Problem C. Jump

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Snuke is standing on an infinitely long road.

The position on this road is represented by a real number.

Snuke can perform N types of jumps. The jump of type i is symmetric with respect to the point a_i. That is, if he performs this jump at point x, he will jump to $2a_i - x$).

You are given Q queries. In the i-th query, you are asked to compute the minimum number of jumps Snuke must perform to go from s_i to t_i. If t_i is unreachable from s_i by performing a series of jumps, print -1 instead.

Input

First line of the input contains one integer N ($1 \le N \le 200$). Next N lines contain integers a_i, one per line ($0 \le a_1 < \ldots < a_N \le 10^4$). Next line contains one integer Q — the number of queries ($0 \le Q \le 10^5$). Each of the next Q lines contains one query and consists of two integers s_i and t_i ($0 \le s_i, t_i \le 10^4$).

Output

For each query, print the answer in a single line.

Example

standard input	standard output
4 1 2 4 7 10 2 3 5 6 6 0 3 7 10 3 7 6 5 5 2 10 4 10 10 10	-1 -1 2 2 -1 -1 0 3 1 0