Search for people, places and things

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Facebook Hacker Cup 2012 Qualification Round

This round has ended. Feel free to use the problems for practice though!

Auction

Download input file | Submit answers | **Practice mode**

You have encountered a new fancy online auction that offers lots of products. You are only interested in their strictly preferred over product B if A costs less than B and is not heavier (they may be of equal weight) or if A can have equal price).

We shall call a product A a bargain if there is no product B such that B is better than A. Similarly, we shall ca product D such that C is better than D. Note that according to our definitions, the same product may be both auctioneers sell such products though.

One day you wonder how many terrible deals and bargains are offered. The number of products, N, is too la Fortunately, you discovered that the auction manager is terribly lazy and decided to sell the products based generator.

If product i has price P_i and weight W_i, then the following holds for product i+1:

$P_i = ((A*P_{i-1} + B) \bmod M) + 1$ (for all i = 2..N)
$W_i = ((C*W_{i-1} + D) \bmod K) + 1$ (for all i = 2..N)

You carefully calculated the parameters for the generator (P_1, W_1, M, K, A, B, C and D). Now you want to ca on the site.

Input

The first line of the input file contains a single integer T: the number of test cases. T lines follow, each repres integers: N, P_1, W_1, M, K, A, B, C and D.

Output

Output T lines, one for each test case. For each case, output "Case #t: a b", where t is the test case number deals and b is the number of bargains.

Constraints

$1 \le T \le 20$
$1 \le N \le 10^{18}$
$1 \le M, K \le 10^7$
$1 \le P_1 \le M$
$1 \le W\_1 \le K$
$0 \le A,B,C,D \le 10^9$

Example input

```
5
5 1 4 5 7 1 0 1 2
3 1 3 3 3 1 0 1 1
8 1 3 3 3 1 0 1 2
13 5 7 5 9 1 3 2 5
11 2 3 5 7 11 13 17 19
```

```
Case #1: 3 3
Case #2: 3 3
Case #3: 2 3
Case #4: 2 2
Case #5: 3 1
```