

LAB # 03



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Data Structures and Algorithm

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Class Section: **A**

“On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work.”

Submitted to:

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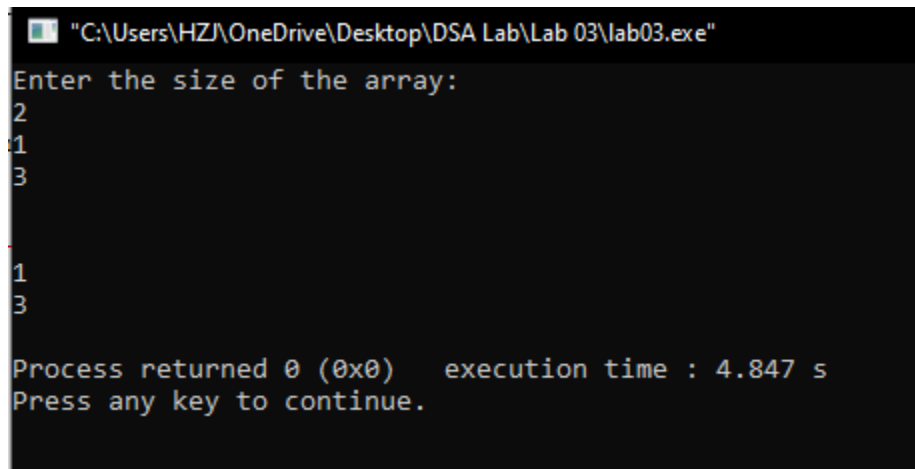
Problem 1:

Solution:

Code:

```
#include <iostream>
using namespace std;
//task 1 selection sorting
int main() {
    int size;
    cout<<"Enter the size of the array:"<<endl;
    cin>>size;
    int arr[size];
    for(int i=0;i<size;i++){
        cin>>arr[i];
    }
    for (int i = 0;i<size-1; i++) {
        int min_index = i;
        for (int j=i+1;j<size;++j) {
            if (arr[j]<arr[min_index])
            {
                min_index=j;
            }
        }
        swap(arr[i], arr[min_index]);
    }
    cout<<endl;
    cout<<endl;
    for (int i = 0; i < size; ++i)
    {cout<<arr[i]<<endl;}
    return 0;
}
```

Output:



```
"C:\Users\HZJ\OneDrive\Desktop\DSA Lab\Lab 03\lab03.exe"
Enter the size of the array:
2
1
3

1
3

Process returned 0 (0x0)   execution time : 4.847 s
Press any key to continue.
```

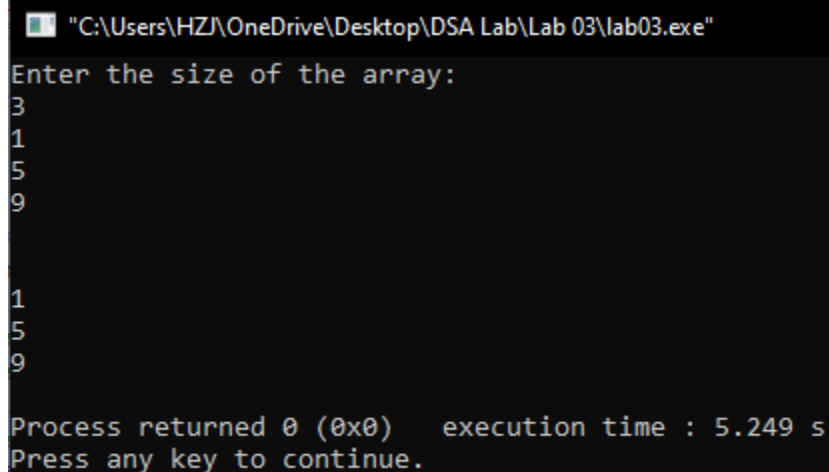
Problem 2:

Solution:

Code:

```
int main() {
    int size;
    cout << "Enter the size of array:" << endl;
    cin >> size;
    int arr[size];
    cout << "Enter the array elements:" << endl;
    for (int i = 0; i < size; i++) {
        cin >> arr[i];
    }
    for(int j=0;j<size-1;j++)
    {
        for (int k=0;k<size-1;k++) {
            if (arr[k]>arr[k + 1])
            {
                arr[k]=arr[k]+arr[k + 1];
                arr[k + 1]=arr[k]-arr[k + 1];
                arr[k]=arr[k]-arr[k + 1];
            }
        }
    }
    cout<< endl;
    for (int l = 0; l < size; l++)
    {cout <<arr[l]<< endl;}
    return 0;
}
```

Output:



```
"C:\Users\HZJ\OneDrive\Desktop\DSA Lab\Lab 03\lab03.exe"
Enter the size of the array:
3
1
5
9

1
5
9

Process returned 0 (0x0)   execution time : 5.249 s
Press any key to continue.
```

Problem 3:

Solution:

Code:

```
int main() {  
    int size;  
    cout<<"Enter the size of the array:"<<endl;  
    cin>>size;  
    int arr[size];  
    cout<<"Enter elements of array:"<<endl;  
    for(int i=0;i<size;i++){  
        cin>>arr[i];  
    }  
    for (int i = 1; i < size; i++) {  
        int key = arr[i];  
        int j = i - 1;  
        while (j >= 0 && arr[j] > key) {  
            arr[j + 1] = arr[j];  
            j = j - 1;  
        }  
        arr[j + 1] = key;  
    }cout<<endl;  
    cout<<"sorted array:"<<endl;  
    for (int i = 0; i < size; ++i)  
    {  
        cout<<arr[i]<<endl;  
    }  
    return 0;  
}
```

Output:

```
"C:\Users\HZJ\OneDrive\Desktop\DSA Lab\Lab 03\lab03.exe"  
Enter the size of the array:  
2  
1  
2  
  
1  
2  
  
Process returned 0 (0x0)   execution time : 3.813 s  
Press any key to continue.
```