

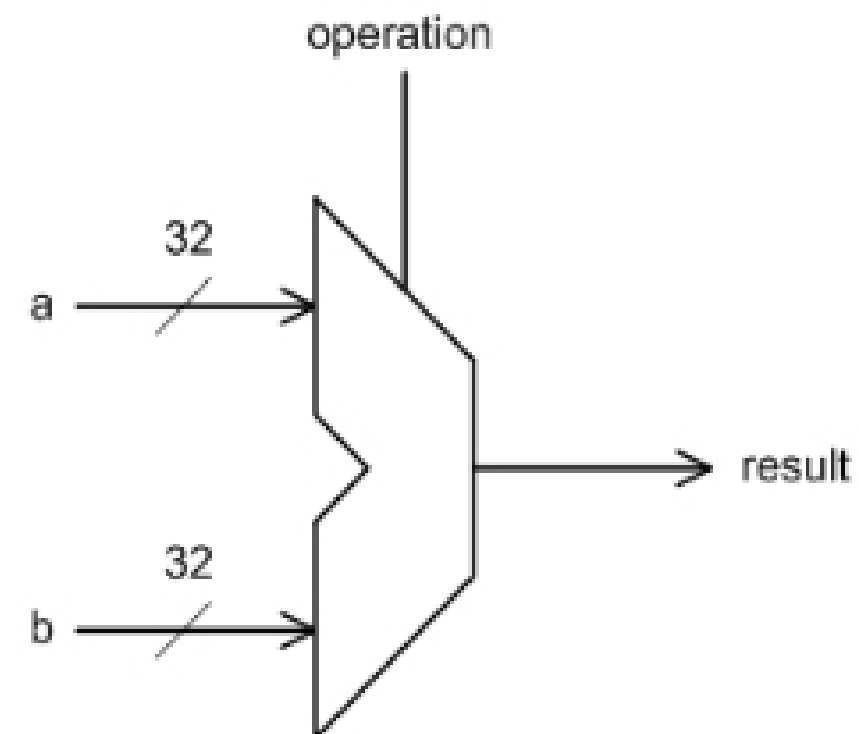
CS/COE0447

Computer Organization & Assembly Language

Chapter 3 Part 1

Arithmetic

- So far we studied
 - Instruction set basics
 - Assembly & machine language
- We will review binary arithmetic algorithms and their implementations
- Binary arithmetic will provide basis for CPU's "datapath" implementation



Binary Number Representation

- We looked at unsigned numbers before
 - $B_{31}B_{30}\dots B_2B_1B_0$
 - $B_{31}\times 2^{31}+B_{30}\times 2^{30}+\dots+B_2\times 2^2+B_1\times 2^1+B_0\times 2^0$
- Now we want to deal with more complicated cases
 - Negative numbers
 - Real numbers (a.k.a. floating-point numbers)
- How do we represent negative numbers?
 - Bit patterns and what they represent...