Problem G: Array Polarization

Filename: `polarize`
Time limit: `2 seconds`

You have an integer **k** and arrays **a** and **b**, both of length **n**. Initially, the array **a** is full of zeros, and your goal is to make array **a** equal to array **b**. Two arrays **c** and **d**, both of length **n**, are equal if and only if, for all **i** in $1 \le i \le n$, $c_i = d_i$.

Since the initial array **a** is quite boring and neutral in nature, you may perform an operation on **a** to further polarize the array. An operation consists of the following.

1. Select two integers **l** and **r** such that $1 \le l \le n$, $1 \le r \le n$, $l < r$ and $r - l \ge k$.
2. Add 1 to a_l and subtract 1 from a_r.

Problem

Determine if it is possible to transform **a** into **b** by performing a series of operations (possibly 0) on **a**.

Input

The first line of input contains one integer **c**, representing the number of test cases.

The first line of each test case contains two integers **n**, the number of values in the array **b** for the case and **k**, the value described above.

The second line of each test case contains **n** integers separated by spaces, the i^{th} of which is b_i, representing the i^{th} value in the array **b**.

Output

For each test case, print “YES” on its own line if **a** can be transformed into **b** after a series of operations. Otherwise, print “NO”.

Input Bounds and Corresponding Credit

30 Points	70 Points
• $1 \le c \le 75$ • $2 \le n \le 1{,}000$ • $1 \le k < n$ • $-10^9 \le b_i \le 10^9$	• $1 \le c \le 100$ • $2 \le n \le 100{,}000$ • $1 \le k < n$ • $-10^9 \le b_i \le 10^9$

Samples

Input	Output
3 5 1 3 -2 1 4 -6 7 2 1 2 -1 2 -3 1 -2 6 2 4 5 2 -6 -1 -3	YES NO NO