

1058. Minimize Rounding Error to Meet Target

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Given an array of `prices`  $[p_1, p_2, \dots, p_n]$  and a `target`, round each price  $p_i$  to  $\text{Round}_i(p_i)$  so that the rounded array  $[\text{Round}_1(p_1), \text{Round}_2(p_2) \dots, \text{Round}_n(p_n)]$  sums to the given `target`. Each operation  $\text{Round}_i(p_i)$  could be either  $\text{Floor}(p_i)$  or  $\text{Ceil}(p_i)$ .

Return the string `"-1"` if the rounded array is impossible to sum to `target`. Otherwise, return the smallest rounding error, which is defined as  $\sum |\text{Round}_i(p_i) - (p_i)|$  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 <= 106`

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Hide 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.

Hide Hint 2

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

Hide 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.

1class Solution {  
2public String minimizeError(String[] prices, int target) {  
3  
4 }  
5}