

853. Car Fleet

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📌 Difficulty	Medium
🔗 LC Url	https://leetcode.com/problems/car-fleet/
📌 Importance	
🏷️ Tag	NEET Stack
📺 Video	

There are `n` cars going to the same destination along a one-lane road. The destination is `target` miles away.

You are given two integer array `position` and `speed`, both of length `n`, where `position[i]` is the position of the `i`th car and `speed[i]` is the speed of the `i`th car (in miles per hour).

A car can never pass another car ahead of it, but it can catch up to it and drive bumper to bumper **at the same speed**. The faster car will **slow down** to match the slower car's speed. The distance between these two cars is ignored (i.e., they are assumed to have the same position).

A **car fleet** is some non-empty set of cars driving at the same position and same speed. Note that a single car is also a car fleet.

If a car catches up to a car fleet right at the destination point, it will still be considered as one car fleet.

Return *the number of car fleets that will arrive at the destination*.

Example 1:

```
Input: target = 12, position = [10,8,0,5,3], speed = [2,4,1,1,3]
Output: 3
Explanation:
The cars starting at 10 (speed 2) and 8 (speed 4) become a fleet, meeting each other at 12.
The car starting at 0 does not catch up to any other car, so it is a fleet by itself.
The cars starting at 5 (speed 1) and 3 (speed 3) become a fleet, meeting each other at 6.
```

The fleet moves at speed 1 until it reaches target.
Note that no other cars meet these fleets before the destination, so the answer is 3.

Example 2:

Input: target = 10, position = [3], speed = [3]
Output: 1
Explanation: There is only one car, hence there is only one fleet.

Example 3:

Input: target = 100, position = [0,2,4], speed = [4,2,1]
Output: 1
Explanation:
The cars starting at 0 (speed 4) and 2 (speed 2) become a fleet, meeting each other at 4.
The fleet moves at speed 2.
Then, the fleet (speed 2) and the car starting at 4 (speed 1) become one fleet, meeting each other at 6. The fleet moves at speed 1 until it reaches target.

Constraints:

- `n == position.length == speed.length`
- `1 <= n <= 10`
- `0 < target <= 10`
- `0 <= position[i] < target`
- All the values of `position` are **unique**.
- `0 < speed[i] <= 10`

Solution

```
class Solution:
    def carFleet(self, target: int, position: List[int], speed: List[int]) -> int:
        pair = [(p, s) for p, s in zip(position, speed)]
        pair.sort(reverse=True)
        stack = []
        for p, s in pair: # Reverse Sorted Order
            stack.append((target - p) / s)
            if len(stack) >= 2 and stack[-1] <= stack[-2]:
```

```
        stack.pop()  
    return len(stack)
```