

1167. Minimum Cost to Connect Sticks

Medium 808 142 Add to List Share

You have some number of sticks with positive integer lengths. These lengths are given as an array `sticks`, where `sticks[i]` is the length of the i^{th} stick.

You can connect any two sticks of lengths x and y into one stick by paying a cost of $x + y$. You must connect all the sticks until there is only one stick remaining.

Return the minimum cost of connecting all the given sticks into one stick in this way.

Example 1:

Input: sticks = [2,4,3]
Output: 14
Explanation: You start with sticks = [2,4,3].
1. Combine sticks 2 and 3 for a cost of 2 + 3 = 5. Now you have sticks = [5,4].
2. Combine sticks 5 and 4 for a cost of 5 + 4 = 9. Now you have sticks = [9].
There is only one stick left, so you are done. The total cost is 5 + 9 = 14.

Example 2:

Input: sticks = [1,8,3,5]
Output: 30
Explanation: You start with sticks = [1,8,3,5].
1. Combine sticks 1 and 3 for a cost of 1 + 3 = 4. Now you have sticks = [4,8,5].
2. Combine sticks 4 and 5 for a cost of 4 + 5 = 9. Now you have sticks = [9,8].
3. Combine sticks 9 and 8 for a cost of 9 + 8 = 17. Now you have sticks = [17].
There is only one stick left, so you are done. The total cost is 4 + 9 + 17 = 30.

Example 3:

Input: sticks = [5]
Output: 0
Explanation: There is only one stick, so you don't need to do anything. The total cost is 0.

Constraints:

- $1 \leq \text{sticks.length} \leq 10^4$
- $1 \leq \text{sticks}[i] \leq 10^4$

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Hide Hint 1

How many times does every stick contribute to the answer?

Hide Hint 2

Some of the sticks will be used more than the others. Which sticks should be used the most/least?

Hide Hint 3

The sticks with long lengths cost a lot so we should use these the least.

Hide Hint 4

What if we keep merging the two shortest sticks?

i Java Autocomplete

```
1 class Solution {
2     public int connectSticks(int[] sticks) {
3         int totalCost = 0;
4
5         PriorityQueue<Integer> pq = new PriorityQueue<>();
6
7         // add all sticks to the min heap.
8         for (int stick : sticks) {
9             pq.add(stick);
10
11
12         // combine two of the smallest sticks until we are left with just one.
13         while (pq.size() > 1) {
14             int stick1 = pq.remove();
15             int stick2 = pq.remove();
16
17             int cost = stick1 + stick2;
18             totalCost += cost;
19
20             pq.add(stick1 + stick2);
21         }
22         return totalCost;
23     }
24 }
25 }
```