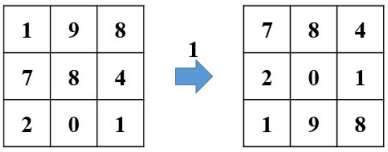
Problem B
Dancing Matrix

Time limit: **3 seconds**
Memory limit: **1024 megabytes**

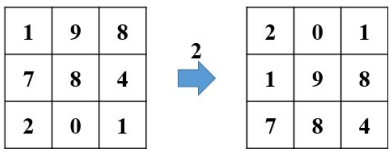
Problem Description

The matrix will move or rotate like the example below:

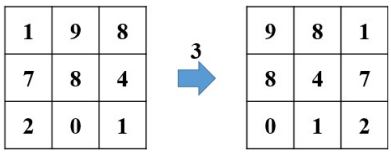
If the operation is `1` (up), then each row will move up one row, and the top row will go to the bottom.



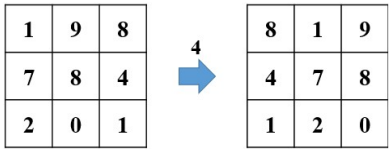
If the operation is `2` (down), then each row will move down one row, and the bottom row will go to the top.



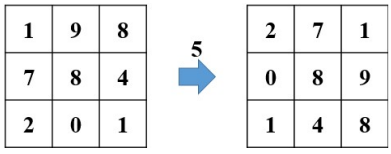
If the operation is `3` (left), then each column will move left one column, and the leftmost column will go to the rightmost.



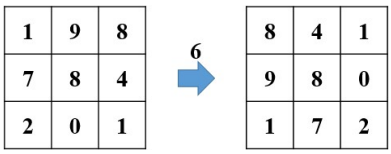
If the operation is `4` (right), then each column will move right one column, and the rightmost column will go to the leftmost.



If the operation is `5` (clockwise), then the matrix will rotate right, and rows will become columns. For rows, the top row will become the rightmost column, the second top row will become the second rightmost column, and so on. For columns, the leftmost column will become the top row, the second leftmost column will become the second top row, and so on.



If the operation is 6 (counterclockwise), then the matrix will rotate left, and rows will become columns. For rows, the top row will become the leftmost column, the second top row will become the second leftmost column, and so on. For columns, the rightmost column will become the top row, and the second rightmost column will become the second top row, and so on.



Give you a matrix and some operations, please output the result matrix after applying all the operations.

Input Format

Your program is to read from standard input. The input consists of T test cases. The number of test cases T is given in the first line of the input. Each test case, the first line contains two integers n and m. The next n lines contain an $n \times m$ matrix. The last line contains $k + 1$ numbers separated by a blank, the k is given as the first number, and next k numbers, each one means an operation.

Output Format

Your program is to write to standard output. Each test case, print the matrix after applying all the operations. Each test case is separated by a blank line. Please see the sample output.

Technical Specification

- $1 \leq T \leq 50$
- $3 \leq n, m \leq 100$
- $1 \leq k \leq 50$
- The values in the matrix are the integers in the range of [-9, 9].
- The only possible operations are 1, 2, 3, 4, 5, and 6.

Sample Input 1

```
6
3 3
1 9 8
7 8 4
2 0 1
1 1
3 3
1 9 8
7 8 4
2 0 1
1 2
```

Sample Output 1

```
7 8 4
2 0 1
1 9 8

2 0 1
1 9 8
7 8 4

9 8 1
8 4 7
0 1 2
```

```
3 3
1 9 8
7 8 4
2 0 1
1 3
3 3
1 9 8
7 8 4
2 0 1
1 4
3 3
1 9 8
7 8 4
2 0 1
1 5
3 3
1 9 8
7 8 4
2 0 1
1 6
```

```

8 1 9
4 7 8
1 2 0

2 7 1
0 8 9
1 4 8

8 4 1
9 8 0
1 7 2
```

Sample Input 2

```
1
3 3
1 9 8
7 8 4
2 0 1
6 6 5 4 3 2 1
```

Sample Output 2

```
1 9 8
7 8 4
2 0 1
```

Almost blank page