[CS 11 25.1] Lab 4h – In and Out

Submit solution [CS 11 25.1] Lab Exercise 4

My submissions

✓ **Points:** 200 (partial)

Time limit: 8.0s

Memory limit: 2G

Problem type

Allowed languages
py3

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

Problem Statement

The Department of Cubes and Squares (henceforth referred to as DCS) is a square whose bottom-left and top-right corners are located at the points (a, b) and (c, d), respectively.

There are n people located at the points $(x_1, y_1), (x_2, y_2), \cdots, (x_n, y_n)$. Determine which people are inside DCS and which people are outside DCS.

It is guaranteed that no person is on the boundary of DCS.

Task Details

Your task is to implement a function named `in_and_out`, which should have the following *signature*:

```
def in_and_out(bl, tr, people):
```

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The above says that it has three arguments `bl`, `tr`, and `people`.

- `bl` is a pair (`tuple` of length 2) of two integers denoting (a, b).
- `tr` is a pair (`tuple` of length 2) of two integers denoting (c, d).
- `people` is a sequence of n pairs, where each pair consists of a string and a pair denoting a person's name and current position, respectively.

The function must return two lists of strings. The first list should contain the names of all people that are inside DCS, and the second list should contain the names of all people that are outside DCS. The names should appear in the order they were given in the input.

Restrictions

- The following symbols can be used:
  - `list`, `set`, `dict`, `enumerate`, `append`, `pop`, `extend`, `remove`, `sort`, `sorted`, `insert`, `clear`, `reverse`.
- Loops are allowed.
- Generators and comprehensions are *disallowed*.
- Recursion is *disallowed*.
- Your source code must have at most 600 bytes.

Examples

Example 1 Function Call

```
in_and_out((2, 2), (4, 4), [("Kevin", (1, 3)), ("Jem", (3, 3
```

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Example 1 Return Value

```
(["Jem"], ["Kevin"])
```

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Constraints

- The function `in_and_out` will be called at most $70{,}000$ times.
- $0 \leq n \leq 350{,}000$
- The sum of n across all calls to `in_and_out` will be $\leq 350{,}000$.
- For each point (x, y), $|x|, |y| \leq 10^8$.
- (a, b) is lower-left of (c, d).
- No person is on the boundary of DCS.
- Each name is a string of English letters with length at most 5.

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 25 ❤ points if you solve all test cases where:
  - $n \leq 50$
  - The sum of n across all calls to `in_and_out` will be ≤ 800.
  - For each point (x, y), $|x|, |y| \leq 100$.
- You get 50 ❤ points if you solve all test cases where:
  - $n \leq 50$
  - The sum of n across all calls to `in_and_out` will be ≤ 800.
- You get 125 ● points if you solve all test cases.

Clarifications

Report an issue

No clarifications have been made at this time.