Merge Sort

In [61]:

```
def mergeSort(myList):
    if len(myList) > 1:
        mid = len(myList) // 2
        left = myList[:mid]
        right = myList[mid:]
        mergeSort(left)
        mergeSort(right)

        i = 0
        j = 0

        k = 0

        while i < len(left) and j < len(right):
            if left[i] <= right[j]:
              myList[k] = left[i]
              i += 1
            else:
                myList[k] = right[j]
                j += 1

            k += 1


        while i < len(left):
            myList[k] = left[i]
            i += 1
            k += 1

        while j < len(right):
            myList[k]=right[j]
            j += 1
            k += 1
if __name__ == '__main__':
    a = [int(item) for item in input("Enter Elements in List : ").split()]
    mergeSort(a)
    print(a)
```

```
Enter Elements in List : 12 78 56 34 89 91 2
[2, 12, 34, 56, 78, 89, 91]
```

Binary Search

In [62]:

```
def binarySearch(a,lb,ub,key) :
    if(lb<ub) :
        mid = (lb+ub) // 2;
        if(a[mid] == key) :
            return mid
        if(a[mid] > key) :
            return binarySearch(a,lb,mid-1,key)
        else :
            return binarySearch(a , mid+1, ub,key)
    else : return -1

if __name__ == '__main__':
    a = [int(item) for item in input("Enter Elements in ascending order : ").split()]
    key = int(input("Enter Key Element :"))
    result = binarySearch(a , 0 , len(a)-1 , key)
    if result == -1 :
        print("Element not found:")
    else : print("position of key is :",result)
```

```
Enter Elements in ascending order : 12 23 34 45 56 67 78 89
Enter Key Element :23
position of key is : 1
```