

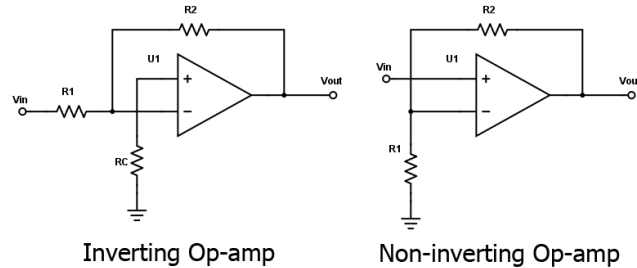


HACETTEPE UNIVERSITY
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
ELE338 MICROPROCESSOR ARCHITECTURE and PROGRAMMING LAB.

Project Name: Design Inverting Op-Amp and Non-inverting Op-Amp

Project Explanation:

The operational amplifier is a staple in electronics design as it can be found in hundreds of applications. The most common uses of the op-amp include amplification, as buffer, as controlled source and in active filters. The op-amp can be configured as a non-inverting amplifier or as an inverting amplifier. The circuits for this two-amplifier configuration are shown below:



Project Requirements:

1. You can use equations given below for calculations.
2. There should be realized two calculations for each non-inverting and inverting Op-Amp.
 - a. One for calculating resistances R1 and R2 from given gain of amplifier.
 - b. One for calculating gain of amplifier from resistances R1 and R2.
3. Therefore, there should be a menu to select which calculation will be done. Calculation options as follows:
 - a. Resistances R1 and R2 from given gain of amplifier for non-inverting Op-Amp.
 - b. Resistances R1 and R2 from given gain of amplifier for inverting Op-Amp.
 - c. Gain of amplifier from resistances R1 and R2 for non-inverting Op-Amp.
 - d. Gain of amplifier from resistances R1 and R2 for inverting Op-Amp
4. With respect to calculations, the results should be plot on the screen like the figures above. Results should be printed on the screen in a clear and understandable way.
5. According to the calculation type, the required values should be inputted by the user, and the which units are wanted should be expressed.
6. Program should be able to terminate with the ESC key on the keyboard at any time and return to the operating system successfully.
7. The application should not get stuck in any infinite loops.

Equations:

The gain of the inverting op-amp can be calculated using the formula: $A = -\frac{R_2}{R_1}$,
while the gain of the non-inverting op-amp is given as $A = 1 + \frac{R_2}{R_1}$

Project Inputs and Outputs:

	Inputs	Outputs
Calculation 1	R1, R2	A
Calculation 2	A	R1,R2 ratio

Project Grading:

- Input and output interfaces: %20
- Results of the gain calculations: %30
- Results of R1 and R2 calculations: %30
- Accuracy of general template and intelligibility of the codes: %20