[CS 11] Prac 9m – Sculk Spreading II

Problem Statement

The sculk in Steve's world is still spreading, and he's getting worried!

We can model the cave floor as a grid. Some of the cells in this grid are *ores*, some are *stone*, and some are *sculk*. You are given the state of the cave floor.

Every day, every stone block adjacent to a sculk block has turned into sculk!

Steve returned to the cave after d days.

What is the state of the cave floor that Steve saw?

Task Details

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

- The first is the `int` d.
- The second is a `tuple` or r `str`s, each of length c. Each cell corresponds to a block and is represented by a character:
  - `.` means a stone block.
  - `#` means an ore block.
  - `X` means a sculk block.

The function must return a `list` or r `str`s, each of length c, representing the state of the cave floor that Steve saw.

Restrictions

(See 9a for more restrictions)

For this problem in particular:

- Recursion is allowed.
- The source code limit is 2000.

Example Calls

Example 1 Function Call

```
spread_d(1, (
    '.....X',
    '.X...#',
    '....#.',
    '..#X..',
    '...#..',
    '.X.X..',
    '.X....',
))
```

Example 1 Return Value

```
[
    '.X..XX',
    'XXX..#',
    '.X.X#.',
    '..#XX.',
    '.X.#..',
    'XXXXX.',
    'XXXX..',
]
```

Example 2 Function Call

```
spread_d(2, (
    '.....X',
    '.X...#',
    '....#.',
    '..#X..',
    '...#..',
    '.X.X..',
    '.X....',
))
```

Example 2 Return Value

```
[
    'XXXXXX',
    'XXXXX#',
    'XXXX#.',
    '.X#XXX',
    'XXX#X.',
    'XXXXXX',
    'XXXXX.',
]
```

Constraints

- The function `spread_d` will be called at most $60{,}000$ times.
- The sum of rc across all inputs will be at most $3{,}000{,}000$.
- $1 \le r, c \le 1{,}200$
- $0 \le d \le 10^{50}$

Scoring

- You get 60 ❤️ points if you solve all test cases where:
  - $r, c \le 8$
  - ~d \le 8
  - The sum of rc is at most 600.
- You get 60 ❤️ points if you solve all test cases where:
  - $r, c \le 60$
  - $d \le 42$
  - The sum of rc is at most $12{,}000$.
- You get 60 ❤️ points if you solve all test cases where:
  - $d \le 42$
  - The sum of rc is at most $2{,}000{,}000$.
- You get 50 ❤️ points if you solve all test cases.

Submit solution

[CS 11] Practice 9 ❤️

Points: 230 (partial)

Time limit: 7.0s

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.