Problem L
Linking Bits

What should you do with a lot of bits? Link them together, of course!

Today at class, Minh learnt about binary representation of integers and he was excited to practice his knowledge.

Initially, Minh has a graph of m vertices, numbered from 0 to $m-1$, with no edges. Minh then writes down the binary representation of every integer from 1 to n. After writing down the binary representation of the integer x, Minh adds an edge between every pair of nodes (i, j), satisfying that both the i-th and the j-th bits of x are 1.

More formally, for each integer x from 1 to n:

- Let $x_{m-1}x_{m-2}\ldots x_0$ be the m least significant bits of x, where x_0 is the least significant one. We may add leading zeroes so that the binary representation of x contains at least m bits.
- For all pairs of indices (i, j) $(0 \le i < j \le m-1)$ such that $x_i = x_j = 1$, Minh adds an edge connecting the i-th and the j-th vertices.

After finishing the graph with all the satisfied edges, Minh wonders if it is connected. Please help him to answer the question.

Input

The first line of the input contains a single integer t $(1 \le t \le 10^3)$ – the number of test cases. t test cases follow, each is presented as below:

- The first line contains a single integer m $(1 \le m \le 10^3)$.
- The second line contains a string demonstrating the binary representation of n $(0 \le n < 2^{10^3})$. It is guaranteed that this string does not contain leading zeroes.

Output

For each test case, output a single line containing `YES` if the graph is connected, and `NO` otherwise.

Sample Explanation

In the first test case, $m = 3$ and $n = 4$:

- No edges are added when Minh writes down the binary representation of 1 - `001`, 2 - `010` and 4 - `100`.
- Edge $(0, 1)$ is added when Minh writes down the binary representation of 3 - `011`.

The resulting graph is not connected since there is no path from vertex 2 to vertex 0 and 1.

For the second sample, with $m = 3$ and $n = 5$:

- No edges are added when Minh writes down the binary representation of 1 – `001`, 2 – `010` and 4 – `100`.
- Edge $(0, 1)$ is added when Minh writes down the binary representation of 3 – `011`.
- Edge $(0, 2)$ is added when Minh writes down the binary representation of 5 – `101`.
- Edge $(1, 2)$ is added when Minh writes down the binary representation of 6 – `110`.
- Edges $(0, 1)$, $(0, 2)$ and $(1, 2)$ are added when Minh writes down the binary representation of 7 – `111`.

The resulting graph is this case is connected.

Sample Input 1	Sample Output 1
2 3 100 3 111	NO YES