Coin Toss
Problem ID: cointoss
Time limit: 1 second

A sequence of coin toss can be encoded as a binary string, '0' for head, '1' for tail. Given an encoded sequence S, toss the coin until S appears in the result sequence then stop.

Let T be the number of coin toss taken for S to appear, find the expected value of T.

Input

The first line of input contains the one integer Q ($1 \leq Q \leq 10^4$), the number of test cases.
The following Q lines, each contain a string S ($1 \leq |S| \leq 20$).

Output

Output Q lines, each contains the respective value of T. The answer is considered correct if the precision error is less than 10^{-9}.

Sample Input 1	Sample Output 1
1 00	6