A humongous Query | Problem Code: **XYHUMOQ**

Let's define a *10-string* as a string that contains only characters '1' and '0', starts with '1' and ends with '0'. For example, **"10101010"**, **"100"** or **"1010"** are 10-strings, while **"011"**, **"11120"** or **"10101"** are not.

A subsequence of any 10-string is called *humongous* if it is of the form "1010...10" ("10" concatenated an arbitrary number of times).

For example, the 10-string **"110"** contains exactly 2 humongous subsequences and **"1010"** contains exactly 4 humongous subsequences (formed using indices **{1, 2}**, **{3, 4}**, **{1, 4}**, **{1, 2, 3, 4}**).

You should process some really humongous queries. Each query is as follows:

- You're given a 10-string **S** and an integer **X**.
- You should convert **S** into another 10-string **U** by flipping a number of characters (possibly zero; a flip means changing a '1' to '0' or '0' to '1') of **S**.
- The string **U** should contain exactly **X** humongous subsequences.
- The answer to the query is the **minimum** number of flips that need to be performed. If it's impossible to convert **S** into a valid string **U**, the answer doesn't exist.

Note that **U** has to be a 10-string.

For each query, compute the minimum possible number of flips or determine that there is no answer.

Input

- The first line of the input contains a single integer **T** denoting the number of test cases. The description of **T** test cases follows.
- The first line of each test case contains a single string **S**.
- The second line contains a single integer **X**.

Output

For each test case:

- If there is no answer, print a single line containing one string `"NO"` (without quotes).
- If an answer exists, print two lines.
- The first line should contains a single string `"YES"` (without quotes).
- The second line should contain a single integer denoting the minimum necessary number of flips.

Constraints

- $1 \leq \mathbf{T} \leq 10$

- $2 \le |S| \le 32$
- $1 \le X \le 10^6$
- **S** will be a 10-string

Subtasks

Subtask #1 (15 points):

- $|S| \le 20$
- $X \le 10^3$

Subtask #2 (85 points): original constraints

Example

```
Input:

2
1110
4
110
1

Output:

YES
1
NO
```

Explanation

Example case 1: We can convert the given 10-string into **U** = "1010" using only one flip; this string has exactly 4 humongous subsequences. This is the minimum possible number of flips.

Example case 2: The only 10-strings we can obtain after any number of flips are "100" and "110". Each of them contains exactly 2 humongous subsequences, so there is no answer.

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