Search Algorithms

```
#Linear


def linear(arr,l,x):
    for i in range(0,l):
      if (arr[i]==x):
        return i
    return -1

arr= [1,3,4,5,10,23]
x = 5
l = len(arr)
result = linear(arr,l,x)
print("the number", x,"is on index ",result)

# array[i]
```

```
 the number 5 is on index  3
```

Binary

```
# Binary
def binary(array,x,l,r):
  while l<=r:
    # mid = l+r/2
    mid = l+(r-1)//2;
    print("mid",mid)
    print("left",l,"right",r)


    if array[mid]==x: #equal
       return mid
    # less
    if array[mid]<x:
      binary(array,x,mid+1,r):
      # l = mid +1
    #greater
    else:
      # r = mid-1
      binary(array,x,l,mid-1):
  return -1



arr= [1,2,3,4,5,6,7,8,9,10]
x=9
```

```
result = binary(arr,x,0,len(arr)-1)
print("the number", x,"is on index ",result)
```

```
     mid 4
     left 0 right 9
     mid 9
     left 5 right 9
     mid 8
     left 5 right 8
     the number 9 is on index  8
```

```
l = 2
r = 6
mid = l+r//2
mid
```

```
     5
```

Task 1: Binary Search using Recurrsion

Task 2: Merge Sort