Non Inverting Amplifier

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Theory:
This circuit provides a gain to the input signal without any change in polarity. The gain of the non-inverting amplifier is

$$A = 1 + (Rf/Ri)$$

where Rf is the feedback resistance and
Ri is the input resistance.
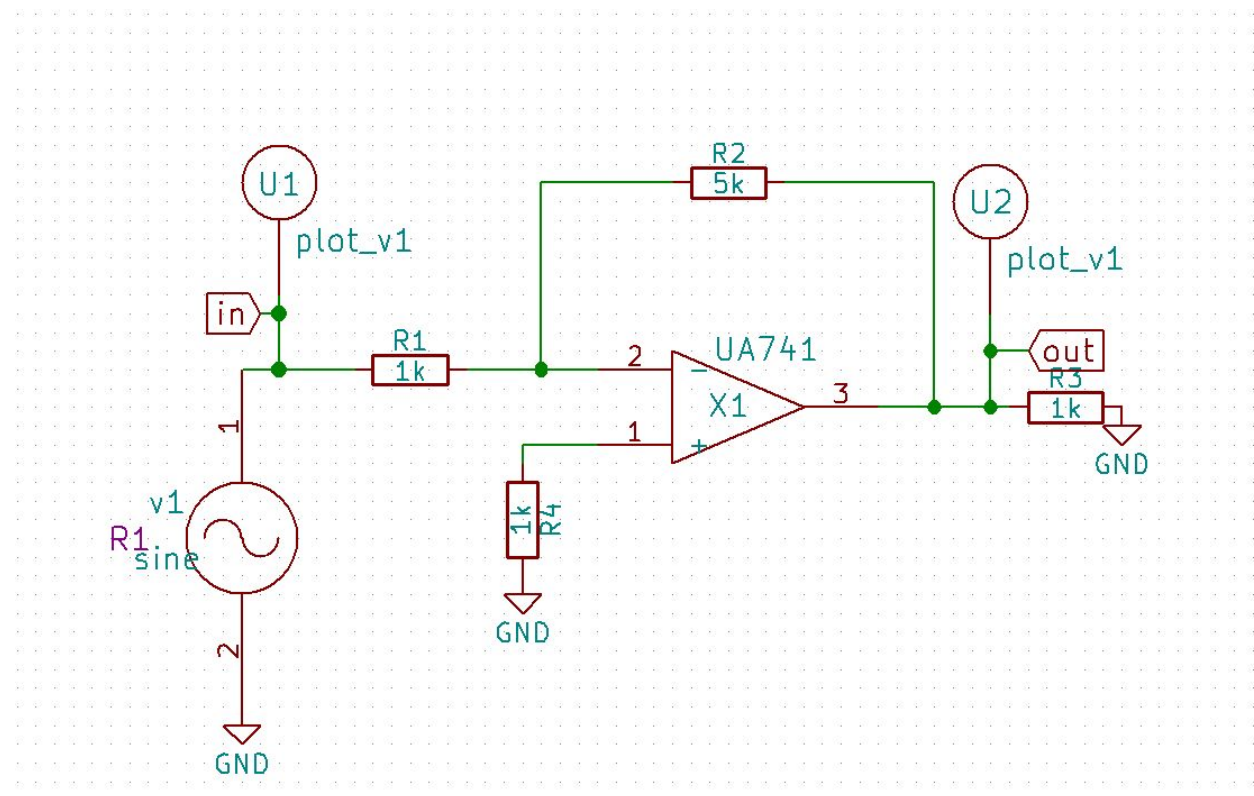The Ri of the non-inverting amplifier is extremely large. So it draws a negligible current from signal source.

Design:
Gain of non- inverting amplifier, A =1+ (Rf/Ri)
Let gain A=11 so that the ratio
(Rf/Ri) =10. Then RI=1KΩ, Rf=10KΩ.

Schematic:

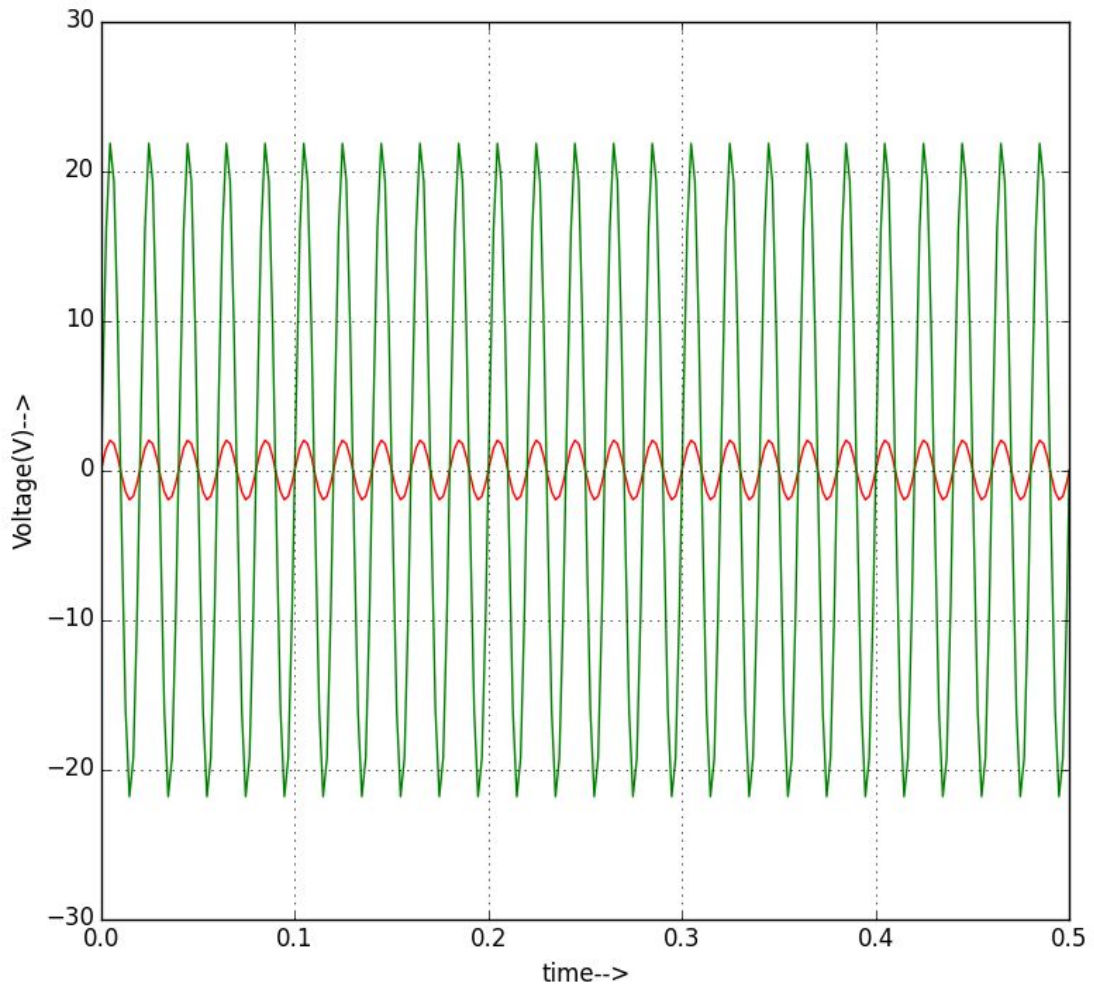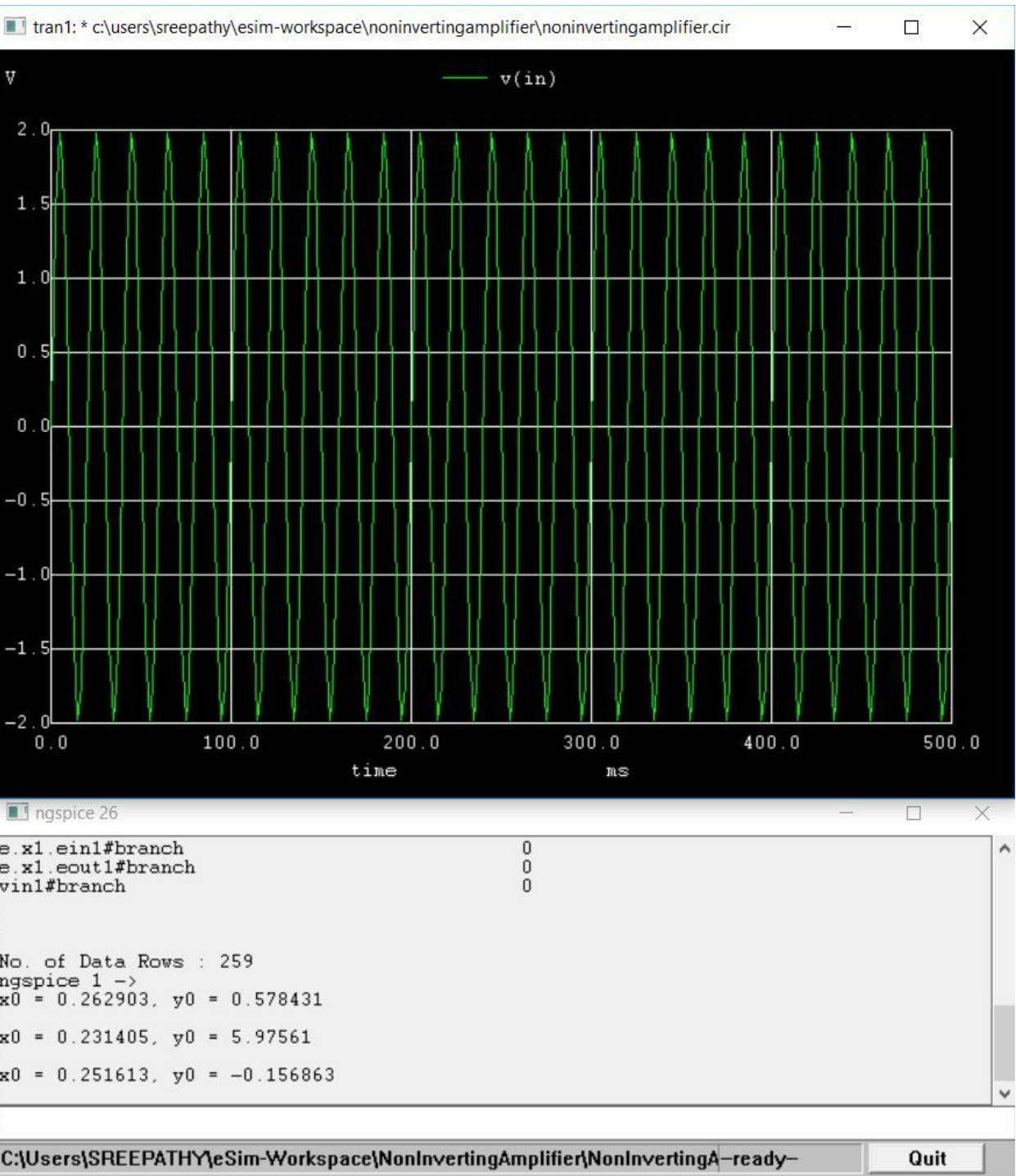**Simulation Output:**

NGSPICE Plot:

V

v(in)

```
 2.0
 1.5
 1.0
 0.5
 0.0
-0.5
-1.0
-1.5
-2.0
     0.0      100.0      200.0      300.0      400.0      500.0
                        time                    ms
```

ngspice 26

```
e.x1.ein1#branch                        0
e.x1.eout1#branch                       0
vin1#branch                             0


No. of Data Rows : 259
ngspice 1 ->
x0 = 0.262903, y0 = 0.578431

x0 = 0.231405, y0 = 5.97561

x0 = 0.251613, y0 = -0.156863
```

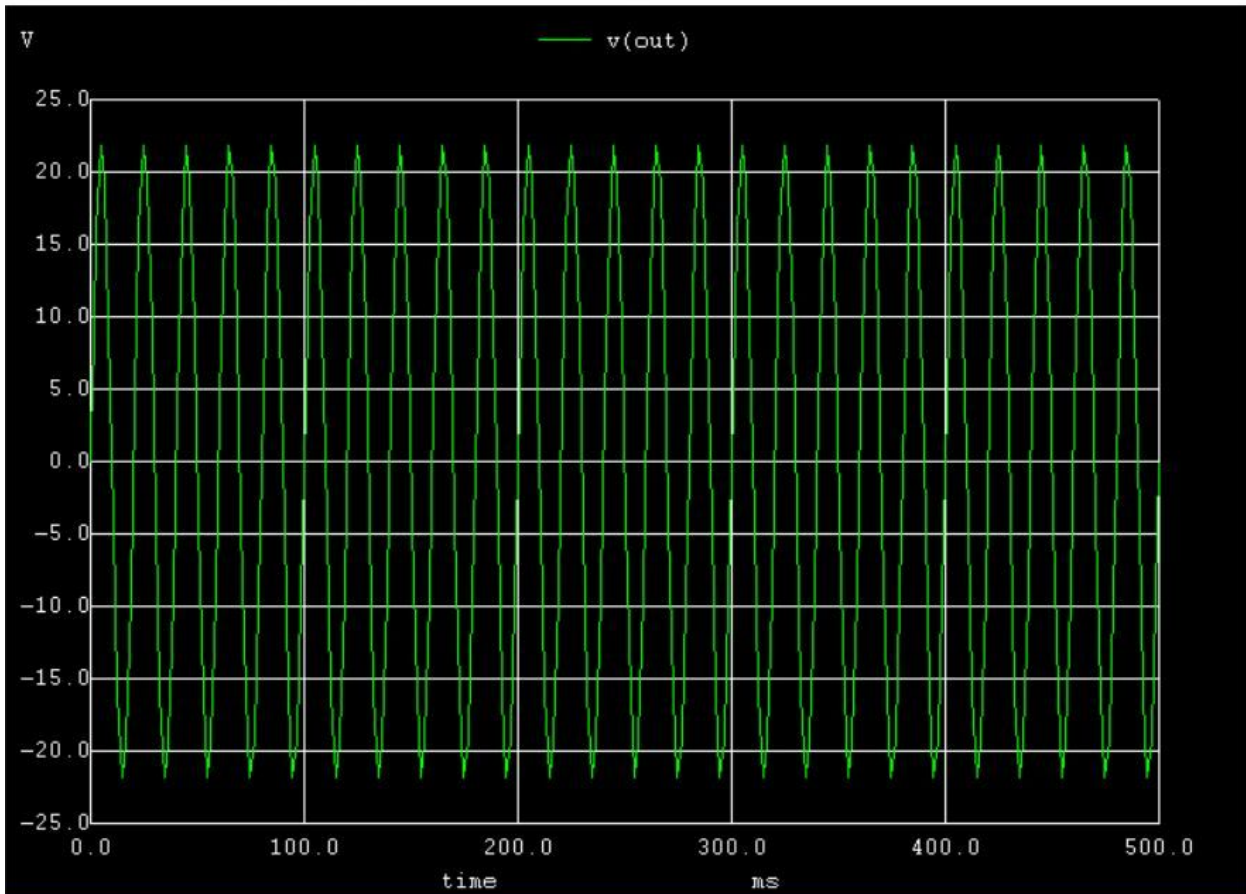C:\Users\SREEPATHY\eSim-Workspace\NonInvertingAmplifier\NonInvertingA--ready--   Quit

ngspice 26   —   □   ✕

```
x1.4                                      0
in                                        0
e.x1.ein1#branch                          0
e.x1.eout1#branch                         0
vin1#branch                               0


No. of Data Rows : 259
ngspice 1 ->
x0 = 0.262903, y0 = 0.578431

x0 = 0.231405, y0 = 5.97561
```

C:\Users\SREEPATHY\eSim-Workspace\NonInvertingAmplifier\NonInvertingA—ready—   Quit