

ICS'12 Spring Homework 2

- I. Integer representation using 1's and 2's complement. Assume we have an integer type of 8bits, fill in the following table.

Value	2's complement	1's complement	Sign-Magnitude
5	0000 0101	0000 0101	0000 0101
			0000 1011
	0100 0000		
		1011 1111	
			1000 0000

- II. Expression evaluation in C language. In C language, if an evaluation expression contains both unsigned and signed values, then signed values will be implicitly casted into unsigned ones before evaluation. Please fill the following table with "<" or ">".

Constant A	Constant B	Relation
-1	0U	>
-1	0	
-1	-2U	
-9U	-8	
-9	-8	

-65554	65553U	
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III. Unsigned Multiplication. Solve the following equation group step by step. Notice that each value is represented by unsigned integer of 4-bits.

$$\begin{cases} 0010 * x + 0100 * y = 1010 & (a) \\ 0100 * x + 0010 * y = 1000 & (b) \end{cases}$$

Your solution:

/*

*Add on here

*/

Result: x = _____, y = _____

IV. Error correction. The C code below is supposed to output **-1**, but the actual output is **2147483646**. Please Explain the reason, and Correct the error.(Tips: You can refer to slides on page 33 of 5-cast for inspiration)

```
#include <stdio.h>
#include <string.h>

int main()
{
    int x = 2;
    char * str = "abcde";
    int y = (x - strlen(str) ) / 2;

    printf("%d\n",y);
    return 0;
}
```