

Czech ACM Student Chapter
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CTU Open Contest 2004

Firepersons

`f.p`, `f.c`, `f.C`

The Association for Courtly Manners, an international organization for standardization of social interactions[1] has decided to create a new international standard defining ranks of firepersons[2] – each fireperson receives an integer number describing his rank and when they arrive to a fire, they must enter the fire ground in order of increasing ranks and the low ranked firepersons must keep the fire burning long enough for the high ranked firepersons to enjoy extinguishing sufficiently.

The ranks are assigned according to an Arbitrary Constant Multiplier Sequence. An ACM-sequence of order k is an integer sequence defined by its first k terms $a_0, a_1, \ldots a_{k-1}$ and a recurrence relation $a_n = \sum_{i=1}^{k} a_{n-i} b_i \bmod 10\,000$ for $n \geq k$, where the b_i's are integer constants. The i-th oldest fireperson then gets rank a_i.

Your task is to calculate the rank of the i-th fireperson, given parameters of the ACM-sequence and the number i.

[1] Better known under the name Absurdly Clumsy Moralists, but let's not take prejudice.
[2] Formerly firemen, but the international standards of course must be politically correct.

Input Specification

The input consists of several instances. Each instance is described on a single line containing the following integers separated by a single space: k, a_0, ..., a_{k-1}, b_1, ..., b_k, i. Here $1 \leq k \leq 100$ is the order of the sequence, $0 \leq a_i < 10\,000$ are the first k elements of the sequence, $0 \leq b_i < 10\,000$ are the multipliers and $0 \leq i < 1\,000\,000\,000$ is the number of the element we ask for.

The input ends with a line containing a number 0.

Output Specification

The output consists of several lines corresponding to the instances on the input. The l-th line contains a single integer a_i which is the i-th element of the sequence described by the l-th input instance.

Sample Input

```
2 0 1 1 1 6
0
```

Output for Sample Input

```
8
```