Title of the Experiment:

Construction and working of a Full Adder using NgSpice.

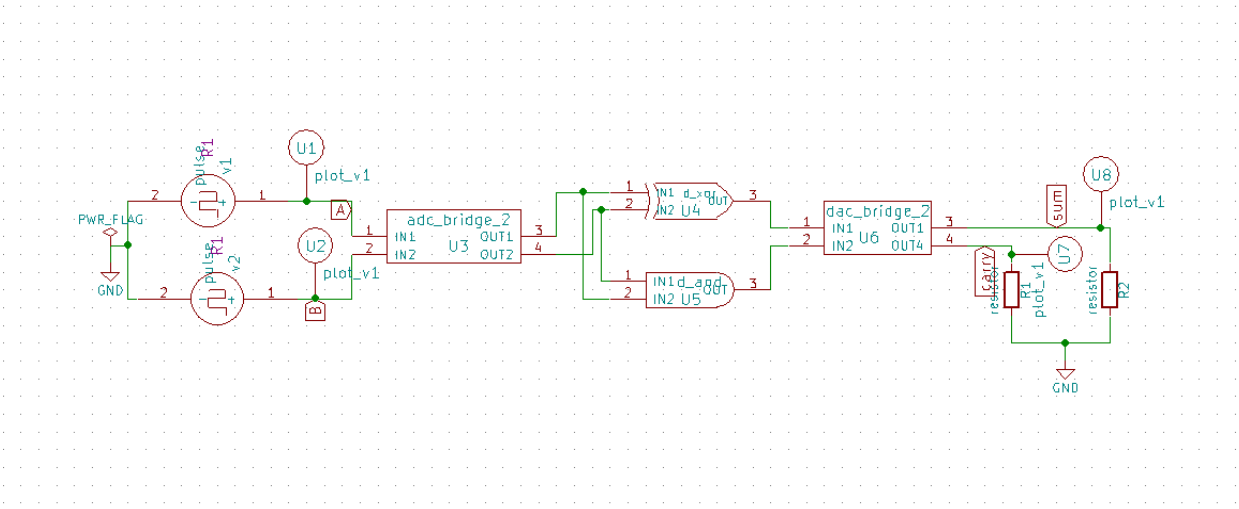
Theory:

A full adder circuit takes two inputs and gives two outputs. It provides the sum and carry and is implemented using two half adder circuits.

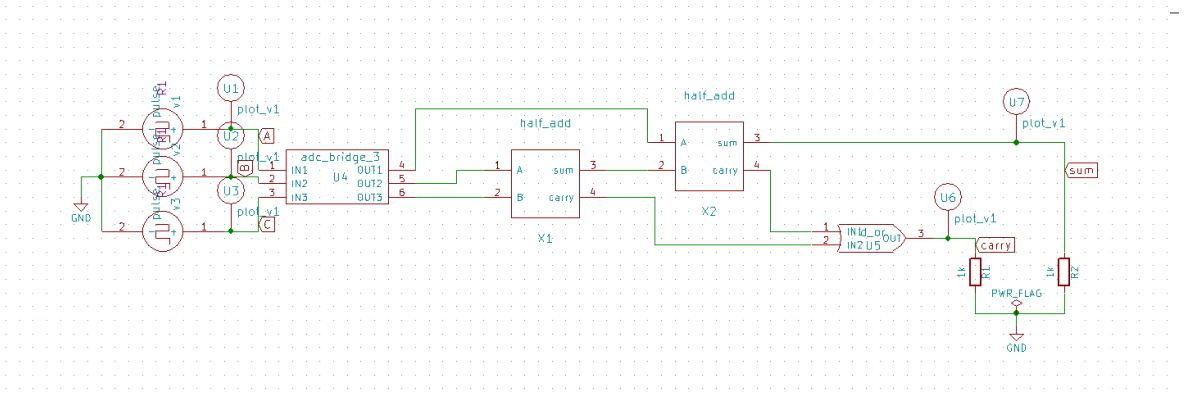
The first half adder takes A and B as an input and creates an intermediate sum which is later used by the second half adder. The carry of both the half adders is taken as input in the OR gate and the result is our final carry output.

Schematic Diagram:

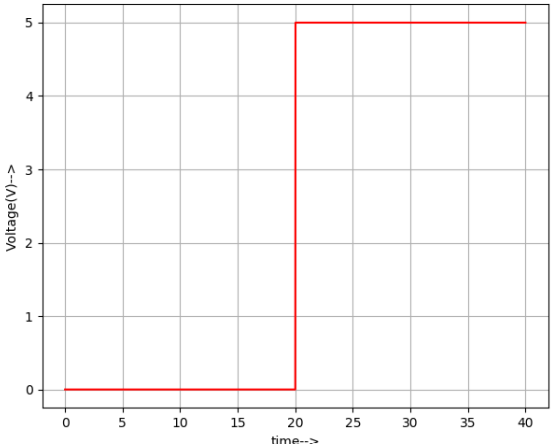
HALF ADDER:



FULL ADDER:



Plots:


Voltage(V)-->
time-->
0
5
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2
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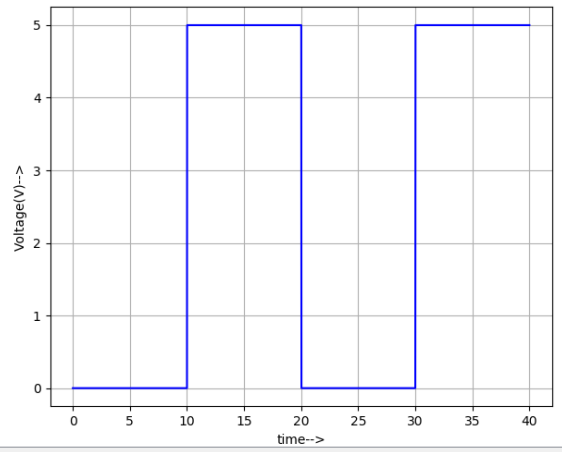
4
5


a
b
c
carry
sum
List of Branches:
a3#branch_1_0
a3#branch_1_1
v1#branch
v2#branch
v3#branch
Plot
Multimeter
Function:
Clear
Plot Function
Standard functions
Addition: Node1 + Node2
Subtraction: Node1 - Node2
Multiplication: Node1 * Node2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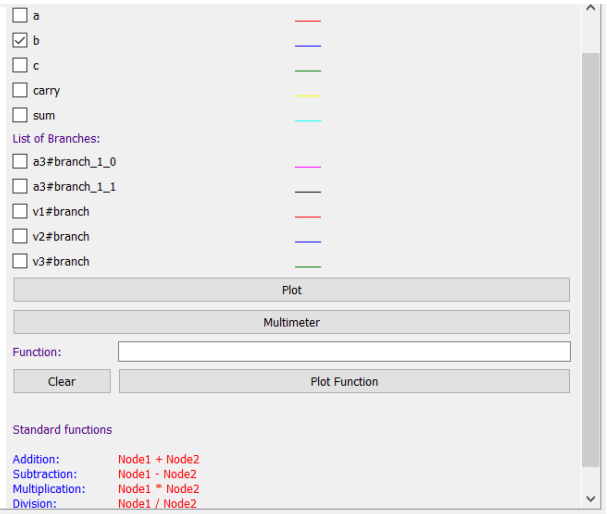
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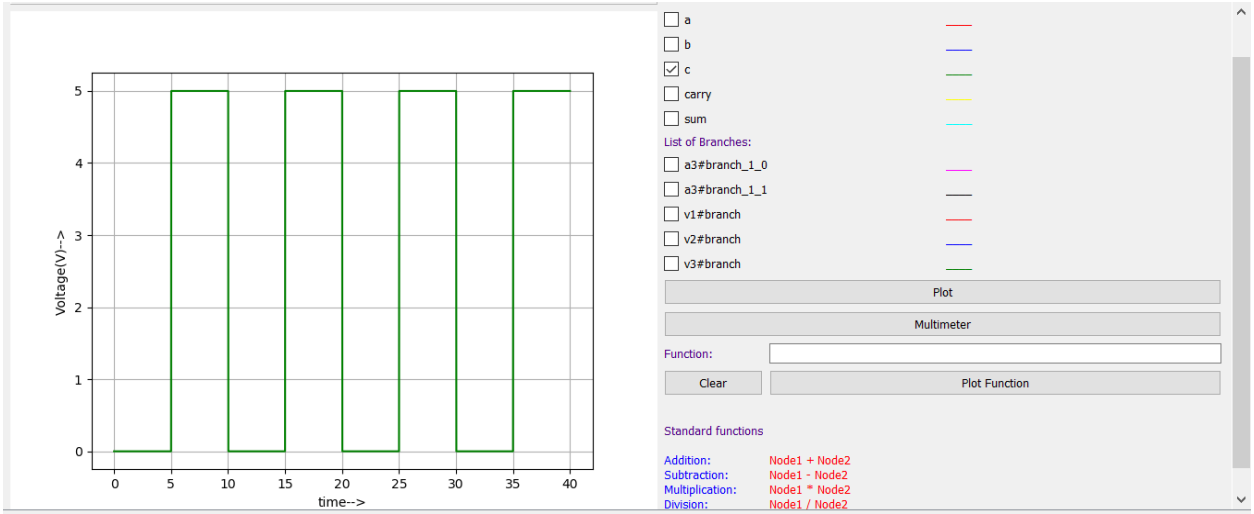
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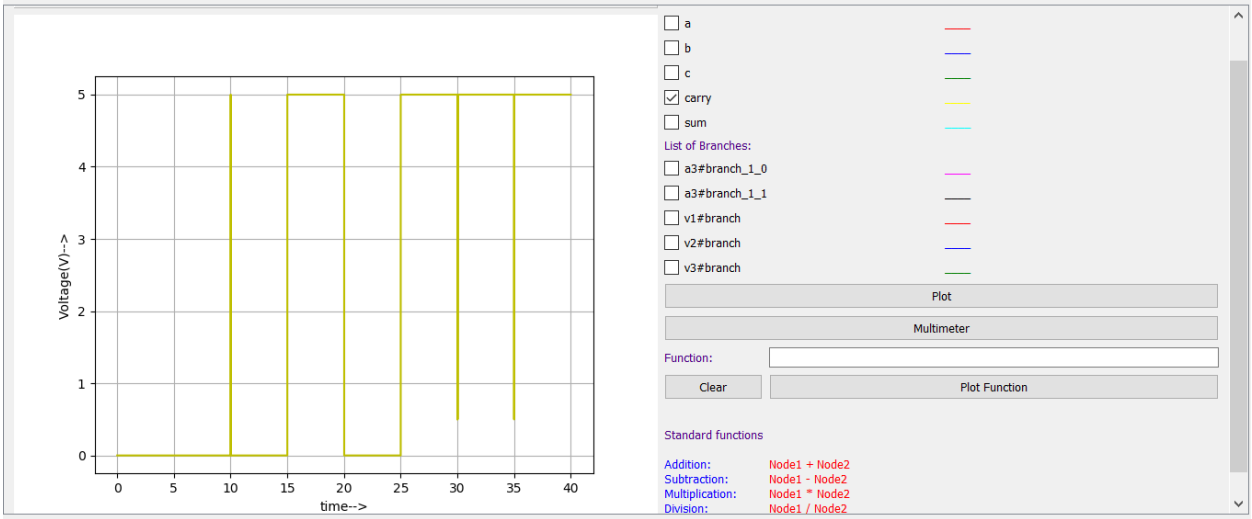
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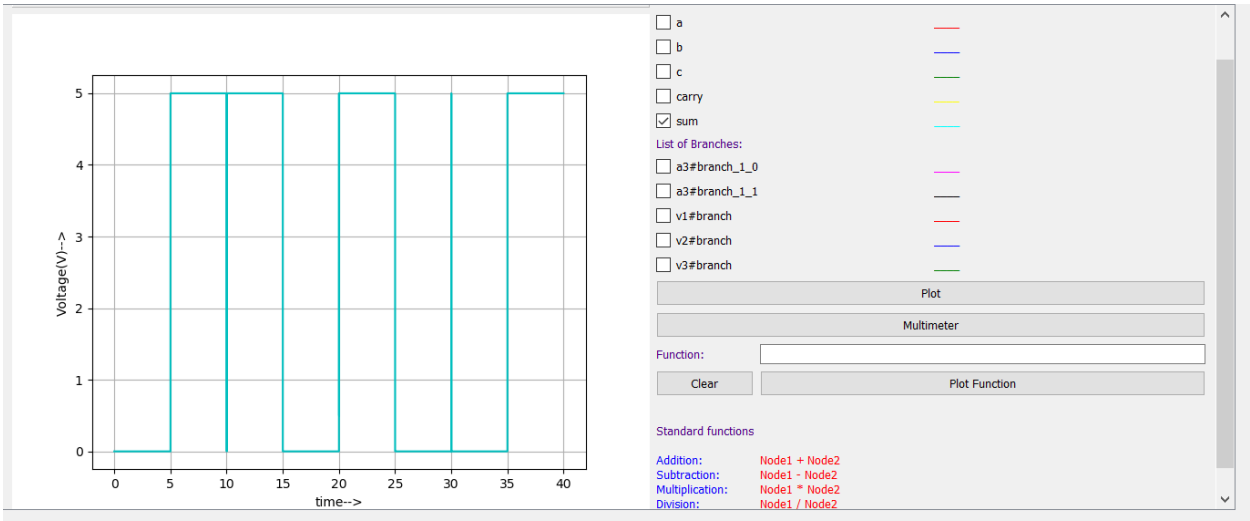
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Conclusion:

Hence, we constructed a full adder using two half adders and verified the result of the same.

References:

https://www.geeksforgeeks.org/full-adder-in-digital-logic/