Problem A. Runs

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

Small input 14 points	Solve A-small
Large input 16 points	Solve A-large

Problem

I have a string **S** consisting of lower-case alphabetic characters, 'a' - 'z'. Each maximal sequence of contiguous characters that are the same is called a "run". For example, "bookkeeper" has 7 runs. How many different permutations of **S** have exactly the same number of runs as **S**?

Two permutations a and b are considered different if there exists some index `i` at which they have a different character: `a[i] ≠ b[i]`.

Input

The first line of the input gives the number of test cases, **T**. **T** lines follow. Each contains a single non-empty string of lower-case alphabetic characters, **S**, the string of interest.

Output

For each test case, output one line containing "Case #x: y", where x is the case number (starting from 1) and y is the number of different permutations of **S** that have exactly the same number of runs as **S**, modulo 1000003.

Limits

$1 \le \mathbf{T} \le 100$.
S is at least 1 character long.

Small dataset

S is at most 100 characters long.

Large dataset

S is at most 450000 characters long.
S has at most 100 runs.
The input file will not exceed 1 megabyte in size.

Sample

Input	Output
2 aabcd bookkeeper	Case #1: 24 Case #2: 7200