A Divisibility

Input: Standard Input
Output: Standard Output

You are in the system of **N**-dimensional infinite hyper-grid with each hyper cell having an integer. In an N-dimensional grid the co-ordinates of a cell are denoted as $(X_1, X_2, ..., X_N)$. Any hyper cell with at least one negative co-ordinate contains the value **0** (zero). The origin hyper cell (the one with all zero co-ordinates) contains the value **1**. The value of a hyper cell with co-ordinate $(X_1, X_2, ..., X_N)$ (with all non-negative X_i) is the sum of the values in **N** hyper cells with co-ordinates $(X_1-1, X_2, ..., X_N)$, $(X_1, X_2-1, ..., X_N)$, ..., $(X_1, X_2, ..., X_N-1)$. You are given the starting and ending co-ordinate of a sub-hypercube. You need to compute how many hyper cells in this sub hypercube contain an integer **not** divisible by a given prime **P**.

Input

First line of the input contains **T (0 < T < 51)** the number of test cases. Each test case starts with a line containing **N (0 < N < 8)** the dimension of the hypercube and the prime **P (1 < P < 20)**. The second line contains **N** integers denoting the co-ordinate of the starting cell of the hypercube. The third line contains **N** integers denoting the co-ordinate of the ending cell of the hypercube. All the co-ordinates will be non negative integers with at most **15** digits.

Output

For each test case, print the serial of output followed by the number of hyper cells in the given sub hypercube that contains an integer not divisible by a given prime **P**. Since the result can be too big so output the result modulo **1000000009**. Look at the output for sample input for details.

Sample Input

```
3
3 2
4 0 4
7 9 8
4 3
0 3 0 2
6 8 1 5
5 7
1 2 3 4 5
11 12 13 14 15
```

Output for Sample Input

```
Case 1: 9
Case 2: 17
Case 3: 2515
```

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