Due: Friday 14 February 2014 ♥

Submission: Turn in a printed or neatly written copy of your work at the beginning of class.

Collaboration: Each student must work on and submit their assignment individually.

1. Convert the decimal number -9 to the equivalent signed magnitude representation, in which numbers are stored using 5 bits. Show your work.

2. Convert the decimal number -7 to the equivalent one’s complement representation, in which numbers are stored using 5 bits. Show your work.

3. Convert the decimal number -10 to the equivalent two’s complement representation, in which numbers are stored using 5 bits. Show your work.

4. Convert the 5 bit binary number 10011 represented in signed magnitude representation to the equivalent decimal representation. Show your work.

5. Convert the 5 bit binary number 11001 represented in one’s complement to the equivalent decimal representation. Show your work.

6. Convert the 5 bit binary number 10011 represented in two’s complement to the equivalent decimal representation. Show your work.

7. Perform the following additions, assuming the numbers are given in two’s complement notation, with numbers stored using 5 bits. Show your work. For each problem specify whether the result is incorrect due to overflow.
   
   (a)  
   \[
   \begin{array}{c}
   01111 \\
   + 00001 \\
   \end{array}
   \]
   (b)  
   \[
   \begin{array}{c}
   11110 \\
   + 10101 \\
   \end{array}
   \]

8. Convert the following (positive) binary number into a base ten number. (You may give the fractional part of the answer as a fraction, if you wish.) Show your work.

   01101.0101