[CS 11] Prac 10b – Magtanim Ay Di Biro

Problem Statement

You have n flowers in your garden, each with a positive integer height. They form a single row. We label the flowers 1 to n from left to right, so flower 1 is the leftmost, while flower n is the rightmost.

Every day (for q days), you decide to do one of two things:

1. You water every single flower once. Every time a flower is watered, its height increases by 2.
2. Given i and j such that $1 \leq i \leq j \leq n$, you compute the total height of flowers i to j, inclusive.

For each action of the second type above, what is the total height that you obtain?

Task Details

Your task is to implement a function called `flower_heights`. This function has two parameters:

- the first parameter is a `tuple`/`list` of n `int`s denoting the initial heights of the flowers.
- the second parameter is a `tuple`/`list` of q `tuple`s, each representing an action for the next days. Each element is either:
  - `('water',)` denoting an action of the first type.
  - `('total', i, j)` denoting an action of the second type. Here, i and j are `int`s with $1 \leq i \leq j \leq n$.

The function must return a `list` of `int`s denoting the total heights that you obtain for all actions of the second type, in the order they appear in the input.

Restrictions

(See 10a for more restrictions)

For this problem in particular:

- The source code limit is 2000.

Example Calls

Example 1 Function Call

```
flower_heights((3, 1, 4, 1, 5, 9), [
    ('total', 2, 4),
    ('total', 3, 3),
    ('total', 5, 6),
    ('water',),
    ('total', 2, 4),
    ('total', 5, 6),
    ('water',),
    ('water',),
    ('water',),
    ('water',),
    ('water',),
    ('water',),
    ('total', 3, 3),
    ('water',),
])
```

Example 1 Return Value

```
[6, 4, 14, 12, 18, 18]
```

Constraints

- The function `flower_heights` will be called at most $60{,}000$ times.
- $0 \leq n \leq 250{,}000$
- $0 \leq q \leq 250{,}000$
- The sum of ns across all calls will be $\leq 250{,}000$.
- The sum of qs across all calls will be $\leq 250{,}000$.
- Each initial height value is between 1 and 10^{10}.

Scoring

- You get 60 ❤️ points if you solve all test cases where:
  - $n \leq 50$
  - $q \leq 50$
  - The sum of the ns across all calls will be 500.
  - The sum of the qs across all calls will be 500.
- You get 60 ❤️ points if you solve all test cases where:
  - $n \leq 4{,}000$
  - $q \leq 4{,}000$
  - The sum of the ns across all calls will be $8{,}000$.
  - The sum of the qs across all calls will be $8{,}000$.
- You get 65 ❤️ points if you solve all test cases.

Submit solution [CS 11] Practice 10

My submissions

Points: 185 (partial)
Time limit: 4.0s
Memory limit: 1G

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Problem type

Allowed languages ~~NONE~~, py3

Clarifications

Report an issue

No clarifications have been made at this time.