

Name: _____

CSCI 237

Practice Problems :: Bits and Ints

Please show your work to receive credit. Clearly indicate your final answer.

1. **Two's Complement:** For this question, please consider the following 12-bit **two's complement** representation of an integer x :

$$x = 1001\ 1100\ 1011$$

What is the decimal value of x ?

What is the decimal value of x if we instead interpret it as a 12-bit unsigned number?

2. **Truncating:** Consider the primitive C types `short` and `char` on our lab's `x86_64` systems. The type `short` is used to represent 16-bit two's complement numbers, and the type `char` is used to represent 8-bit two's complement numbers. What output is printed after executing the following C code snippet?

```
short s = 0x58b;  
char c = (char) s;  
printf("%d", c);
```

Hint: The `printf` format string character `%d` is used to print the decimal value of an integral type, including the primitive type `char`.

3. **Bit operations:** What does this C expression evaluate to? Please express your answer in hexadecimal.

```
0xabbedeed & (0xff << 16);
```