CS 163 Discrete Math **Fall 2019**
http://neilklingensmith.com/teaching/loyola/cs163/

Homework 4

Due: October 1, 2019

Name:

1. (25 points) Two's complement representation

   (a) (5 points) Compute the **one's** complement of the following binary number. Also convert the binary to hex in the box at right.

Original Number	0	0	0	0	1	1	0	1	0x
One's Complement									0x

   (b) (5 points) Copy your binary one's complement number from above and add 1 to it. Convert the result from binary to hex in the box at right.

One's Complement									
+								1	
Two's Complement									0x

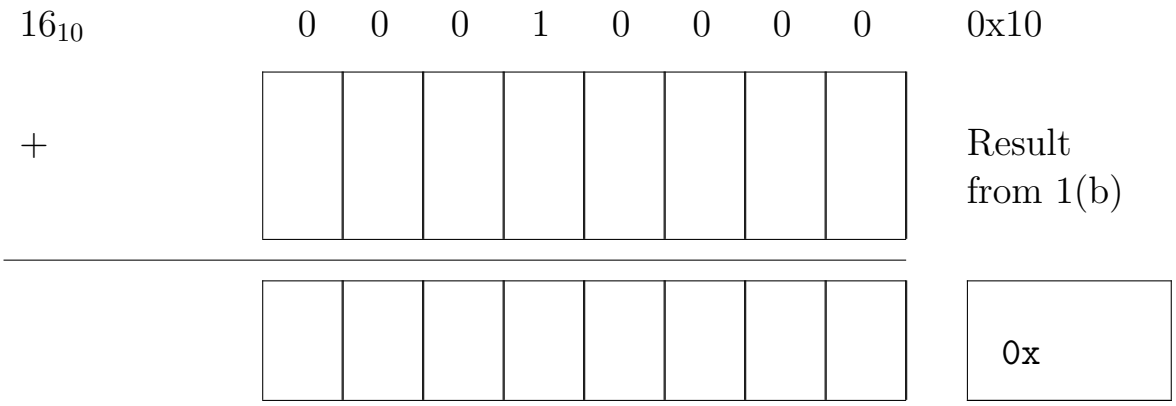
   (c) (5 points) Is the original number from part 1(a) positive or negative? How do you know?

   (d) (5 points) Is the two's complement number from part 1(b) positive or negative? How do you know?

(e) (5 points) What is the decimal representation of the two's complement number from 1(b) (including the sign)? *Hint: what is the decimal representation of the original number? What happens to the sign when you take the two's complement?*

2. (15 points) More hex addition.

(a) (10 points) Fill in your binary two's complement result from part 1(b) and add it to 0x10 = 16_{10}.



(b) (5 points) Is this the result that you expected? Explain.