Apex College

BCIS Program

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Data Structure & Algorithms
Lab Report
18
Linear & Binary Search
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Lab 18 Objectives

- To implement linear search algorithm to sort a list of data
- To implement binary search algorithm to sort a list of data.

Introduction

—Searching is a method to find some relevant information in a data set. It is a process to finding a particular element in a data structure.

- Linear searching is a simple searching algorithm in a sequential form where search is made over all items one by one. It search every items sequentially until it match with with given item.

- Binary searching is an algorithm that looks for particular item by comparing the middle most item of the data collection. This can search from already sorted list only.

Source Code

```
#include <stdio.h>

int LinearSearch (int arr[], int item, int size){
    int i, n;
    i = 1;
```

```
    for (i=0; i<size; i++){
        if (arr[i] == item){
            printf("Search Successfull. \n");
            return printf("Location of data is %d. \n", i);
        }
    }
    return printf("Search Unssuccessful(: \n");
}

int binarySearch (int arr[], int l, int h, int item) {
    if(l>h).
        printf ("Search Unsuccessful. \n");
    else {
        int mid = (l+h)/2;
        if (arr[mid] == item){
            printf ("Search Succesfull. \n");
            printf ("Location of data is %d \n", mid);
        }
        else if (arr[mid] < item):
            binarySearch (arr, 1+mid, h, item);

        else
            binarySearch (arr, l, h-mid, item);
    }
}

int main (){
    int opt;
    printf ("1. Linear Search, \n 2. Binary Search \n");
    printf("Choose any option: ");
    scanf ("%d", &opt);
```

```
int item;
switch (opt) {
    case 1 :
        printf ("\n Enter data : ");
        scanf ("%d", &item);
        int am[] = {1, 44, 22, 60, 80, 9, 5, 7, 2, 0};
        linearSearch (am, item, size);
        break;

    case 2:
        printf ("\n Enter data :");
        scanf ("%d", &item);
        int am[] = {1, 2, 5, 6, 9, 12, 15, 19, 22};
        binarySearch (am, 0, n-1, item);
        break;

    case 3 :
        exit(0);

    default :
        printf ("Invalid option choosen \n");
}
}
```

#Activities

- We performed linear & binary search algorithms.

#Conclusion

- I learned about linear & binary search algorithm