1058. Minimize Rounding Error to Meet Target Premium

Medium | Topics | Companies | Hint

Given an array of `prices` `[p1,p2...,pn]` and a `target`, round each price `pi` to `Roundi(pi)` so that the rounded array `[Round1(p1),Round2(p2)...,Roundn(pn)]` sums to the given `target`. Each operation `Roundi(pi)` could be either `Floor(pi)` or `Ceil(pi)`.

Return the string `"-1"` if the rounded array is impossible to sum to `target`. Otherwise, return the smallest rounding error, which is defined as `Σ |Roundi(pi) - (pi)|` for `i` from `1` to `n`, as a string with three places after the decimal.

Example 1:

```
Input: prices = ["0.700","2.800","4.900"], target = 8
Output: "1.000"
Explanation:
Use Floor, Ceil and Ceil operations to get (0.7 - 0) + (3 - 2.8) + (5 - 4.9) = 0.7 + 0.2 + 0.1 = 1.0 .
```

Example 2:

```
Input: prices = ["1.500","2.500","3.500"], target = 10
Output: "-1"
Explanation: It is impossible to meet the target.
```

Example 3:

```
Input: prices = ["1.500","2.500","3.500"], target = 9
Output: "1.500"
```

Constraints:

- `1 <= prices.length <= 500`
- Each string `prices[i]` represents a real number in the range `[0.0, 1000.0]` and has exactly 3 decimal places.
- `0 <= target <= 10^6`

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

Yes No

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Topics

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Hint 1

If we have integer values in the array then we just need to subtract the target those integer values, so we reduced the problem.

Hint 2

Similarly if we have non integer values we have two options to put them flor(value) or ceil(value) = floor(value) + 1, so the idea is to just subtract floor(value).

Hint 3

Now the problem is different for each position we can sum just add 0 or 1 in order to sum the target, minimizing the deltas. This can be solved with DP.

Discussion (3)