Random Number Generator

Problem code: RNG

You may know how to write a random number generator (RNG) after solving this problem (SEAPROAR).

Another way to write a RNG is to use linear recurrence relation. e.g. let's consider the following linear recurrence:

$A_i = (A_{i-1} \times C_1 + A_{i-2} \times C_2 + ... + A_{i-k} \times C_k) \bmod 104857601$, for $i = k+1, k+2, ...$,

where **k** is a positive integer.

You are given initial values $A_1, A_2, ..., A_k$ and the coefficients $C_1, C_2, ..., C_k$. Then the RNG can be used to generate any A_i for **i** larger than **k**.

Your task is to calculate A_N for a given **N**.

Input

There is exactly one test case in each test file.

The first line of input contains two space-separated integers **k** and **N** as described in the statement. The second line contains **k** space-separated integers $A_1, A_2, ..., A_k$ denoting the initial values as defined in the problem statement.

Then the third line contains **k** space-separated integers $C_1, C_2, ..., C_k$, denoting the coefficients.

Output

Print a single integer denoting value of A_N.

Constraints and Subtasks

- $1 \le N \le 10^{18}$
- $0 \le A_i, C_i < 104857601$

Subtask 1: 10 points

- $1 \le k \le 3000$

Subtask 2: 90 points

- $1 \le k \le 30000$

Example

Input:
3 5
1 2 3
4 5 6

Output:
139

Explanation

$A_1 = 1$.

$A_2 = 2$.

$A_3 = 3$.

$A_4 = (A_3 \times C_1 + A_2 \times C_2 + A_1 \times C_3) \bmod 104857601 = (3 \times 4 + 2 \times 5 + 1 \times 6) \bmod 104857601 = (12 + 10 + 6) \bmod 104857601 = 28$.

$A_5 = (A_4 \times C_1 + A_3 \times C_2 + A_2 \times C_3) \bmod 104857601 = (28 \times 4 + 3 \times 5 + 2 \times 6) \bmod 104857601 = (112 + 15 + 12) \bmod 104857601 = 139$.

Author:	cgy4ever
Date Added:	12-12-2014
Time Limit:	15 sec
Source Limit:	50000 Bytes

Languages:	ADA, ASM, BASH, BF, C, C99 strict, CAML, CLOJ, CLPS, CPP 4.3.2, CPP 4.9.2, CPP14, CS2, D, ERL, FORT, FS, GO, HASK, ICK, ICON, JAVA, JS, LISP clisp, LISP sbcl, LUA, NEM, NICE, NODEJS, PAS fpc, PAS gpc, PERL, PERL6, PHP, PIKE, PRLG, PYTH, PYTH 3.1.2, RUBY, SCALA, SCM guile, SCM qobi, ST, TCL, TEXT, WSPC

SUBMIT

Comments

Need help? Post a comment. But before that please spare a moment to read the guidelines.

Your name:
shubhmsng

Comment: *

Save

CodeChef - A Platform for Aspiring Programmers

CodeChef was created as a platform to help programmers make it big in the world of algorithms, **computer programming** and **programming contests**. At CodeChef we work hard to revive the geek in you by hosting a **programming contest** at the start of the month and another smaller programming challenge in the middle of the month. We also aim to have training sessions and discussions related to **algorithms, binary search**, technicalities like **array size** and the likes. Apart from providing a platform for **programming competitions**, CodeChef also has various algorithm tutorials and forum discussions to help those who are new to the world of **computer programming**.

Practice Section - A Place to hone your 'Computer Programming Skills'

Try your hand at one of our many practice problems and submit your solution in a language of your choice. Our **programming contest** judge accepts solutions in over 35+ programming languages. Preparing for coding contests were never this much fun! Receive points, and move up through the CodeChef ranks. Use our practice section to better prepare yourself for the multiple **programming challenges** that take place through-out the month on CodeChef.

Compete - Monthly Programming Contests and Cook-offs

Here is where you can show off your **computer programming** skills. Take part in our 10 day long monthly **coding contest** and the shorter format Cook-off **coding contest**. Put yourself up for recognition and win great prizes. Our **programming contests** have prizes worth up to INR 20,000 (for Indian Community), $700 (for Global Community) and lots more CodeChef goodies up for grabs.

Programming Tools
- Online IDE
- Upcoming Coding Contests
- Contest Hosting
- Problem Setting
- CodeChef Tutorials
- CodeChef Wiki

Practice Problems
- Easy
- Medium
- Hard
- Challenge
- Peer
- School
- FAQ's

Initiatives
- Go for Gold
- CodeChef for Schools
- Campus Chapters