Can We Still Qualify For Semifinals?

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

The Cricket World Cup is a highly anticipated event, captivating fans worldwide. During the tournament, a common curiosity arises: Can a specific team still qualify for the semifinals, i.e., the top 4? This problem aims to address such queries.

A total of 10 teams are participating in the Cricket World Cup: India, Australia, England, New Zealand, Pakistan, South Africa, Sri Lanka, Afghanistan, Bangladesh, and the Netherlands. We number the teams 1 to 10, with India being number 1.

The tournament follows a round-robin format, where each team plays against every other team exactly once, spread across a series of phases/rounds. In each round, every team participates in one game. The match selection process ensures that each team faces every other team exactly once, resulting in a total of 45 games.

The rounds of the tournament can be systematically structured using a mathematical approach, described below.

The method for generating the fixtures would be a round-robin method. In phase 1, the teams are initially arranged in ascending order (e.g., [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]). Matches are then formed by pairing the first team with the last team, the second team with the second-to-last team, and so on, until the middle teams meet. In other words, in this phase, the matches would be team 1 vs team 10, 2 vs 9, 3 vs 8, 4 vs 7, 5 vs 6

The subsequent phases involve a circular rotation of the team list, keeping the position of the first team fixed at the start. In each phase, teams are matched with their counterparts in a mirrored fashion. For example, in the second phase, the teams are arranged as [1, 10, 2, 3, 4, 5, 6, 7, 8, 9], where the first team faces the second-to-last team, the second team faces the second-to-second-last team, and so forth. In the third phase, the teams would be arranged as [1, 9, 10, 2, 3, 4, 5, 6, 7, 8].

The exact details of matches in various rounds can also be read from the table below.

Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8	Round 9
1 vs 10	1 vs 9	1 vs 8	1 vs 7	1 vs 6	1 vs 5	1 vs 4	1 vs 3	1 vs 2
2 vs 9	10 vs 8	9 vs 7	8 vs 6	7 vs 5	6 vs 4	5 vs 3	4 vs 2	3 vs 10
3 vs 8	2 vs 7	10 vs 6	9 vs 5	8 vs 4	7 vs 3	6 vs 2	5 vs 10	4 vs 9
4 vs 7	3 vs 6	2 vs 5	10 vs 4	9 vs 3	8 vs 2	7 vs 10	6 vs 9	5 vs 8
5 vs 6	4 vs 5	3 vs 4	2 vs 3	10 vs 2	9 vs 10	8 vs 9	7 vs 8	6 vs 7

The above matches are supposed to happen in order given.

Given the results of first k matches, your task is to determine whether the Indian team still has a chance to qualify for the semifinals.

A team can qualify to semifinals if and only if its number of wins is greater or equal to the fourth highest number of wins among the teams. (The fourth highest number of wins is obtained by sorting the list of 10 numbers of wins, and then taking the fourth one starting from the back.)

The results of first k matches would be given to you in a binary string of length k. Let the ith match be between the team x vs team y. Then, if ith (1-based indexing) character of string is 1, then team x wins, otherwise team y wins.

Input

The first line of the input contains a single integer t corresponding to the number of test cases. The t test cases follow.

Each test case consists of two lines. The first line of each test case contains the integer k. The next line

contains a binary string of length k denoting the result of the matches.

- $1 \le t \le 10$

- $1 \le k \le 45$

Output

For each test case, output a single line containing `YES` or `NO` depending on whether India can still qualify for the semi-finals or not, respectively.

Example

standard input	standard output
3	YES
3	YES
111	NO
25	
1000010101111111111010100	
35	
01111011110111101111011110111101111	

Note

In the first test case, India has got a really good start by winning its first match. India could qualify in the semi-finals. The coolest way to qualify would to be win all its upcoming matches :)

In the second test case, India has won all of its conducted matches already.

In the third test case, India has lost all of its already conducted 7 matches. India has now no way to qualify to the semis.