1503. Reducing Dishes

Difficulty : Hard

https://leetcode.com/problems/reducing-dishes

A chef has collected data on the `satisfaction` level of his `n` dishes. Chef can cook any dish in 1 unit of time.

Like-time coefficient of a dish is defined as the time taken to cook that dish including previous dishes multiplied by its satisfaction level i.e. `time[i] * satisfaction[i]`.

Return the maximum sum of **like-time coefficient** that the chef can obtain after preparing some amount of dishes.

Dishes can be prepared in **any** order and the chef can discard some dishes to get this maximum value.

Example 1:

```
Input: satisfaction = [-1,-8,0,5,-9]
Output: 14
Explanation: After Removing the second and last dish, the maximum total like-time coefficient will be equal to (-1*1 + 0*2 + 5*3 = 14).
Each dish is prepared in one unit of time.
```

Example 2:

```
Input: satisfaction = [4,3,2]
Output: 20
Explanation: Dishes can be prepared in any order, (2*1 + 3*2 + 4*3 = 20)
```

Example 3:

```
Input: satisfaction = [-1,-4,-5]
Output: 0
Explanation: People do not like the dishes. No dish is prepared.
```

Constraints:

- `n == satisfaction.length`
- `1 <= n <= 500`
- `-1000 <= satisfaction[i] <= 1000`