# Homework 1

(Not for submission, use it for quiz & exam preparation)

1. Given an integer n>0, write a recursive C++ function that returns the sum of 1 through n.
2. What output does the following program produce?

int getValue(int a, int b, int n);

int main()

{

cout<<getValue(1,7,7)<<endl;

return 0;

}

int getValue(int a, int b, int n)

{

int returnValue;

cout<<”Enter: a=”<<a<<”b=”<<b<<endl;

int c=(a+b)/2;

if (c\*c<=n)

returnValue=c;

else

returnValue=getValue(a, c-1, n);

cout<<”Leave: a=”<<a<<”b=”<<b<<endl;

return returnValue;

}

1. Trace the recursive function binarySearch, which we studied in the class with the array 1, 5, 9, 12, 15, 21, 29, 31 for each of the following search values:
2. 5
3. 13
4. 16
5. This problem considers several ways to compute xn for some n>=0.
6. Write an iterative function power1 to compute xn for n>=0.
7. Write a recursive function power2 to compute xn by using the following recursive formulation:

x0=1

xn=x\*xn-1 if n>0

1. Write a recursive function power3 to compute xn by using the following recursive formulation:

x0=1

xn=(xn/2)2 if n>0 and n is even

xn=x\*(xn/2)2 if n>0 and n is odd

1. How many multiplications will each of the functions power1, power2, and power3 perform when computing 332? 319?
2. How many recursive calls will power2 and power3 make when computing 332? 319?