Rotations

Rotate a given R x C table of letters clockwise by a given angle K (in degrees), a multiple of 45.

Input

The first line contains two integers R and C, the number of rows and columns in the table respectively.

The next R lines each contain a string of C lowercase letters. The i'th line represents the i'th row of the table.

The last line contains an integer K, a multiple of 45.

Output

Print the table rotated K degrees clockwise, exactly as shown in the examples. There should not be any trailing whitespace after the last character in a line.

Constraints

0 < R < 12

0 < C < 12

0 <= K <= 360

Example

Input 1:
3 7
pxwdhey
sremkev
ujnuhhv
90

Output 1:
usp
jrx
new
umd
hkh
hee
vvy

Input 2:
1 5

qvydg
45

Output 2:
q
 v
  y
   d
    g

Input 3:
5 5
abcde
bcdef
cdefg
defgh
efghi
315

Output 3:
    e
   d f
  c e g
 b d f h
a c e g i
 b d f h
  c e g
   d f
    e