Separate the chocolate

Chinese Version
Russian Version

Tom and Derpina have a rectangular shaped chocolate bar with chocolates labeled T, D and U. They want to split the bar into exactly two pieces such that:

- Tom's piece can not contain any chocolate labeled D and similarly, Derpina's piece can not contain any chocolate labeled T and U can be used by either of the two.
- All chocolates in each piece must be connected (two chocolates are connected if they share an edge), i.e. the chocolates should form one connected component
- The absolute difference between the number of chocolates in pieces should be at most K
- After dividing it into exactly two pieces, in any piece, there should not be 4 adjacent chocolates that form a square, i.e. there should not be a fragment like this:
  XX
  XX

Input Format

The first line of the input contains 3 integers M, N and K separated by a single space.
M lines follow, each of which contains N characters. Each character is 'T','D' or 'U'.

Constraints

$0 \leq M, N \leq 8$
$0 \leq K \leq M * N$

Output Format

A single line containing the number of ways to divide the chocolate bar.

Sample Input

```
2 2 4
UU
UU
```

Sample Output

```
12
```

Explanation

Note: In the explanation T and D are used to represent, which parts belong to Tom and Derpina respectively. There are $2^4 = 16$ possible separations. The 4 invalid are:

```
TT
TT

DD
DD

DT
TD

TD
DT
```

Some of the valid ones are:

```
TD
TD

TT
DD

DD
TT

DT
DT
```