Blind Queens

Lea has recently learned of the n queens problem. The task for this problem is to count in how many ways one can place n chess queens on a n by n checkerboard so that no two queens can capture each other. Of course Lea has solved this trivial problem in no time and knows for example that for $n = 4$ there are two solutions, but those are the same up to reflection. For $n = 27$, there are $29.363.495.934.315.694$ solutions up to rotations and reflections.

Since this problem was so easy, Lea decided to try a variation: What if a queen can only see queens at a Manhattan distance of at most k? Furthermore, she introduces queens of multiple colors, and each queen can only see queens of the same color. This seems to be much harder, so she asked you to compute the number of solutions, the number of solutions up to rotations, and even the number of solutions up to rotations and reflections. There can still only be at most one queen per square.

Input

The first line of the input contains an integer t. t test cases follow.

Each test case consists of a single line contatining three integers n k c, the size of the board n, the distance k and the number of colors c.

Output

For each test case, output one line containing "Case #i: x y z" where i is its number, starting at 1, x is the number of configurations possible, y is the number of configurations up to rotations, and z is the number of configurations up to rotations and reflections.

Constraints

- $1 \leq t \leq 25$
- $1 \leq n \leq 5$
- $k = 0$
- $1 \leq c \leq 5$

Sample Input 1	Sample Output 1
2 3 0 2 2 0 3	Case #1: 512 140 102 Case #2: 81 24 21