



National Institute of Technology, Rourkela

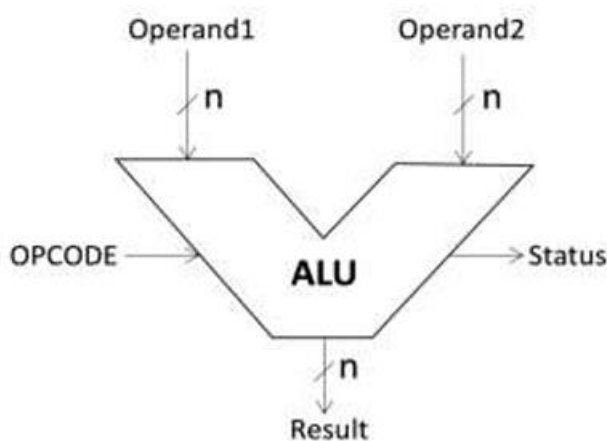
CS2074: Computer Organization Laboratory

SPRING 2021-2022

Assignment 7: ALU Design

Due: March 24, 2022, 23:59 hours

1. Write a Verilog description for a multiplier bit. Using this multiplier bit write a Verilog code for a 4 x 4 array multiplier. Then, design an ALU that performs eight functions according to the following table. The data inputs of the ALU are A and B each of 4 bits. Use always blocks and case statements in your Verilog description. Use the adder/subtractor and multiplier bit circuit designed previously.



S <sub>2</sub>	S <sub>1</sub>	S <sub>0</sub>	Function
0	0	0	A and B
0	0	1	A sub B
0	1	0	A add 2*B
0	1	1	A sub 2*B
1	0	0	A*B
1	0	1	Min(A,B)
1	1	0	Abs(A)
1	1	1	B