



# 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 [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

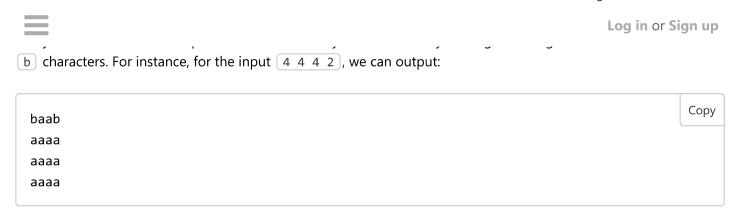
The solutions to subtasks 1 and 2 should give some intuition here. From subtask 1, we propose the following general solution:

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.

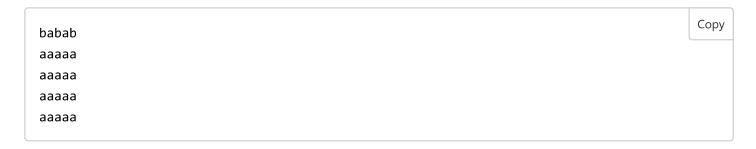
If R=0, we can fill the first M-1 columns with the letter  $\ \ \,$  and the last column with the letter  $\ \ \,$  b, and then increment the last M-C characters of the last row. For instance, for the input  $\ \ \,$  4 0 2 we can output:

aaab	Сору
aaab	
aaab aaab	
aabc	



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  $\begin{bmatrix} 5 & 5 & 5 & 2 \end{bmatrix}$ :



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.

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