Editorial for CCC '23 S3 - Palindromic Poster

Remember to use this editorial **only** when stuck, and **not to copy-paste code from it**. Please be respectful to the problem author and editorialist.
Submitting an official solution before solving the problem yourself is a bannable offence.

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Subtask 1

For this subtask, since $R = 1$ and $C = 1$, we can try and make only the first row and column a palindrome. One way to do this is to fill the first row and column with the letter `a` and fill the rest of the grid with the letter `b`.

Subtask 2

Because there are so few cases, it suffices to solve this subtask on paper and hardcode the answers. To reduce the amount of casework, notice that if we have a solution for (R, C), we can get a solution for (C, R) by flipping the grid.

Another possible approach is to write a brute force since there are only four important possibilities for each cell.

Subtask 3

This subtask is intended to aid students in thinking about the problem.

Subtask 4

The solutions to subtasks 1 and 2 should give some intuition here. From subtask 1, we propose the following general solution:

Fill the first R rows and the first C columns with the letter `a` and fill the rest of the grid with the letter `b`.

We notice that this fails when $R = 0$, $C = 0$, $R = N$ or $C = M$. We can handle these in pairs since we can flip the grid.

If $R = 0$, we can fill the first $M - 1$ columns with the letter `a`, and the last column with the letter `b`, and then increment the last $M - C$ characters of the last row. For instance, for the input `4 4 0 2` we can output:

```
aaab
aaab
aaab
aabc
```

Copy

`b` characters. For instance, for the input `4 4 4 2`, we can output:

```
baab
aaaa
aaaa
aaaa
```

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However, this fails if C is not the same parity as M, that is, if we cannot get C by subtracting 2 an integer number of times from M.

In this case, it depends: if M is odd, we can use the middle column. For instance, for the input `5 5 5 2`:

```
babab
aaaaa
aaaaa
aaaaa
aaaaa
```

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However, the input `4 4 4 1` is impossible since there is no middle column.

We can handle $C = 0$ and $C = M$ symmetrically by flipping the inputs, processing, and then flipping the output.

Comments

There are no comments at the moment.