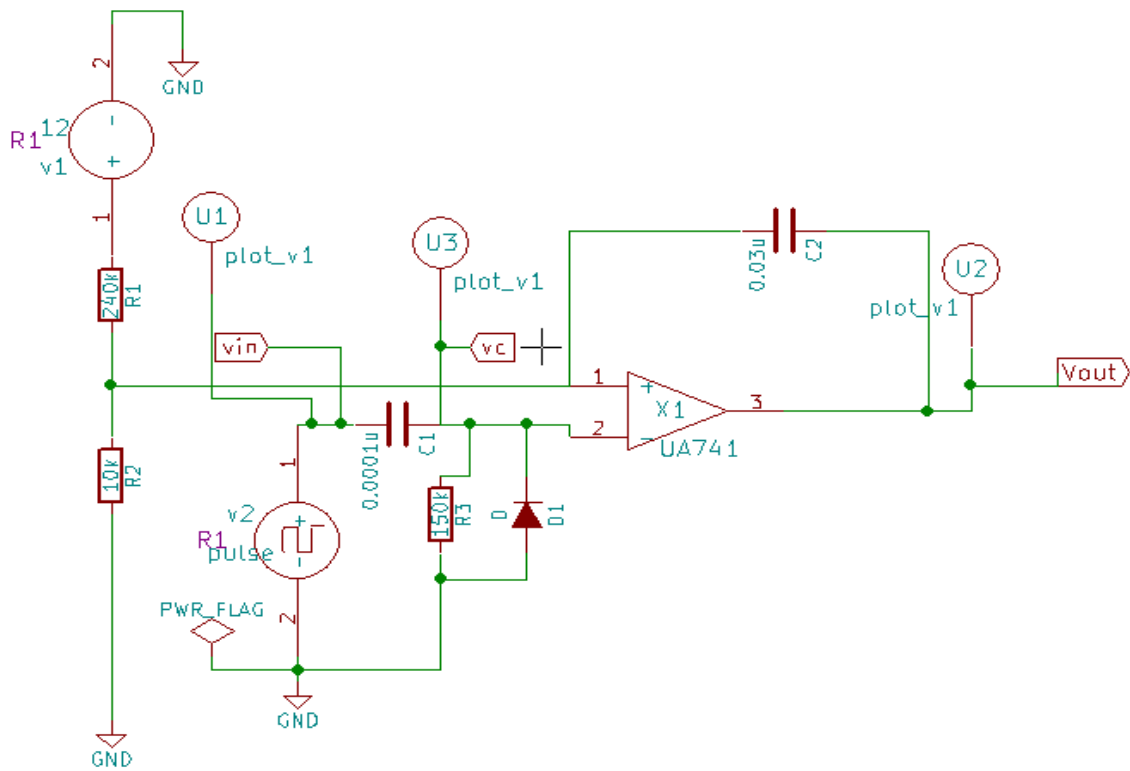
Monostable Multivibrators have only one stable state as referred to the name. It returns back to its stable state after a time constant as per the RC circuit. It remains in its stable state until external trigger pulse is sent through the circuit. The circuit here comprises of Op-Amp 741. The inverting terminal is grounded via a resistor while the non-inverting terminal is biased positively by 2 resistors.

As an input pulse is applied on the inverting side of the Op-Amp, it gets differentiated between the capacitor and resistor producing spikes. The diode connected in parallel to capacitor clips the negative part of the spike. The positive spike raises the  $V_{in}$  above the bias voltage applied at non-inverting terminal. Thus, the output moves to the negative saturation level but since the spike has short duration, the  $V_{in}$  turns to zero. Meanwhile the capacitor C2 holds the output to the negative saturation level.

## **Schematic Diagram:**

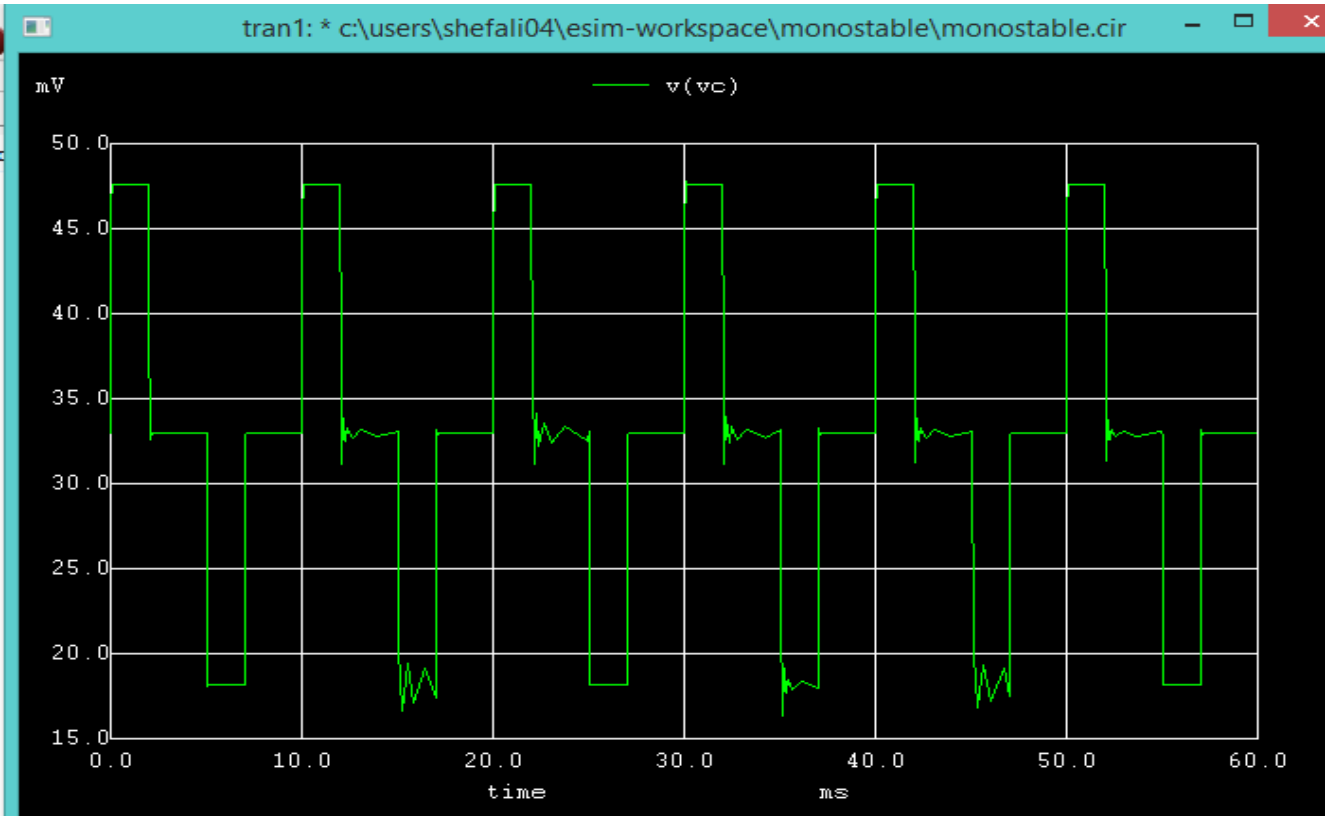
The circuit schematic of full adder in eSim is as shown below:

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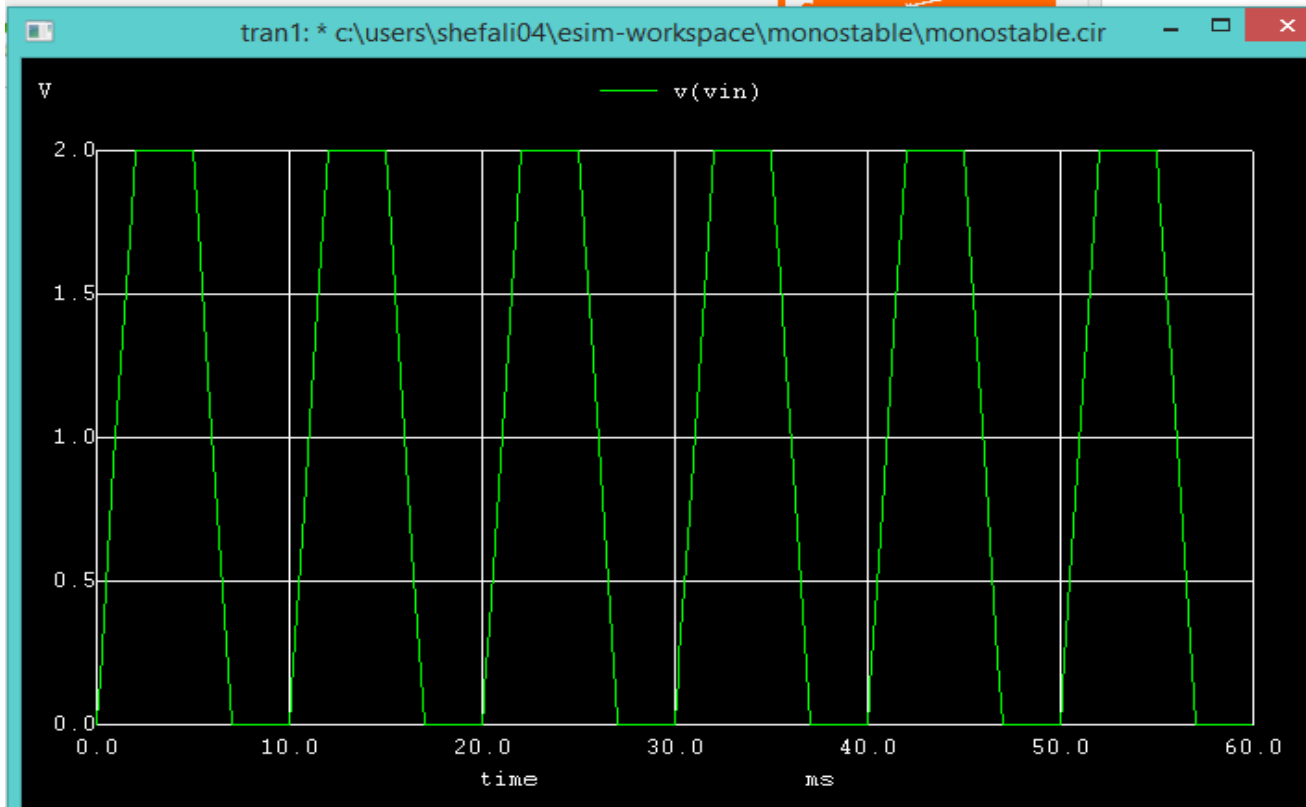


## Simulation Results:

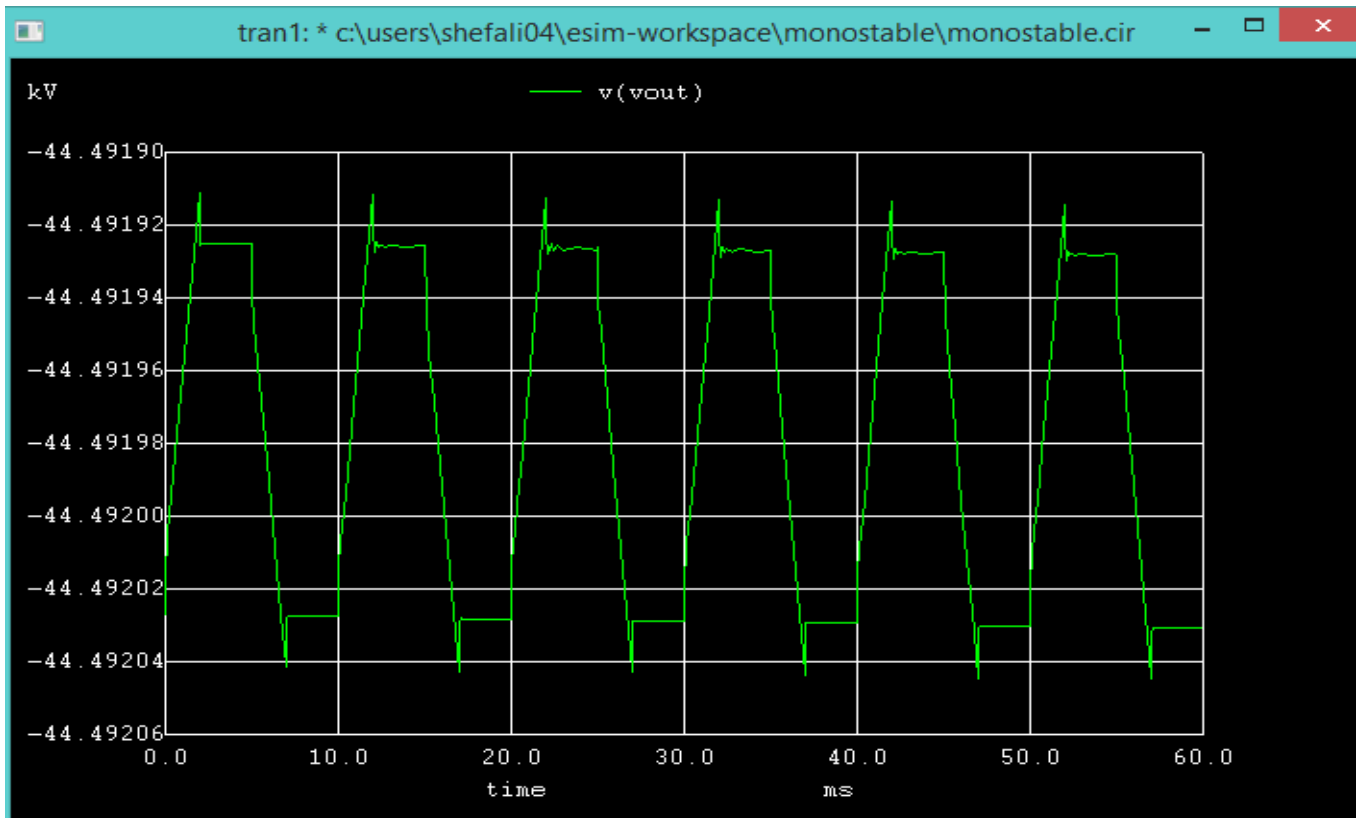
- Ngspice plots:



1. Capacitor Voltage

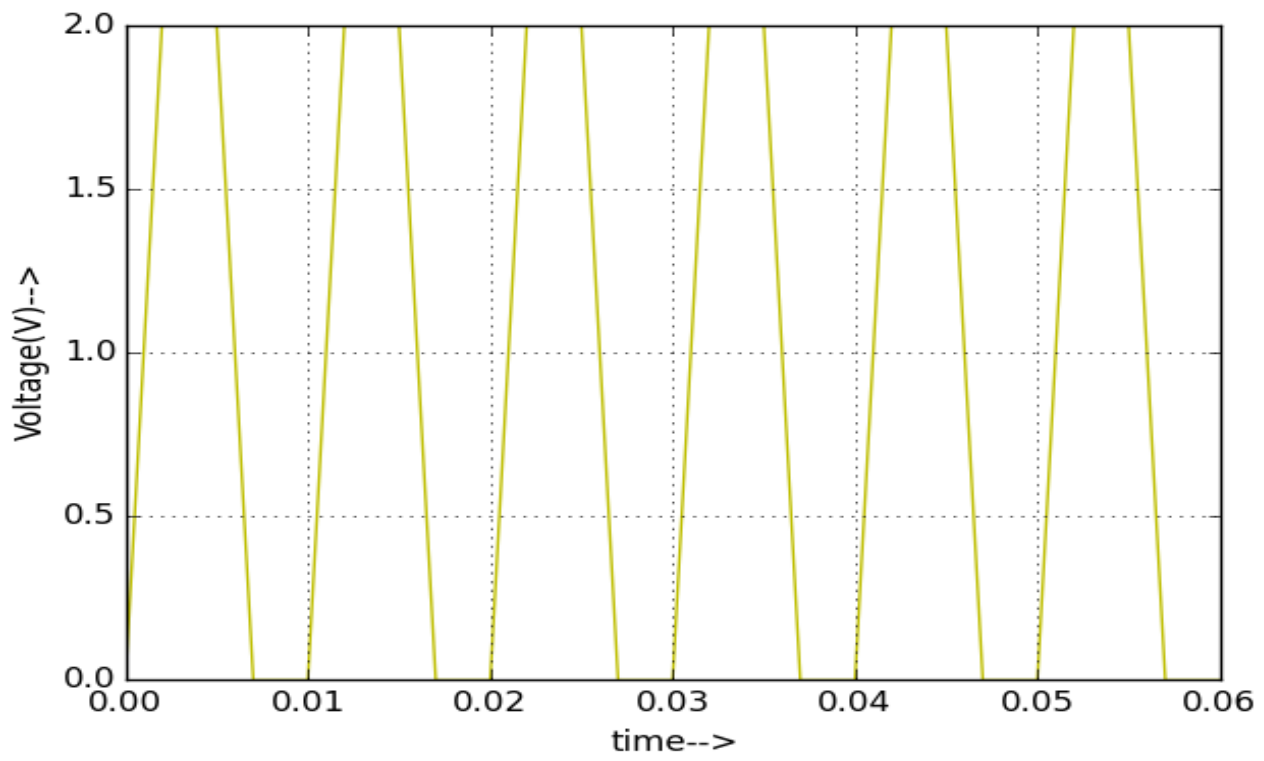


2. Input wave(Vin)

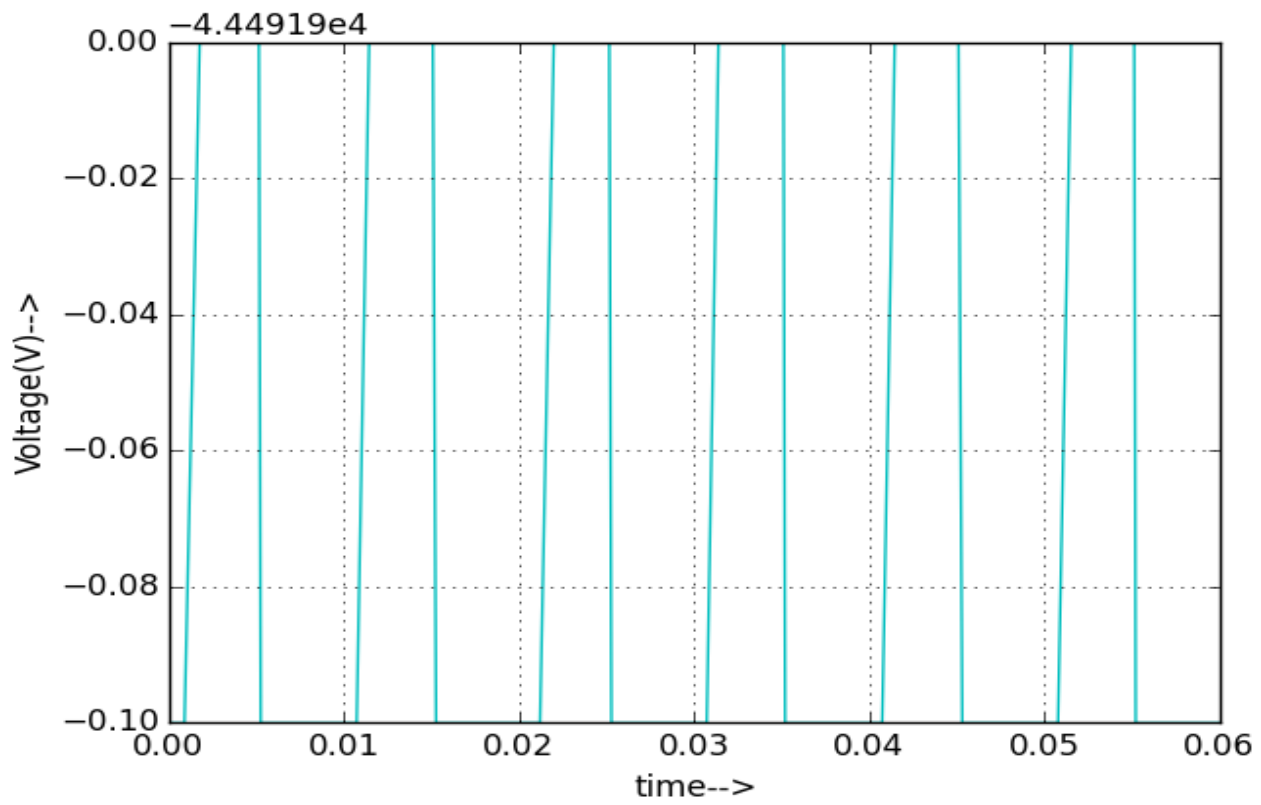


3. Output Waveform

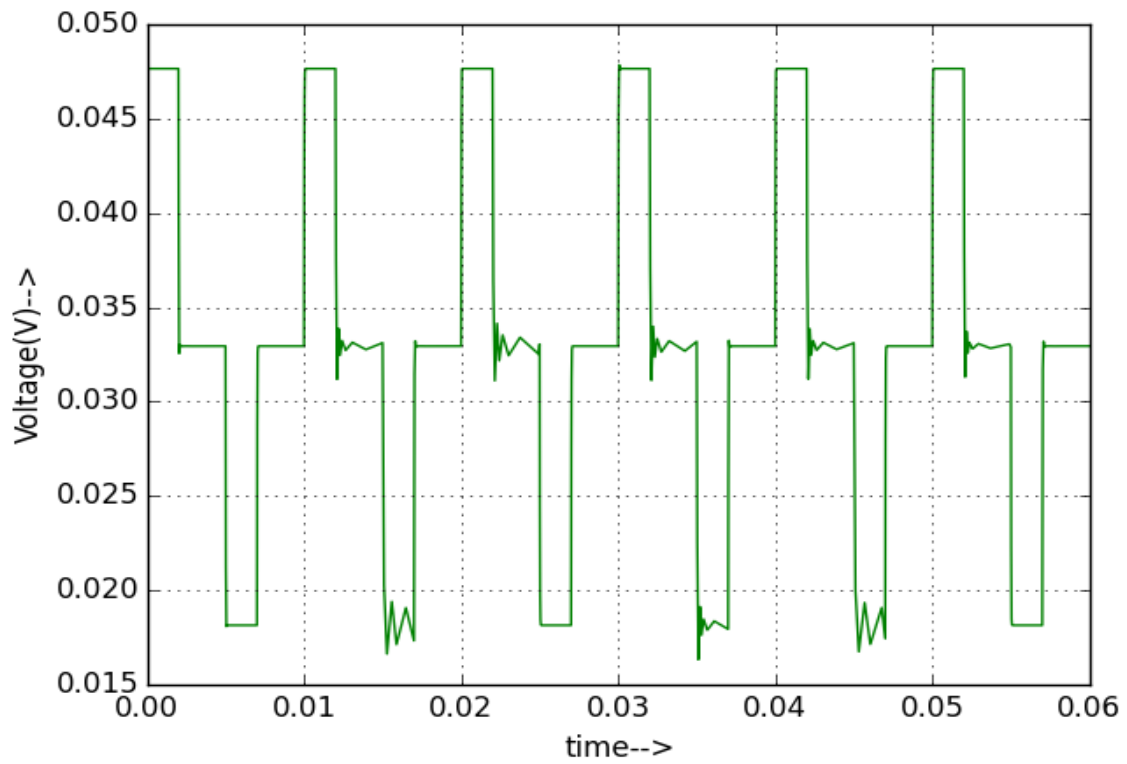
- Python plots:



1. Input Waveform



2. Output Waveform



### 3. Capacitor Voltage (Vc)

#### References:

1. <http://www.electronicshub.org/non-linear-op-amp-circuits/> - Date: 4/11/2017



