Title of the Experiment:

Design and simulation of Non-Inverting amplifier circuit using esim.

Theory:

The non-inverting amplifier is one in which the output is in phase with respect to the input. The feedback is applied at the inverting input. However, the input is now applied at the non-inverting input. The output is a non-inverted amplified version of the input. The gain of the non-inverting amplifier circuit for the operational amplifier is easy to determine. The calculation hinges around the fact that the voltage at both inputs is the same. This arises from the fact that the gain of the amplifier is exceedingly high. If the output of the circuit remains within the supply rails of the amplifier, then the output voltage divided by the gain means that there is virtually no difference between the two inputs.

Schematic Diagram:

The circuit schematic of the Non-Inverting Amplifier circuit in eSim is as shown below:

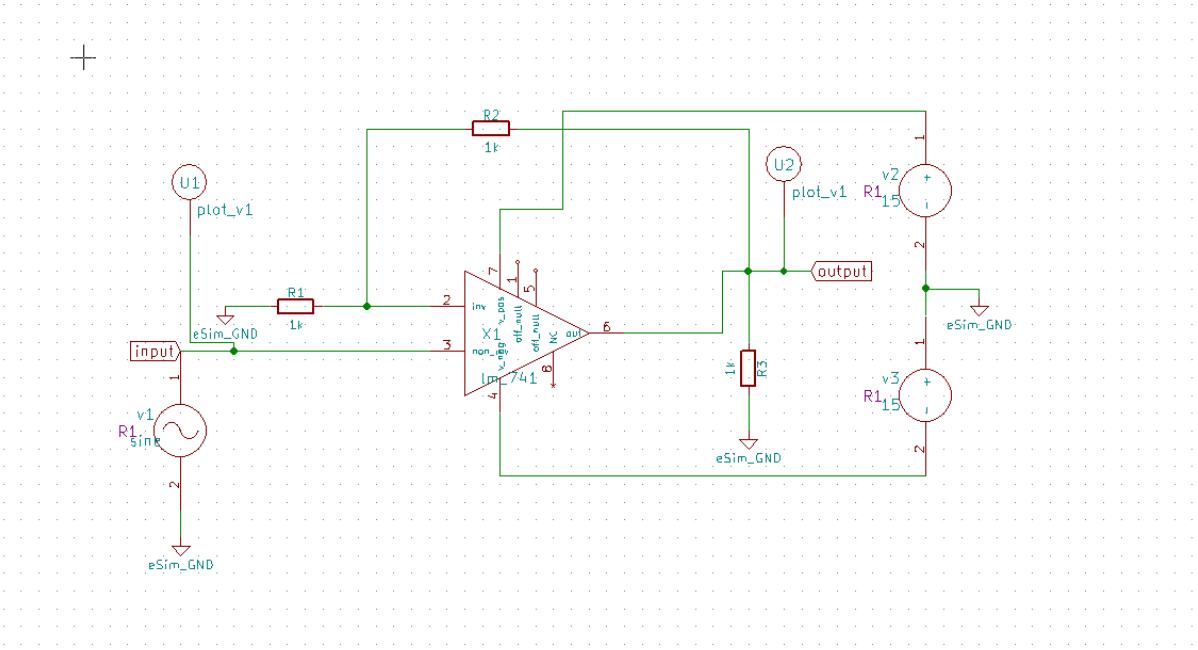

Figure1. Simulation of Non-inverting Amplifier

Simulation Results:

1. Ngspice plots:

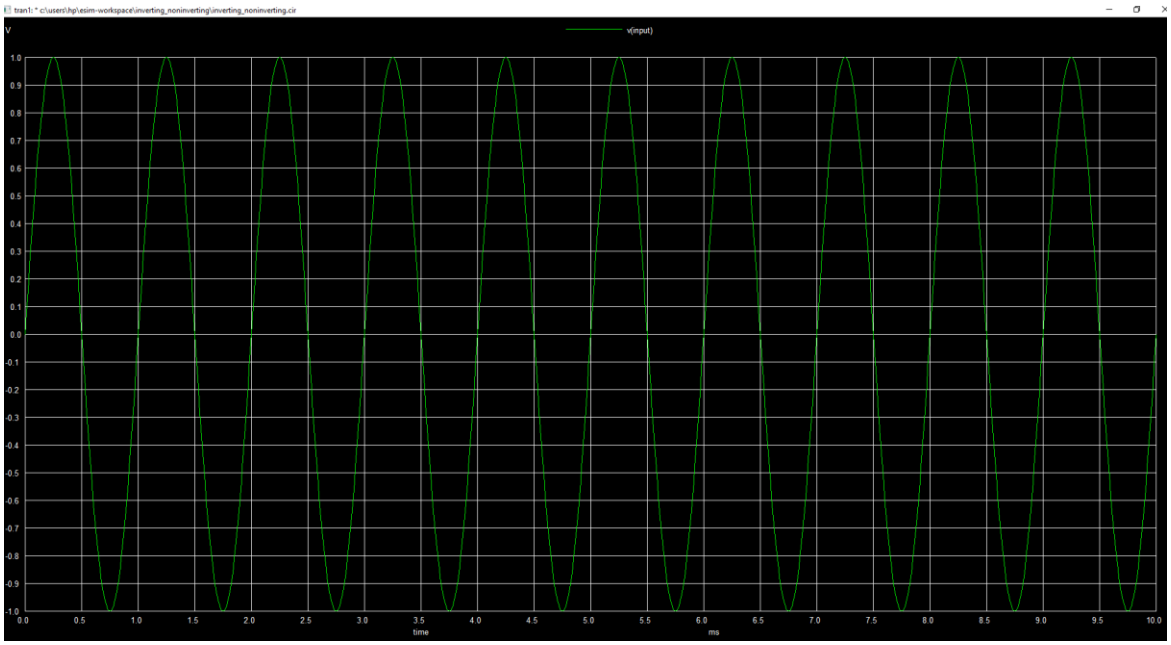

Figure 2. Ngspice input plot

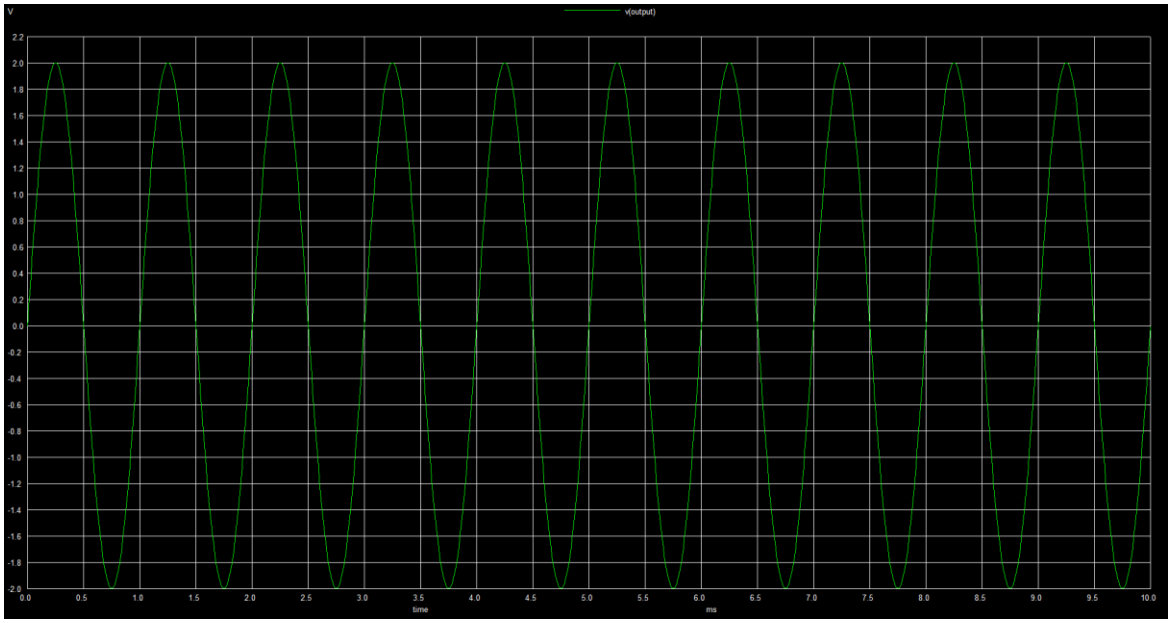

Figure 3. Ngspice output frequency plot

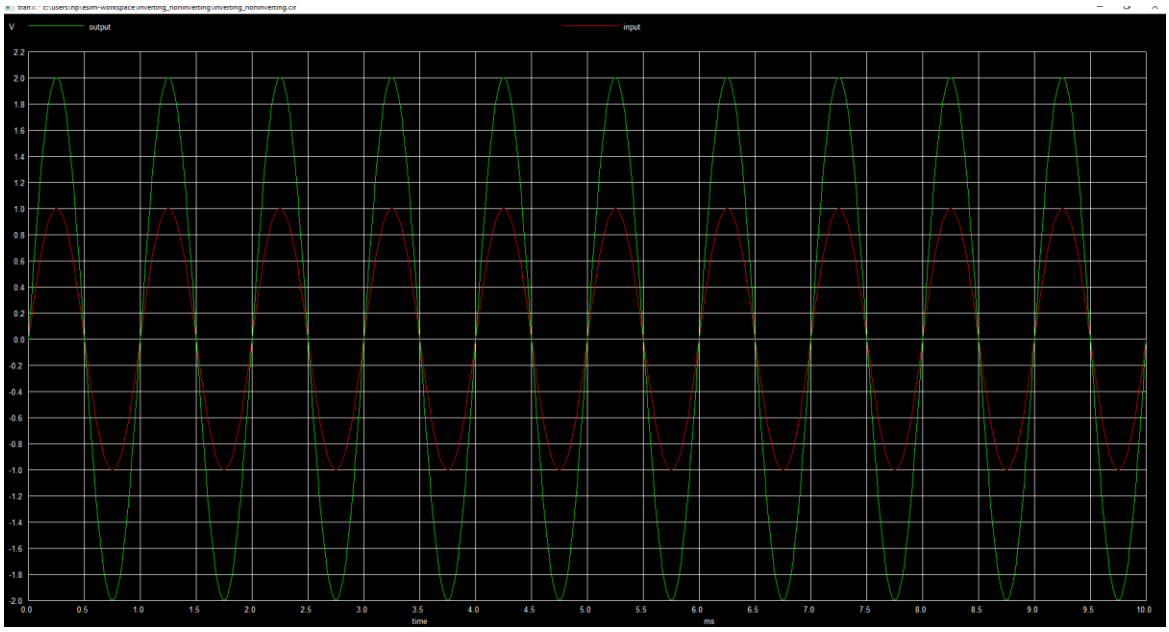

Figure 4. Ngspice Output phase plot

2. Python plots:

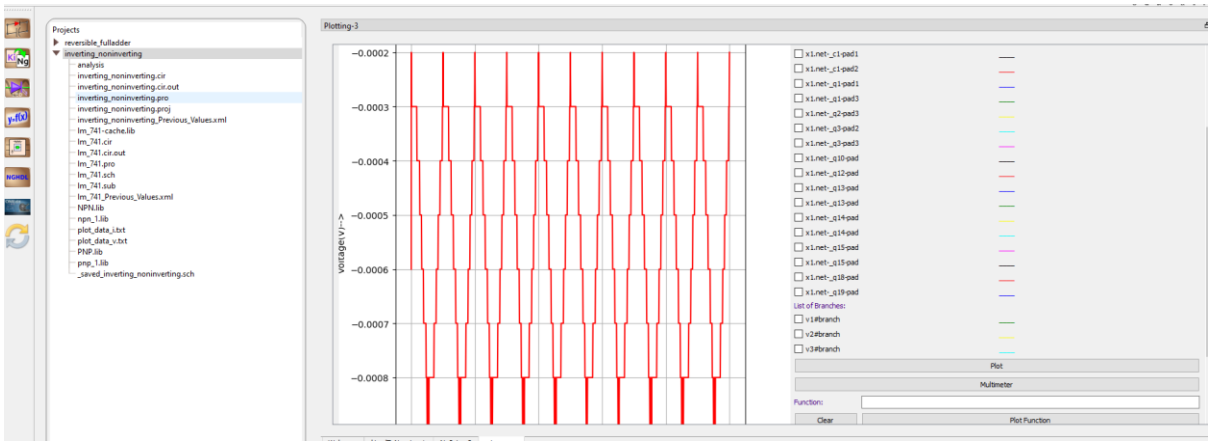

Figure 5. Python plot input

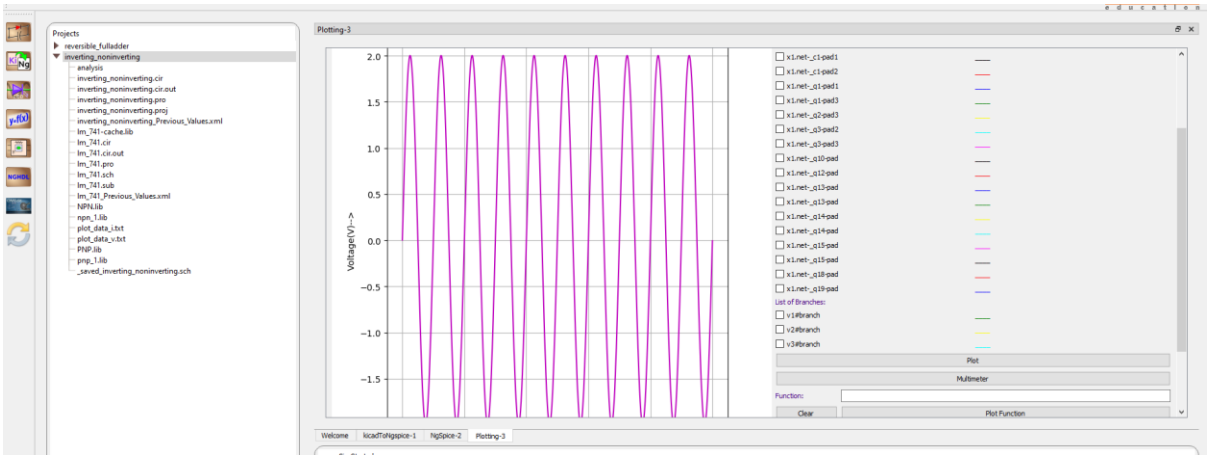

Figure 6. Python plot Output

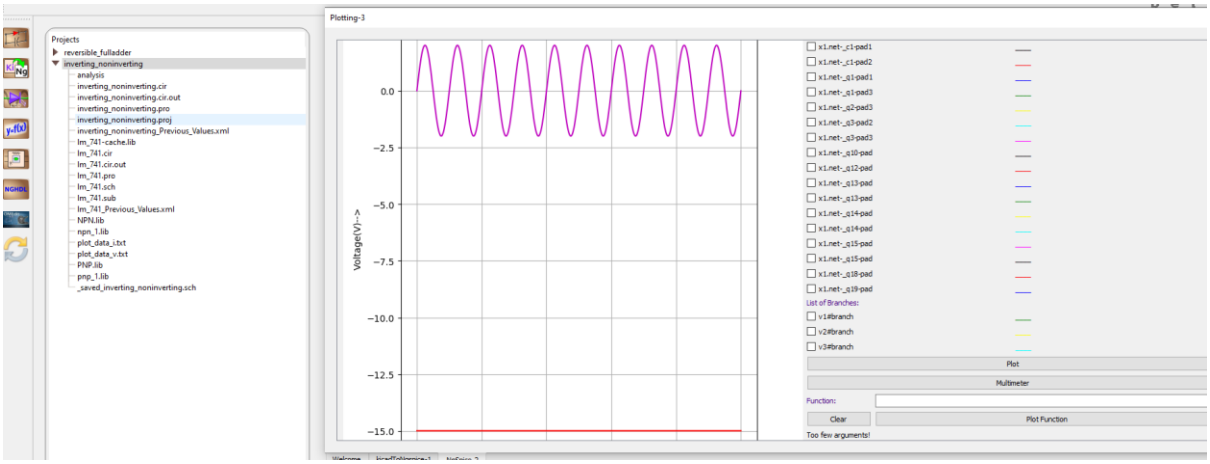

Figure 7. Python plot of non-inverting Amplifier

Conclusion:

Thus, we have studied the simulation of Non-Inverting amplifier using eSim and we get the appropriate waveforms.

Reference:

1) https://www.electronics-tutorials.ws/opamp/opamp_3.html