

<b>Ex. No. 8</b>	<b>IMPLEMENTATION OF INSERTION AND SELECTION SORT</b>
06-09-2017	

**Question:**

To implement the working of implementation of insertion and selection sort.

**Algorithm:**

1. Start.
2. For insertion sort, follow the steps:
3. If it is the first element, it is already sorted. return 1;
4. Pick next element.
5. Compare with all elements in the sorted sub-list
6. Shift all the elements in the sorted sub-list that is greater than the value to be sorted
7. Insert the value
8. Repeat until list is sorted
9. For selection sort, follow the steps:
10. Set MIN to location 0
11. Search the minimum element in the list
12. Swap with value at location MIN
13. Increment MIN to point to next element
14. Repeat until list is sorted
15. End.

### Program:

/\*To implement the working of implementation of Selection and insertion sort.\*/

```
#include <iostream>
```

```
using namespace std;
```

```
int i, j, MIN, temp, V;
```

```
void inssort()
```

```
{
```

```
    cout<<"\n*****INSERTION SORT*****";
```

```
    cout<<"\n Enter the elements of the array: ";
```

```
    int A[5];
```

```
    for(i=0;i<=4;i++)
```

```
    {
```

```
        cin>>A[i];
```

```
    }
```

```
    for( i=1;i<=4;i++)
```

```
    {
```

```
        V=A[i];
```

```
        j=i-1;
```

```
        while(j>=0 && A[j]>V)
```

```
        {
```

```
            A[j+1]=A[j];
```

```
        j=j-1;
    }
    A[j+1]=V;
}
cout<<"*****"<<endl;

cout<<"The sorted elements are : ";
for(i=0;i<=4;i++)
{
    cout<<A[i]<<" ";
}
cout<<endl;
}

void selsort()
{
    cout<<"\n*****SELECTION SORT*****";
    cout<<"\n Enter the elements of the array : ";
    int A[5];
    for(i=0;i<5;i++)
    {
        cin>>A[i];
    }
}
```

```
    for(i=0;i<5;i++)
    { MIN=i;
      for(j=i+1;j<5;j++)
      {
        if (A[j]<A[MIN])
        { MIN=j;
          }
        temp=A[i];
        A[i]=A[MIN];
        A[MIN]=temp;
      }
    }

    cout<<"*****"<<endl;

    cout<<"The sorted elements are : ";

    for(i=0;i<5;i++)
    { cout<<A[i]<<" ";}

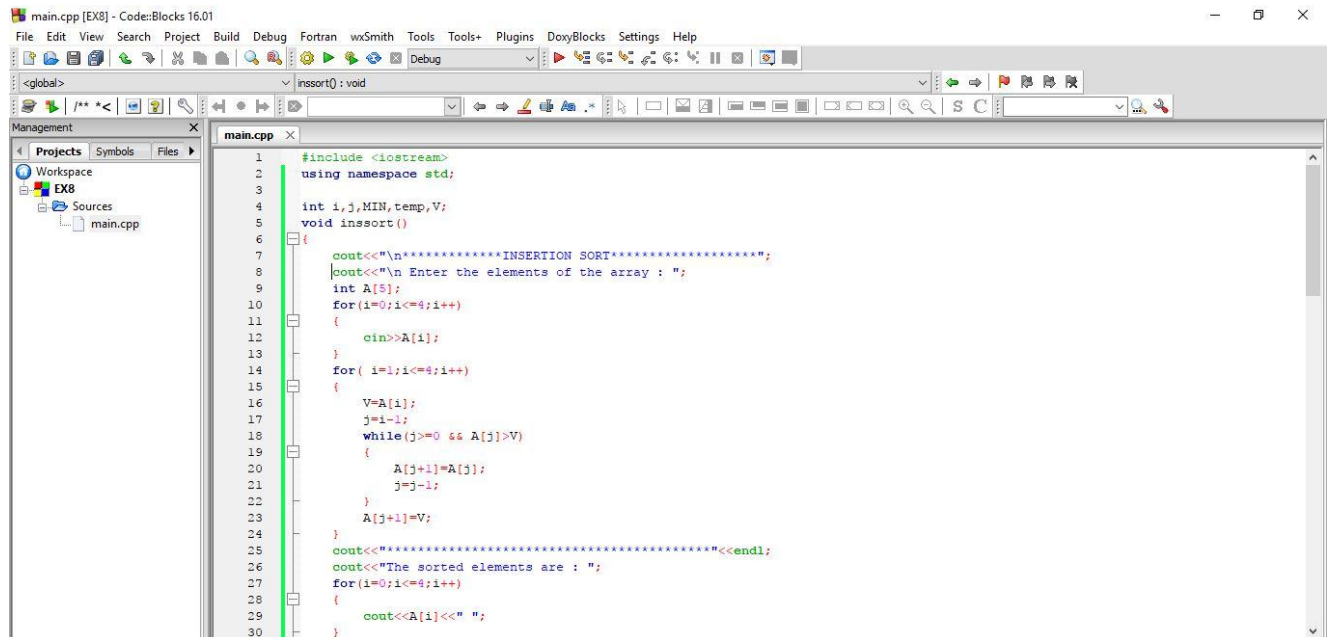
    cout<<endl;
  }

int main()
{
  int opt;

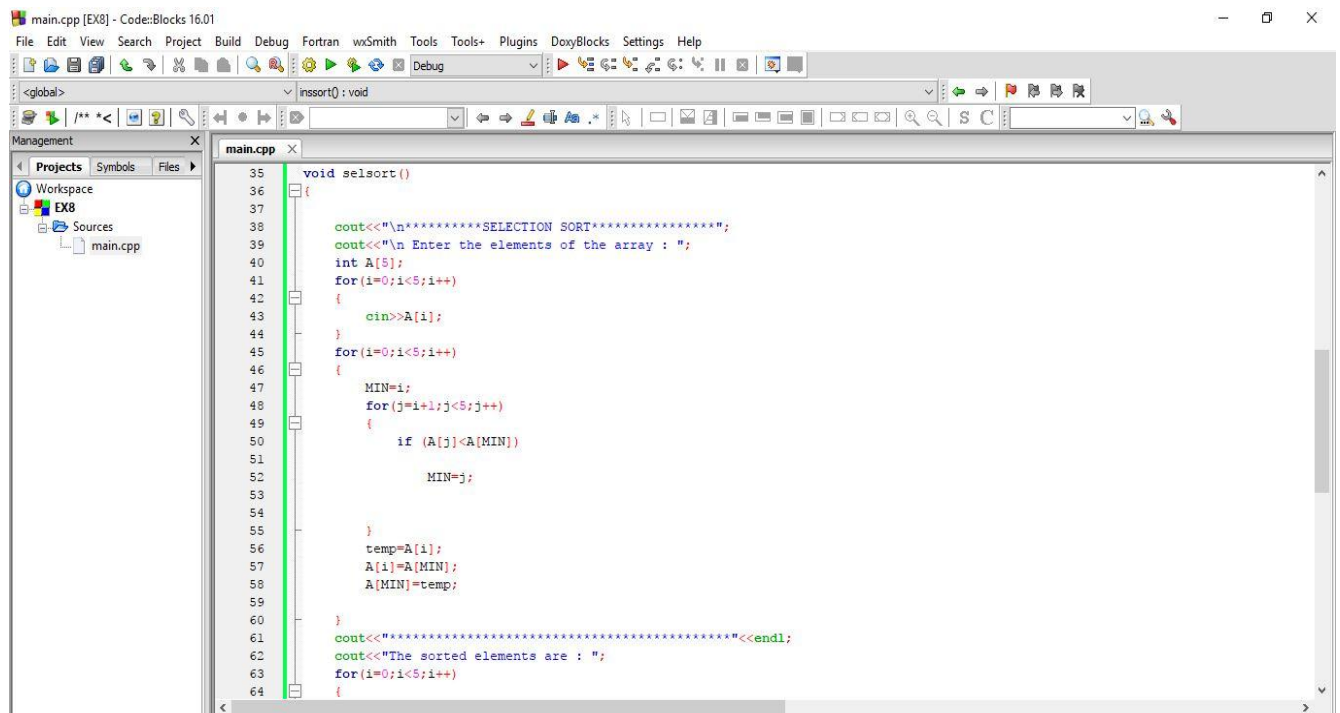
  while(1)
```

```
{  
cout<<"\n CHOICES TO DO.....";  
  
cout<<"\n-----";  
  
cout<<"\n 1.Insertion sort";  
cout<<"\n 2.Selection sort";  
cout<<"\n 3.Exit";  
  
cout<<"\n\n Enter your choice: ";  
cin>>opt;  
switch(opt)  
{  
case 1:  
    inssort();  
    break;  
case 2:  
    sensor();  
    break;  
case 3:  
    return 0;  
default:  
    cout<<"\n Invalid choice";  
}  
}}
```

## Output:

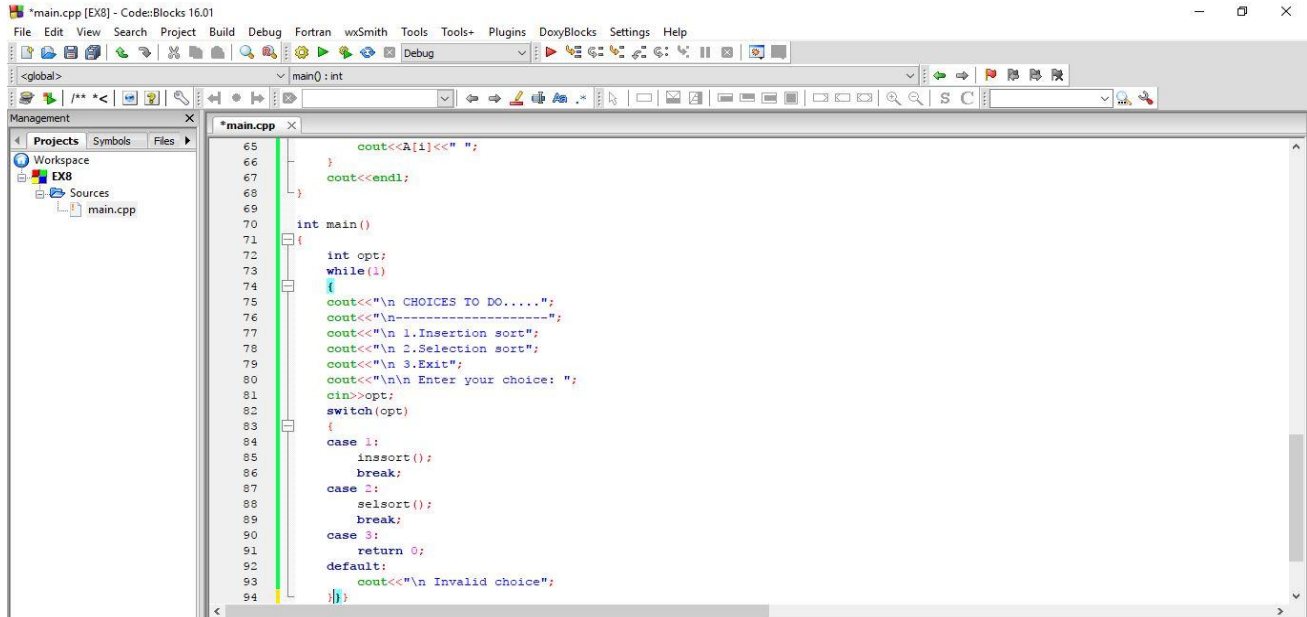


```
1 #include <iostream>
2 using namespace std;
3
4 int i,j,MIN,temp,V;
5 void insort ()
6 {
7     cout<<"\n*****INSERTION SORT*****";
8     cout<<"\n Enter the elements of the array : ";
9     int A[5];
10    for(i=0;i<=4;i++)
11    {
12        cin>>A[i];
13    }
14    for( i=1;i<=4;i++)
15    {
16        V=A[i];
17        j=i-1;
18        while(j>=0 && A[j]>V)
19        {
20            A[j+1]=A[j];
21            j=j-1;
22        }
23        A[j+1]=V;
24    }
25    cout<<"*****\n";
26    cout<<"The sorted elements are : ";
27    for(i=0;i<=4;i++)
28    {
29        cout<<A[i]<<" ";
30    }
```



```
35 void selsort()
36 {
37     cout<<"\n*****SELECTION SORT*****";
38     cout<<"\n Enter the elements of the array : ";
39     int A[5];
40     for(i=0;i<5;i++)
41     {
42         cin>>A[i];
43     }
44     for(i=0;i<5;i++)
45     {
46         MIN=i;
47         for(j=i+1;j<5;j++)
48         {
49             if (A[j]<A[MIN])
50             {
51                 MIN=j;
52             }
53         }
54         temp=A[i];
55         A[i]=A[MIN];
56         A[MIN]=temp;
57     }
58     cout<<"*****\n";
59     cout<<"The sorted elements are : ";
60     for(i=0;i<5;i++)
61     {
62         cout<<A[i]<<" ";
63     }
```

# DATA STRUCTURES LAB



```
65     cout<<A[i]<<" ";
66 }
67     cout<<endl;
68 }
69
70 int main()
71 {
72     int opt;
73     while(1)
74     {
75         cout<<"\n CHOICES TO DO....";
76         cout<<"\n-----";
77         cout<<"\n 1.Insertion sort";
78         cout<<"\n 2.Selection sort";
79         cout<<"\n 3.Exit";
80         cout<<"\n\n Enter your choice: ";
81         cin>>opt;
82         switch(opt)
83         {
84             case 1:
85                 insort();
86                 break;
87             case 2:
88                 selsort();
89                 break;
90             case 3:
91                 return 0;
92             default:
93                 cout<<"\n Invalid choice";
94         }
95     }
```

"F:\2nd yr notes\data structure lab\EX8\bin\Debug\EX8.exe"

```
CHOICES TO DO....
-----
1.Insertion sort
2.Selection sort
3.Exit

Enter your choice: 1

*****INSERTION SORT*****
Enter the elements of the array : 1 3 2 9 6
*****
The sorted elements are : 1 2 3 6 9

CHOICES TO DO....
-----
1.Insertion sort
2.Selection sort
3.Exit

Enter your choice: 2

*****SELECTION SORT*****
Enter the elements of the array : 3 2 9 6 1
*****
The sorted elements are : 1 2 3 6 9

CHOICES TO DO....
-----
1.Insertion sort
2.Selection sort
3.Exit

Enter your choice: 3

Process returned 0 (0x0)   execution time : 30.376 s
```

## VIDEO URL:

[https://youtu.be/do\\_6Gz4grGY](https://youtu.be/do_6Gz4grGY)

## RESULT:

The program of implementation of insertion and selection sort is implemented successfully and the output is verified.