Leading University

Department of Electrical and Electronics Engineering

Course Code: EEE - 4128
Course Title: VLSI(Lab)

Lab Report: 04
Half Adder, Full Adder, 2x1 MUX and 4x1 MUX simulations using DSCH Software

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Date of submission:
26th of December 2021

Experiment No.: 04

Title: Design of half adder, full adder, 2x1 MUX and 4x1 MUX circuits using DSCH2 software.

Circuit Diagram: The Circuit diagram for the Half Adder Circuit and the Full Adder Circuits are provided as follows:

Half Adder Circuit:

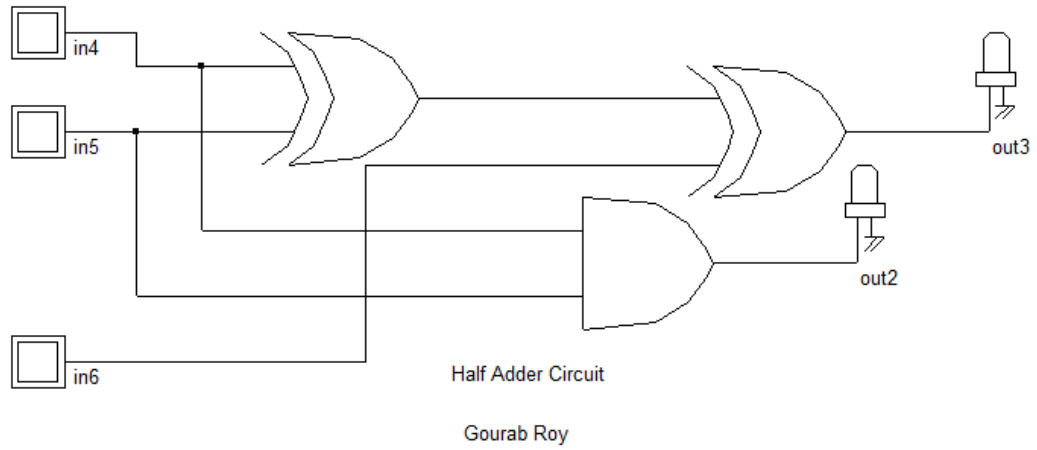

Fig-01: Schematic diagram of half adder circuit

Full Adder Circuit:

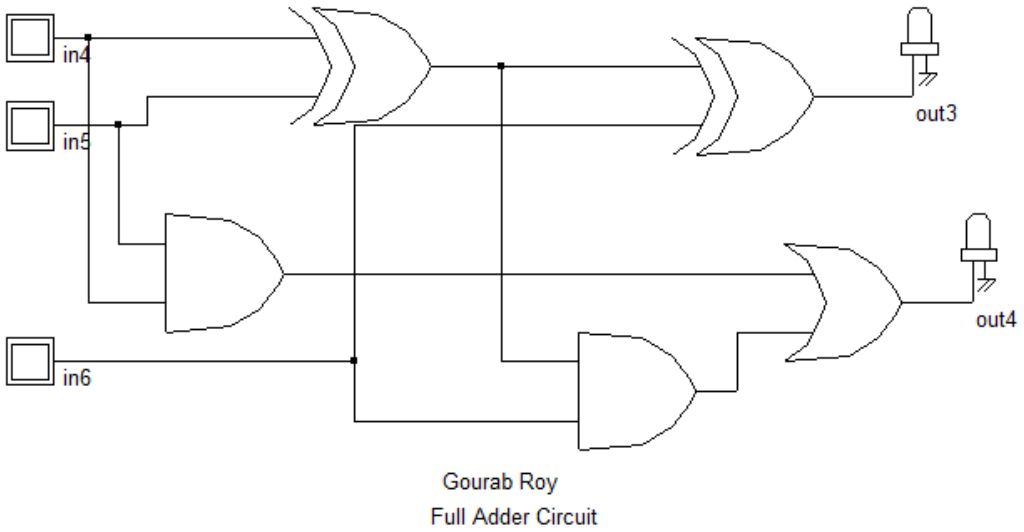

Fig-02: Schematic diagram of full adder circuit

2x1 Multiplexer Circuit:

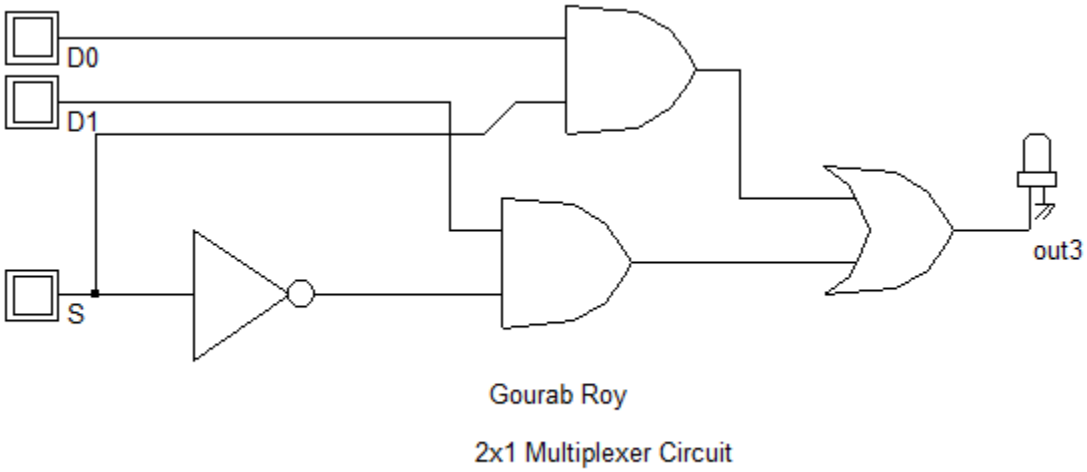

Fig-03: Schematic Diagram of 2x1 Multiplexer Circuit

4x1 Multiplexer Circuit:

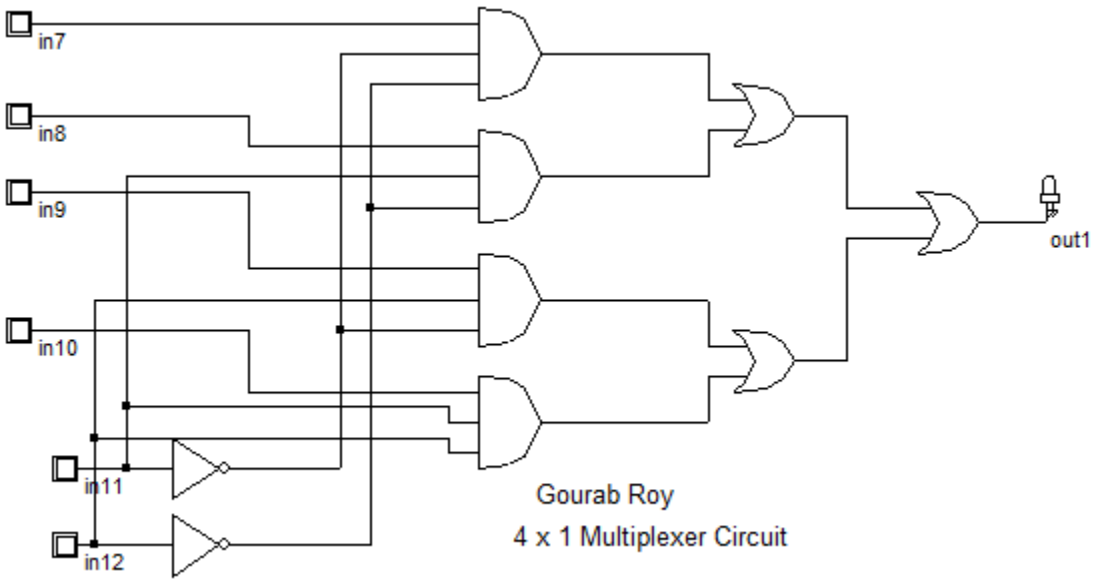

Fig-04: Schematic Diagram of 4x1 Multiplexer Circuit

Software: The name of the software used for simulation is DSCH2.

Simulation Result: The simulation results from DSCH2 are provided below:

Half Adder Circuit Simulation:

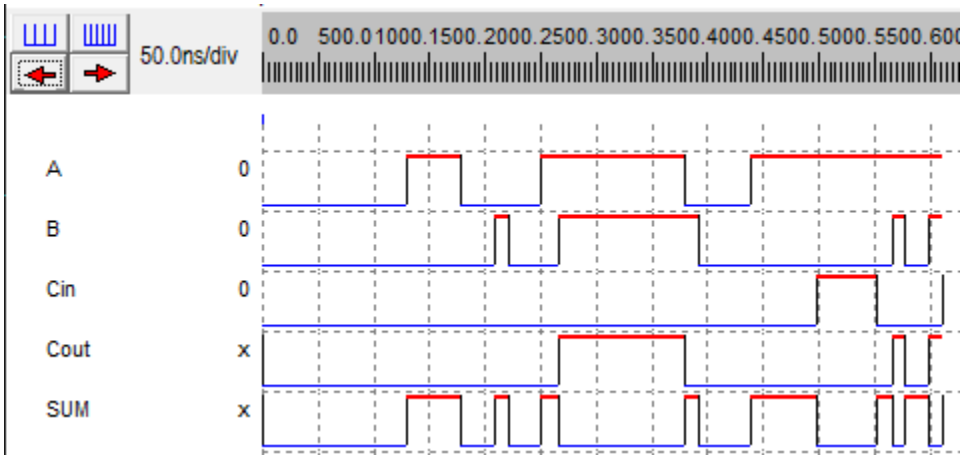

Fig-05: Simulation result of half adder circuit

Full Adder Circuit Simulation:

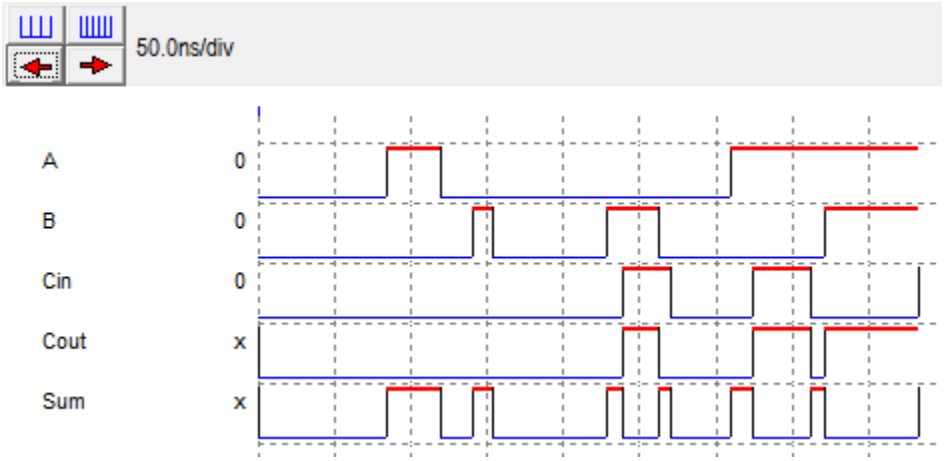

Fig-06: Simulation of full adder circuit

2x1 MUX :

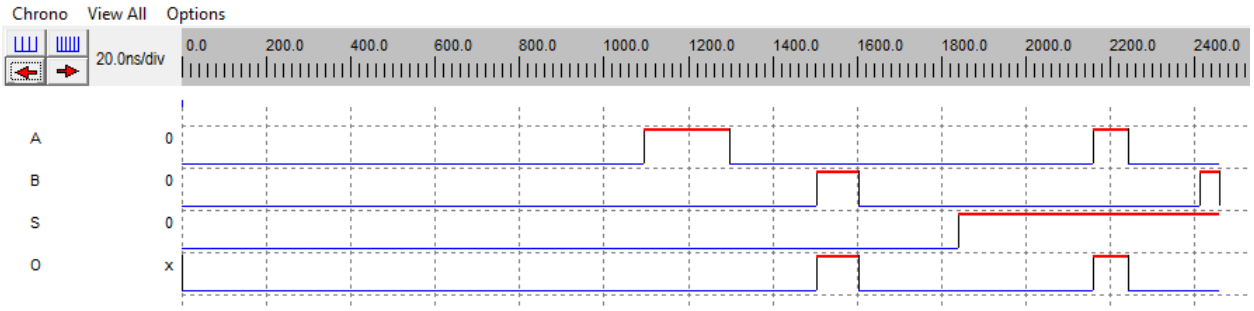

Fig-07: Simulation of 2x1 Multiplexer Circuit

4x1 MUX:

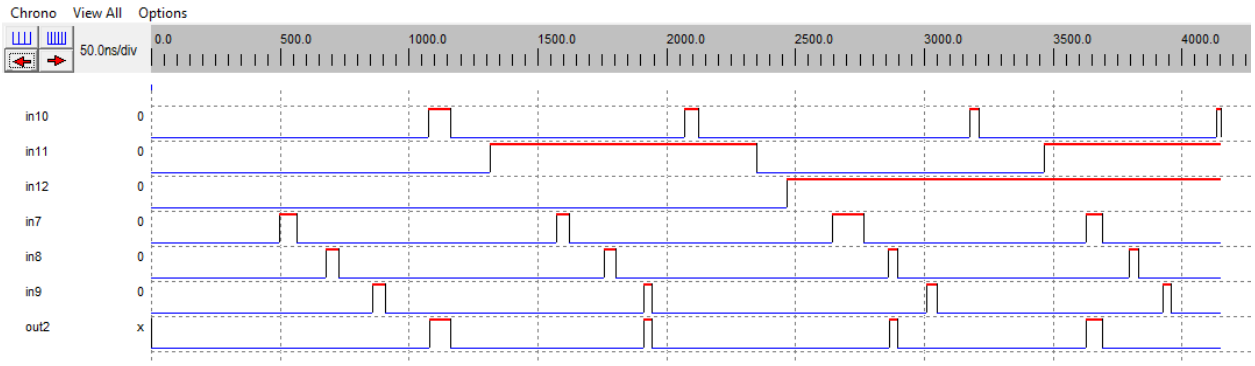

Fig-08: Simulation of 4x1 Multiplexer Circuit

Discussion and Conclusion:

The simulations for this experiment were previously done in the LTSPICE software but this time the simulations are conducted using the DSCH2 software. Error in the output will be seen when the diagram is not connected properly. The Half adder and Full adder circuits take a different number of inputs but both provide two outputs. The half adder takes two inputs and the full adder takes three inputs. 2x1 and 4x1 MUX are combinational logic circuits that select one of either 2 or 4 inputs using control signals. The signal lines are such that they can control the input to provide a desired output. 2x1 MUX and 4x1 MUX have been studied in this lab experiment. The MUX simulations, circuit schematics and results have been determined in this lab experiment using DSCH2 software. In 2x1 MUX we use 2 AND gates and a single OR gate. In 4x1 MUX we use 4 AND gates and a single OR gate. All in all the setup in DSCH2 software is quite user friendly and can be easily implemented by beginners to design complex circuits.