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PHY366 Lab Report
Practical: 2 Registration No.: 11912610 Section: G2903

Aim

To design a non-inverting amplifier circuit an Op-Amp.

Methods

We simulate an operational amplifier circuit on the MULTISIM platform[1]. It was configured to operate in a non-inverting fashion (see Figure 1).

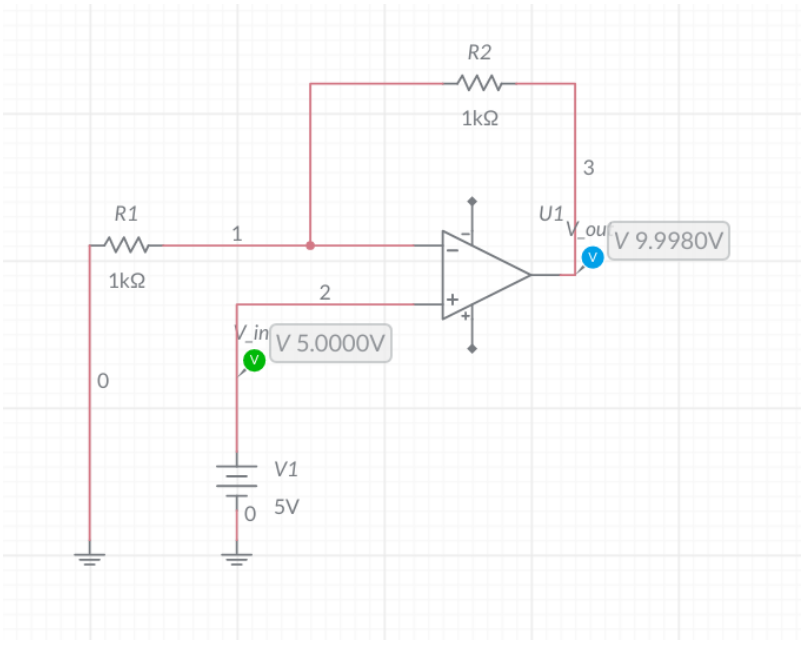

Figure 1: circuit diagram

Theeoretically, the output voltage of an Op-Amp is

$$V_{out} = A_{cl} V_{in}$$

where, for our configuration, the closed loop gain A_{cl} is

$$A_{cl} = 1 + \frac{R_2}{R_1}$$

We check the validity of this result by varying the resistance R_2.

[1]Circuit available publicly at https://www.multisim.com/content/7ZP2r5NA3vzK7DU9bVdrfT/phy366-op-amp-non-inverting/open/

Results and Discussion

For resistances at input ($R_1 = 1\ k\Omega$) and output ($R_2 = 1\ k\Omega$) kept constant, we report the different output DC voltages obtained in Table 1 obtained by varying the input voltage.

V_{in} (V)	V_{out} (V)
0.1	0.198
0.5	0.998
2.0	3.998
4.0	7.998
10.0	19.998
25.0	50.000

Table 1: Variation of output potential V_{out} as R_2 is varied.

Note that the output is short of the theoretical expectations due to minor losses. A plot between input and output voltage is shown in Figure 2.

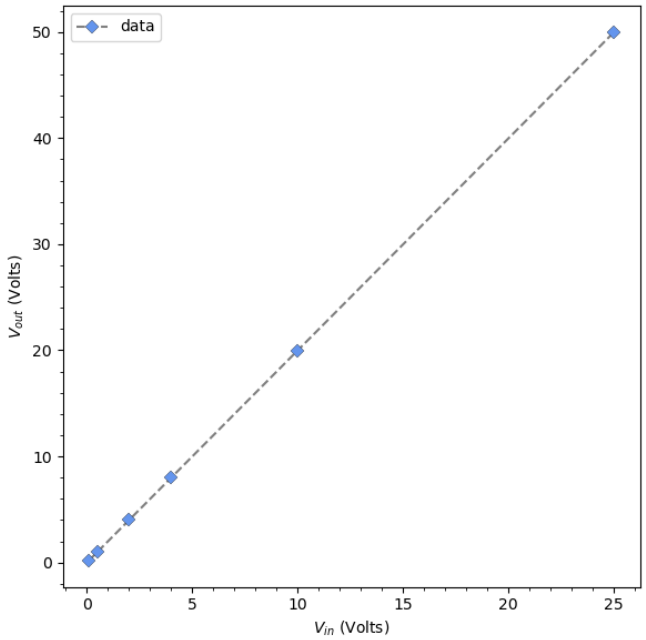

Figure 2: V_{out} plotted against input voltage V_{in} for constant $R_2/R_1 = 1$, corresponding to $A_{cl} = 2$.

The result is therefore, consistent with the straight-line V_{out} expected from the theoretical relation.