

PROBLEMS SUBMIT CODE MY SUBMISSIONS STATUS STANDINGS CUSTOM INVOCATION

H. Prefix and Suffix Array

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Marcos loves strings a lot, so he has a favorite string s consisting of lowercase English letters. For this string, he wrote down all its non-empty prefixes and suffixes (except for s) on a piece of paper in arbitrary order. You see all these strings and wonder if Marcos' favorite string is a palindrome or not. So, your task is to decide whether s is a palindrome by just looking at the piece of paper.

A string a is a prefix of a string b if a can be obtained from b by deletion of several (possibly, zero or all) characters from the end.

A string a is a suffix of a string b if a can be obtained from b by deletion of several (possibly, zero or all) characters from the beginning.

A palindrome is a string that reads the same backward as forward, for example, strings "gg", "ioi", "abba", "icpci" are palindromes, but strings "codeforces", "abcd", "alt" are not.

Input

Each test consists of multiple test cases. The first line contains a single integer t ($1 \leq t \leq 120$) — the number of test cases. The description of test cases follows.

The first line of each test case contains a single integer n ($2 \leq n \leq 20$) — the length of the string s .

The second line of each test case contains $2n - 2$ strings $a_1, a_2, \dots, a_{2n-2}$ — all non-empty prefixes and suffixes of s , not including itself, in arbitrary order.

It is guaranteed that these strings are all the non-empty prefixes and suffixes of some string consisting of lowercase English letters.

Output

For each test case, output "YES" if s is a palindrome, and "NO" otherwise.

You can output the answer in any case (upper or lower). For example, the strings "yEs", "yes", "Yes", and "YES" will be recognized as positive responses.

Example

input	Copy
5 4 bcd cd a d abc ab 3 i io i oi 2 g g 3 t al lt a 4 bba a ab a abb ba	
output	Copy
NO YES YES NO YES	

Note

In the first test case, s is "abcd". Its prefixes are "a", "ab" and "abc", and its suffixes are "d", "cd" and "bcd". As the string "abcd" is not a palindrome, the answer is NO.

In the second test case, s is "ioi". Its prefixes are "i" and "io", and its suffixes are "i" and "oi". As the string "ioi" is a palindrome, the answer is YES.

In the third test case, s is "gg" which is a palindrome.

In the fourth test case, s is "alt" which is not a palindrome.

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Finished

Practice

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Start virtual contest

→ Submit?

Language: GNU G++20 11.2.0 (64 bit, w

Choose file: Choose File No file chosen

Submit

Submission	Time	Verdict
227203691	Oct/08/2023 16:49	Accepted
227199819	Oct/08/2023 16:23	Accepted
227193891	Oct/08/2023 15:46	Accepted