Problem F - Replicated Substrings

Description

A character string is said to have period k if it can be formed by concatenating one or more repetitions of another string of length k. For example, the string "abcabcabcabc" has period 3, since it is formed by 4 repetitions of the string "abc". It also has periods 6 (two repetitions of "abcabc") and 12 (one repetition of "abcabcabcabc").

Write a program to read a character string and determine its smallest period.

Input

The first line oif the input file will contain a single integer N indicating how many test case that your program will test followed by a blank line. Each test case will contain a single character string of up to 80 non-blank characters. Two consecutive input will separated by a blank line.

Output

An integer denoting the smallest period of the input string for each input. Two consecutive output are separated by a blank line.

Example

Input:

    1

    HoHoHo

Ouput:

    2