

## Count Reverse Pairs

**Problem Statement:** Given an array of numbers, you need to return the count of reverse pairs. **Reverse Pairs** are those pairs where  $i < j$  and  $arr[i] > 2 * arr[j]$ .

class Solution:

```
def reversePairs(self, nums: List[int]) -> int:
```

```
    self.count = 0
```

```
def merge_sort(nums, low, high):
```

```
    if low < high:
```

```
        mid = (low + high) // 2
```

```
        merge_sort(nums, low, mid)
```

```
        merge_sort(nums, mid + 1, high)
```

```
        merge(nums, low, mid, high)
```

```
def merge(nums, low, mid, high):
```

```
    i, j = low, mid + 1
```

```
    while i <= mid and j <= high:
```

```
        if nums[i] <= 2 * nums[j]:
```

```
            i += 1
```

```
        else:
```

```
            self.count += mid - i + 1
```

```
            j += 1
```

```
    temp = []
```

```
    i, j = low, mid + 1
```

```
    while i <= mid and j <= high:
```

```
        if nums[i] <= nums[j]:
```

```
        temp.append(nums[i])
        i += 1
    else:
        temp.append(nums[j])
        j += 1

    while i <= mid:
        temp.append(nums[i])
        i += 1

    while j <= high:
        temp.append(nums[j])
        j += 1

    for k in range(len(temp)):
        nums[low + k] = temp[k]

merge_sort(nums, 0, len(nums) - 1)
return self.count
```