Problem 1471: The k Strongest Values in an Array

Problem Information

Difficulty: Medium
Acceptance Rate: 62.35%
Paid Only: No
Tags: Array, Two Pointers, Sorting

Problem Description

Given an array of integers `arr` and an integer `k`.

A value `arr[i]` is said to be stronger than a value `arr[j]` if `|arr[i] - m| > |arr[j] - m|` where `m` is the **centre** of the array. If `|arr[i] - m| == |arr[j] - m|`, then `arr[i]` is said to be stronger than `arr[j]` if `arr[i] > arr[j]`.

Return _a list of the strongest`k`_ values in the array. return the answer **in any arbitrary order**.

The **centre** is the middle value in an ordered integer list. More formally, if the length of the list is n, the centre is the element in position `((n - 1) / 2)` in the sorted list **(0-indexed)**.

* For `arr = [6, -3, 7, 2, 11]`, `n = 5` and the centre is obtained by sorting the array `arr = [-3, 2, 6, 7, 11]` and the centre is `arr[m]` where `m = ((5 - 1) / 2) = 2`. The centre is `6`. * For `arr = [-7, 22, 17, 3]`, `n = 4` and the centre is obtained by sorting the array `arr = [-7, 3, 17, 22]` and the centre is `arr[m]` where `m = ((4 - 1) / 2) = 1`. The centre is `3`.

Example 1:

Input: arr = [1,2,3,4,5], k = 2 **Output:** [5,1] **Explanation:** Centre is 3, the elements of the array sorted by the strongest are [5,1,4,2,3]. The strongest 2 elements are [5, 1]. [1, 5] is also **accepted** answer. Please note that although |5 - 3| == |1 - 3| but 5 is stronger than 1 because 5 > 1.

Example 2:

Input: arr = [1,1,3,5,5], k = 2 **Output:** [5,5] **Explanation:** Centre is 3, the elements of the array sorted by the strongest are [5,5,1,1,3]. The strongest 2 elements are [5, 5].

Example 3:

Input: arr = [6,7,11,7,6,8], k = 5 **Output:** [11,8,6,6,7] **Explanation:** Centre is 7, the elements of the array sorted by the strongest are [11,8,6,6,7,7]. Any permutation of [11,8,6,6,7] is **accepted**.

Constraints:

* `1 <= arr.length <= 105` * `-105 <= arr[i] <= 105` * `1 <= k <= arr.length`

Code Snippets

C++:

```
class Solution {
public:
vector<int> getStrongest(vector<int>& arr, int k) {

}
};
```

Java:

```
class Solution {
public int[] getStrongest(int[] arr, int k) {

}
}
```

Python3:

```
class Solution:
def getStrongest(self, arr: List[int], k: int) -> List[int]:
```