Assignment 9.

Class - SE IV Roll NO - 21430.
Batch - F4
D.O.S - 29/10/2020

Title -: Function Template.

Problem statement -:
Write a function template for selection sort that inputs, sorts and outputs of integer array and a float array.

Objectives -: To learn the concept of template.

S/W and H/W requirements -:
1. Ecellipse IDE.
2. Laptop / PC.

Theory -:
Function Templates -:
function templates are special function that can operate with generic types which allows us to create a function template whose functionality can be adapted to more than one type or class without repeating the code for each data type.

Syntax for declaring function template -:

```
template < typename identifier>
function declaration
```

Selection Sort :

Selection sort is a simple sorting algorithm In this list is individual into two parts the sorted part or left and unsorted at right. The smallest element is selected from unsorted array and swapped with left most element which becomes part of sorted array. This process Continuous until s. whole lost is sorted.

Psuedocode :

```
1. START.
2. arr[ ]
3. for ( i=1 to i=n-1 )
       min=i
       for ( j=i+1 to n )
           if (arr[min]>arr[j])
               min=j
   swap( arr[min], arr[j] )

4. END.
```

* ADT for class

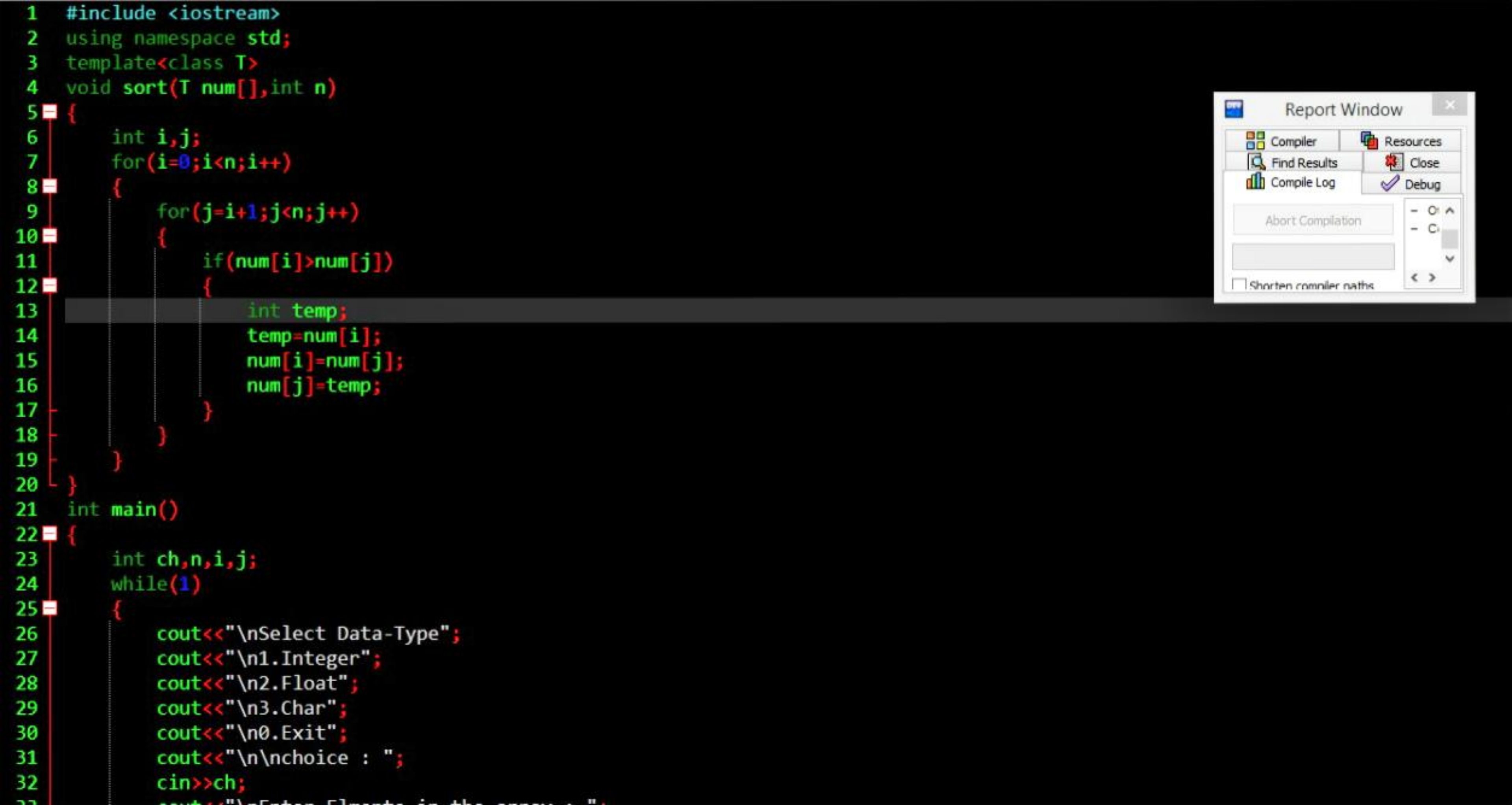
```
template < class T>
Void Selection_sort( )
{
    // Selection sort

}
```

Test case.:

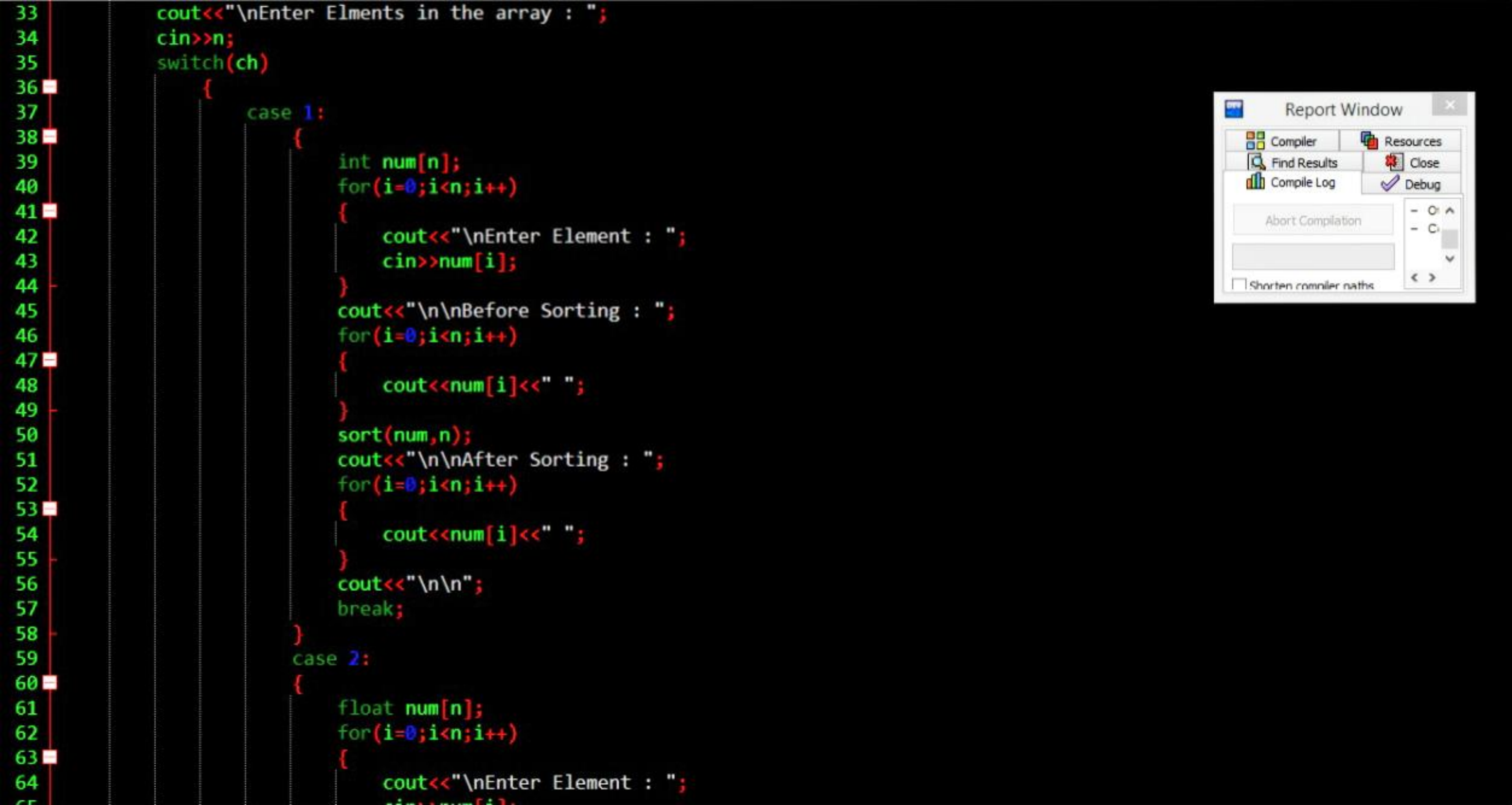
No.	Description	Input	Expected o/p	Actual o/p	Result
1.	Sort + Display int array	n=5 arr=[7,9,2, 1,4]	1,2,4,7,9	1,2,4,7 9	Pass.
2.	sort + Display char array	n=4 arr=[d,a,z, u]	a,d,u,z	a,d,u,z	passs

Conclusion.:

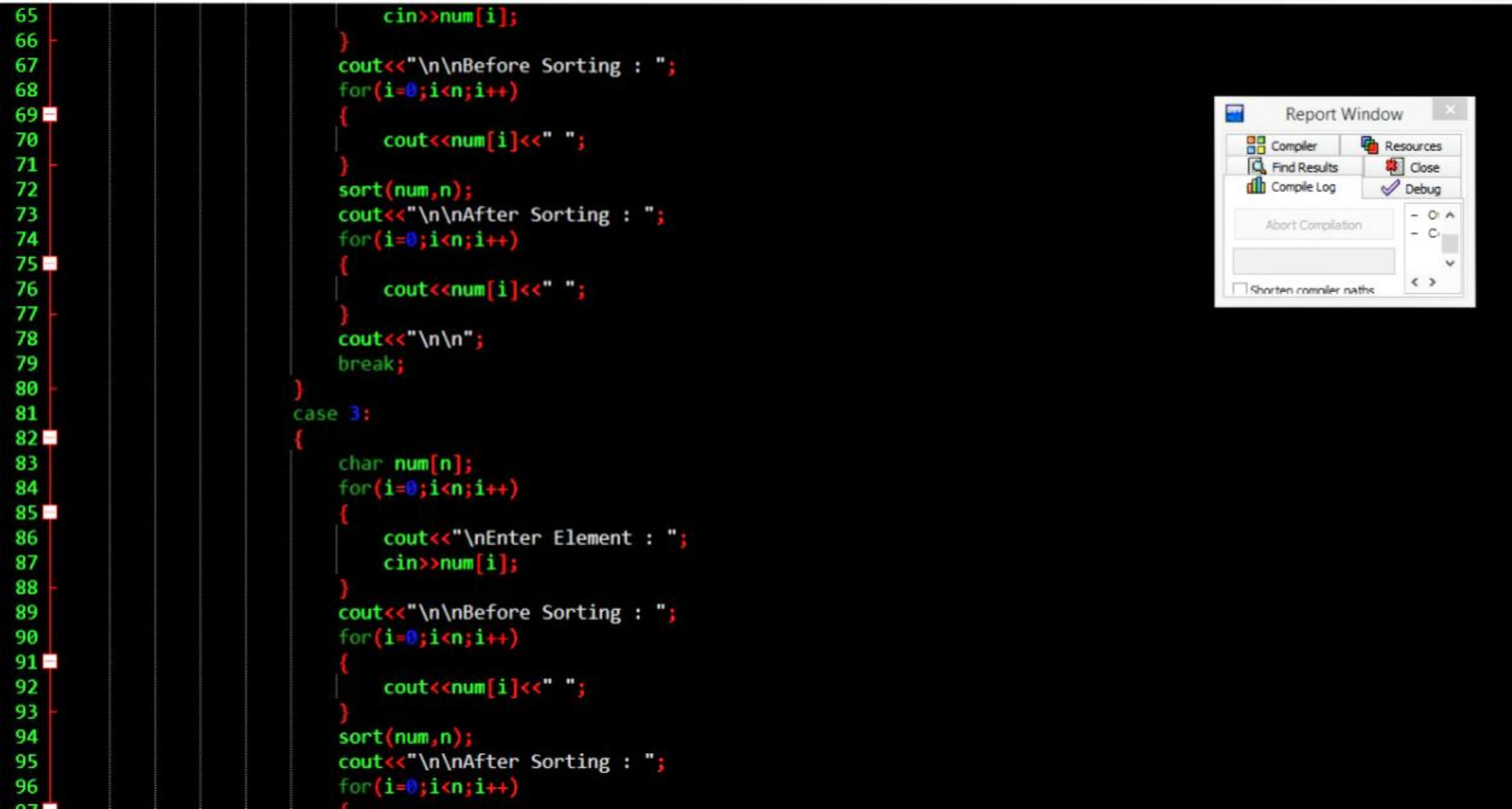
1. The program for sorting array of some data type using Selection sort was implemented ~~occu~~ succesfully.
2. The concept of fun template, selection sort was learnt and implemented in program.



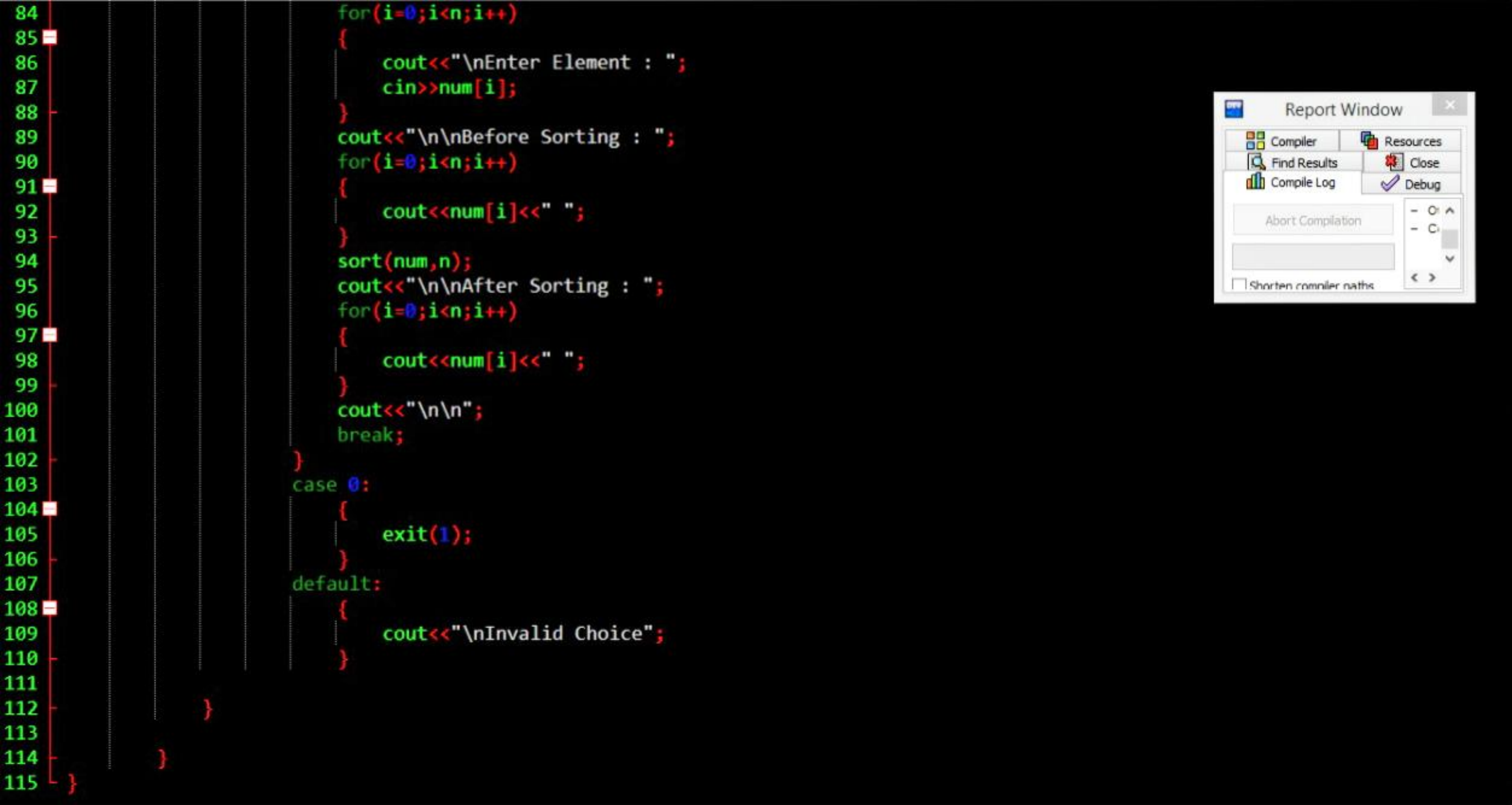
```cpp
#include <iostream>
using namespace std;
template<class T>
void sort(T num[],int n)
{
    int i,j;
    for(i=0;i<n;i++)
    {
        for(j=i+1;j<n;j++)
        {
            if(num[i]>num[j])
            {
                int temp;
                temp=num[i];
                num[i]=num[j];
                num[j]=temp;
            }
        }
    }
}
int main()
{
    int ch,n,i,j;
    while(1)
    {
        cout<<"\nSelect Data-Type";
        cout<<"\n1.Integer";
        cout<<"\n2.Float";
        cout<<"\n3.Char";
        cout<<"\n0.Exit";
        cout<<"\n\nchoice : ";
        cin>>ch;
        cout<<"\nEnter Elements in the array : ";
```



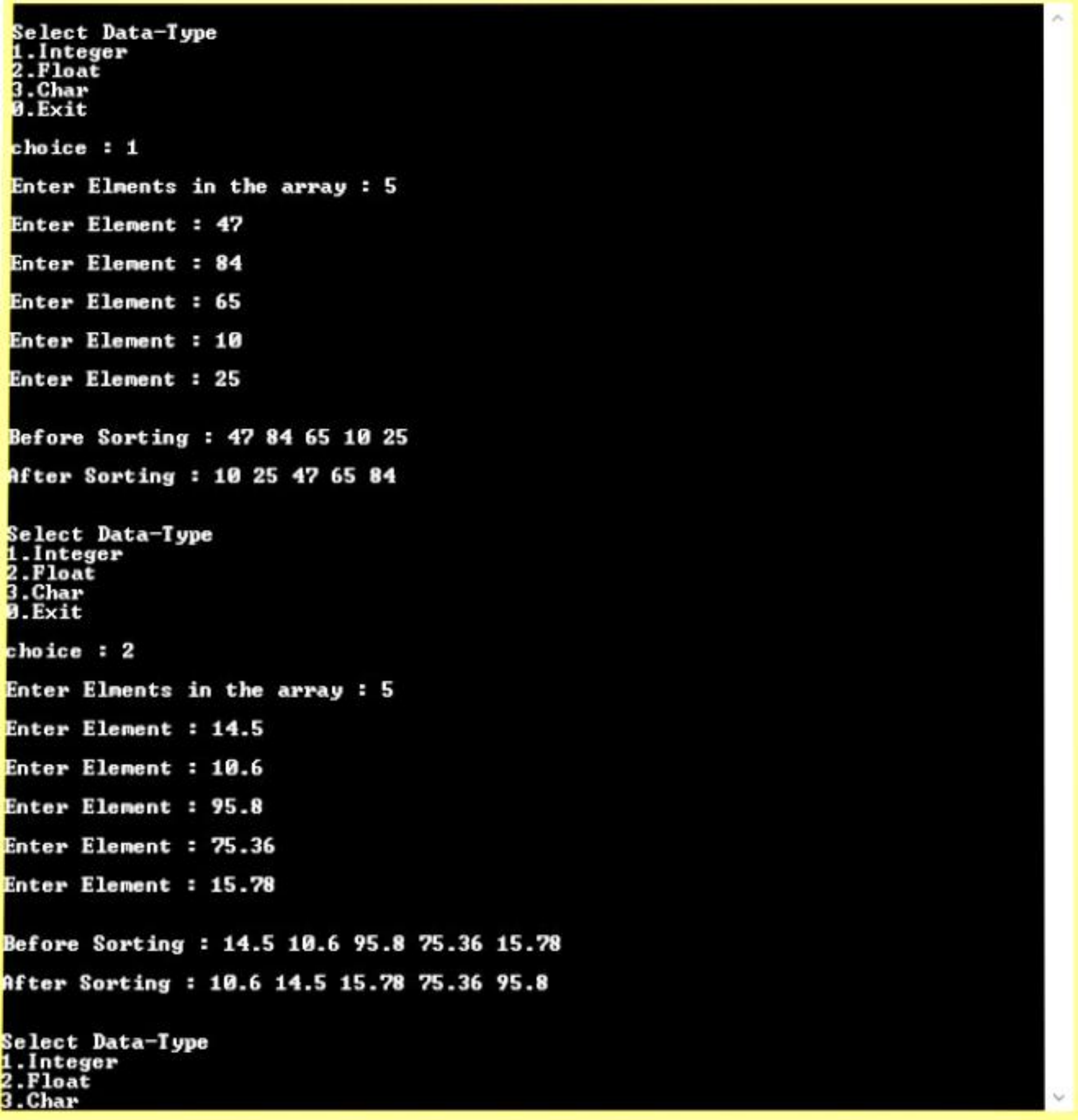
```
        cout<<"\nEnter Elments in the array : ";
        cin>>n;
        switch(ch)
            {
                case 1:
                    {
                        int num[n];
                        for(i=0;i<n;i++)
                        {
                            cout<<"\nEnter Element : ";
                            cin>>num[i];
                        }
                        cout<<"\n\nBefore Sorting : ";
                        for(i=0;i<n;i++)
                        {
                            cout<<num[i]<<" ";
                        }
                        sort(num,n);
                        cout<<"\n\nAfter Sorting : ";
                        for(i=0;i<n;i++)
                        {
                            cout<<num[i]<<" ";
                        }
                        cout<<"\n\n";
                        break;
                    }
                    case 2:
                    {
                        float num[n];
                        for(i=0;i<n;i++)
                        {
                            cout<<"\nEnter Element : ";
                            cin>>num[i];
```



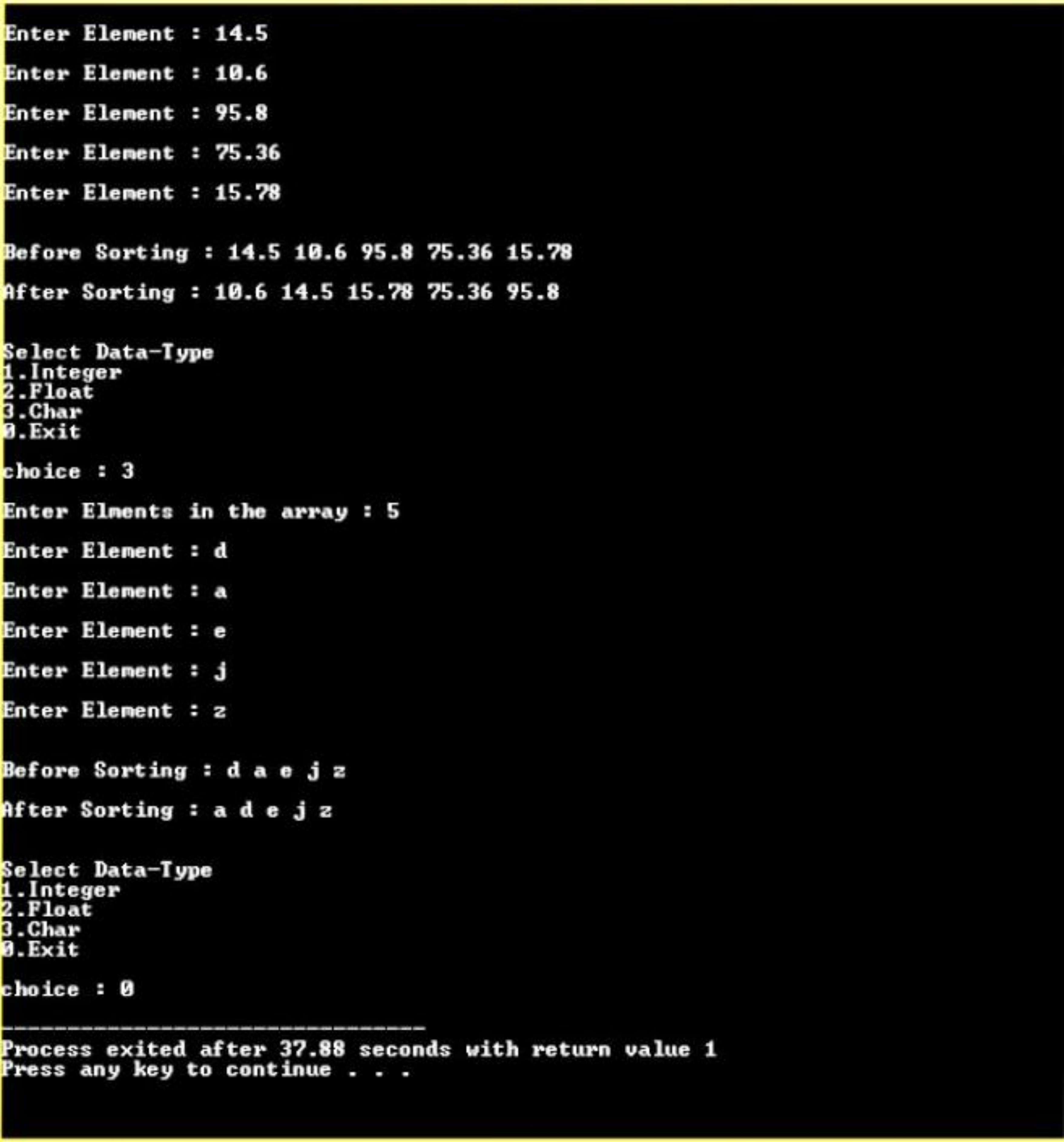
```
                cin>>num[i];
            }
            cout<<"\n\nBefore Sorting : ";
            for(i=0;i<n;i++)
            {
                cout<<num[i]<<" ";
            }
            sort(num,n);
            cout<<"\n\nAfter Sorting : ";
            for(i=0;i<n;i++)
            {
                cout<<num[i]<<" ";
            }
            cout<<"\n\n";
            break;
        }
        case 3:
        {
            char num[n];
            for(i=0;i<n;i++)
            {
                cout<<"\nEnter Element : ";
                cin>>num[i];
            }
            cout<<"\n\nBefore Sorting : ";
            for(i=0;i<n;i++)
            {
                cout<<num[i]<<" ";
            }
            sort(num,n);
            cout<<"\n\nAfter Sorting : ";
            for(i=0;i<n;i++)
```



```
                        for(i=0;i<n;i++)
                        {
                            cout<<"\nEnter Element : ";
                            cin>>num[i];
                        }
                        cout<<"\n\nBefore Sorting : ";
                        for(i=0;i<n;i++)
                        {
                            cout<<num[i]<<" ";
                        }
                        sort(num,n);
                        cout<<"\n\nAfter Sorting : ";
                        for(i=0;i<n;i++)
                        {
                            cout<<num[i]<<" ";
                        }
                        cout<<"\n\n";
                        break;
                    }
                    case 0:
                        {
                            exit(1);
                        }
                    default:
                        {
                            cout<<"\nInvalid Choice";
                        }

            }

        }
}
```



```
Select Data-Type
1.Integer
2.Float
3.Char
0.Exit

choice : 1

Enter Elments in the array : 5

Enter Element : 47

Enter Element : 84

Enter Element : 65

Enter Element : 10

Enter Element : 25


Before Sorting : 47 84 65 10 25

After Sorting : 10 25 47 65 84


Select Data-Type
1.Integer
2.Float
3.Char
0.Exit

choice : 2

Enter Elments in the array : 5

Enter Element : 14.5

Enter Element : 10.6

Enter Element : 95.8

Enter Element : 75.36

Enter Element : 15.78


Before Sorting : 14.5 10.6 95.8 75.36 15.78

After Sorting : 10.6 14.5 15.78 75.36 95.8


Select Data-Type
1.Integer
2.Float
3.Char
```



```
Enter Element : 14.5

Enter Element : 10.6

Enter Element : 95.8

Enter Element : 75.36

Enter Element : 15.78


Before Sorting : 14.5 10.6 95.8 75.36 15.78

After Sorting : 10.6 14.5 15.78 75.36 95.8


Select Data-Type
1.Integer
2.Float
3.Char
0.Exit

choice : 3

Enter Elments in the array : 5

Enter Element : d

Enter Element : a

Enter Element : e

Enter Element : j

Enter Element : z


Before Sorting : d a e j z

After Sorting : a d e j z


Select Data-Type
1.Integer
2.Float
3.Char
0.Exit

choice : 0

--------------------------------
Process exited after 37.88 seconds with return value 1
Press any key to continue . . .
```