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Semester: 3RD

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**Data Structures Final LAB
Assignment**

Final Semester Spring-2020

Q1. Design a linear array B [] of size 7 elements. Put the following elements in it.

s, u, g, a, z, e, y

a. Implement the Linear Search Algorithm on it to find “g” and display the message
Element g is found successfully

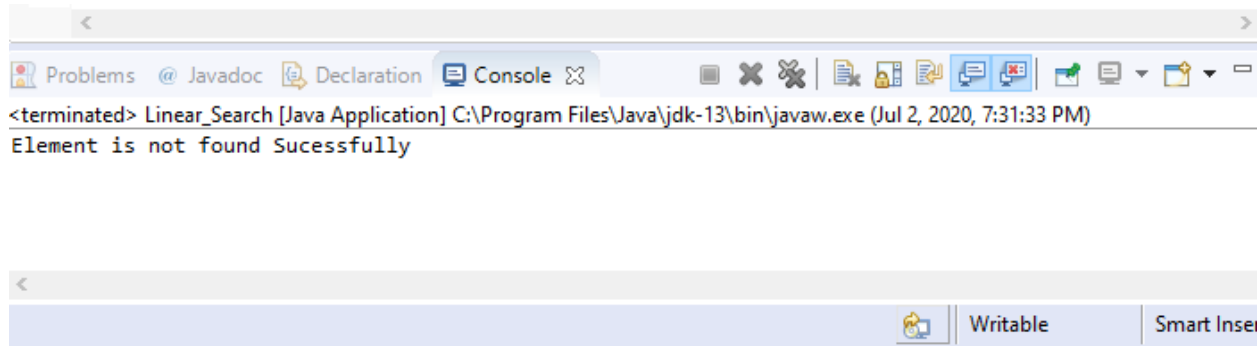
b. Search for element “m” and message should be displayed
Search is Unsuccessful.

Ans.

```
package q1;
```

```
public class Linear_Search {
    public static void main(String [] args) {
        char B[] = { 's','u','g','a','z','e','y'};
        boolean found= false;
        int i=1;
        int max=6;
        char item ='g';
        while(i<max && found==false)
        {
            if (B[i]==item)
            {
                found=true;
            }
            else {
                i++;
            }
        }
        if (found==true) {
            System.out.println("Element is found Sucessfully");
        }
        else {
            System.out.println("Element is not found Sucessfully");
        }
    }
}
```

Output:



Q2. Suppose there is a list of 6 unsorted elements.

15, 10, 12, 11, 9, 10

Design a Program to create an array A [] and store this list in it, and then apply Insertion Sort Algorithm to Sort the list.

Ans.

```
#include <iostream>
using namespace std;
void insertionSort(int arr[], int length);
void printArray(int A[], int size);

int main()
{
    int A[6] = {15, 10, 12, 11, 9, 10};

    insertionSort(A, 6);
    return 0;
}
```

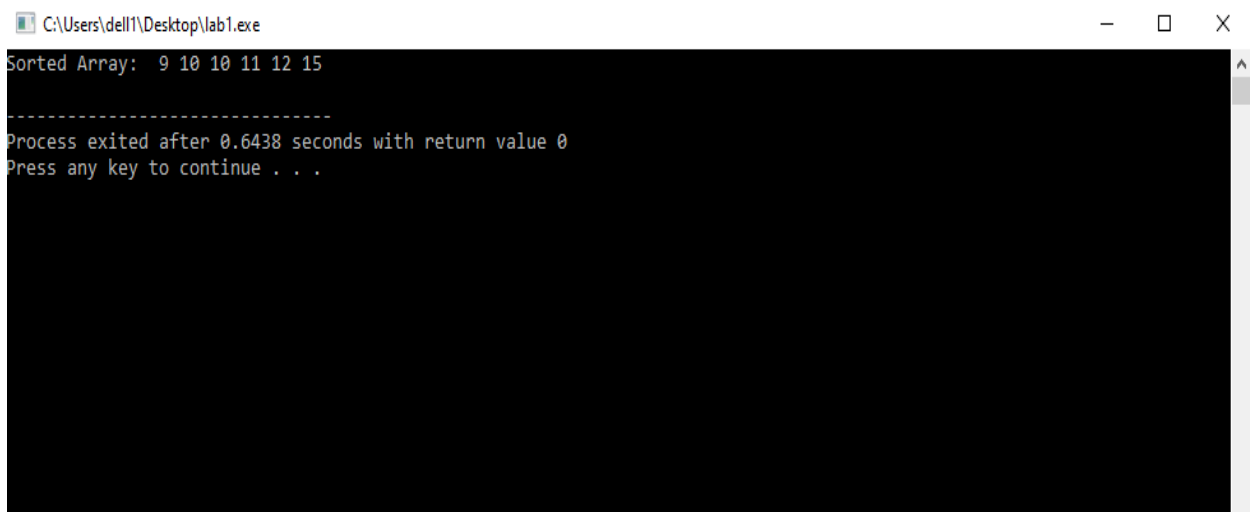
```
void insertionSort(int arr[], int length)
{
    int i, j, key;
    for (i = 1; i < length; i++)
    {
        j = i;
        while (j > 0 && arr[j - 1] > arr[j])
        {
            key = arr[j];
            arr[j] = arr[j - 1];
            arr[j - 1] = key;
            j--;
        }
    }
    cout << "Sorted Array: ";

    printArray(arr, length);
}
```

```
void printArray(int A[], int size)
{
    int j;
    for (j = 0; j < size; j++)
```

```
{  
    cout <<" "<< A[j];  
}  
cout << endl;  
}
```

Output:



```
C:\Users\dell\Desktop\lab1.exe  
Sorted Array: 9 10 10 11 12 15  
-----  
Process exited after 0.6438 seconds with return value 0  
Press any key to continue . . .
```