[CS 11] Prac 1h – Transpose

oj.dcs.upd.edu.ph/problem/cs11prac1h

Submit solution
Points: 100 (partial)

Time limit: 4.0s

Memory limit: 1G

Author:
kvatienza (Kevin Atienza)
Problem type

Allowed languages

~~NONE~~, py3

Problem Statement

Given a grid, its **transpose** is obtained by flipping it along the down-right diagonal, starting with the topleftmost corner. For example, the transpose of

Copy

```
1 2 3
4 5 6
7 8 9
8 7 6
```

is

Copy

```
1 4 7 8
2 5 8 7
3 6 9 6
```

This operation appears in linear algebra; it encodes the **adjoint** of a linear map, if we look at the maps' matrix representations.

Given a grid, represented as a `tuple` of `tuple` of `int`s, what is its ranspose?

Task Details

Your task is to implement a function called `transpose`. This function has a single parameter denoting the grid. It is a `tuple` of `tuple` of `int`s.

The function must return a value of the same type denoting the transpose.

Restrictions

For this problem:

- Assignment is allowed.
- Recursion is allowed.
- Up to 66 function definitions are allowed.
- Comprehensions are **disallowed**.
- `range` is **disallowed**.
- The `abs` symbol is now allowed.
- The source code limit is 10001000.

Example Calls

Example 1 Function Call

Copy

```
transpose((
    (1, 2, 3),
    (4, 5, 6),
    (7, 8, 9),
    (8, 7, 6),
))
```

Example 1 Return Value

Copy

```
(
    (1, 4, 7, 8),
    (2, 5, 8, 7),
    (3, 6, 9, 6),
)
```

Example 2 Function Call

Copy

```
transpose((
    (1,),
))
```

Example 2 Return Value

Copy

```
(
    (1,),
)
```

Constraints

- The function `transpose` will be called at most 1,0001,000 times.
- The number of rows and the number of columns in the grid are between 11 and 2020, inclusive.
- Each element of the grid is an integer with absolute value at most 1010.

Scoring

You get 100100 ❤️ points if you solve all test cases.
Report an issue

Clarifications

No clarifications have been made at this time.