

Printing Spiral Digits

You are given two integers, the number of Rows(N) and the number of Columns(M) of a matrix. Your task is to print numbers from 1 to $N \cdot M$ in a spiral form. The spiral number begins from the top-left corner, continues to the top right corner, then bottom right corner, then goes to bottom left corner, and goes back up to 1 row below the top row, and then the pattern continues until the matrix is full. If the largest number is more than 9, then print 0 before the number if the number is less than 10 (see input examples for clarification).

Input

Input starts with an integer T ($1 \leq T \leq 20$), denoting the number of test cases. Each of the test cases consists of integer N and M ($1 \leq N \cdot M \leq 99$), denoting the number of rows and columns of the matrix.

Output

For each case print "Case X:", where X ($1 \leq X \leq T$) is the case number, followed by a newline. There must be no trailing spaces at the end of printed lines, neither empty characters. After that, print the sets of number in spiral form. Print a newline after each testcase.

Example

Input:

```
3
4 5
3 3
2 3
```

Output:

```
Case 1:
01 02 03 04 05
14 15 16 17 06
13 20 19 18 07
12 11 10 09 08
Case 2:
1 2 3
8 9 4
7 6 5
Case 3:
1 2 3
6 5 4
```