G. Lucky Number (Number)

Problem Statement

BB is a genius that loves travelling, recently he decided to travel around the world despite his girlfriend opposing him!

BB decides to go to Q very special countries. For the i-th country, they only issue bills of denomination $1, b_i, b_i^2, b_i^3, \ldots$ (i.e. non-negative powers of b_i). There are N souvenirs at every country, the i-th souvenir costs a_i dollars in that country's currency, for every country from 1 to Q.

For some reason, BB is obsessed with the integer M, so he defines the "greatness" of a country as the number of souvenirs in that country such that M is the minimal number of bills required to buy that souvenir.

BB only likes to travel, so he asked you to find the greatness of every country he wants to go, that way he can plan out the rest of the trip, can you write a program solving BB's problem?

Input Format

$N\ M\ Q$
$a_1\ a_2\ \ldots\ a_n$
b_1
b_2
$\ldots$
b_Q

- The meaning of N, M, Q, a_i, b_i is described in the statement.

Output Format

ans_1
ans_2
$\ldots$
ans_Q

- ans_i is the greatness of the i-th country.

Constraints

- $1 \leq N \leq 2 \times 10^6$
- $1 \leq M, Q, a_i \leq 2 \times 10^6$

- $2 \leq b_i \leq 10^9$
- All inputs are integers

Example

Sample Input	Sample Output
10 3 10 1 2 3 4 5 6 7 8 9 10 2 3 4 5 6 7 8 9 10 11	1 2 3 2 2 2 2 1 1 1

Scoring

There are 4 subtasks in this problem. The score and additional constraints of each subtask are as follows:

Subtask	Score	Additional constraints
1	9	$N, Q \leq 1000$
2	29	$a_i \leq 40000$
3	24	$a_i \leq 3 \times 10^5$
4	38	No other constraints