CS 31 Worksheet 3

This worksheet is entirely **optional**, and meant for extra practice. Some problems will be more challenging than others and are designed to have you apply your knowledge beyond the examples presented in lecture, discussion or projects. All exams will be done on paper, so it is in your best interest to practice these problems by hand and not rely on a compiler.

Concepts

Switch, functions

1) What does the following code snippet output?

```
void mystery(int a, int b) {
      int count = 0;
      while (count < 2) {
            a = a + b/2;
            b = a + 5;
            cout << "a: " << a << " b: " << b << endl;
            count++;
      }
}

int main() {
      int a = 5, b = 10;
      cout << "a: " << a << " b: " << b << endl;
      mystery(a, b);
      cout << "a: " << a << " b: " << b << endl;
}
```

2. What does the following code snippet output?

```
int mystery(char code) {
  switch(code) {
    case 'a':
    case 'b':
    case 'c':
      cout << "spooky";
      break;
    case 'd':
      cout << "feeling";
      break;
    case '1':
      cout << " ";
```

```
        break;
      case '2':
        cout << "?";
      default:
        cout << endl;
        break;
    }
    return( 0 );
  }

  int main() {
    mystery( '2' );
    mystery( 'a' );
    mystery( 'Z' );
    mystery( 'd' );
    mystery( '1' );
    mystery( 'c' );

}
```

3. Consider the two programs shown below. If there are no errors in the program, show what will be printed by each of the following programs. If there are any errors in the program explain what is wrong. If not, what will be the output be?

a.
```
#include <iostream>
using namespace std;
int three(int,int);
int main()
{
   int a,b;
   a = 3;
   b = 4;
   cout << three(a,b);
   return( 0 );
}
int three(int x, int y)
{
   int a;
   a = x + y;
   return a;
 }
```

b.
```
#include <iostream>
using namespace std;
int three(int,int);
int main()
{
   int f;
   f = 1;
   int i = 1;
   while( i < 5 ) {
      f = three(i,f);
      cout << f << endl;
      i = i + 1;
   }
   return( 0 );
}
int three(int a, int b)
{
   int z;
   z = a + a * b;
   return z;
}
```

Programming Problems

1) Write a function that returns whether or not two integers are palindrome number. A palindrome number is a value that reads the same forwards and backwards. HINT: Use % and / to break the value into its different digits. For example:

intPalindrome(62, 26) should return true
intPalindrome(154, 451) should return true
intPalindrome(25, 56) should return false

2) Write a function checkeven which accepts 3 integer parameters and prints YES if all three numbers are even. Otherwise the function prints NO. Then write a main program with the statements to read in 3 integers. Then call your function to determine whether the data entered was all even.

3) Write a function that returns the cost of mailing a package, given the weight of the package in pounds and ounces, and a cost per ounce are supplied as arguments to the function. Recall that there are 16 ounces in a pound. Then write a main program with the statements to read in the weight of a package (in pounds and ounces), and the cost per ounce for mailing. Then call your function to calculate the mailing cost, and print the mailing cost.

4) Write a function that does integer division without using the division operator (/). Return -1 if second number is 0. Your main driver code should recognize that -1 and print an error statement as shown below. Then write a main program with the statements to read in 2 integers. Then call your function.

integerDivide(6, 2) should return 3
integerDivide(2, 0) should return -1 and then your main program should print:
Error: Cannot divide by 0

5) Write a function that does integer multiplication without using the multiplication operator (*). Return true if the multiplied value equals the third argument, false otherwise. Then write a main program with the statements to read in 3 integers. Then call your function passing these three arguments.
HINT: Perform the multiplication by repetitively using addition.

integerMultiply(6, 2, 12) should return true
integerMultiply(2, 0, 7) should false