

# Problem 1648: Sell Diminishing-Valued Colored Balls

## Problem Information

**Difficulty:** Medium

**Acceptance Rate:** 29.94%

**Paid Only:** No

**Tags:** Array, Math, Binary Search, Greedy, Sorting, Heap (Priority Queue)

## Problem Description

You have an `inventory` of different colored balls, and there is a customer that wants `orders` balls of **any** color.

The customer weirdly values the colored balls. Each colored ball's value is the number of balls **of that color** you currently have in your `inventory`. For example, if you own `6` yellow balls, the customer would pay `6` for the first yellow ball. After the transaction, there are only `5` yellow balls left, so the next yellow ball is then valued at `5` (i.e., the value of the balls decreases as you sell more to the customer).

You are given an integer array, `inventory`, where `inventory[i]` represents the number of balls of the `i`th color that you initially own. You are also given an integer `orders`, which represents the total number of balls that the customer wants. You can sell the balls **in any order**.

Return **the maximum** total value that you can attain after selling `orders` colored balls. As the answer may be too large, return it **modulo**  $10^9 + 7$ .

**Example 1:**

 (<https://assets.leetcode.com/uploads/2020/11/05/jj.gif>)

**Input:** `inventory = [2,5]`, `orders = 4` **Output:** `14` **Explanation:** Sell the 1st color 1 time (2) and the 2nd color 3 times (5 + 4 + 3). The maximum total value is  $2 + 5 + 4 + 3 = 14$ .

**Example 2:**

**Input:** inventory = [3,5], orders = 6 **Output:** 19 **Explanation:** Sell the 1st color 2 times (3 + 2) and the 2nd color 4 times (5 + 4 + 3 + 2). The maximum total value is 3 + 2 + 5 + 4 + 3 + 2 = 19.

**Constraints:**

$1 \leq \text{inventory.length} \leq 105$   $1 \leq \text{inventory}[i] \leq 109$   $1 \leq \text{orders} \leq \min(\sum(\text{inventory}[i]), 109)$

## Code Snippets

### C++:

```
class Solution {
public:
    int maxProfit(vector<int>& inventory, int orders) {

    }
};
```

### Java:

```
class Solution {
    public int maxProfit(int[] inventory, int orders) {

    }
}
```

### Python3:

```
class Solution:
    def maxProfit(self, inventory: List[int], orders: int) -> int:
```