# 2548. Maximum Price to Fill a Bag Premium

Medium | Topics | Companies | Hint

You are given a 2D integer array `items` where `items[i] = [price_i, weight_i]` denotes the price and weight of the `i^th` item, respectively.

You are also given a **positive** integer `capacity`.

Each item can be divided into two items with ratios `part1` and `part2`, where `part1 + part2 == 1`.

- The weight of the first item is `weight_i * part1` and the price of the first item is `price_i * part1`.
- Similarly, the weight of the second item is `weight_i * part2` and the price of the second item is `price_i * part2`.

Return ***the maximum total price*** *to fill a bag of capacity* `capacity` *with given items*. If it is impossible to fill a bag return `-1`. Answers within `10^-5` of the **actual answer** will be considered accepted.

**Example 1:**

> **Input:** items = [[50,1],[10,8]], capacity = 5
> **Output:** 55.00000
> **Explanation:**
> We divide the 2nd item into two parts with part1 = 0.5 and part2 = 0.5.
> The price and weight of the 1st item are 5, 4. And similarly, the price and the weight of the 2nd item are 5, 4.
> The array items after operation becomes [[50,1],[5,4],[5,4]].
> To fill a bag with capacity 5 we take the 1st element with a price of 50 and the 2nd element with a price of 5.
> It can be proved that 55.0 is the maximum total price that we can achieve.

**Example 2:**

> **Input:** items = [[100,30]], capacity = 50
> **Output:** -1.00000
> **Explanation:** It is impossible to fill a bag with the given item.

**Constraints:**

- `1 <= items.length <= 10^5`
- `items[i].length == 2`
- `1 <= price_i, weight_i <= 10^4`
- `1 <= capacity <= 10^9`

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

Yes No

Accepted 1.5K | Submissions 2.3K | Acceptance Rate 66.1%

Topics

Array Greedy Sorting

Companies

0 - 6 months

Microsoft 2

Hint 1

If the total weight of the items is less than the capacity, then it is impossible to fill a bag.

Hint 2

The intended solution greedily chooses items to fill a bag.

Hint 3

Sort items in decreasing order of price/weight and greedily fill a bag. The main intuition behind the greedy strategy is that we try to take the highest possible price for 1 unit of weight.

Discussion (5)