Circuit Simulation Project

https://esim.fossee.in/circuit-simulation-project

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Title of the circuit: Variable Power Supply

Theory/Description: The term linear power supply implies that the power supply is regulated to provide the correct voltage at the output. Sometimes the sensing of the voltage may be accomplished at the output terminals, or on some occasions it may be achieved directly at the load. When the output voltage is varied, it is called as Linear Variable Power Supply.

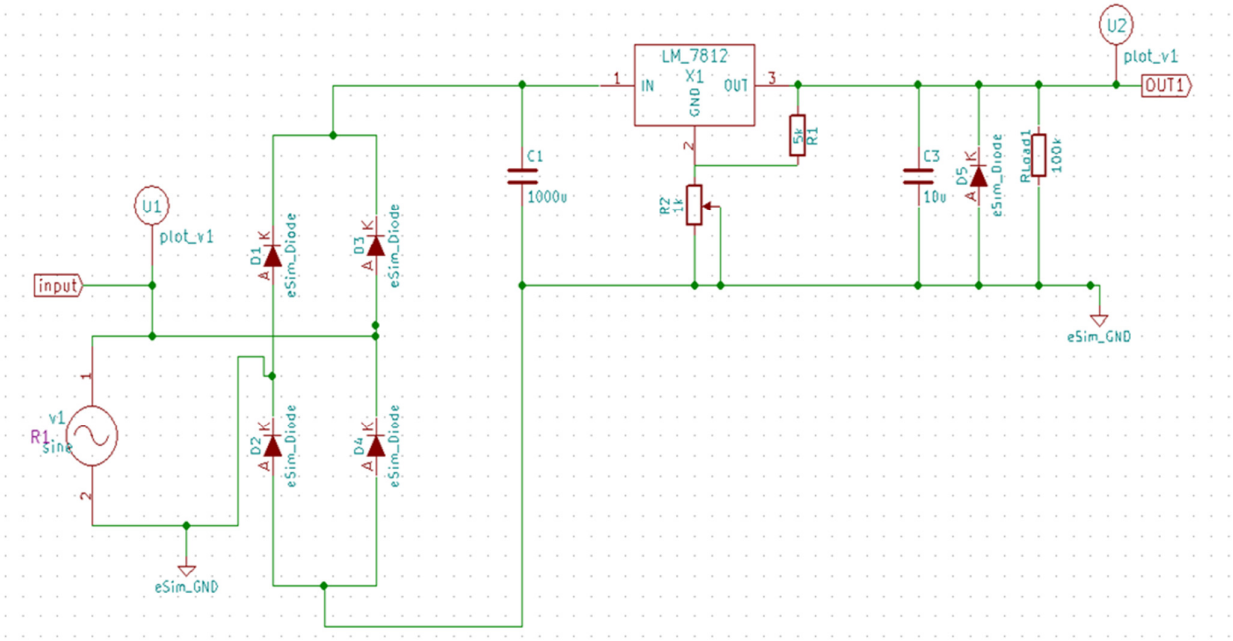
This project shows how to make a linear variable DC power supply from a fixed 12V linear voltage regulator IC 7812. This is attained by adding two resistors R1 and R2 as shown in figure. When the resistors R1 and R2 are added the equation for the output voltage of 7812 becomes:

Vout= Vfixed + {R2 [(V fixed/R1) + Istandby]}

where **Vfixed=12V** and **Istandby=6A(From 7812 datasheet)**

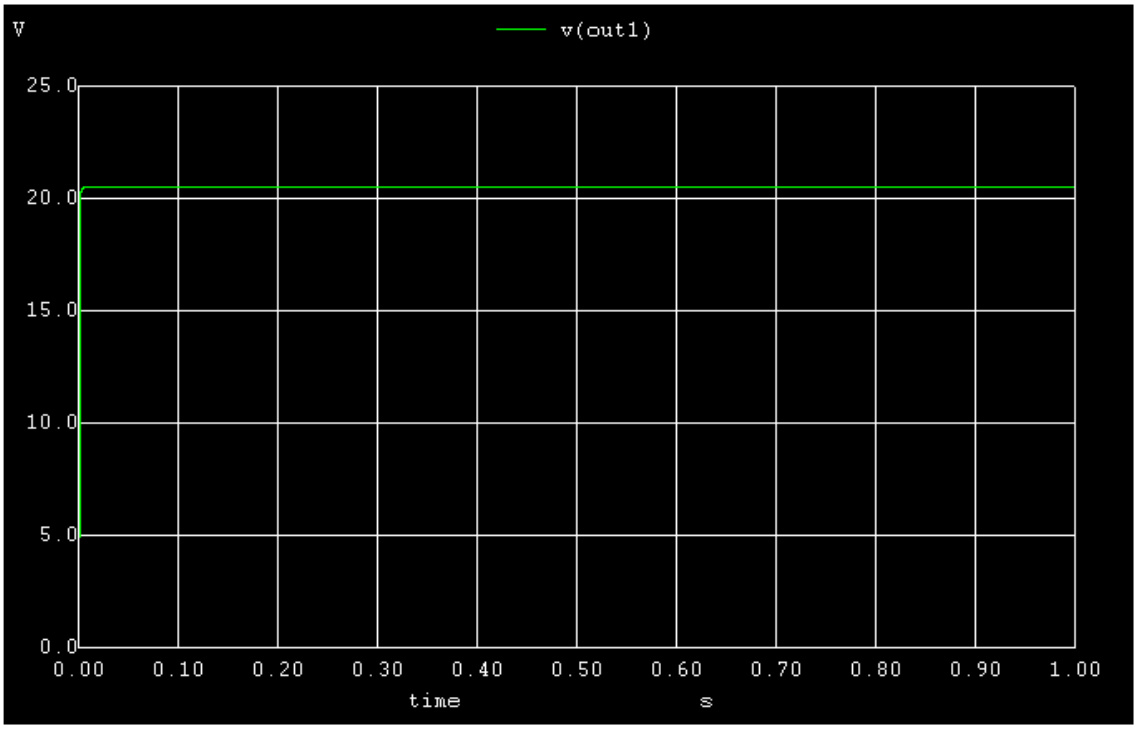
By varying the POT(R2), you can adjust the output voltage.

Circuit Diagram(s):

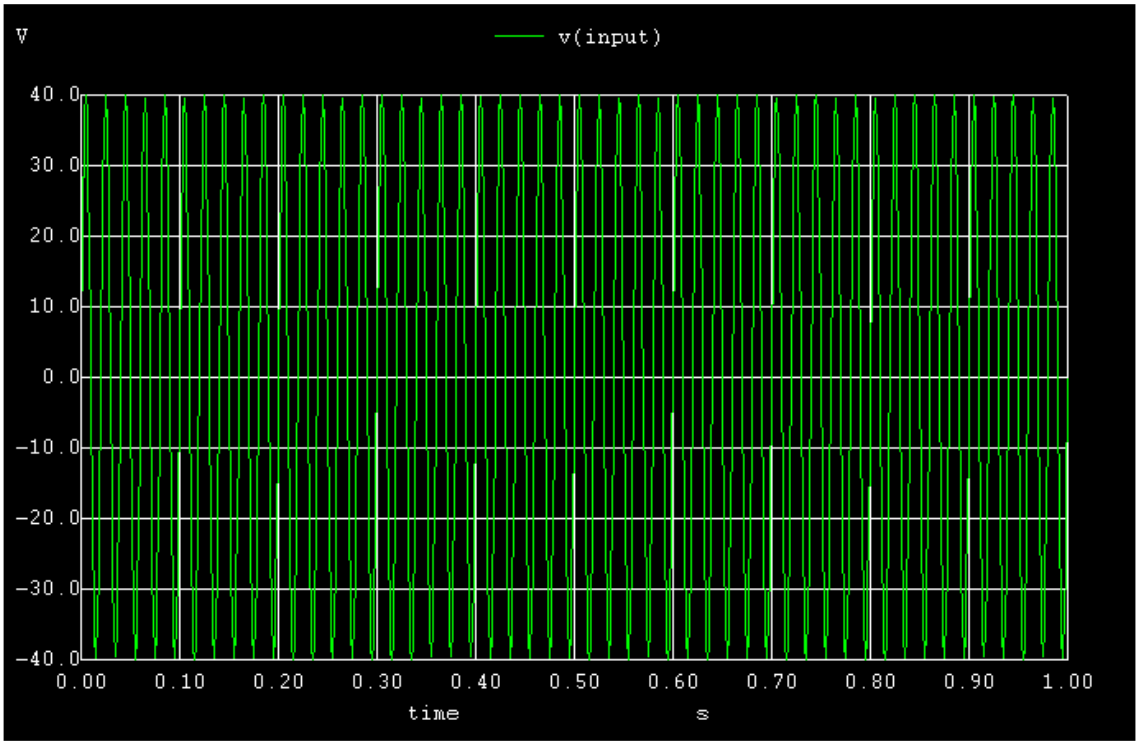


Results (Input, Output waveforms and/or Multimeter readings):

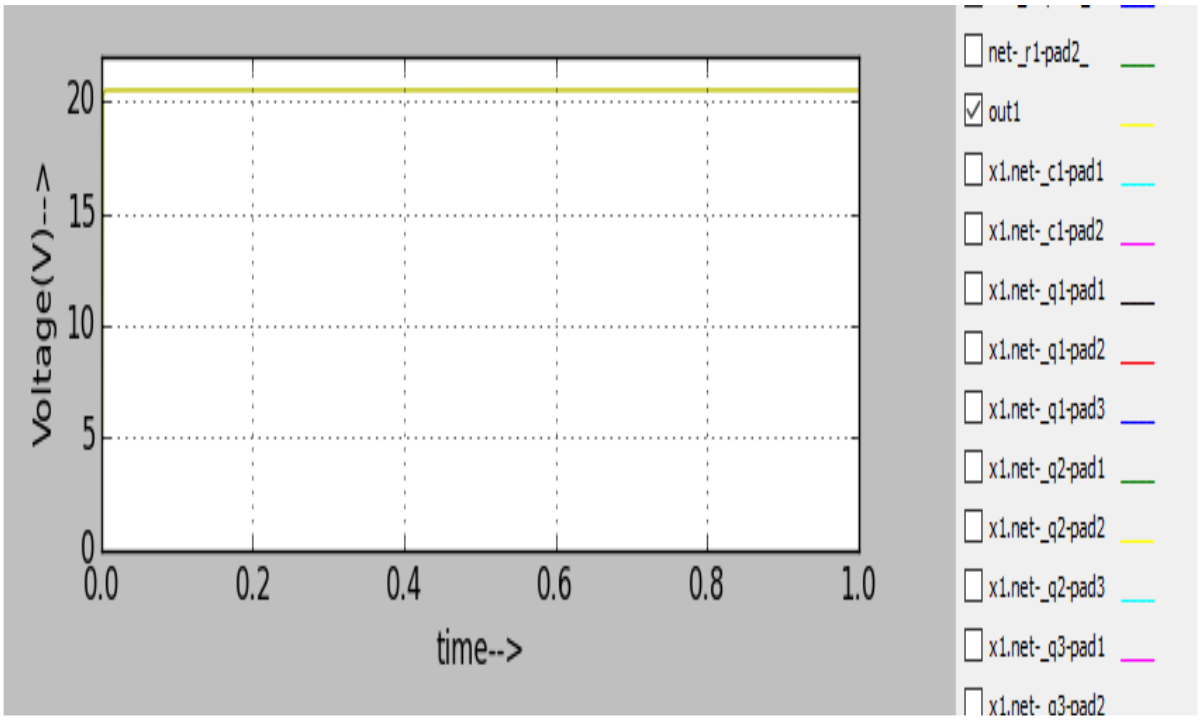
Ngspice Plots- Output Signal



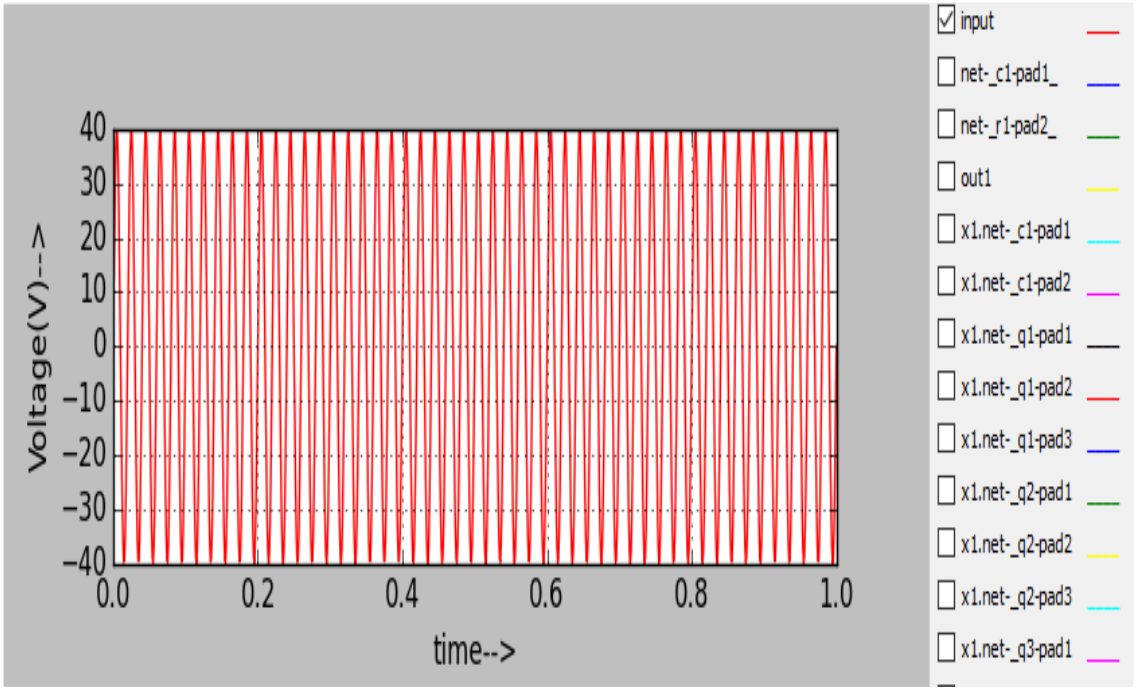
Ngspice Plots- Input Signal



Python Plots- Output Signal



Python Plots- Input Signal



Conclusion:

Thus, we have studied the variable power supply using IC 78xx and the simulation plot of ngspice and python plot obtained in eSim.

Source/Reference(s):

1) https://www.elprocus.com/variable-power-supply-digital-control/
2) http://www.circuitstoday.com/variable-power-supply-using-7805
3) https://www.electronics-notes.com/articles/analogue_circuits/power-supply-electronics/linear-psu-basics-primer.php
4) https://www.alldatasheet.com/