C335 HW2, due February 4th, 12:00n

Note that spaces have been inserted within some numbers to make them easier to read.

1. Convert the following numbers from binary into hexadecimal representations:

a. 01101101

b. 10001111

c. 10111001 00001100

2. Convert the following numbers from hexadecimal into binary representations:

a. 0x76

b. 0xDAC

c. 0xB1C3 G8F6

3. Convert the following numbers from decimal into binary representations:

a. 31

b. 0.5

4. Convert the following numbers from decimal into hexadecimal representations:

a. 72

b. 127

5. Convert the following numbers from decimal into a 16-bit Two's Compliment representations:

a. 33

b. -173

6. Add the following 16-bit Two's Compliment numbers.

a. 0x1DC9 + 0x1BDC

b. 0xCE95 + 0xF737

7. Convert the following numbers using the IEEE 754 floating point numbers and give the values for the sign, the unbiased exponent, the biased exponent, and the significand in hexadecimal form:

a. 7.25

b. 1 10000001 111 0000 00000000 00000000

8. Calculate the resulting values from the bitwise and (&) operator below:

a. 1001 1110 & 1011 1001

b. 0xF7 & 0x61

9. Calculate the resulting values from the bitwise or (|) operator below:

a. 1001 1110 | 1011 1001

b. 0xF7 | 0x61

10. Calculate the resulting values from the bitwise exclusive or (^) operator below (note that exclusive or is also sometimes called xor):

a. 1001 1110 ^ 1011 1001

b. 0xF7 ^ 0x61

11. Calculate the resulting values from the bitwise not (~) operator below:

a. ~ 1001 1110

b. ~0xF7

12. Calculate the resulting values from the left shifts below:

a. 0011 1010 << 2

b. 0x00F2 << 4

c. 0x1DE0<<3

d. What arithmetic operator (on smallish integers) is implemented by a left shift of b bits?

13. Calculate the resulting values from the right shifts below, and give the results in hexadecimal:

a. 0011 1010 >> 2

b. 0x00F2 >> 3

c. Java has another right shift operator >>>. Guess what it means. (Do \*not\* look it up!)