

## EXERCISE-80 MERGE SORT

### PROGRAM

```
def merge_sort(arr):
    if len(arr) <= 1:
        return arr
    mid = len(arr) // 2
    left, right = merge_sort(arr[:mid]), merge_sort(arr[mid:])
    return merge(left, right)

def merge(left, right):
    result = []
    left_idx, right_idx = 0, 0
    while left_idx < len(left) and right_idx < len(right):
        if left[left_idx] < right[right_idx]:
            result.append(left[left_idx])
            left_idx += 1
        else:
            result.append(right[right_idx])
            right_idx += 1
    return result + left[left_idx:] + right[right_idx:]

arr = [3, 6, 1, 89, 25, 76]
sorted_arr = merge_sort(arr)
print("Sorted array:", sorted_arr)
```

OUTPUT;

```
Sorted array: [1, 3, 6, 25, 76, 89]
```

TIME COMPLEXITY  $O(n \log n)$ .