

Problem A. Planets Queries I

Time limit 1000 ms

Mem limit 524288 kB

You are playing a game consisting of n planets. Each planet has a teleporter to another planet (or the planet itself).

Your task is to process q queries of the form: when you begin on planet x and travel through k teleporters, which planet will you reach?

Input

The first input line has two integers n and q : the number of planets and queries. The planets are numbered $1, 2, \dots, n$.

The second line has n integers t_1, t_2, \dots, t_n : for each planet, the destination of the teleporter. It is possible that $t_i = i$.

Finally, there are q lines describing the queries. Each line has two integers x and k : you start on planet x and travel through k teleporters.

Output

Print the answer to each query.

Constraints

- $1 \leq n, q \leq 2 \cdot 10^5$
- $1 \leq t_i \leq n$
- $1 \leq x \leq n$
- $0 \leq k \leq 10^9$

Sample

Input	Output
4 3 2 1 1 4 1 2 3 4 4 1	1 2 4