

D - ブロックの配置 / Placing Blocks

Time limit : 5sec / Memory limit : 256MB

Score : 100 points

Problem Statement

You are given three pieces composed of 1×1 unit square blocks. Each piece is connected and falls within a 3×3 square. These pieces are named A, B and C .

Here, a *connected* piece is a piece that satisfies the following two conditions:

- The piece consists of at least one block.
- All the blocks in the piece can be reached from a certain block in the piece by repeatedly moving to the vertically or horizontally adjacent block.

In the input, the piece A is described by three strings A_1, A_2 and A_3 , each of length 3. The existence and non-existence of a block in each position is represented by a character: '#' indicates existence of a unit block, and '.' indicates non-existence of a unit block.

The j -th character in the string A_j corresponds to the position at the i -th row from the top and the j -th column from the left in the piece A ($1 \leq i, j \leq 3$).

Similarly, the piece B is described by three strings B_1, B_2 and B_3 , and the piece C is described by three strings C_1, C_2 and C_3 , each of length 3.

The j -th character in the string B_j corresponds to the position at the i -th row from the top and the j -th column from the left in the piece B ($1 \leq i, j \leq 3$).

The j -th character in the string C_j corresponds to the position at the i -th row from the top and the j -th column from the left in the piece C ($1 \leq i, j \leq 3$).

Your task is to place these three pieces without overlapping so that all of them fall within a rectangle that is as small as possible. Find the minimum possible area of that rectangle.

Here, each side of the rectangle must be parallel or perpendicular to each side of each block in the pieces. The operation you may perform on the pieces are: rotating each piece by 90 degrees, flipping each piece horizontally, and shifting each piece horizontally and vertically. On each piece, these operations can be performed any number of times in any order. No other operation is allowed.

Constraints

- $A_i, B_i, C_i (1 \leq i \leq 3)$ consist of ' # ' and ' . '.
- Each piece is connected.
- No piece consists only of ' . '.

Input

The input is given from Standard Input in the following format:

```
A1  B1  C1
A2  B2  C2
A3  B3  C3
```

Output

Follow the problem statement and print the expected output.

Sample Input 1

```
..# ..# .#.
### ### .#.
..# #.. .#.
Copy
```

Sample Output 1

```
16
Copy
```

- One optimal placement is as follows:

```
CCCA
BAAA
BBBA
..B.
```

Sample Input 2

```
### ... ..
#.# ... ..#
Copy
```

##. .#. ...

Sample Output 2

9

Copy

- One optimal placement is as follows:

AAA
ABA
AAC

Sample Input 3

#. #..
#.. #. ...
#.. .## ...

Copy

Sample Output 3

12

Copy

Sample Input 4

###

Copy

Sample Output 4

27

Copy