Bucket Bonanza

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Welcome to Mr. Ant Tenna's TV Time! In this round of game, you're given n buckets, where the i-th bucket has a maximum capacity of v_i volumes of water. At the start of the game, all buckets will be fully filled with water, and your mission is to keep it contained as much as you can for the next t seconds. But here's the twist: these buckets are broken! The i-th bucket has a leaking speed of l_i, meaning that every second after the game starts, the i-th bucket dribbles away l_i volumes of water.

Before the game starts, you may merge any number of buckets into one. The resulting bucket has a capacity equal to the maximum capacity among the merged buckets, and a leaking speed equal to the minimum leaking speed among the merged buckets. You can do the merging an arbitrary number of times, but they must be performed before filling any water.

Tenna poses q questions, where the i-th question has a time limit t_i. For each $1 \le i \le q$, calculate the maximum total retained volume after t_i seconds. Note that each question is independent.

Input

There are multiple test cases. The first line of the input contains an integer T ($1 \le T \le 5 \times 10^4$) indicating the number of test cases. For each test case:

The first line contains an integer n ($1 \le n \le 2 \times 10^5$), indicating the number of buckets.

The second line contains n integers $v_1, v_2, \cdots, v_n$ ($1 \le v_i \le 4 \times 10^{13}$), where v_i is the capacity of the i-th bucket.

The third line contains n integers $l_1, l_2, \cdots, l_n$ ($0 \le l_i \le 10^9$), where l_i is the leaking speed of the i-th bucket.

The fourth line contains an integer q ($1 \le q \le 2 \times 10^5$), indicating the number of questions.

The fifth line contains q integers $t_1, t_2, \cdots, t_q$ ($0 \le t_i \le 10^9$), where t_i is the time limit for the i-th query.

It's guaranteed that neither the sum of n nor the sum of q of all test cases will exceed 2×10^5.

Output

For each test case, output one line containing q integers separated by a space, where the i-th integer is the maximum total retained volume after t_i seconds.

Example

standard input	standard output
2 4 5 4 7 6 2 1 3 2 3 3 1 2 4 19 47 21 13 5 14 2 3 5 5 2 6 1 4	4 14 8 43 67 38 77 48