

B. T-shirt buying

time limit per test: 3 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

A new pack of n t-shirts came to a shop. Each of the t-shirts is characterized by three integers p_i , a_i and b_i , where p_i is the price of the i -th t-shirt, a_i is front color of the i -th t-shirt and b_i is back color of the i -th t-shirt. All values p_i are distinct, and values a_i and b_i are integers from 1 to 3.

m buyers will come to the shop. Each of them wants to buy exactly one t-shirt. For the j -th buyer we know his favorite color c_j .

A buyer agrees to buy a t-shirt, if at least one side (front or back) is painted in his favorite color. Among all t-shirts that have colors acceptable to this buyer he will choose the cheapest one. If there are no such t-shirts, the buyer won't buy anything. Assume that the buyers come one by one, and each buyer is served only after the previous one is served.

You are to compute the prices each buyer will pay for t-shirts.

Input

The first line contains single integer n ($1 \leq n \leq 200\,000$) — the number of t-shirts.

The following line contains sequence of integers p_1, p_2, \dots, p_n ($1 \leq p_i \leq 1\,000\,000\,000$), where p_i equals to the price of the i -th t-shirt.

The following line contains sequence of integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq 3$), where a_i equals to the front color of the i -th t-shirt.

The following line contains sequence of integers b_1, b_2, \dots, b_n ($1 \leq b_i \leq 3$), where b_i equals to the back color of the i -th t-shirt.

The next line contains single integer m ($1 \leq m \leq 200\,000$) — the number of buyers.

The following line contains sequence c_1, c_2, \dots, c_m ($1 \leq c_j \leq 3$), where c_j equals to the favorite color of the j -th buyer. The buyers will come to the shop in the order they are given in the input. Each buyer is served only after the previous one is served.

Output

Print to the first line m integers — the j -th integer should be equal to the price of the t-shirt which the j -th buyer will buy. If the j -th buyer won't buy anything, print -1 .

Examples

input
5 300 200 400 500 911 1 2 1 2 3 2 1 3 2 1 6 2 3 1 2 1 1
output
200 400 300 500 911 -1

input
2 1000000000 1 1 1 1 2 2 2 1
output
1 1000000000