

## 3490 Generator

We can generate a random string by generating a sequence of random characters and concatenating them together. Each character is chosen independently from the first  $n$  letters in the English alphabet with equal probability. Only capital letters are used in this problem. The generation is stopped as soon as a specific pattern occurs in the random string.

Your task is to predict the expected length of the generated string.

### Input

Standard input will contain multiple test cases. The first line of the input is a single integer  $T$  ( $1 \leq T \leq 10$ ) which is the number of test cases.  $T$  test cases follow, each preceded by a single blank line.

Each test case consists of a single integer  $N$  ( $1 \leq N \leq 26$ ) which is the number of letters used, and a pattern, which is a non-empty string consisting of letters chosen from the first  $N$  upper case English letters. The length of any pattern will not exceed 12.

### Output

Results should be directed to standard output. Start each case with 'Case #:' on a single line, where # is the case number starting from 1. Two consecutive cases should be separated by a single blank line. No blank line should be produced after the last test case.

For each test case, print the expected length of the generated random string.

### Sample Input

```
5
2 A
2 ABA
3 AAAAA
26 ACMICPC
26 ZJUZJU
```

### Sample Output

```
Case 1:
2
Case 2:
10
Case 3:
363
Case 4:
```

8031810176

Case 5:  
308933352