

Merge Sort

Explanation:

Merge sort is a sorting algorithm that works by dividing the array in half, sorting each half recursively, and then merging the two sorted halves back together. It works by comparing the first element of each half and then copying the smaller element into the new sorted array. This process is done recursively until all the elements from both halves have been copied into the new array.

Algorithm:

```
def merge_sort(array):
```

```
    if len(array) <= 1:
```

```
        return array
```

```
    middle = len(array) // 2
```

```
    left = merge_sort(array[:middle])
```

```
    right = merge_sort(array[middle:])
```

```
    return merge(left, right)
```

```
def merge(left, right):
```

```
    result = []
```

```
    while left and right:
```

```
        if left[0] < right[0]:
```

```
            result.append(left.pop(0))
```

```
        else:
```

```
            result.append(right.pop(0))
```

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