**LAB 10**

**10.1 Write a program that prompts the user to enter the number of elements and the numbers themselves to be placed in an integer array that holds a maximum of 20 elements. The program should then prompt the user for an integer which will be searched for in the array using a binary search. Make sure to include the following steps along the way:**

**i) A sort routine must be called before the binary search. You may use either the selection sort or the bubble sort. However, the sort must be implemented in its own function and not in main. ii) Next include a function called by main to implement the binary search. The ordered array produced by the sort should be passed to the search routine which returns the location in the sorted array of the sought value, or -1 if the value is not in the array**

**SOURCE CODE**

#include<iostream>

using namespace std;

void bubbleSort(int [], int);

int searchBinary( int[], int);

void displayArray(int[], int);

int main ()

{

int userValue;

const int SIZE = 20;

int numArray[SIZE];

cout << "Enter the 20 element numbers to be placed into the integer array." << endl;

for (int count = 0; count < SIZE; count ++)

{

cout << "enter integer #" << count + 1 << " ";

cin >> numArray[count];

}

bubbleSort (numArray, SIZE);

cout << "The array has been sorted." << endl;

displayArray(numArray,SIZE);

cout << "what integer would you like to retrieve?";

cin >> userValue;

cout << "Searching the array..." << endl;

cout << searchBinary(numArray, userValue);

return 1;

}

void bubbleSort (int arrayNumx[], int ELEMS)

{

bool elemswap;

int temp1 = 0;

int endValue = ELEMS - 1;

do

{

elemswap = false;

for (int count = 0; count < endValue; count ++)

{

if (arrayNumx[count] > arrayNumx[count+1])

{

temp1 = arrayNumx[count];

arrayNumx[count] = arrayNumx[count + 1];

arrayNumx[count+1] = temp1;

elemswap = true;

}

}

endValue--;

}

while (elemswap != false);

}

int searchBinary (int intArray[], int quantity)

{

for(int i=0; i<=quantity; i++)

{

if (intArray[i]==quantity)

{

cout<<"Value is present in the array at position: "<<i<<endl;

return 0;

}

}

cout<<"-1"<<endl;

}

void displayArray (int shownum[], int dec)

{

for(int count = 0; count < dec; count++)

cout << shownum[count] << endl;

}

OUTPUT

