

EE 3755, Fall 2011

Homework # 1

Due Monday September 19, 2011, in class

Please do the following problems:

- 1 Perform the addition $X+Y$ where X and Y are the following 8-bit sign magnitude numbers:

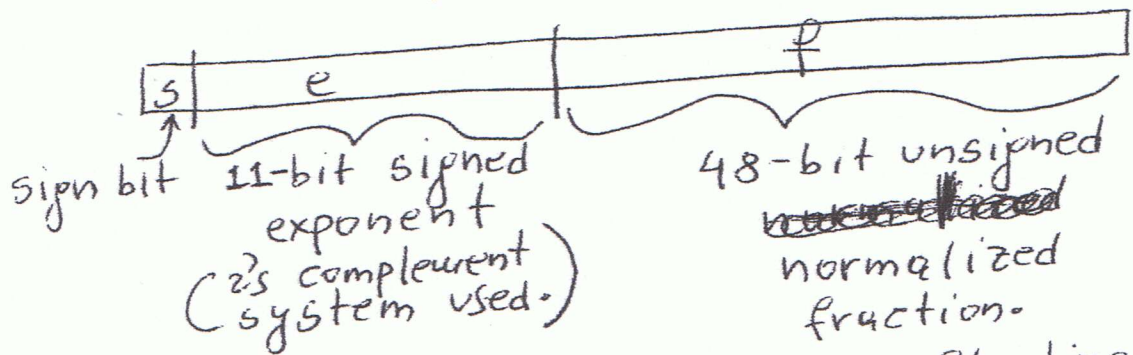
$$X = (01011011)_2 = (+91)_{10}, Y = (11101001)_2 \\ = (-105)_{10}$$

- 2 Using the Booth algorithm that relies on examining three bits at a time, perform the signed multiplication with multiplier $= (-27)_{10}$, multiplicand $= (-18)_{10}$ and length $n=6$.

- 3 Using the shift-subtract/add division algorithm, perform the division of the 10-bit dividend $A = (0101010001)_2$ by the 5-bit divisor $B = (01101)_2$

- 4 Using the shift-subtract/add division algorithm, perform the division of the 10-bit dividend $A = (0101000011)_2$ by the 5-bit divisor $B = (01101)_2$

5 Compute the Dynamic Range for a floating point system based on the 60-bit binary FLP format shown below:



6 Consider the following two floating point numbers with 4-bit exponents in biased form and 8-bit unsigned normalized fractions.

s_1	e_1	f_1	s_2	e_2	f_2
A_1 : 0	0111	11110000	A_2 : 1	1001	10010010

Compute the summation $A_3 = A_1 + A_2$.

Return the result A_3 in a form consisting of a normalized fraction and exponent in biased form.