

Write the user defined functions to implement the following searching algorithm.

- i. Linear search
- ii. Binary search

Program –

(i) Linear Search:

```
#include<stdio.h>
#define SIZE 100
void linearS(int arr[], int size, int item)
{
    int position=0, index=0, i=0;
    while(i<size)
    {
        if(item == arr[i])
        {
            index=i;
            position=i+1;
            break;
        }
        else
        {
            position=0;
            index=0;
            i++;
        }
    }
    if(position==0)
    {
        printf("Element isn't present here.");
    }
    else
    {
        printf("Element present here at position %d and
at index number %d.", position, index);
    }
}

int main()
```

```
{
    int size, arr[SIZE], item, i;
    printf("Enter the size of array: \n");
    scanf("%d",&size);
    printf("Enter the data: \n");
    for(i=0;i<size;i++)
    {
        scanf("%d",&arr[i]);
    }
    printf("Enter the item to be searched: ");
    scanf("%d",&item);
    linearS(arr, size, item);
    return 0;
}
```

(ii) Binary Search:

```
#include<stdio.h>
#define SIZE 100
void binaryS(int arr[], int size, int item)
{
    int begin=0, end=size, mid=0, index=0, i=0,
    position=0;
    while((begin<end))
    {
        mid = ((begin+end)/2);
        if(item == arr[mid])
        {
            index = mid;
            position=index+1;
            break;
        }
        else if(item < arr[mid])
        {
            end = mid - 1;
        }
        else if(item > arr[mid])
        {
            begin = mid + 1;
        }
    }
}
```

```
        if(position<=0)
        {
            printf("Element isn't present here.");
        }
        else
        {
            printf("Element present here at position %d and
at index number %d.", position, index);
        }
    }

int main()
{
    int size, arr[SIZE], item, i;
    printf("Enter the size of array: \n");
    scanf("%d",&size);
    printf("Enter the data: \n");
    for(i=0;i<size;i++)
    {
        scanf("%d",&arr[i]);
    }
    printf("Enter the item to be searched: ");
    scanf("%d",&item);
    binaryS(arr, size, item);
    return 0;
}
```