Tittle of the experiment:

DESIGN OF FULL ADDER USING A 4:1 MUX USING ESIM

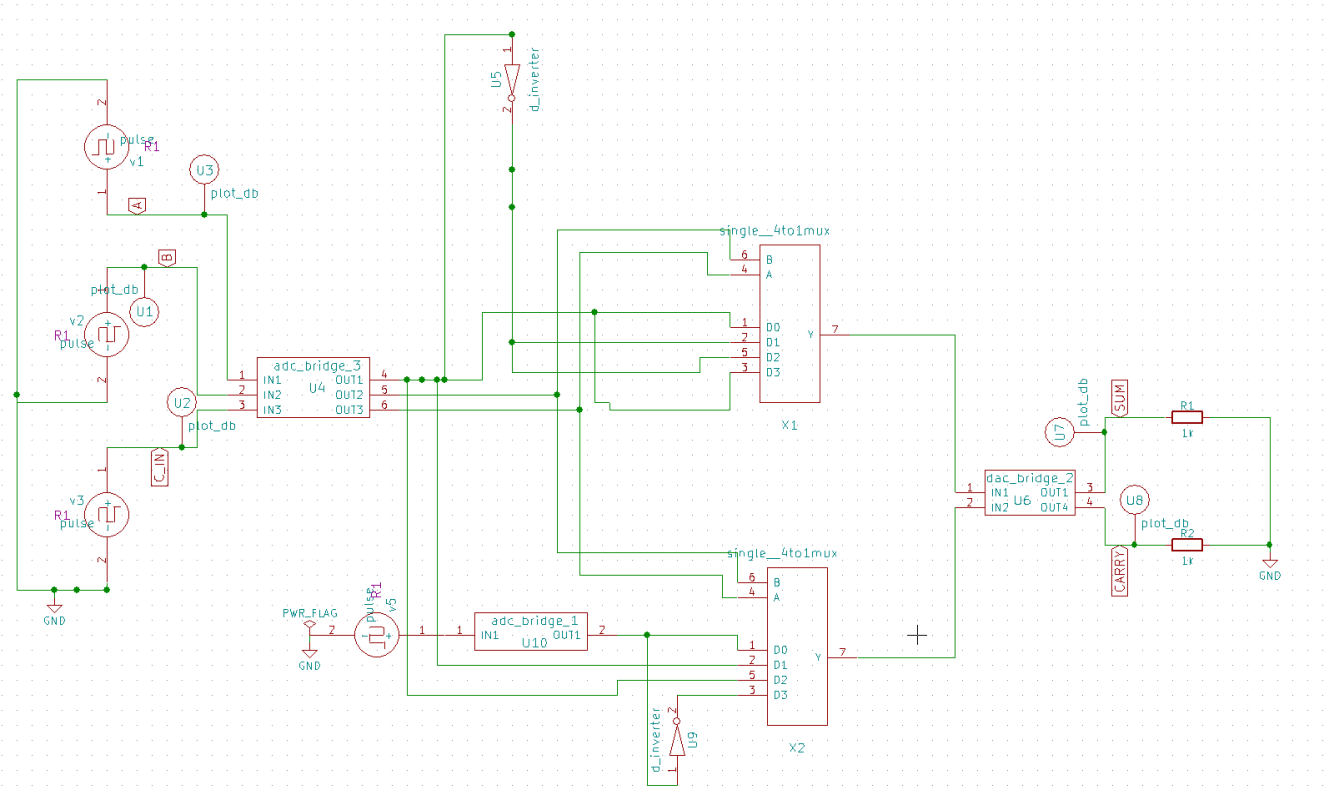
Theory:

In electronics, a multiplexer (or MUX) is a device that selects one of several analog or digital input signals and forwards the selected input into a single line. A multiplexer of 2n inputs has n select lines, which are used to select which input line to send to the output. Multiplexers are mainly used to increase the amount of data that can be sent over the network within a certain amount of time and bandwidth. A multiplexer is also called a data selector.

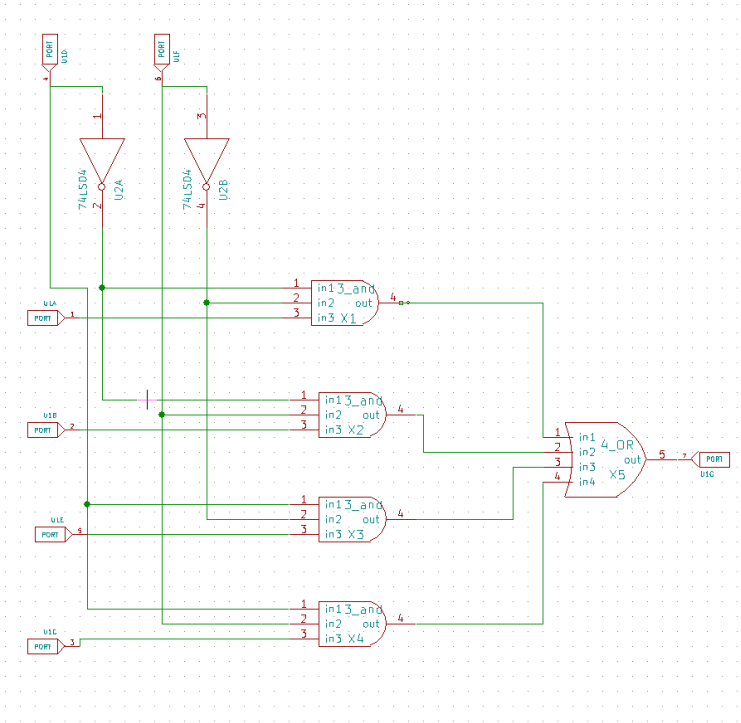
Multiplexer is also called a data selector, whose single output can be connected to anyone of N different inputs. A 4 to 1 line multiplexer has 4 inputs and 1 output line. In our experiment, we use IC 74153(Multiplexer) and IC 7404(NOT gate) for implementing the full adder.

Schematic Diagram

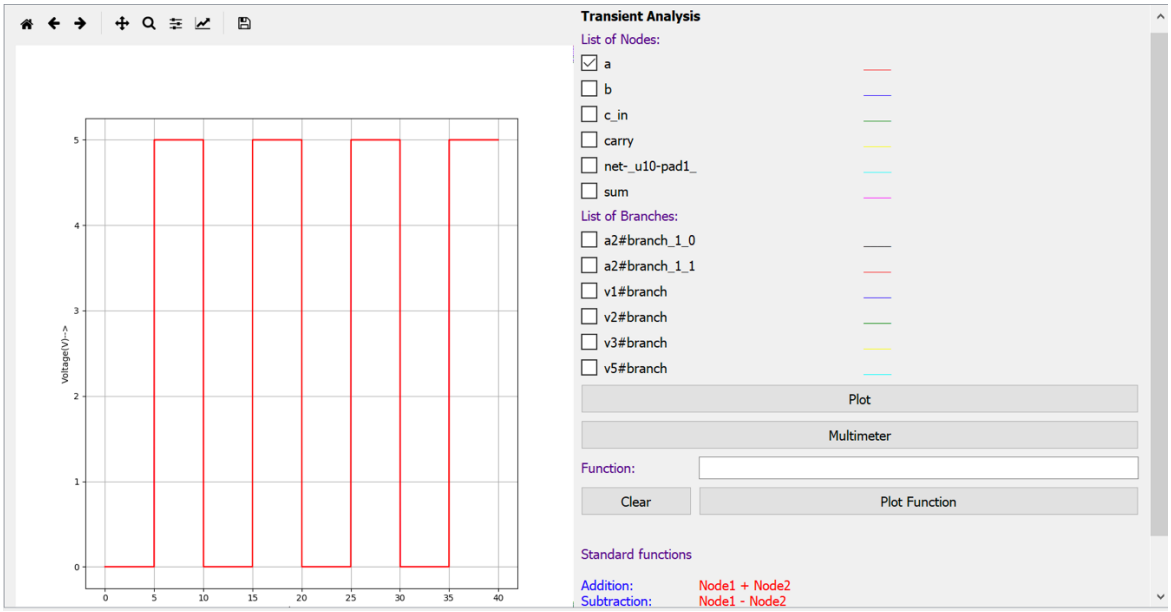
The schematic diagram of full adder is:

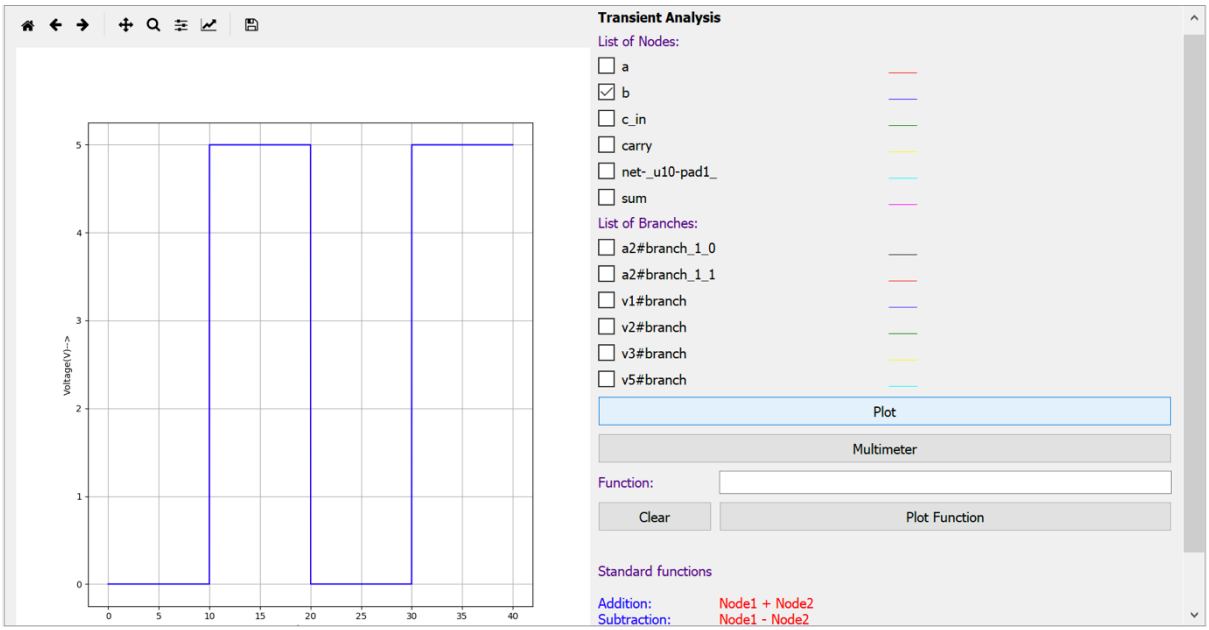


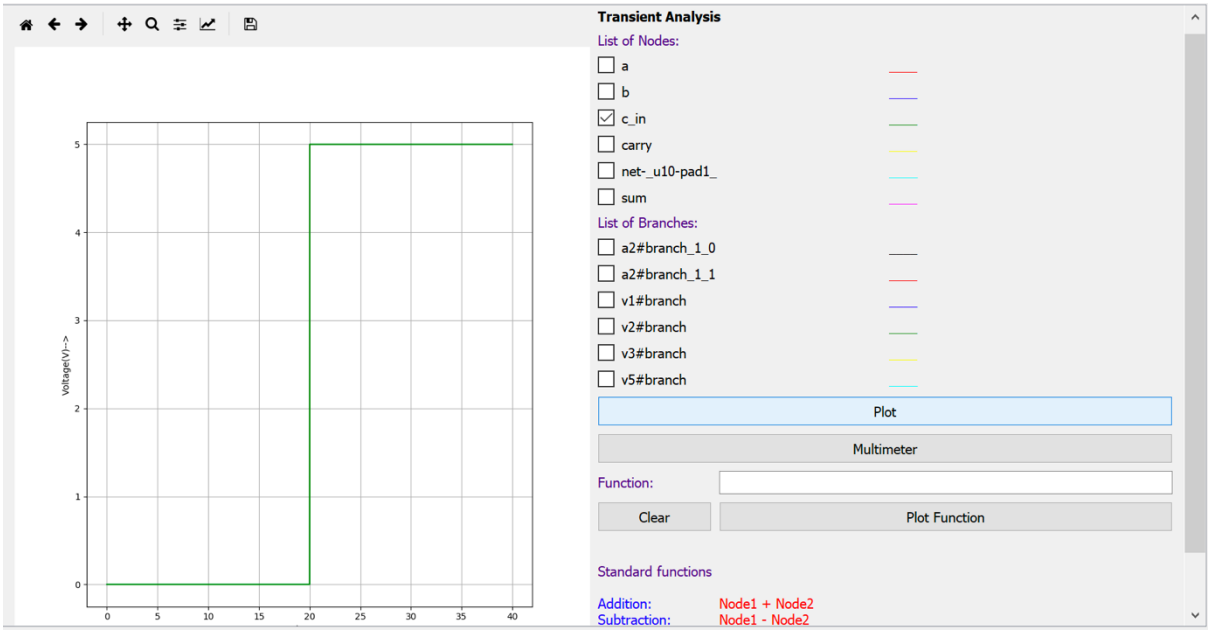
Here I used a subcircuit for 4:1 mux which was used in the circuit. The internal structure of 4:1 mux is shown below.



Input Python Plots:




Transient Analysis
List of Nodes:
a
b
c_in
carry
net-_u10-pad1_
sum
List of Branches:
a2#branch_1_0
a2#branch_1_1
v1#branch
v2#branch
v3#branch
v5#branch
Plot
Multimeter
Function:
Clear
Plot Function
Standard functions
Addition: Node1 + Node2
Subtraction: Node1 - Node2
Voltage(V)-->
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40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5
0
5
10
15
20
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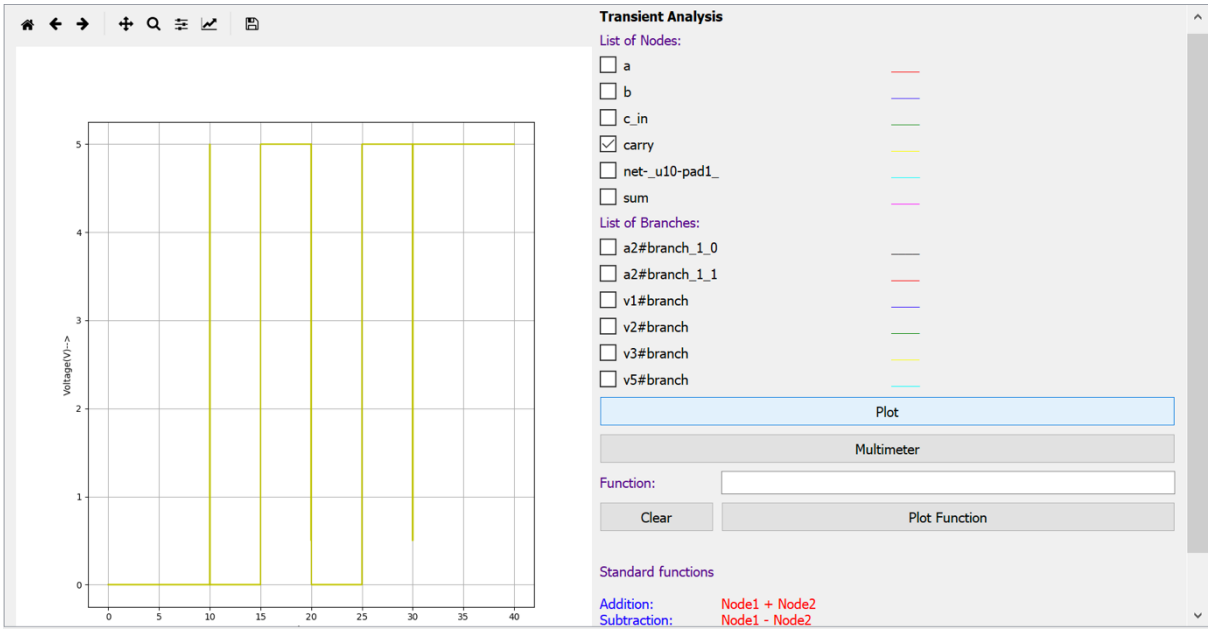
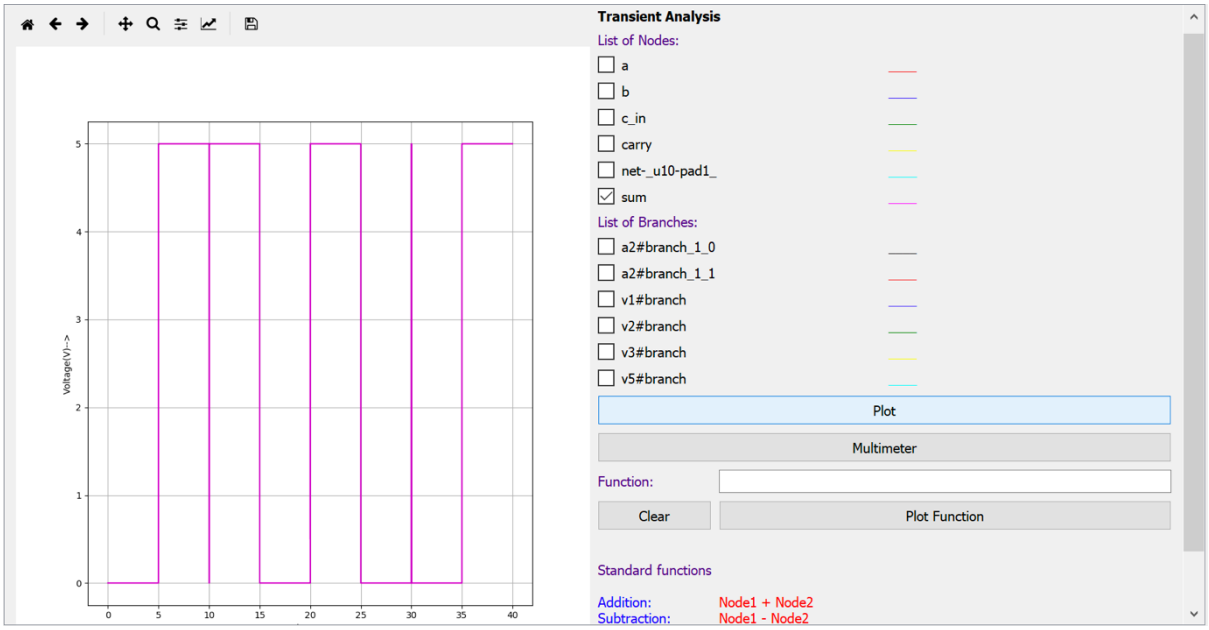
30
35
40

Output Python Plots:





Conclusion:

Thus, we created a full adder with 4:1 mux using eSim and got the appropriate waveforms.

References:

https://www.ques10.com/p/30280/implement-a-full-adder-circuit-using-two-41-multip