CS1356 Introduction to Information Engineering

Homework 2

1. Convert each of the following 5-bit two's complement representation to its equivalent base ten representation

   a. 01111   b. 10011   c. 01101

   d. 10000   e. 10111

2. Convert each of the following base ten representation to its equivalent 5-bit two's complement representation

   a. 12   b. −12   c. −1

   d. 0   e. 8

3. Perform each of the following additions assuming the bit pattern represent values in two's complement notation. Identify the cases that will cause overflow.

   a.   00101   b.   11111   c.   01111
         +01000   +00001   +00001

   d.   10111   e.   00111   f.   00111
         +11010   +00111   +01100

   g.   11111   h.   01010   i.   01000
         +11111   +00011   +01000

   j.   01010
         +10101

4. Solve each of the following problems by translating the values into two's complement notation (5-bit), converting any subtraction problem to an equivalent addition problem, and performing that addition.

   a.   7   b.   7   c.   12
        +1   −1   −4

   d.   8   e.   12   f.   5
        −7   −4   −11