Introduction to Computer Science Homework 2
Assigned Sept. 11, 2012
Due Sept. 18, 2012

Background:
This homework covers the content of the lectures on Sept. 6, 11, and 13.

Problems:

1. What is the smallest two’s complement value representable on a computer with 18-bit integers?
2. Suppose you have a 5-bit two’s complement machine. What are the values of the following signed binary operations? Represent the answers in signed base 10.
   a. 11111 * 11111
   b. 00100 - 01000
   c. 00100 / 00011
   d. 10100 + 01100
3. Consider the single-precision IEEE 754 floating point number 0xC1880000.
   a. What binary digits are associated with the sign, exponent, and fraction parts? Get the layout from the Single precision floating point format Wikipedia page.
   b. What sign (+1 or -1), exponent (-128 to 127), and fraction (1.0 to 2.0) do they correspond to (in base 10)?
   c. What is the decimal value of 0xC1880000?
4. Create a Java program named UpperOrLower that asks a user to type a number and prints "Uppercase or lowercase: true" if the Unicode character with that number is either uppercase or lowercase and "Uppercase or lowercase: false" otherwise. Use Character.isUpperCase and Character.isLowerCase. Running the program should look like this:
   $ java UpperOrLower
   Enter a number: 88
   Uppercase or lowercase: true

Please check your solutions to problems 1, 2, and 3 into Subversion as a text file named submit/hw2/hw2.txt. Check in your solution to problem 4 as Java source named submit/hw2/UpperOrLower.java.