Activity 4

Write a program to perform searching activity using Linear and binary search.

1.Linear Search

In [8]:

```
def linear_Search(list1,n,key):
    for i in range(0,n):
        if(list1[i]==key):
            return i
    return -1

list1 = [1,3,4,5,6,7,8]
key=7
n=len(list1)
res = linear_Search(list1,n,key)
if(res == -1):
    print('Element not Found')
else:
    print('Element found at index:',res)
```

```
Element found at index: 5
```

2. Binary Search

In [1]:

```
def binary_search(list1,n):
    low = 0
    high = len(list1)-1
    mid = 0
    while low <= high:
        mid = (high+low)//2
        if list1[mid]<n:
            low = mid + 1
        elif list1[mid]>n:
            high = mid -1
        else:
            return mid
    return -1

list1 = [12,24,32,39,45,50,54]
n = 45
result = binary_search(list1,n)

if result != -1:
    print('Element is present at index', str(result))
else:
    print('Element is not present in list1')
```

```
Element is present at index 4
```

3. Recursive Binary Search

In [4]:

```
def binary_search(list1,low,high,n):
    if low <= high:
        mid = (low+high)//2
        if list1[mid] == n:
            return mid
        elif list1[mid]>n:
            return binary_search(list1,low,mid-1,n)
        else:
            return binary_search(list1,mid+1,high,n)
    else:
        return -1

list1 = [12,24,32,39,45,50,54]
n = 32
res = binary_search(list1,0,len(list1)-1,n)

if res != -1:
    print('Element is present at index', str(res))
else:
    print('Element is not present in list1')
```

```
Element is present at index 2
```