[CS 11 25.1] HOPE 2a – Cakevin's Cake Shop

Cheatsheet is available here: https://oj.dcs.upd.edu.ph/cs11cheatsheet/

Problem Statement

Cakevin runs a shop that sells n cakes numbered 0 to $n-1$, and for each i from 0 to $n-1$, cake i is sliced into s_i pieces. A cake that is sliced into d pieces is worth d tokens.

There are m groups of customers that will enter the shop, numbered 0 to $m-1$. The jth group consists of p_j people. Each group of people will buy all cakes where they can evenly share the slices among themselves, without leaving any pieces behind. For example, a group of 3 people will buy a cake that is sliced into 9 pieces, but not a cake that is sliced into 5 pieces.

How many tokens will Cakevin earn from each group of customers?

If some group buys cake i, assume that Cakevin immediately bakes another cake i and slices it into s_i pieces.

Task Details

Your task is to implement a function named `earnings`, which should start like this:

```
def earnings(slices, groups):
```

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Here,

- `slices` is a `list` of integers of length n, corresponding to the number of slices of each cake.
- `groups` is a `list` of integers of length m, corresponding to the sizes of each group.

The function must return a list of integers of length m, where the jth element in this sequence is the number of tokens Cakevin earns from the jth group.

Restrictions

- Loops and lists are allowed.
- Sets and dictionaries are allowed.
- Generators and comprehensions are **disallowed**.
- Recursion is **disallowed**. (The recursion limit has been greatly reduced.)
- Your source code must have at most 500 bytes.

Examples

Example 1 Function Call

```
earnings([2, 10, 15], [1, 3, 5])
```

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Example 1 Return Value

```
[27, 15, 25]
```

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Example 1 Explanation

- The first group will buy all three cakes, so Cakevin will earn $2 + 10 + 15 = 27$ tokens from this group.
- The second group will only buy the third cake, so Cakevin will only earn 15 tokens from this group.
- The third group will only buy the second and third cakes, so Cakevin will only earn $10 + 15 = 25$ tokens from this group.

Constraints

- The function `earnings` will be called at most $6{,}000$ times.
- $1 \le n \le 6{,}000$
- $1 \le s_i \le 10^{20}$
- $1 \le m \le 6{,}000$
- $1 \le p_j \le 10^{20}$
- The sum of the ns across all test cases is at most $12{,}000$.
- The sum of the ms across all test cases is at most $12{,}000$.

Scoring

Note: New tests may be added and all submissions may be rejudged at a later time. (All future tests will satisfy the constraints.)

- You get 90 ❤️ points if you solve all test cases where:
  - $n = 1$ **or** $m = 1$.
- You get 140 🔴 points if you solve all test cases.

Clarifications

Report an issue

No clarifications have been made at this time.

Submit solution [CS 11 25.1] HOPE 2

My submissions

Points: 230 (partial)
Time limit: 12.0s
Memory limit: 2G

Problem type

Allowed languages
py3