Non Inverting Amplifier

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Theory:

The non-inverting amplifier is one of the most widely used forms of operational amplifier circuit. The op amp non-inverting amplifier circuit provides a high input impedance along with all the advantages gained from using an operational amplifier. The basic non-inverting op amp circuit requires the same number of components as its inverting counterpart, it finds uses in applications where the high input impedance is of importance.

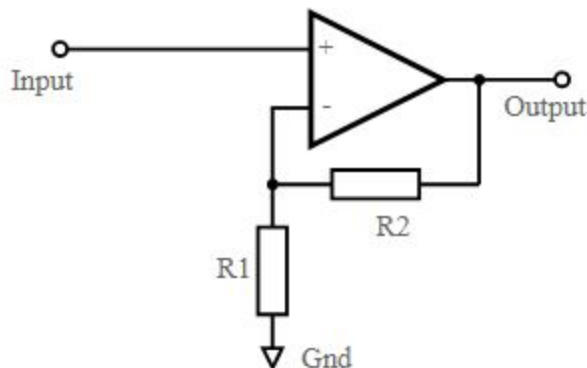**Non Inverting Amplifier Circuit:**

Figure 1: Basic Non inverting amplifier circuit

In this circuit the signal is applied to the non-inverting input of the op-amp. In this way the signal at the output is not inverted when compared to the input. However the feedback is taken from the output of the op-amp via a resistor to the inverting input of the operational amplifier where another resistor is taken to ground. It has to be applied to the inverting input as it is negative feedback. It is the value of these two resistors that govern the gain of the operational amplifier circuit as they determine the level of feedback.

Design:

As the input to the op-amp draws no current this means that the current flowing through the resistors R1 and R2 is the same. The voltage at the inverting input is formed from a potential divider consisting of R1 and R2, and as the voltage at both inputs is the same, the voltage at the inverting input must be the same as that at the non-inverting input. This means that

$$Vin = Vout \times R1 / (R1 + R2).$$

Hence the voltage gain of the circuit Av can be taken as:

$$Av = 1 + (R2/R1)$$

Let gain A=11 so that the ratio
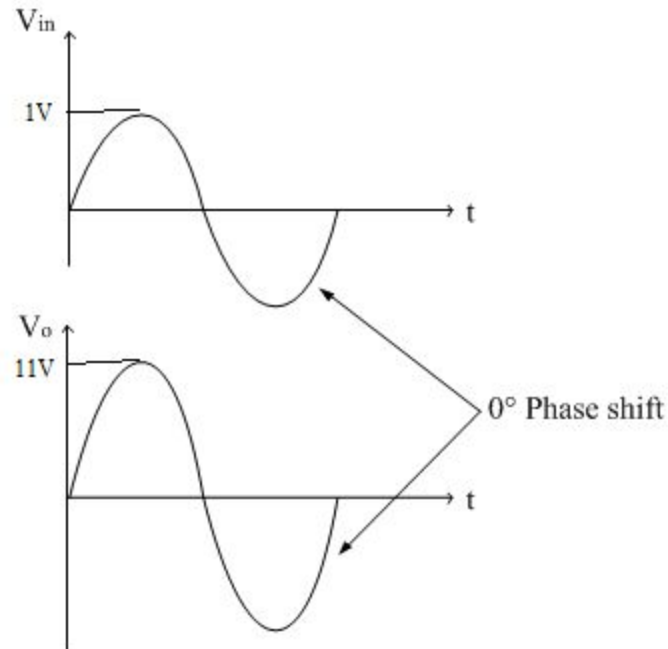(Rf/Ri) =10. Then for R1=1KΩ, R2=10KΩ.

Input & Output Waveforms:

Figure 2: Expected Input & Output waveforms

Reference:

http://bit.ly/2MtTKAC