Algorithm 1 Merge Sort

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1: procedure COMBINE(A, B)                    ▷ Merges two sorted arrays A and B
2:     i ← 0, j ← 0, t ← 0
3:     n ← size(A) + size(B)
4:     Initialize an array Y
5:     while i + j < n do
6:         if A[i] ≤ B[j] then
7:             Y[t] ← A[i]
8:             i ← i + 1
9:             if i = size(A) then
10:                A[i] ← ∞
11:            end if
12:        else
13:            Y[t] ← B[j]
14:            j ← j + 1
15:            if j = size(B) then
16:                B[j] ← ∞
17:            end if
18:        end if
19:        t ← t + 1
20:    end while
21:    return Y
22: end procedure
```

```
1: procedure MERGESORT(X)
2:     if size(X) > 1 then
3:         MERGESORT(X[0,..,n/2])                ▷ Sort the first two halves
4:         MERGESORT(X[n/2+1,..,n-1])            ▷ Then combine
5:         X ← COMBINE(X[0, .., n/2], X[n/2 + 1, .., n − 1])
6:     end if
7: end procedure
```