2838. Maximum Coins Heroes Can Collect Premium

Solved

Medium | Topics | Companies | Hint

There is a battle and `n` heroes are trying to defeat `m` monsters. You are given two **1-indexed** arrays of **positive** integers `heroes` and `monsters` of length `n` and `m`, respectively. `heroes[i]` is the power of `i^th` hero, and `monsters[i]` is the power of `i^th` monster.

The `i^th` hero can defeat the `j^th` monster if `monsters[j] <= heroes[i]`.

You are also given a **1-indexed** array `coins` of length `m` consisting of **positive** integers. `coins[i]` is the number of coins that each hero earns after defeating the `i^th` monster.

Return *an array* `ans` *of length* `n` *where* `ans[i]` *is the* ***maximum*** *number of coins that the* `i^th` *hero can collect from this battle.*

Notes

- The health of a hero doesn't get reduced after defeating a monster.
- Multiple heroes can defeat a monster, but each monster can be defeated by a given hero only once.

Example 1:

```
Input: heroes = [1,4,2], monsters = [1,1,5,2,3], coins = [2,3,4,5,6]
Output: [5,16,10]
Explanation: For each hero, we list the index of all the monsters he can defeat:
1st hero: [1,2] since the power of this hero is 1 and monsters[1], monsters[2] <= 1. So this hero collects coins[1] + coins[2] = 5 coins.
2nd hero: [1,2,4,5] since the power of this hero is 4 and monsters[1], monsters[2], monsters[4], monsters[5] <= 4. So this hero collects coins[1] + coins[2] + coins[4] + coins[5] = 16 coins.
3rd hero: [1,2,4] since the power of this hero is 2 and monsters[1], monsters[2], monsters[4] <= 2. So this hero collects coins[1] + coins[2] + coins[4] = 10 coins.
So the answer would be [5,16,10].
```

Example 2:

```
Input: heroes = [5], monsters = [2,3,1,2], coins = [10,6,5,2]
Output: [23]
Explanation: This hero can defeat all the monsters since monsters[i] <= 5. So he collects all of the coins: coins[1] + coins[2] + coins[3] + coins[4] = 23, and the answer would be [23].
```

Example 3:

```
Input: heroes = [4,4], monsters = [5,7,8], coins = [1,1,1]
Output: [0,0]
Explanation: In this example, no hero can defeat a monster. So the answer would be [0,0],
```

Constraints:

- `1 <= n == heroes.length <= 10^5`
- `1 <= m == monsters.length <= 10^5`
- `coins.length == m`
- `1 <= heroes[i], monsters[i], coins[i] <= 10^9`

Seen this question in a real interview before? 1/5

Yes No

Accepted 6.3K | Submissions 9K | Acceptance Rate 69.7%

Topics

Array Two Pointers Binary Search Sorting Prefix Sum

Companies

0 - 6 months

Deutsche Bank 2

Hint 1

If a hero can defeat the `i^th` monster, then he defeats all the monsters having a power less than `monster[i]`.

Hint 2

Sort monsters by their powers. Also change the order of the coins array according to this sort.

Hint 3

Construct a prefix sum array for the updated coins array.

Hint 4

For each hero, do a binary search and find the last position of the most powerful monster that this hero can defeat.

Hint 5

If said monster has index `i`, then the `i^th` element of the partial sum array would be the answer.

Discussion (18)