UNIVERSITY OF ROCHESTER
ECE -200
LAB-1

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Abstract Summary:

Through this lab we learnt the usage of modelsim software and designing ALU like 4-bit Adder/Subtractor and an 8-bit shift register. We were able to implement the circuit using Verilog in modelsim.

Introduction:

-Part 2: 4-Bit Add/Sub Module

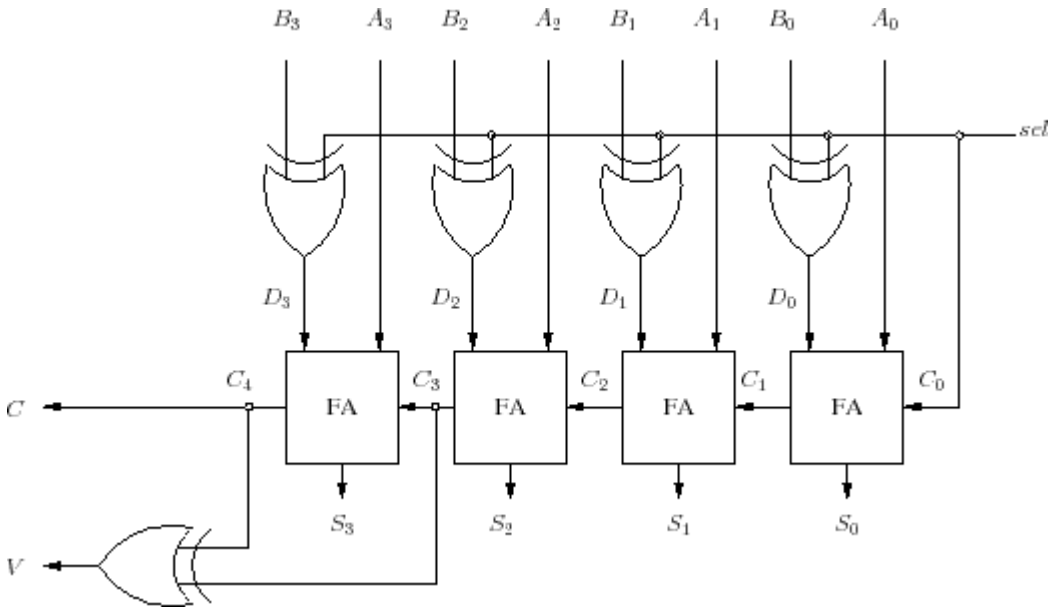
It is a digital circuit which is capable of adding or subtracting a 4 bit value and the operation is dependent on an input called control Bit. If control bit is 0 then it adds the number and if control bit is 1, it subtracts the numbers.

-Part 6: 8-Bit Shift Register

A shift register is a series of connected registers, connected together so a value at input is passed from one register to the next on each clock cycle.

Design Approach:

-Part 2: 4-Bit Add/Sub Module



Circuit Diagram

Full Adder Truth Table

A	B	Cin	Cout	F
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

Full Subtractor truth table

A	B	C	BORROW	DIFFERENCE
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	1	0
1	0	0	0	1
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1

-Part 6: 8-Bit Shift Register

INPUT								OUTPUT		
7	6	5	4	3	2	1	0	4	3	2
0	0	0	0	0	0	0	1	0	0	0
0	0	0	0	0	0	1	0	0	0	1
0	0	0	0	0	1	0	0	0	1	0
0	0	0	0	1	0	0	0	0	1	1
0	0	0	1	0	0	0	0	1	0	0
0	0	1	0	0	0	0	0	1	0	1
0	1	0	0	0	0	0	0	1	1	0
1	0	0	0	0	0	0	0	1	1	1

Comments:

Through this lab we were able to simulate ALU on modelsim and observe the result and got hands on experience with Verilog.

There are few thing that I could not figure out like the functioning of modelsim since I had to leave back home for 2 weeks for family emergency but I will rectify those faults once back.