

Four Season

time limit per test: 1 second (1 second for Python)
memory limit per test: 976.6 megabytes
input: standard input
output: standard output
points: 100 · problem code: fourseason

After extreme changes in the Earth's climate, Parsa started studying temperatures in different countries. In each country, the number of days in a year may be different.

If each season in a country lasts k days, then the whole year has $4k$ days.

The temperature pattern of each country is periodic with period $4k$. In other words, the temperature of any day is the same as the temperature $4k$ days later.

Parsa observed the temperatures of $4k$ consecutive days and gives them to you. Note that he did not necessarily start collecting data from the first day of spring.

The seasons of each country are, in order:

- Spring
- Summer
- Autumn
- Winter

A summer is called **hellish** if the sum of temperatures in that summer is not smaller than the sum of temperatures of any other consecutive k days in the year.

A winter is called **freezing** if the sum of temperatures in that winter is not greater than the sum of temperatures of any other consecutive k days in the year.

From Parsa's point of view, a country is a four-season country if its summer is hellish and its winter is freezing.

For each test case, determine whether it is possible that the given list is a sequence of $4k$ consecutive days from such a country. Equivalently, determine whether it is possible to rotate the cyclic sequence so that:

- the year is split into spring, summer, autumn, and winter, each of length k
- the chosen summer is hellish
- the chosen winter is freezing

Print if such a rotation exists, otherwise print .

Input

The first line contains an integer T , the number of test cases.

Each test case consists of two lines:

- The first line contains an integer k
- The second line contains $4k$ integers $a_1, a_2, \dots, a_{4k}$

Here, a_j is the temperature of the j -th day in the given cyclic order.

Output

For each test case, print:

- if the sequence can represent such a country
- otherwise

Constraints

- $1 \leq T \leq 5 \times 10^4$
- $1 \leq k \leq 5 \times 10^4$
- $-10^9 \leq a_j \leq 10^9$
- the sum of k over all test cases does not exceed 5×10^4 .

Example 1

Input

```
3
1
1 2 3 4
1
1 3 4 2
2
1 2 3 4 4 3 2 1
```

Output

```
No
Yes
Yes
```