CSE 321b: Computer Organization (II)
Third Year, Computer & Systems Engineering

Assignment #3

Due date: **Thursday, May 25th, 2017**

1. Apply **Booth's** algorithm to multiply -8 (multiplicand) by +5 (multiplier). Represent the numbers using the least number of bits.

2. Show all the steps required to divide +27 (dividend) by -4 (divisor) using the **non-restoring division** algorithm. Represent the numbers using the least number of bits.

3. Suppose the IEEE 754 Standard has a **binary14** format that uses: 1 sign bit, 7-bit biased exponent, and 6-bit fraction.
   (a) Convert the following numbers to their binary14 counterparts:
      i. -11.375
      ii. $-3.3882 * 10^{-21}$
   (b) Perform the following calculations while interpreting each of the given binary values as a binary14 floating-point number. Use two guard bits and round results down whenever is needed.
      i. 1 0000011 101101 + 0 0000000 101111
      ii. 0 0001111 011011 – 1 1100001 101001