

### Problem 3. Arrays

We are given **N** infinite non-decreasing sequences  $arr_1, arr_2, \dots, arr_N$ , defined in the following manner:  $arr_{i,1} = init_i$ ;  $arr_{i,j} = arr_{i,j-1} + (arr_{i,j-1} * a_i + b_i) \bmod m_i$ ;  $j > 1$ . We are also given the sequence *all*, which is the sorted concatenation of  $arr_1, arr_2, \dots, arr_N$ . Which is the number on the **q**-th position in *all*?

**Input:** On the first line of the input file **arrays.in** there is one integer **N** – the number of sequences. The next **N** lines consist of four number each, the *i* – th of them contains the integers  $init_i, a_i, b_i, mod_i$ . Then follows **M** - the number of queries and the next **M** lines consist of one number **q** each.

**Output:** The output file **arrays.out** must contain **M** integers– the answers to the queries given in the input file, in the same order they are given in there. **All indexes in the sequences start from 1.**

*Note: when printing use printf with “%l64d” or cout.*

**Constraints:**

$1 \leq N, M, q_i \leq 300,000$

$2 \leq init_i, a_i, b_i, mod_i \leq 1,000,000,000$

**TIME LIMIT – 2 sec**

**Example:**

arrays.in	arrays.out
3	2
2 3 5 7	2
2 4 8 7	2
2 2 2 8	4
5	6
1	
2	
3	
4	
5	

