CS 161 Recitation
Worksheet: Week 1

1. Explain these terms:
   - algorithm, programming, signed vs. unsigned, variable

2. Convert 51 (base 10) to the base 2 equivalent.

3. Convert the unsigned binary number, 10110011 (base 2), to the base 10 equivalent.

4. Convert the signed binary number, 10110011 (base 2), to the base 10 equivalent (twos complement).

5. Using a byte of space, what happens when you add 1 to the unsigned binary number, 11111111? What about adding 1 to the signed binary number 01111111?

6. Using a byte of space, what happens when you subtract 1 from the unsigned binary number, 00000000 (what is base 2 of -1)? What about adding 1 to the signed binary number 10000000?

7. Explain each of the following data types: **int, float, double, char, bool**. Include a visual representation of their respective sizes.

8. Why can ints and chars store each other?

9. Which matters more: the name of the variable or the data type? Explain.

10. In the following example, say what will be printed to the screen. Explain how the variables change throughout the program. Do not program the example!

```
#include <iostream>
using namespace std;
int main() {
      int sum, a=7, b=6, c, x=12;

      b = a;
      cout << “The value of b is: ” << b << endl;

      a = b;
      b = x;
      cout << “The value of a is: ” << a << endl;
      cout << “The value of x is: ” << x << endl;
      cout << “The value of b is: ” << b << endl;

      sum = b + a + c;
      cout << “The value of sum is: ” << sum << endl;

      return 0;
}
```