

ASSIGNMENT 7 – Merge Sort & Quick Sort in Python

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# Merge Sort

def merge_sort(lst):
    if len(lst) <= 1:
        return lst

    mid = len(lst) // 2

    left = lst[mid:]
    right = lst[:mid]

    left = merge_sort(left)
    right = merge_sort(right)

    return merge(left, right)

def merge(left, right):
    merged = []
    left_idx = right_idx = 0

    while left_idx < len(left) and right_idx < len(right):
        if left[left_idx] < right[right_idx]:
            merged.append(left[left_idx])
            left_idx += 1
        else:
            merged.append(right[right_idx])
            right_idx += 1
```

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merged.extend(left[left_idx:])
merged.extend(right[right_idx:])
return merged

if __name__ == "__main__":
    lst = [2,5,1,3,9,8,6,7]
    merged = merge_sort(lst)
    print(merged)

```

OUTPUT

```

• PS C:\Users\hello\Documents\SEM3\PYTHON\Lab7> python -u "c:\Users\hello\Documents\SEM3\PYTHON\Lab7\merge_sort.py"
Input List:  [2, 5, 1, 3, 9, 8, 6, 7]
Output List:  [1, 2, 3, 5, 6, 7, 8, 9]

```

```

# Quick Sort

def quick_sort(lst):
    if len(lst) <= 1:
        return lst

    pivot = lst[len(lst) // 2]

    left = [x for x in lst if x < pivot]
    middle = [x for x in lst if x == pivot]
    right = [x for x in lst if x > pivot]

    return quick_sort(left) + middle +
quick_sort(right)

```

```
if __name__ == "__main__":  
    lst = [2, 5, 1, 3, 9, 8, 6, 7]  
    merged = quick_sort(lst)  
    print(merged)
```

OUTPUT

```
• PS C:\Users\hello\Documents\SEM3\PYTHON\Lab7> python -u "c:\Users\hello\Documents\SEM3\PYTHON\Lab7\quick_sort.py"  
Input List:  [2, 5, 1, 3, 9, 8, 6, 7]  
Output List:  [1, 2, 3, 5, 6, 7, 8, 9]
```