GOVERNMENT POLYTECHNIC, KOLHAPUR

MICROPROJECT IN:

DATA STRUCTURE

(ITG310)

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CERTIFICATE

Certified that this project report "VISUALIZATION OF LINEAR SEARCH" is the bonafide work of "PRASAD PORLEKAR & OMKAR BABAR" who carried out project work under my supervision.

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SUPERVISION

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ACKNOWLEDGEMENT

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Secondly we would also like to thank my parents and friends who helped me lot in finalizing this project within the limited time frame.

DATE :______________

INTRODUCTION

In this project, we will discuss the **Visualization of Linear search** Searching is the process of finding some particular element in the list. If the element is present in the list, then the process is called successful, and the process returns the location of that element; otherwise, the search is called unsuccessful.

Two popular search methods are Linear Search and Binary Search. So, here we will discuss the popular searching technique, i.e., Linear Search Algorithm.

Linear search is also called as **Sequential Search Algorithm.** It is the simplest searching algorithm. In Linear search, we simply traverse the list completely and match each element of the list with the item whose location is to be found. If the match is found, then the location of the item is returned; otherwise, the algorithm returns NULL.

It is widely used to search an element from the unordered list, i.e., the list in which items are not sorted. The worst-case time complexity of linear search is **O(n).**

Advantages of Linear Search:

- Linear search is simple to implement and easy to understand.
- Linear search can be used irrespective of whether the array is sorted or not. It can be used on arrays of any data type.
- Does not require any additional memory.
- It is a well suited algorithm for small datasets.

Drawbacks of Linear Search:

- Linear search has a time complexity of O(n), which in turn makes it slow for large datasets.
- Not suitable for large arrays.
- Linear search can be less efficient than other algorithms, such as hash tables

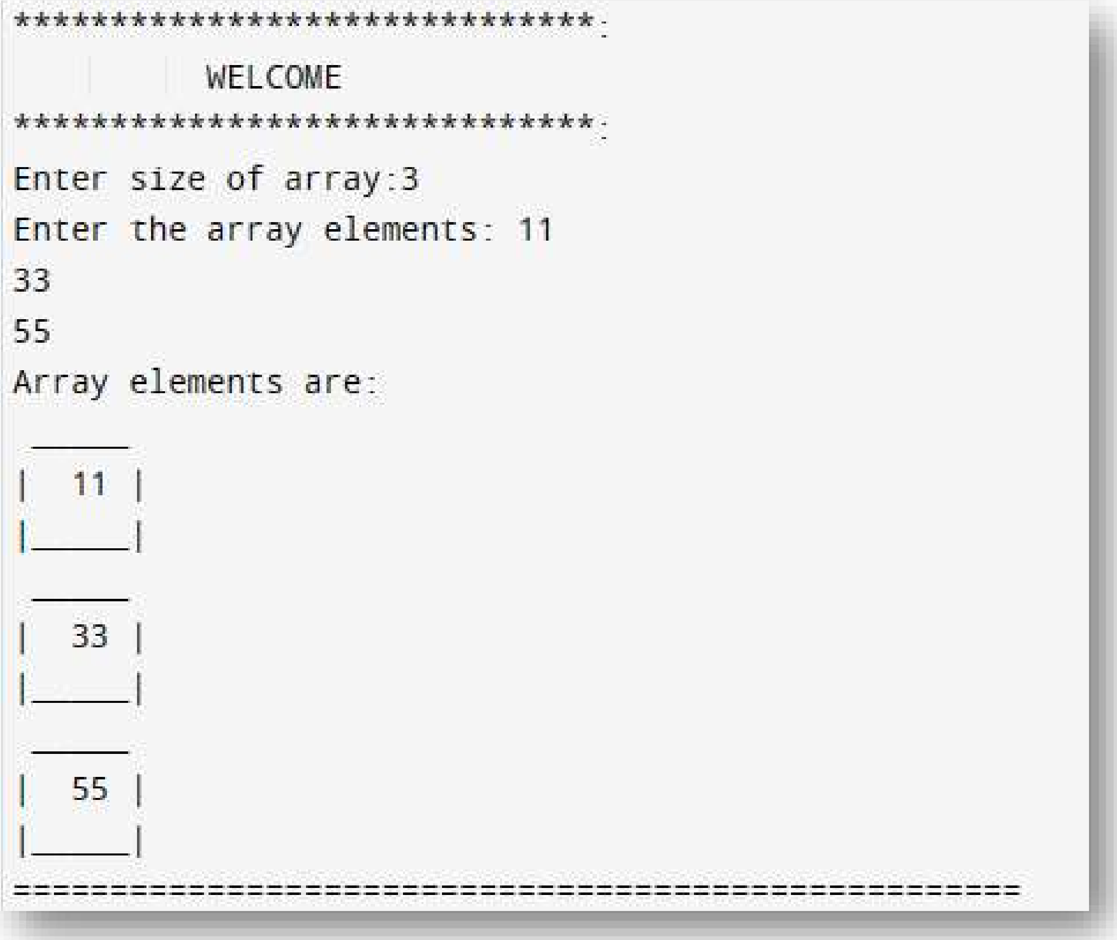
SOURCE CODE :

```
#include<stdio.h>
void main()
{
int a[10],i,key,n,flag=0,next;
printf("\n******************************:");
printf("\n          WELCOME");
printf("\n******************************:");
printf("\nEnter size of array:");
scanf("%d",&n);
printf("\n\nEnter the array elements: ");
for(i=0;i<n;i++)
{
    scanf("%d",&a[i]);
}
printf("\n Array elements are: ");
    for(i=0;i<n;i++)
    {
    printf("\n _____\n");
    printf("|  %d |\n",a[i]);
    printf("|_____|");
    }
printf("\n====================================================");
     printf("\n Press 1 for next");
    scanf("%d",&next);
    if(next==1)
    goto lab1;
    lab1:
printf("\nEnter key element to be search:");
scanf("%d",&key);
```

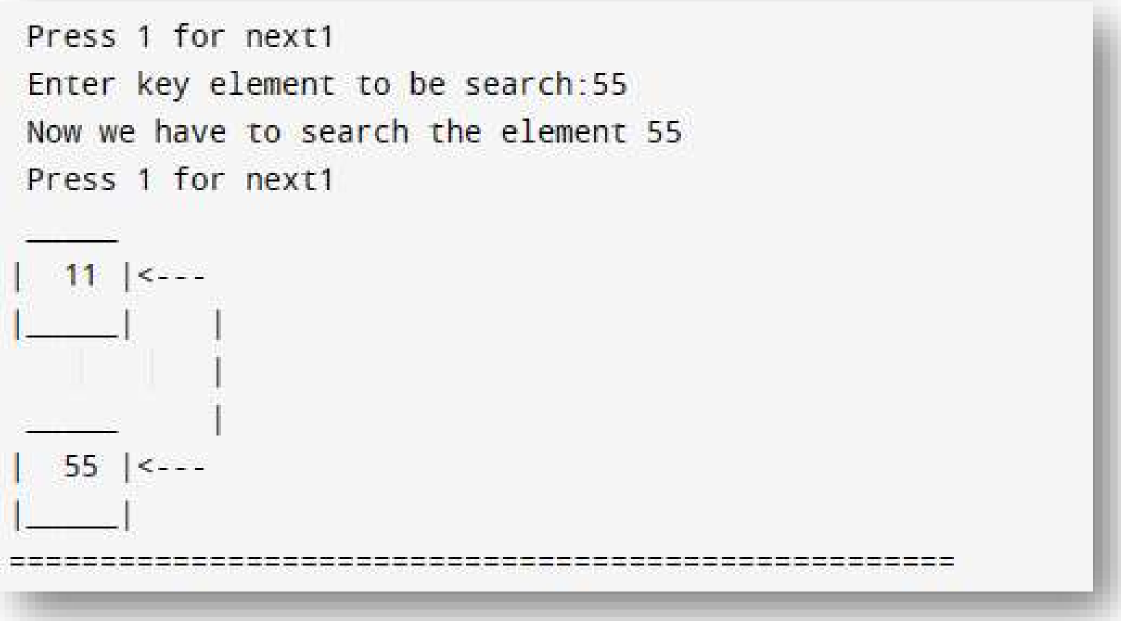
```
printf("\n Now we have to search the element %d",key);
    printf("\n Press 1 for next");
    scanf("%d",&next);
    if(next==1)
    goto lab3;
    lab3:
     printf("\n _____\n");
    printf("|  %d |<---\n",a[0]);
    printf("|_____|    |\n");
    printf("           |\n");
    printf(" _____     |\n");
    printf("|  %d |<---\n",key);
    printf("|_____|");

printf("\n====================================================");
printf("\n\nNow we will check if the key element and array element
is same of not");
    printf("\n Press 1 for next");
    scanf("%d",&next);
    if(next==1)
    goto lab4;
    lab4:
    if(a[0]==key)
    {printf("Element Found!!!");
        flag=1;
        printf("\n ------------");
        printf("\n|  %d = %d  |",a[0],key);
        printf("\n|           |");
        printf("\n ------------");
        goto success;
    }else{
         printf("Element Not Found!!!");
 printf("\n ------------");
        printf("\n|  %d != %d |",a[0],key);
        printf("\n|           |");
        printf("\n ------------");
        goto next1;
    }
next1:
printf("\n====================================================");
    printf("\n\nWe will move further....");
    printf("\n\n Press 1 for next");
    scanf("%d",&next);
    if(next==1)
    goto lab5;
    lab5:
    if(a[1]==key)
    {printf("Element Found!!!");
        flag=1;
        printf("\n ------------");
        printf("\n|  %d = %d  |",a[1],key);
        printf("\n|           |");
        printf("\n ------------");
        goto success;
    }
    else{printf("Element Not Found!!!");
 printf("\n ------------");
        printf("\n|  %d != %d |",a[1],key);
        printf("\n|           |");
        printf("\n ------------");
        goto next2;
    }
next2:
printf("\n====================================================");
    printf("\n\nWe will move further....");
    printf("\n\n Press 1 for next");
    scanf("%d",&next);
    if(next==1)
    goto lab6;
    lab6:
    if(a[2]==key)
    {printf("Element Found!!!");
        flag=1;
        printf("\n ------------");
        printf("\n|  %d = %d  |",a[2],key);
        printf("\n|           |");
        printf("\n ------------");
        goto success; }
    else{
         printf("Element Not Found!!!");
 printf("\n ------------");
        printf("\n|  %d != %d |",a[2],key);
        printf("\n|           |");
        printf("\n ------------");
        goto next3;
    }
next3:
printf("\n====================================================");
   printf("\n\nWe will move further....");
    printf("\n\n Press 1 for next");
    scanf("%d",&next);
    if(next==1)
    goto lab7;
    lab7:
    if(a[3]==key)
    {printf("Element Found!!!");
        flag=1;
        printf("\n ------------");
        printf("\n|  %d = %d  |",a[3],key);
        printf("\n|           |");
        printf("\n ------------");
        goto success;
    }else{
         printf("Element Not Found!!!");
 printf("\n ------------");
        printf("\n|  %d != %d |",a[3],key);
        printf("\n|           |");
        printf("\n ------------");
       goto next4;
    }
next4:
printf("\n====================================================");
    printf("\n\nWe will move further....");
    printf("\n\n Press 1 for next");
    scanf("%d",&next);
    if(next==1)
    goto lab8;
    lab8:
    if(a[4]==key)
    {
        printf("Element Found!!!");
        flag=1;
        printf("\n ------------");
        printf("\n|  %d = %d  |",a[4],key);
        printf("\n|           |");
        printf("\n ------------");
        goto success;
    } else{
         printf("Element Not Found!!!");
 printf("\n ------------");
        printf("\n|  %d != %d |",a[4],key);
        printf("\n|           |");
        printf("\n ------------");
    }
    success:
    printf("Your key element found successfully...");
 printf("\n====================================================");
}
```

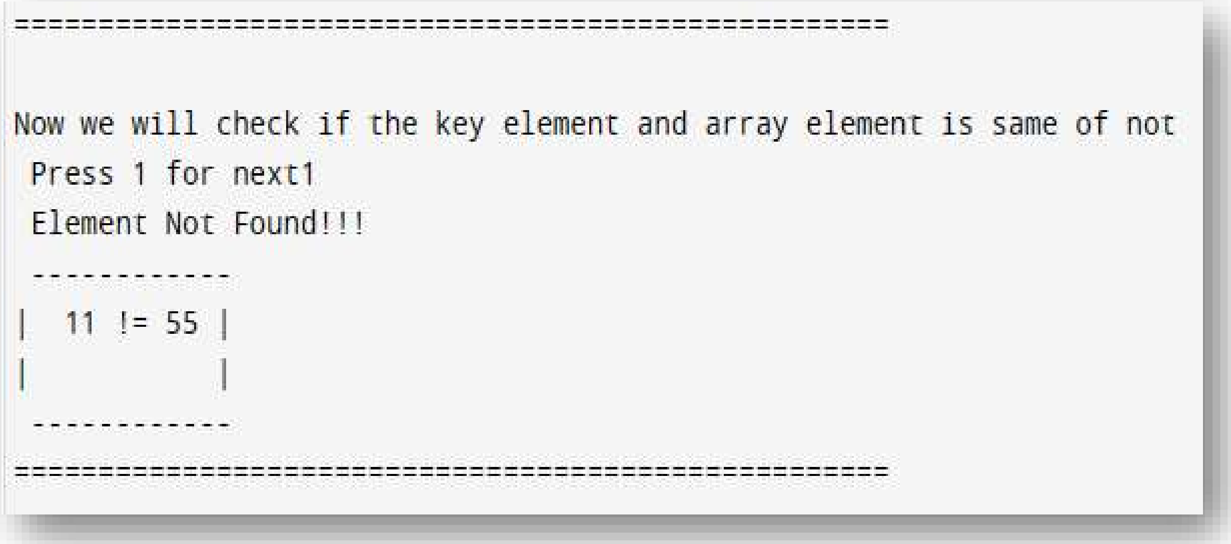
OUTPUT :



```
*******************************:
        WELCOME
*******************************:
Enter size of array:3
Enter the array elements: 11
33
55
Array elements are:
 _____
|  11 |
|_____|
 _____
|  33 |
|_____|
 _____
|  55 |
|_____|
====================================================
```

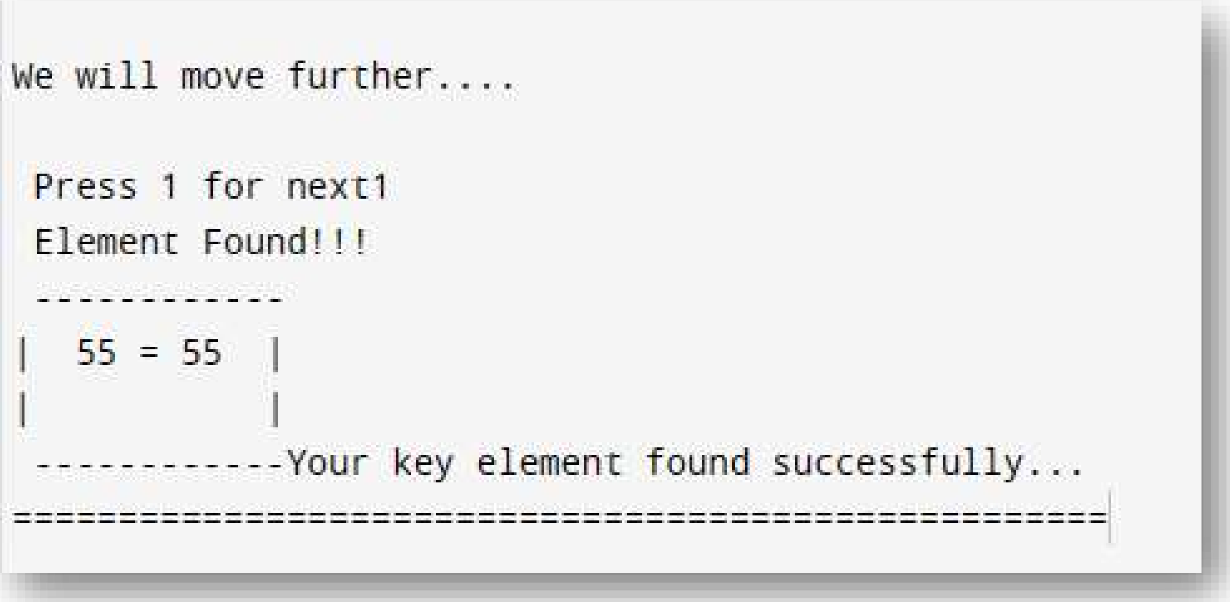


```
 Press 1 for next1
 Enter key element to be search:55
 Now we have to search the element 55
 Press 1 for next1
 _____
|  11 |<---
|_____|    |
           |
 _____     |
|  55 |<---
|_____|
====================================================
```



```
=====================================================


Now we will check if the key element and array element is same of not
 Press 1 for next1
 Element Not Found!!!
 ------------
|  11 != 55 |
|           |
 ------------
=====================================================
```



```

We will move further....


 Press 1 for next1
 Element Found!!!
 ------------
|  55 = 55  |
|           |
 ------------Your key element found successfully...
====================================================
```

THANK YOU !!