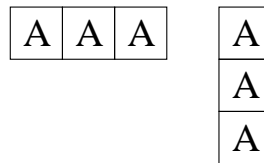# Tiles
P87829_en

Olimpiada Informática Española — Final 2007 (2007)

Your task is to write a program that tiles a rectangle $f \times c$ with tiles $a \times b$. For each one of the 26 uppercase letters, there exactly is a vertical tile and a horizontal tile available, of which can be used at most one. For instance, if $a = 1$ and $b = 3$, we can use at most one of these two tiles:

The rectangle must be totally covered, and any piece of the used tiles can be left. If there are more than a way to tile, your prorgram must find the less in alphabetical order, reading from top to bottom and from left to right. In the case that does not exist any possible way, your program must indicate it.

Input

The input consists of a series of lines, each one with a, b, f and c in this order. All the numbers are between 1 and 50.

Output

For each line of the input, your program must print the least lexicographically tiling, or "!!!" if does not exist any. Separate the answers with a line in white.

Scoring

- **TestA:**   15 Points

    Some test cases will exclusively contain cases like the ones in the instance of input 1, in which $a = 1$, and where f and c are multiples of b.

- **TestB:**   20 Points

    Some test cases will also contain cases like the ones in the instance of input 2, in which f and c are multiples of a and b.

- **TestC:**   65 Points

    Other test cases will contain cases of every kind.

Sample input 1

```
1 3 3 3
1 3 3 6
1 1 3 9
1 1 2 13
```

Sample output 1

```
AAA
BBB
CCC
```

!!!

ABCDEFGHIJKLM
NOPQRSTUVWXYZ

| ## Sample input 2 | ## Sample output 2 |

2 2 4 6
3 4 12 12
3 3 48 48

AABBCC
AABBCC
DDEEFF
DDEEFF

AAAABBBBCCCC
AAAABBBBCCCC
AAAABBBBCCCC
DDDDEEEEFFFF
DDDDEEEEFFFF
DDDDEEEEFFFF
GGGGHHHHIIII
GGGGHHHHIIII
GGGGHHHHIIII
JJJJKKKKLLLL
JJJJKKKKLLLL
JJJJKKKKLLLL

!!!

| ## Sample input 3 | ## Sample output 3 |

3 1 3 5
3 1 2 5
1 20 15 15
1 6 9 8
4 3 7 12
4 3 12 7
2 3 9 6

AAABC
DDDBC
EEEBC

!!!

!!!

!!!

AAAABBBBCCCC
AAAABBBBCCCC
AAAABBBBCCCC
DDDEEEFFFGGG
DDDEEEFFFGGG
DDDEEEFFFGGG
DDDEEEFFFGGG

AAAABBB
AAAABBB
AAAABBB
CCCCBBB
CCCCDDD
CCCCDDD
EEEEDDD
EEEEDDD
EEEEFFF
GGGGFFF
GGGGFFF
GGGGFFF

AAABBB
AAABBB
CCCDDD
CCCDDD
EEEFFF
EEEFFF
GGHHII
GGHHII
GGHHII

Problem information

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