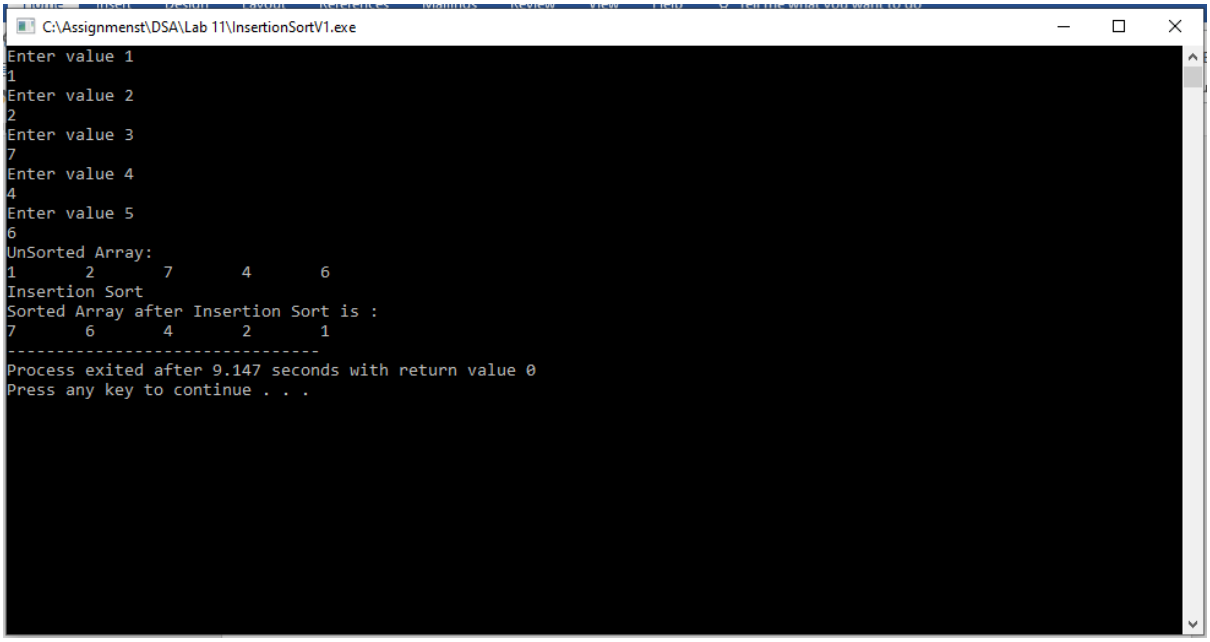
Q1.

```
#include<iostream>
using namespace std;
int main(){
	int n=5;
	int a[n];
	for (int i=0;i<n;i++)
	{cout<<"Enter value "<<i+1<<endl;
	cin>>a[i];
	}
	cout<<"UnSorted Array:"<<endl;
	for(int k=0;k<n;k++)
	cout<<a[k]<< "\t";
	cout<<" "<<endl;
	cout<<"Insertion Sort"<<endl;
	for(int i=1;i<n;i++){
		int temp=a[i];
		int j=i-1;
		while(j>=0 && a[j]<temp){
			a[j+1]=a[j];
			j--;
		}
		a[j+1]=temp;
	}
	cout<<"Sorted Array after Insertion Sort is :"<<endl;
	for(int k=0;k<n;k++)
	cout<<a[k]<< "\t";
}
```



Dry run

Unsorted Array: {1, 2, 7, 4, 6}

Iteration 1 (i = 1)

temp = a[1] = 2, j = 0

Compare a[0] = 1 < temp, so a[1] = a[0] → {1, 1, 7, 4, 6}

Place temp at a[0] → {2, 1, 7, 4, 6}

Iteration 2 (i = 2)

temp = a[2] = 7, j = 1

Compare a[1] = 1 < temp, so a[2] = a[1] → {2, 1, 1, 4, 6}

Compare a[0] = 2 < temp, so a[1] = a[0] → {2, 2, 1, 4, 6}

Place temp at a[0] → {7, 2, 1, 4, 6}

Iteration 3 (i = 3)

temp = a[3] = 4, j = 2

Compare a[2] = 1 < temp, so a[3] = a[2] → {7, 2, 1, 1, 6}

Compare a[1] = 2 < temp, so a[2] = a[1] → {7, 2, 2, 1, 6}

Place temp at a[1] → {7, 4, 2, 1, 6}

Iteration 4 (i = 4)

temp = a[4] = 6, j = 3

Compare a[3] = 1 < temp, so a[4] = a[3] → {7, 4, 2, 1, 1}

Compare a[2] = 2 < temp, so a[3] = a[2] → {7, 4, 2, 2, 1}

Compare a[1] = 4 < temp, so a[2] = a[1] → {7, 4, 4, 2, 1}

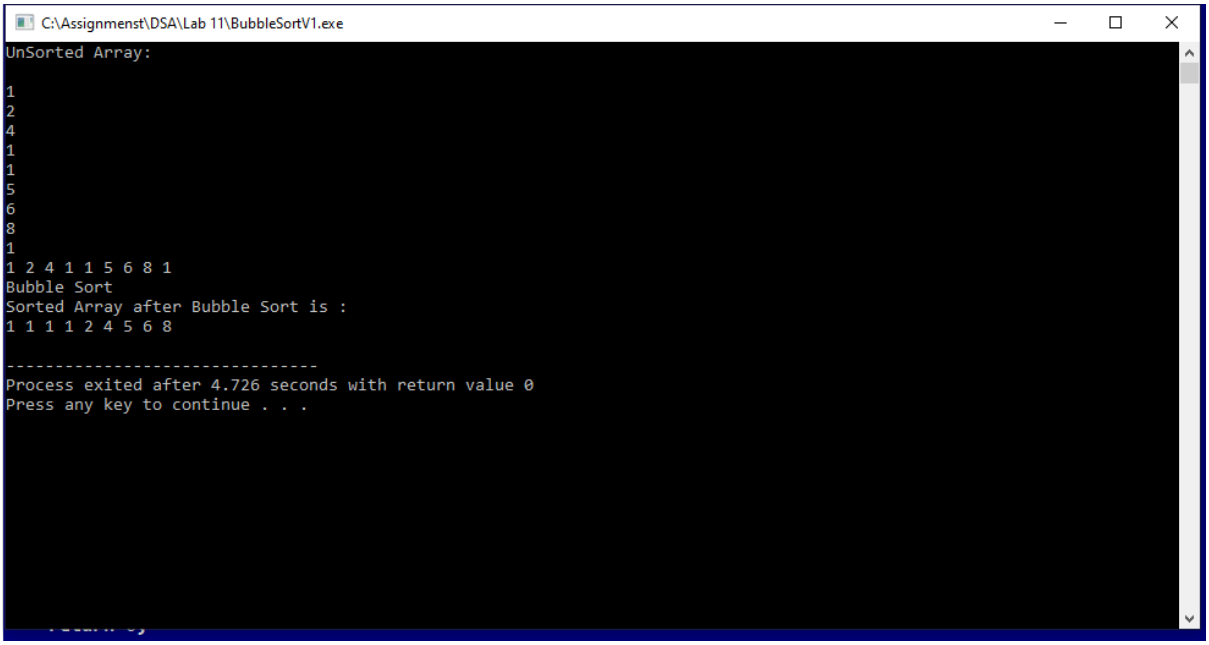
Place temp at a[1] → {7, 6, 4, 2, 1}

Sorted Array: {7, 6, 4, 2, 1}

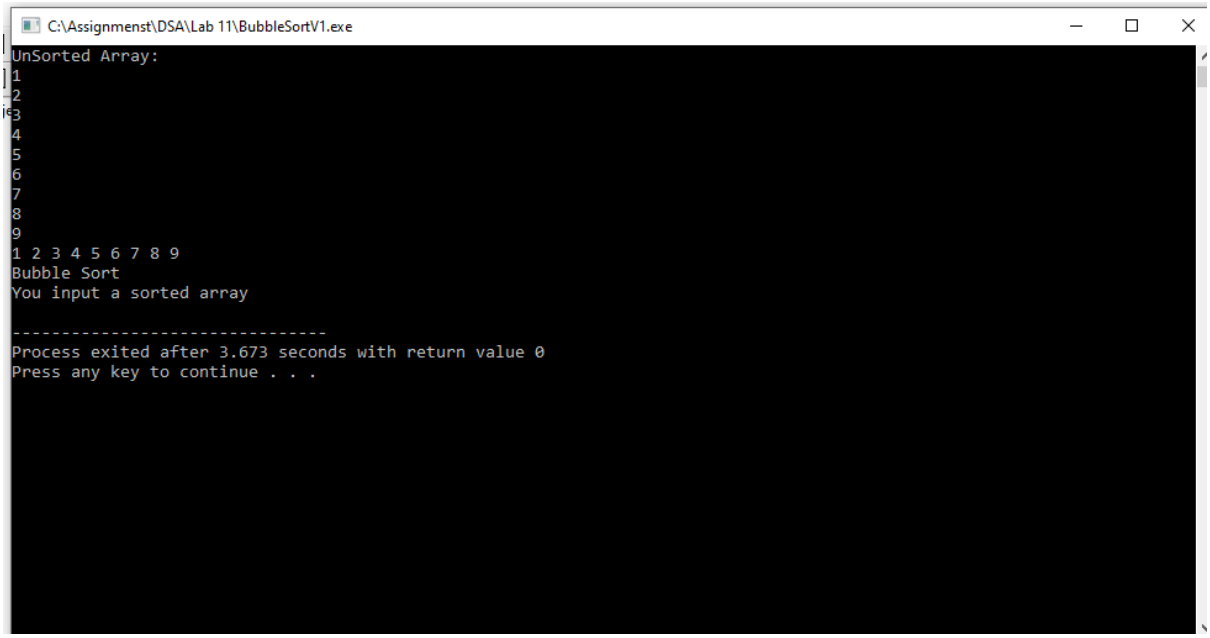
Q2.

```
#include <iostream>
using namespace std;
int main() {
        int n =9,sort=0;
   int a[n];
        cout<<"UnSorted Array:"<<endl;
        for(int k=0;k<n;k++){

        cin>>a[k];
        }
        for(int k=0;k<n;k++){

        cout<<a[k]<< " ";
        }
        cout<<" "<<endl;
        cout<<"Bubble Sort"<<endl;
```

```
        int temp;
        for(int i=0;i<n;i++)
        {
                for(int j=0;j<n-1;j++)
                {
                        if(a[j]>a[j+1])
                        {
                        temp= a[j];
                        a[j]=a[j+1];
                        a[j+1]=temp;
                        sort++;
                        }

                }
        }
        if(sort==0){
                cout<<"You input a sorted array"<<endl;
        }
        else{

        cout<<"Sorted Array after Bubble Sort is :"<<endl;
        for(int k=0;k<n;k++)
        cout<<a[k]<< " ";
        cout<<" "<<endl;}
    return 0;
}
```


C:\Assignmenst\DSA\Lab 11\BubbleSortV1.exe
UnSorted Array:
1
2
4
1
1
5
6
8
1
1 2 4 1 1 5 6 8 1
Bubble Sort
Sorted Array after Bubble Sort is :
1 1 1 1 2 4 5 6 8

Process exited after 4.726 seconds with return value 0
Press any key to continue . . .


C:\Assignmenst\DSA\Lab 11\BubbleSortV1.exe
UnSorted Array:
1
2
3
4
5
6
7
8
9
1 2 3 4 5 6 7 8 9
Bubble Sort
You input a sorted array

Process exited after 3.673 seconds with return value 0
Press any key to continue . . .