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CS 141: Computing Hardware

Lab 2: ALU

Testing and Simulation methodology

The ALU is tested by iterating over all the possible OP codes and for each OP code passing different values of input. To begin, the testbech tests the functionality of all the operations by passing standard case inputs. The first standard case is two positive numbers: X = 2, Y = 3. And the second standard case is a maximum 32 bit number and a zero. X = 4294967295, Y = 0. The testbench then implements the following special cases:

Two negative numbers: X = -2, Y = -3

A positive and a negative number: X = 3, Y=-3

A maximum 32 bit number and 1.

The ALU passed the tests by fulfilling the following expectations:

* The sum of a max 32 bit number and 1 triggered the overflow. The sum of two negative number also triggered the overflow. The same was observed for the sum of a negative and and positive number.
* The logic gates followed the expected outputs as per their respective truth tables.