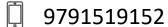


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Matrix rotation for input 4

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

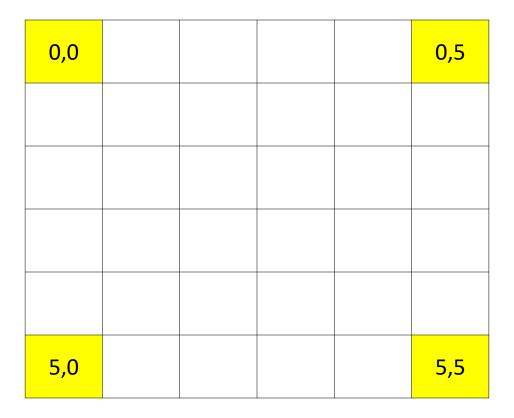
Matrix after rotating 90°

13	9	5	1
14	10	6	2
15	11	7	3
16	12	8	4

How to rotate?

0,0	0,1	0,2	0,3
1,0	1,1	1,2	1,3
2,0	2,1	2,2	2,3
3,0	3,1	3,2	3,3

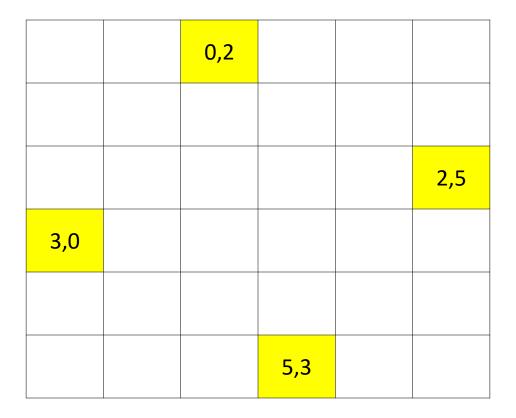
Swapping



Swapping



Swapping



Pseudo code

```
input angle
total = (angle / 90) % 4
while total > 0:
        for i = 0 to n - 1:
                 for j = 0 to n - 1:
                         temp[j][n - i - 1] = matrix[i][j]
        for i = 0 to n - 1:
                 for j = 0 to n - 1:
                          matrix[i][j] = temp[i][j]
        total--
```

- You are given a square matrix of dimension N. Let this matrix be called A. Your task is to rotate A in clockwise direction by S degrees, where S is angle of rotation. On the matrix, there will be 3 types of operations viz.
- Rotation
 - Rotate the matrix A by angle S, presented as input in form of A S
- Querying
 - Query the element at row K and column L, presented as input in form of Q K L
- Updation
 - Update the element at row X and column Y with value Z, presented as input in form of U X Y Z
- Print the output of individual operations as depicted in Output Specification.

- Input Format:
- Input will consist of three parts, viz.
 - Size of the matrix (N)
 - The matrix itself (A = N * N)
 - Various operations on the matrix, one operation on each line. (Beginning either with A, Q or U)
 - -1 will represent end of input
- Note:
 - Angle of rotation will always be multiples of 90 degrees only.
 - All Update operations happen only on the initial matrix. After update all the previous rotations have to be applied on the updated matrix

Output Format:

• For each Query operation print the element present at K-L location of the matrix in its current state.

Constraints:

- 1<=N<=1000
- 1<=Aij<=1000
- 0<=S<=160000
- 1<=K, L<=N
- 1<=Q<=100000

Sample Input and Output

Input

2

12

3 4

A 90

Q 1 1

Q12

A 90

Q 1 1

U116

Q 2 2

-1

Output

3

1

4

6

Pseudo code

```
input matrix
totalangle = 0
while true:
            input choice
            if choice == 'A':
                        input angle
                         rotate(angle)
                        totalangle = totalangle + angle
            else if choice == 'Q':
                        input row, col
                         print matrix[row - 1][col - 1]
            else if choice == 'U':
                         input row, col, value
                         rotate(360 - totalangle % 360)
                         matrix[row - 1][col - 1] = value
                         rotate(totalangle)
            else:
                         break
```

Pseudo code: rotate

```
total = (angle / 90) % 4
while total > 0:
        for i = 0 to n - 1:
                 for j = 0 to n - 1:
                         temp[j][n - i - 1] = matrix[i][j]
        for i = 0 to n - 1:
                 for j = 0 to n - 1:
                          matrix[i][j] = temp[i][j]
        total--
```

Queries?

Thank You...!