









*n*

*n*

*n*

*n*

*m*

*n*





5









2

4



1

2











$O(m + n)$

# Motivating Question...

- If we happen to have two sorted arrays, could we efficiently merge them together into one array?

[       ]       [       ]

[1 2 3 4 5 7 8 12]

- Repeatedly copy the smaller element of each array into a new one.
- How efficient would this merge operation be on two arrays with  $m$  and  $n$  elements, respectively?

$$O(m + n)$$

# Merge Sort