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Section: SE 3-2

Data Structures

Lab # 04 Tasks:-

Task # 01

Program:

```
#include <iostream>
using namespace std;

int linearSearch(int arr[], int size, int target)
{
    for (int i = 0; i < size; i++)
    {
        if (arr[i] == target)
        {
            return i;
        }
    }
}
```

```

        return -1;
    }
}
int main()
{
    int arr[10] = {3, 6, 1, 8, 4, 7};
    int size;
    cout << "Enter size of array: ";
    cin >> size;
    for (int i = 0; i < size; i++)
    {
        cout << "Enter the array element at index: " << i << " \t ";
        cin >> arr[i];
    }
    size = sizeof(arr) / sizeof(arr[0]);
    int target;
    cout << "Enter the value you want to search: " << "\t";
    cin >> target;

    int result = linearSearch(arr, size, target);
    if (result != -1)
    {
        cout << "Element " << target << " found in the array "<< result <<
endl;
    }
    else
    {
        cout << "Element " << target << "not found in the array" << endl;
    }

    return 0;
}

```

Output:

```

PS C:\Users\Ahmed> cd "C:\Users\Ahmed\AppData\Local\Temp\"
; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFil
e }; if ($?) { .\tempCodeRunnerFile }
Enter size of array: 6
Enter the array element at index: 0      2
Enter the array element at index: 1      5
Enter the array element at index: 2      7
Enter the array element at index: 3      8
Enter the array element at index: 4      9
Enter the array element at index: 5     12
Enter the value you want to search:      8
Element 8 found in the array 3
PS C:\Users\Ahmed\AppData\Local\Temp>

```

Program:

```

#include <iostream>
using namespace std;
int binarySearch(int arr[], int size, int target)
{
    int low = 0;
    int high = size - 1;
    while (low <= high)
    {
        int mid = low + (high - low) / 2;
        if (arr[mid] == target)
        {
            return mid;
        }
        else if (arr[mid] > target)
        {
            high = mid - 1;
        }
        else
        {
            low = mid + 1;
        }
    }
    return -1;
}

int main()
{
    int arr[] = {2, 5, 12, 23, 38, 45, 62};
    int size = sizeof(arr) / sizeof(arr[0]);
    int target;
    cout << "Enter the value you want to search:\t";
    cin >> target;
    int result = binarySearch(arr, size, target);
    if (result != -1)
    {
        cout << "Element " << target << " found in the array " << result <<
endl;
    }
    else
    {
        cout << "Element " << target << " not found in the array" << endl;
    }

    return 0;
}

```

Output:

```

✓ TERMINAL Code + - [ ] [ ] [ ] ...
PS C:\Users\Ahmed> cd "C:\Users\Ahmed\AppData\Local\Temp\"
; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerF
ile } ; if ($?) { .\tempCodeRunnerFile }
Enter the value you want to search: 38
Element 38 found in the array 4
PS C:\Users\Ahmed\AppData\Local\Temp>

```