Questions asked 1

Submissions

Sherlock and Parentheses

4pt | Not attempted **3846/5689 users** correct (68%)

7pt | Not attempted **2912/3801 users** correct (77%)

Sherlock and Watson Gym Secrets

6pt | Not attempted **1760/3710 users** correct (47%)

15pt | Not attempted **268/1026 users** correct (26%)

Watson and Intervals

8pt | Not attempted **526/1376 users** correct (38%)

17pt | Not attempted **152/284 users** correct (54%)

Sherlock and Permutation Sorting

19pt | Not attempted **44/428 users** correct (10%)

24pt | Not attempted **15/27 users** correct (56%)

Top Scores

bsbandme	100
alecsyde	100
RiverBlessPeople	100
NAFIS	100
izrak	100
dragon7	100
winoros	100
gvaibhav21	100
stonebuddha	100
VastoLorde95	100

Problem B. Sherlock and Watson Gym Secrets

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

Small input 6 points	Solve B-small
Large input 15 points	Solve B-large

Problem

Watson and Sherlock are gym buddies.

Their gym trainer has given them three numbers, **A**, **B**, and **N**, and has asked Watson and Sherlock to pick two different **positive integers** i and j, where i and j are both less than or equal to **N**. Watson is expected to eat exactly $i^{\mathbf{A}}$ sprouts every day, and Sherlock is expected to eat exactly $j^{\mathbf{B}}$ sprouts every day.

Watson and Sherlock have noticed that if the total number of sprouts eaten by them on a given day is divisible by a certain integer **K**, then they get along well that day.

So, Watson and Sherlock need your help to determine how many such pairs of **(i, j)** exist, where i != j. As the number of pairs can be really high, please output it modulo $\mathbf{10^9+7}$ **(1000000007)**.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow. Each test case consists of one line with 4 integers **A**, **B**, **N** and **K**, as described above.

Output

For each test case, output one line containing `Case #x: y`, where x is the test case number (starting from 1) and y is the required answer.

Limits

$1 \le \mathbf{T} \le 100$.
$0 \le \mathbf{A} \le 10^6$.
$0 \le \mathbf{B} \le 10^6$.

Small dataset

$1 \le \mathbf{K} \le 10000$.
$1 \le \mathbf{N} \le 1000$.

Large dataset

$1 \le \mathbf{K} \le 100000$.
$1 \le \mathbf{N} \le 10^{18}$.

Sample

Input	Output
3 1 1 5 3 1 2 4 5 1 1 2 2	Case #1: 8 Case #2: 3 Case #3: 0

In Case 1, the possible pairs are (1, 2), (1, 5), (2, 1), (2, 4), (4, 2), (4, 5), (5, 1), and (5, 4).
In Case 2, the possible pairs are (1, 2), (1, 3), and (4, 1).
In Case 3, No possible pairs are there, as i != j.

Powered by

Google Cloud Platform