Interactive Problem Not With $\lg(n)$ Queries

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 mebibytes

Alita challenges you for a game. She has a hidden string S consisting of n ($1 \leq n \leq 300$) characters (n is hidden too) where each character is either `a`, `b`, or `c`. You have to guess the string by asking questions of the following type.

- `? P` where P is a string consisting only of characters `a`, `b`, or `c` with length between 1 and 301. Alita will tell you if P is a subsequence of the string S or not.

You can ask at most Q questions (check the scoring section). Can you guess the string S?

Scoring

- Subtask 1 (7 points): S only consists of `a`, $Q = 305$.
- Subtask 2 (13 points): S only consists of `a`, $Q = 15$.
- Subtask 3 (19 points): S only consists of `a` and `b`, $Q = 315$.
- Subtask 4 (25 points): S consists of `a`, `b`, and `c`, $Q = 615$.
- Subtask 5 (36 points): S consists of `a`, `b`, and `c`, $Q = 535$.

Interaction Protocol

- Interaction is done via standard input and output.
- First you should read a single integer t ($1 \leq t \leq 5$) which is the subtask number.
- Then you can ask queries by printing `? P` where P is the string you want to ask about. P should not contain any character other than `a`, `b`, `c` and the length of P should be between 1 and 301 (inclusive).
- After printing a query **you must** flush the output stream. You may write `fflush(stdout);` or `cout.flush();` for this purpose.
- After printing a query, you should read a single string R from standard input. R is either `YES` or `NO` depending on whether P is a subsequence of S or not.
- You may ask at most Q such questions. When you're sure of the string S, you should print `! S` on a single line and terminate your program.

Example

standard input	standard output
1 YES YES YES NO	? a ? aa ? aaa ? aaaa ! aaa
3 YES NO NO YES NO	? a ? aa ? ab ? ba ? bba ! ba

Explanation

- Recall that a string P is called a **subsequence** of a string S if and only if P can be obtained by deleting some characters from S while retaining the relative order of other characters. For example, `a`, `ac`, `aba`, `abca` are subsequences of `abca`, but `cb`, `abb`, `aaa` are not.
- The first sample belongs to subtask 1. The original string S is `aaa`. So `a`, `aa`, `aaa` are subsequences of S but not `aaaa`.
- The second sample belongs to subtask 3. The original string S is `ba`. So `a`, `ba` are subsequences of S but not `aa`, `ab`, `bba`.