REQUIREMENTS NOT MET

- **Requirement 1:** The requirement was not met because of this reason.
- **Requirement 2:** The requirement was not met because of this reason.
- **Requirement 3:** The requirement was not met because of this reason.

PROBLEMS ENCOUNTERED

- **Problem 1:** The problem was encountered because of this reason.
- **Problem 2:** The problem was encountered because of this reason.
- **Problem 3:** The problem was encountered because of this reason.

INTRODUCTION

Now we start our introduction to our write up For your write up, write a brief introduction to what you are doing in the in lab. two to four sentences. Omit this section for the prelab.

DISCUSSION

8.5 Pre-Lab Requirements:

8.5.1 LTspice Simulations:

1. Set the input to a 1 kHz, 5 V amplitude sine wave and run a transient simulation with a stop time of 1m (.tran 1m) and plot the input and output. To use the 1N4148 diode model, right click on the diode after placing it, Pick New Diode, and then choose the 1N4148 model (Mfg. OnSemi). Save an image of the circuit and the plot of the input and output voltage for submission to canvas.

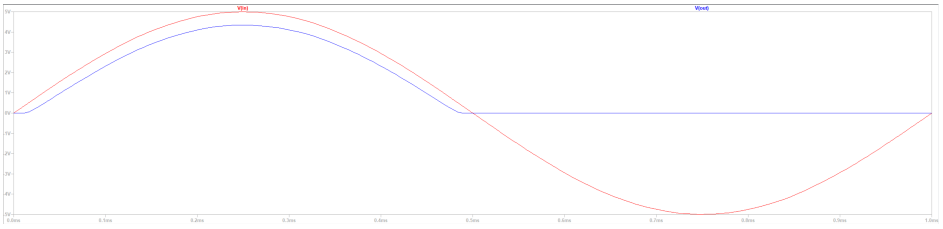

Figure 1: HALF WAVE RECTIFIER PLOT

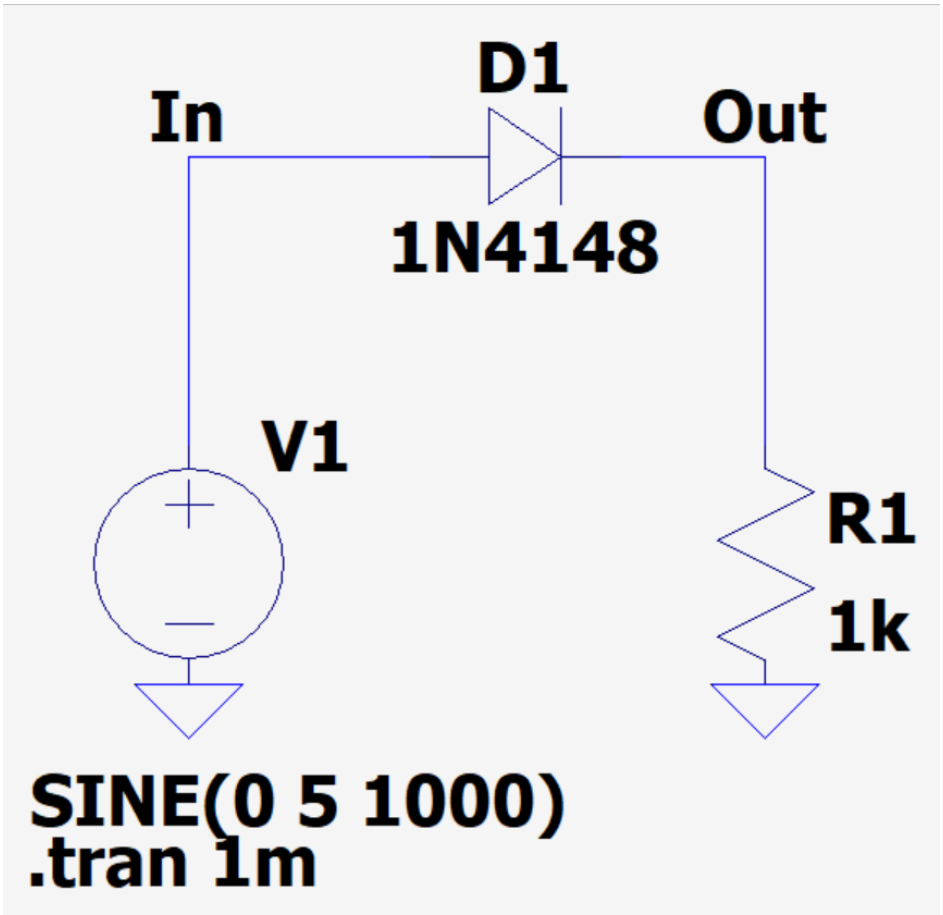

Figure 2: HALF WAVE RECTIFIER CIRCUIT

2. Build the circuit in Figure 8.3 (a). Set the input to a 100 kHz, 5 V amplitude sine wave and run a transient simulation with a stop time of 50u (.tran 50u) and step through possible capacitor values using the following spice directive:

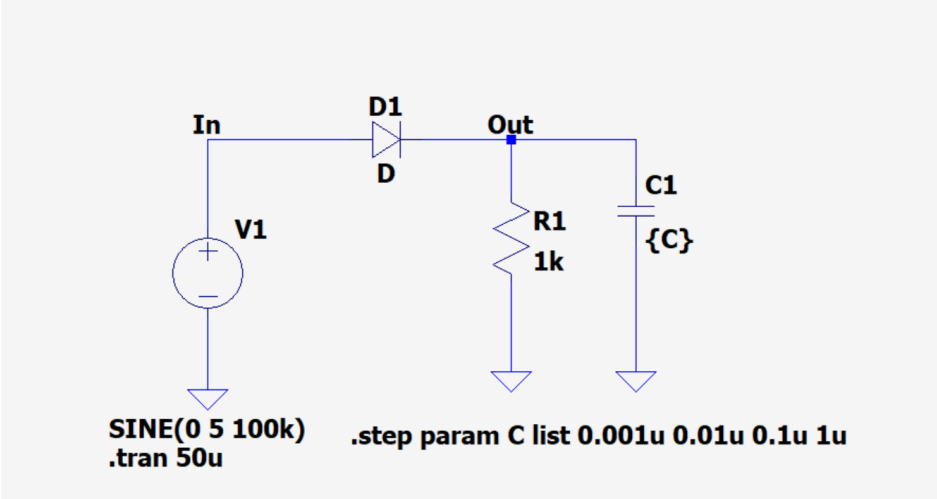

Figure 3: HALF WAVE RECTIFIER CIRCUIT WITH CAPACITOR

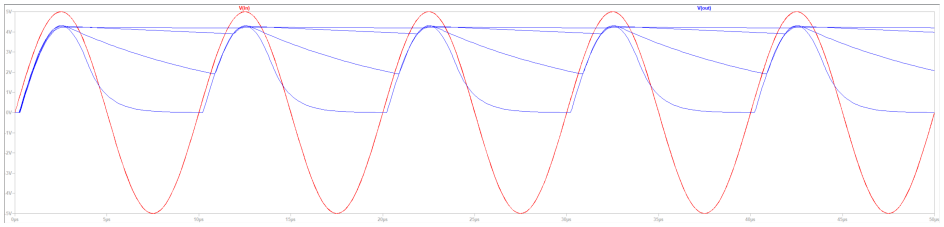

Figure 4: HALF WAVE RECTIFIER CIRCUIT WITH CAPACITOR PLOT

3. Build the circuit in Figure 8.4. Use the default LED model in LTSpice, and download "slcj016.zip" file from Canvas "Lab Related Files" folder for the LM393 comparator model. Don't use the "slcj016b.zip" for the comparator model from TI because it's a newer model that doesn't work for input higher than (Vcc-2V). Power the LM393 with +/-5 V. Set the input voltage to a 1 kHz, 5 V amplitude sine wave and run a transient solution with a stop time of 2m (.tran 2m). Plot the input voltage and the current through each diode. Save an image of the circuit and the plot for submission to canvas

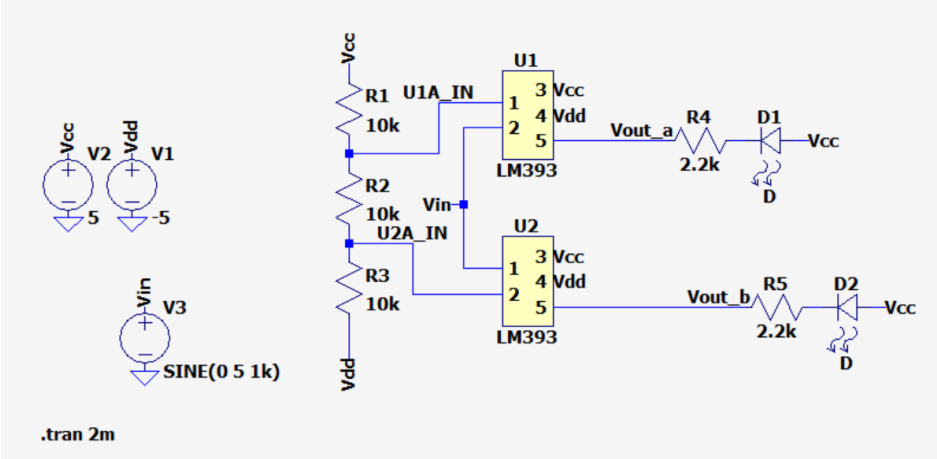

Figure 5: COMPARATOR CIRCUIT

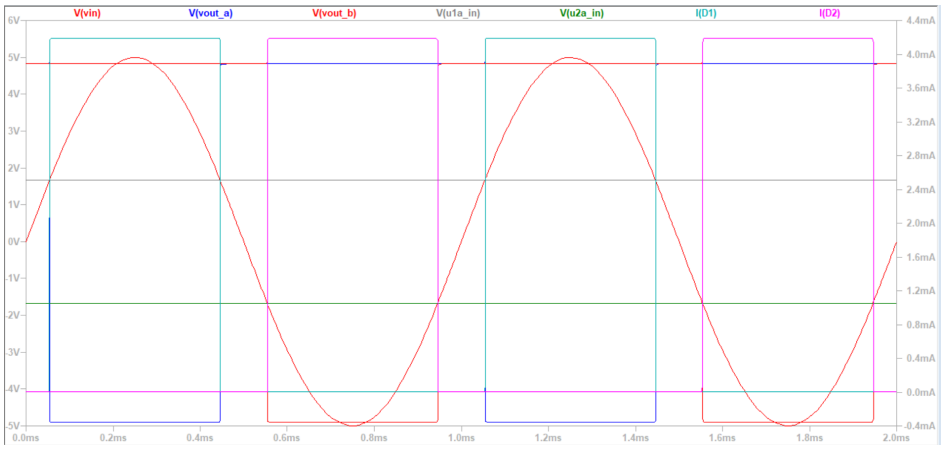

Figure 6: COMPARATOR PLOT

4. Build the circuit in Figure 8.7. Power the LM393 and TLV272 with +/-5 V. Set the input voltage to a 1kHz, 0.1 V amplitude sine wave and run a transient solution with a stop time of 2m. Choose

the value for R1, 10k pot, so that the diodes conduct current and illuminate. Plot the input voltage, output of the op amp, positive and negative inputs to the comparator, and the current through both LEDs. (6 items total). Save an image of the circuit and the plot for submission to canvas.

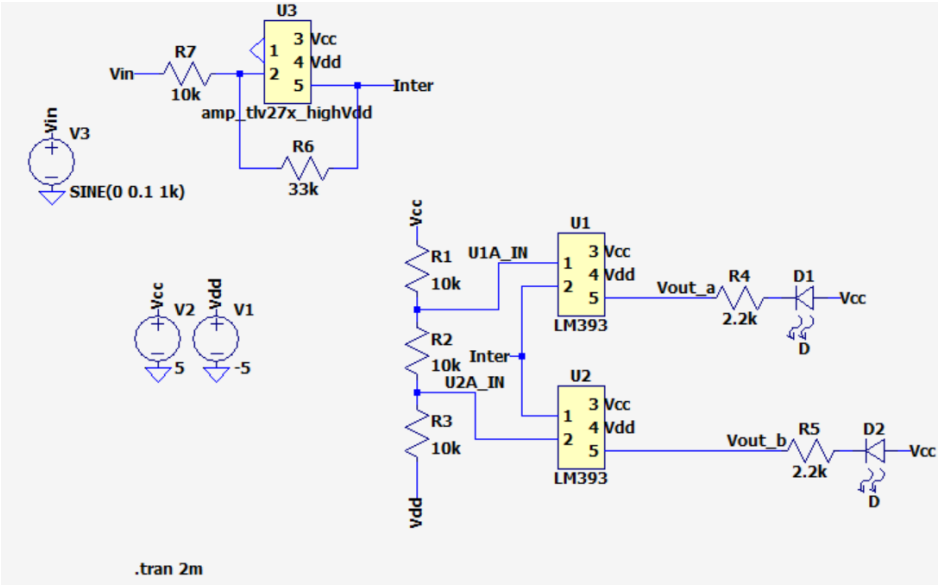

Figure 7: COMPARATOR CIRCUIT WITH OP-AMP

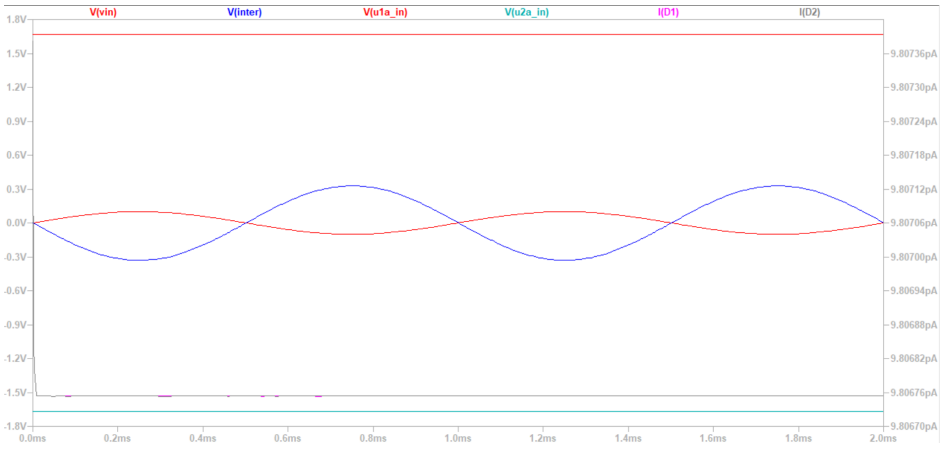

Figure 8: COMPARATOR PLOT WITH OP-AMP

8.5.2 Breadboard Implementation:

1. Build the circuit in Figure 8.4 on the breadboard. Use the LM393.

8.6 In-Lab Requirements:

8.6.1 Breadboard Implementation:

1. Plot the input voltage and the voltage at the output of either comparator, Figure 8.4, on the o-scope and save an image of the display.

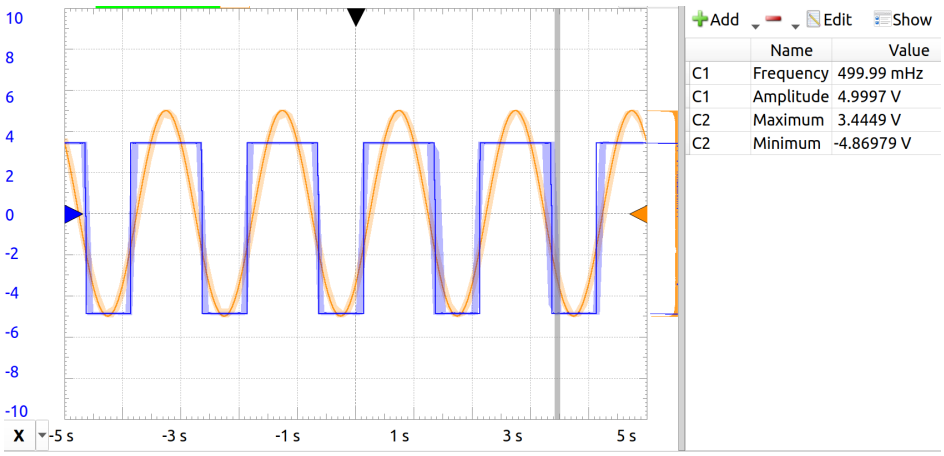

Figure 9: COMPARATOR DIODE PHYSICAL PLOT

2.

CONCLUSION

This is where I start to answer the questions in the lab. We only need to do this for the write up.