CSCI 2170 Homework 3 (Due beginning of class, Monday, February 27th) (150 points)

1. (40 pts) PeerCode review for OLA 3(The programs will be ready for viewing beginning of Thursday Feb 28th)

2. Read Chapter 2 (Basic recursion) of the text book

3. (20 pts) Consider the following function that converts a positive decimal number to have base 8 and displays the result.

```
void DisplayOctal(int n)
{
        if (n>0)
        {
                if (n/8 > 0)
                        DisplayOctal(n/8);
                cout << n%8;
        }
}
```

   Describe how the algorithm works. Trace the function with n=100.

4. (20 pts) Trace the execution of the following program as shown in class. Write the final output of the program:

```
#include <iostream>
using namespace std;
void mystery (int n);

int main()
{
        cout << mystery(5) << endl;
        return 0;
}

void mystery (int n)
{
        if (n <= 1)
                return   n;
        else
        {
                return (mystery(n-1)+mystery(n-2));
        }
}
```

<turn the page to see additional problems on the back>

5. (30 pts) Given:
   array "values":

2	5	10	15	23	44	47	53	77	86

Trace the execution of the recursive BinarySearch function when it is called with the following function call:

(1) BinarySearch(A, 0, 9, 10, found, location)
(2) BinarySearch(A, 0, 9, 25, found, location)

6. (20 pts) Given an integer n>0, write a recursive C++ function that returns the sum of 1 through n.

7. (20 pts) Write a void ***recursive*** function **WriteBackwards** that has one parameter which is a positive integer. When called, the function writes its argument to the screen backward. That is, if the argument is 1234, it outputs the following to the screen: 4321

```
void WriteBackwards(int number)
{
    ....
}
```