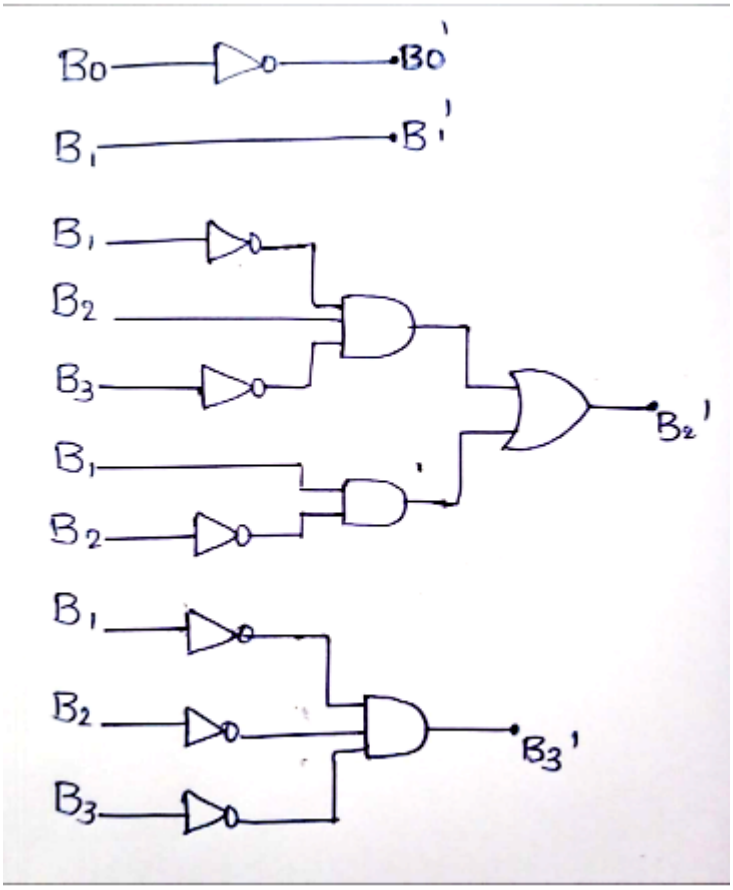
Name of the participant: MS SUSMITHA K

Title of the circuit: 9'S COMPLEMENT OF A BCD DIGIT

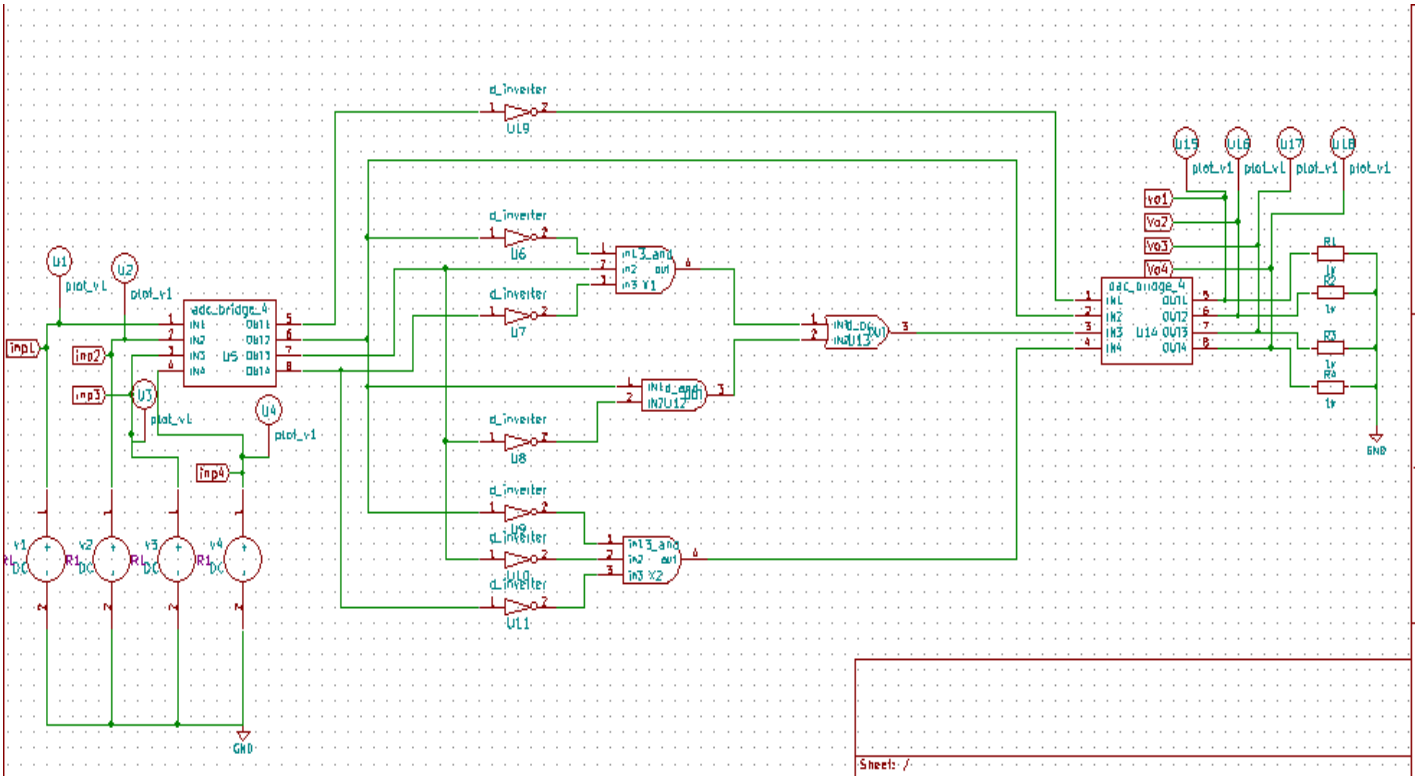
Theory:

If the number is binary, then use 1's complement and 2's complement. But in case, when the number is a decimal number, we will use the 9's and 10's complement. The 9's complement is used to find the subtraction of a decimal numbers. The 9's complement of a number is calculated by subtracting each digit of the number by 9.With the help of 9's complement, the process of subtraction is done in a much easier way.

Logic Diagram:



Schematic:



Results(Input Waveforms and/or Multimeter readings):

Add parameters for DC source v1

Enter value(Volts/Amps): 0

Add parameters for DC source v2

Enter value(Volts/Amps): 0

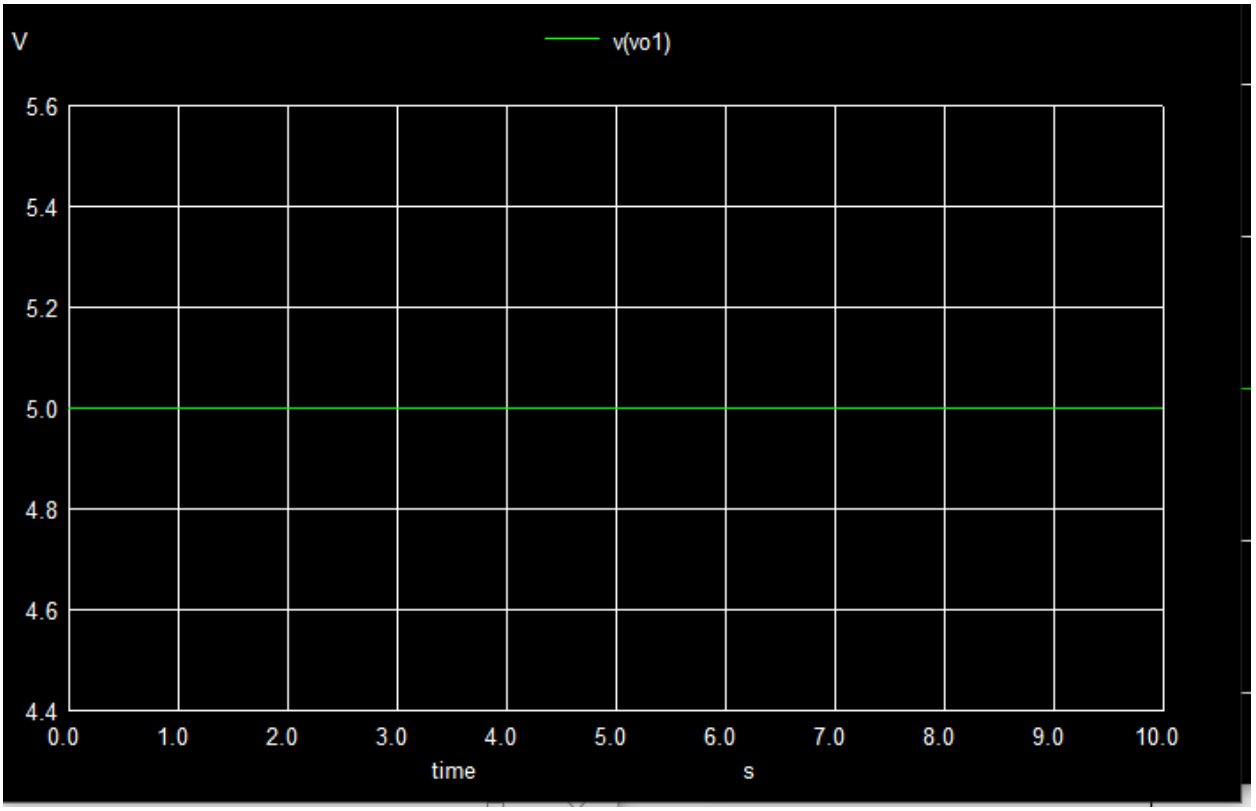
Add parameters for DC source v3

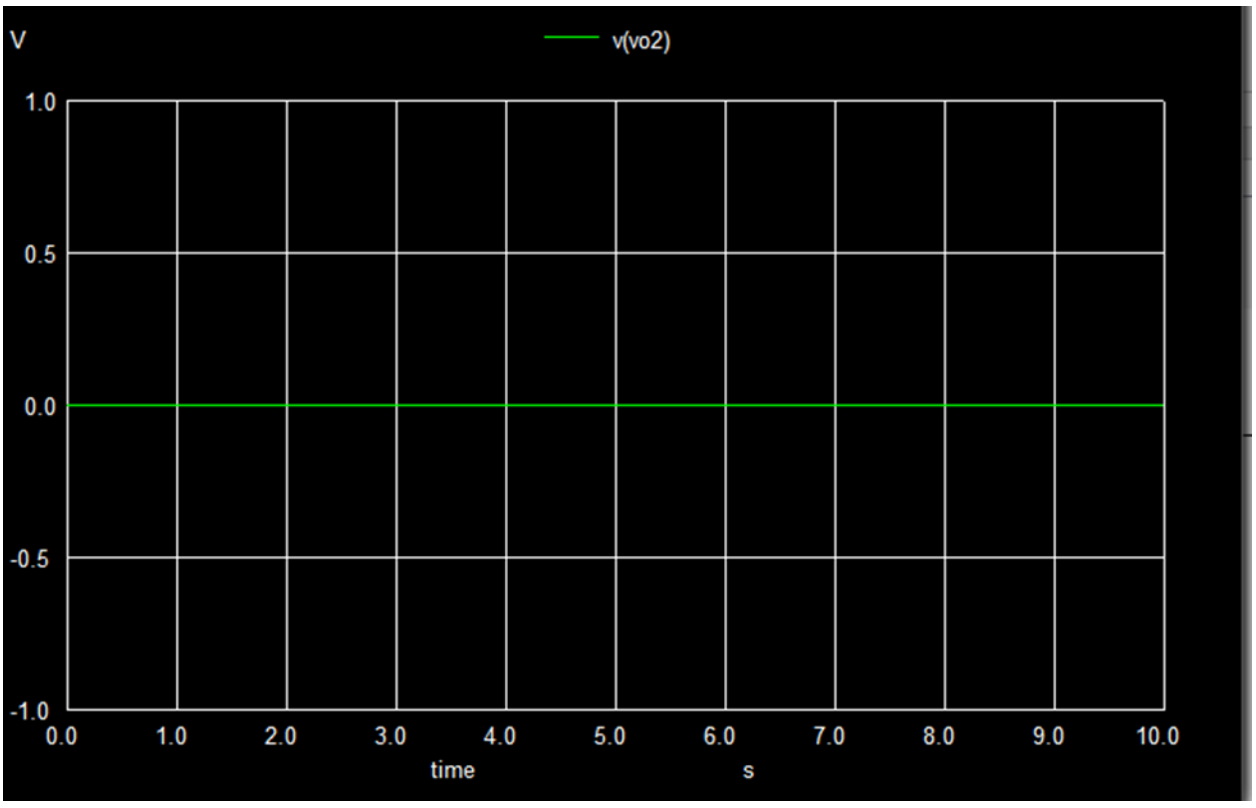
Enter value(Volts/Amps): 0

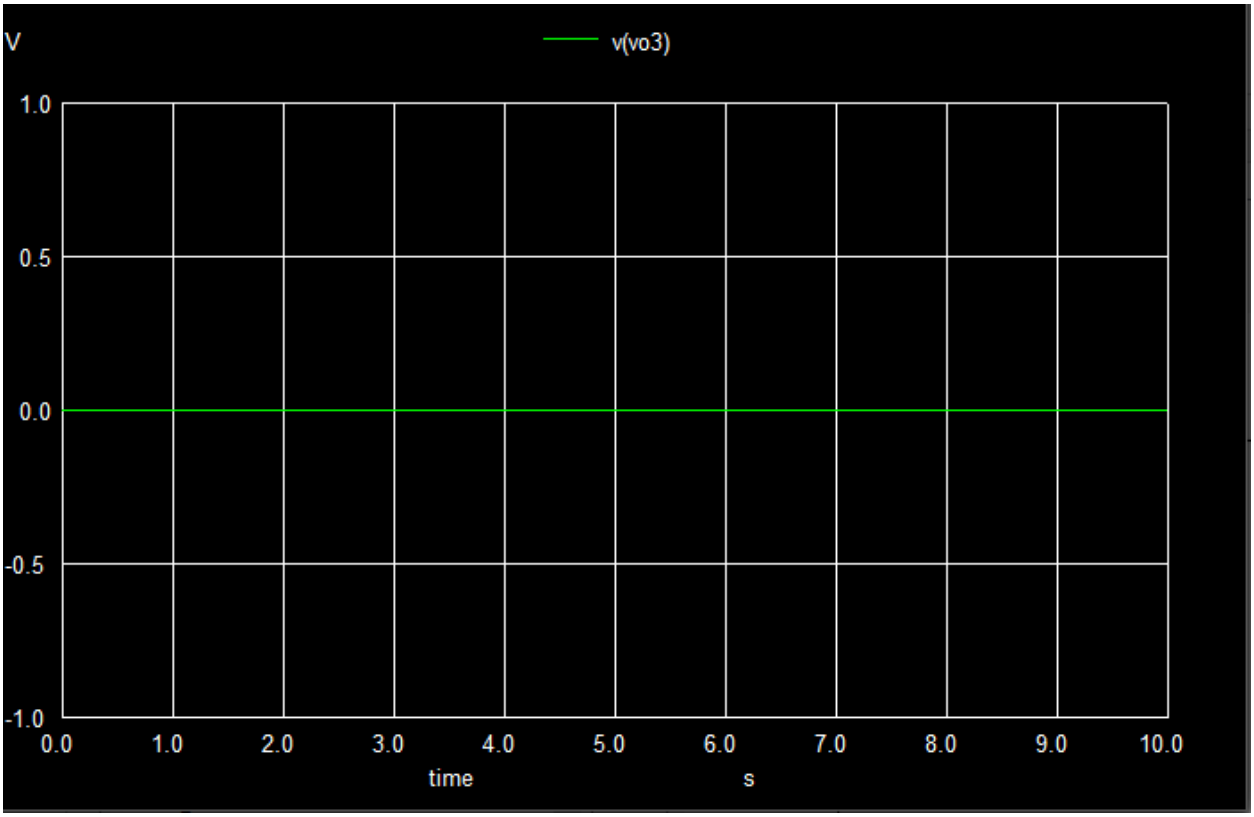
Add parameters for DC source v4

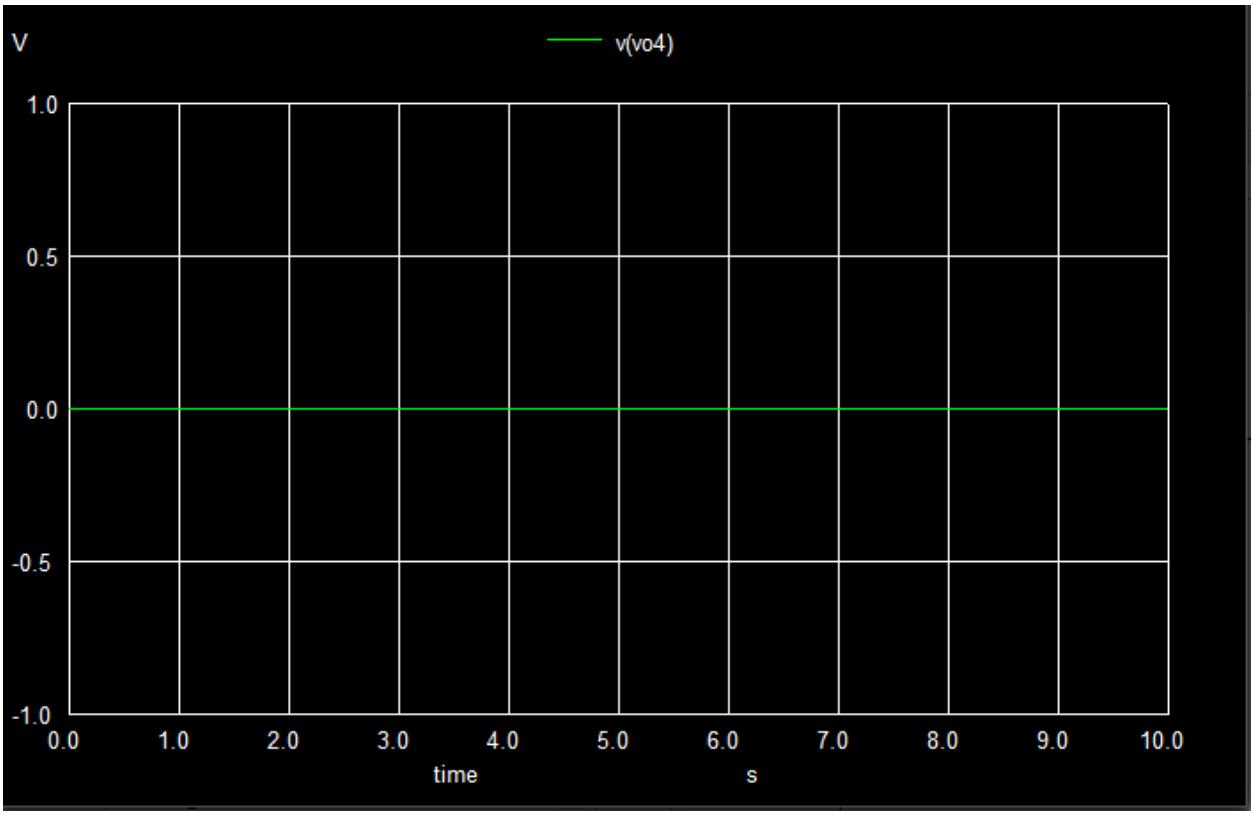
Enter value(Volts/Amps): 5

Ngspice plots:






V
v(vo3)
1.0
0.5
0.0
-0.5
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
time
s


V
v(vo4)
1.0
0.5
0.0
-0.5
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
time
s

Reference:

https://www.instructables.com/BINARY-CODE-CONVERTER-USING-9S-COMPLEMENT/