Cyclic Shift II

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

You are given two integer sequences A and B of lengths $2n$ and $2m$, respectively. All elements are non-zero integers.

The sequence $A = (a_1, a_2, \ldots, a_{2n})$ satisfies the following condition: for every integer i such that $1 \le i \le n$, there are exactly two indices j such that $|a_j| = i$. In particular, $\{|a_j| : 1 \le j \le 2n\} = \{1, 2, \ldots, n\}$, and each absolute value appears exactly twice (if we disregard the signs).

The sequence $B = (b_1, b_2, \ldots, b_{2m})$ satisfies a similar condition: for every i such that $1 \le i \le m$, there are exactly two indices j such that $|b_j| = i$.

You may perform the following operations on the sequence A, in any order and any number of times:

1. **Cyclic shift.** Regard the current sequence as a cycle, and perform a rotation:
$$(a_1, a_2, \ldots, a_{2k}) \longrightarrow (a_{r+1}, a_{r+2}, \ldots, a_{2k}, a_1, \ldots, a_r)$$
where $0 \le r < 2k$.
2. **Delete a prefix of a pair of opposite numbers.** If the current sequence has the form $A = (x, -x, S_1)$, where $x \ne 0$ and S_1 may be empty, you may replace A by S_1; that is, delete the first two elements, x and $-x$.
3. **Insert a new pair of opposite numbers at the front.** If the current sequence is $A = (S_1)$ (may be empty), you may replace it by $(x, -x, S_1)$, where $x \ne 0$, and neither x nor $-x$ appears anywhere in S_1.
4. **Reverse and negate.** If the current sequence is
$$A = (a_1, a_2, \ldots, a_{2k}),$$
you may replace it by
$$\mathrm{nRev}(A) = (-a_{2k}, -a_{2k-1}, \ldots, -a_1).$$
5. **Rearrange across a cut.** Choose a cut that splits the current sequence into a prefix and a suffix. Suppose the sequence can be written as
$$A = (S_1, x, S_2, S_3, y, S_4)$$
where $x > 0$, $y \in \{x, -x\}$, and the cut is between S_2 and S_3. Here, S_1, S_2, S_3, and S_4 may be empty sequences. Then you may apply one of the following transformations:
   - If $y = x$ (that is, you choose a pair x and x), you may replace A by
$$(S_1, \mathrm{nRev}(S_3), x, \mathrm{nRev}(S_4), S_2, y).$$
   - If $y = -x$ (that is, you choose a pair x and $-x$), you may replace A by
$$(S_1, S_4, x, S_3, S_2, y).$$

You have to determine if it is possible to transform sequence A into a sequence that is *equivalent* to sequence B by applying these operations a finite number of times.

Let $C = (c_1, \ldots, c_{2k})$ and $D = (d_1, \ldots, d_{2k})$ be two integer sequences of the same length. We say that C and D are *equivalent* if and only if there exists a mapping $f : \mathbb{Z} \to \mathbb{Z}$ such that:

- for every integer x, $f(-x) = -f(x)$,
- whenever $f(x) \neq 0$, the integers x and $f(x)$ have the same sign (both positive or both negative),

and for all $1 \leq i \leq 2k$ we have $d_i = f(c_i)$. In other words, if we replace each element c_i of the sequence C by $f(c_i)$, we obtain the sequence D. The values of f on integers that do not occur in the sequences may be chosen arbitrarily.

Input

The first line contains a single integer t ($1 \leq t \leq 10^5$), the number of test cases. For each test case:

The first line contains an integer n ($1 \leq n \leq 5 \cdot 10^5$), denoting that the length of sequence A is $2n$.

The second line contains $2n$ integers, denoting $a_1, a_2, \ldots, a_{2n}$.

The third line contains an integer m ($1 \leq m \leq 5 \cdot 10^5$), denoting that the length of sequence B is $2m$.

The fourth line contains $2m$ integers, denoting $b_1, b_2, \ldots, b_{2m}$.

The sequences A and B meet the requirements in the statement.

The total size of all test cases is bounded by $\sum n + \sum m \leq 10^6$.

Output

For each test case, if it is possible to make A equivalent to B, output "`YES`"; otherwise, output "`NO`".

Examples

standard input	*standard output*
4 1 1 -1 2 -1 -2 2 1 1 1 1 1 -1 1 4 1 2 -1 3 -4 2 3 -4 4 1 2 -1 -2 4 3 4 3 4 4 3 -1 -2 -3 2 1 -4 3 -1 1 3 -3 2 2	YES NO YES NO
5 4 1 2 -3 -2 4 -1 3 -4 6 -3 5 2 3 -2 -5 1 -6 -4 -1 4 6 5 -2 4 -4 3 2 -1 -5 1 -3 5 5 3 -4 1 -5 4 -1 2 -2 -3 5 4 -2 1 4 2 -4 3 -1 -3 5 -1 -5 -2 2 1 -4 -3 3 4 5 3 2 -1 -1 -3 -2 3 4 -4 -2 -1 4 1 -2 3 -3 5 3 5 -5 -2 2 -1 -3 -4 1 4 5 3 5 -2 -5 -1 2 -4 1 4 -3	YES YES NO YES NO

Note

In the first example:

In the first test case, $(1, -1) \xrightarrow{op\ 3} (-2, 2, 1, -1) \xrightarrow{op\ 1} (-1, -2, 2, 1)$.

In the third test case, suppose $x = 3$, $y = 3$, $S_1 = (1, 2, -1)$, $S_3 = (-4, 2)$, $S_4 = (-4)$, and S_2 is empty. Then $A = (S_1, x, S_2, S_3, y, S_4)$, and $A \xrightarrow{op\ 5} (1, 2, -1, -2, 4, 3, 4, 3)$.