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Final-Term: Lab

Subject : Data Structures and Algorithms

Teacher : Muhammad Adil

Program : BS (CS)

Task# 1

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

SOL :-

```
#include<iostream>

using namespace std;

int main()
{
    char B[7] = { 's' , 'u' , ' g' , 'a' , 'z' , 'e' , 'y'};

    int check = 0;

    for (int i = 'a' ; i <= 'z' ; i++)
    {
        if(i=='g')
            cout<<"Element g is found successfully:"<<endl;

        if(i!='m')
            check = 1;
    }

    if (check == 1) -
```

```
cout<<"Sea.3rch is unsuccessfully:"<<endl;  
return 0;
```

OUTPUT :-

Element g is found successfully:

Search is unsuccessfully:

Program ended with exit code:0

Task# 2

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

SOL :-

```
def insertionSort(arr):
```

```
    for i in range(1, len(arr)):
```

```
        key = arr[i]
```

```
        j = i-1
```

```
        while j >= 0 and key < arr[j] :
```

```
            arr[j + 1] = arr[j]
```

```
            j -= 1
```

```
        arr[j + 1] = key
```

```
# Driver code to test above
```

```
arr = [15, 10, 12, 11, 9, 10 ]
```

```
insertionSort(arr)
```

```
for i in range(len(arr)):
```

```
    print ("% d" % arr[i])
```

OUTPUT :-

```
Run: KJ
C:\Users\Home\PycharmProjects\untitled2\venv\Scripts\python.exe C:/Users/Home/PycharmProjects/untitled2/KJ.py
9
10
10
11
12
15
Process finished with exit code 0
```

At the bottom of the window, there are tabs for 'TODO', 'Run', 'Python Console', and 'Terminal'.