

Polly

Input File: PollyIn.txt

Maggie's parrot Polly is learning to say sequences of letters. Maggie feels Polly has learned a sequence if she says it once, immediately repeats it, and then continues to repeat it until she is interrupted. For example, Maggie would say Polly learned the sequence "ABC" if Polly said "ABCABCABCABC" and was interrupted at the end of the third repetition, or said "ABCABCABCA" and she was interrupted before the third repetition was complete. Sometimes it takes Polly a while to remember the sequence, and on those days she may say "ABB**ABC**ABCABCA" assuming she was again interrupted during the third repetition.

When Polly is having a bad day, she cannot learn a sequence. For example, on a bad day she may say: "ABCABCABA" or "ABABCABA" before she is interrupted. Your task is to examine what Polly says and determine if she has learned a letter sequence, or if she had a bad day.

Inputs

The first line of input will contain a single integer, which will be the number of days to consider. This will be followed with one line of input per day containing the character string, S, that Polly said that day before she was interrupted.

Outputs

There will be one line of output per day. If Polly learned a sequence that day, the line will contain a string followed by an integer. The string and the integer will be separated by a space. The string will be the character sequence Polly learned that day, and the integer will be the index (beginning from zero) in the input string S where the learning began. If she did not learn a sequence that day, the output will be the string: "Polly had a bad day".

Sample inputs

```
7
ABCABCABCABC
ABCABCABCA
ABBABCABCABCA
ABCABCABA
ABABCABA
FF
ABCABCABCBCFF
```

Sample outputs

```
ABC 0
ABC 0
ABC 3
Polly had a bad day
Polly had a bad day
F 0
F 12
```