Rail fence cipher   X97552_en

Control 5, GRAU-PRO1, FIB (2014-07-11)

In the rail fence cipher, the text to be ciphered is written downwards and diagonally on successive *rails* of an imaginary fence, then moving up when we reach the bottom rail. When we reach the top rail, the message is written downwards again until the whole text is written out. The message is then read off in rows.

For example, if we have 3 *rails* and the message is WE ARE DISCOVERED FLEE AT ONCE, the cipherer writes out:

```
0  W  .  .  .  E  .  .  .  C  .  .  .  R  .  .  .  L  .  .  .  T  .  .  .  E
1  .  E  .  R  .  D  .  S  .  O  .  E  .  E  .  F  .  E  .  A  .  O  .  C  .
2  .  .  A  .  .  .  I  .  .  .  V  .  .  .  D  .  .  .  E  .  .  .  N  .  .
```

Then, the ciphered text is obtained by reading off by rows:

> WECRLTEERDSOEEFEAOCAIVDEN

The ciphered text is finally separated in blocks of 5 letters, except possibly for the last block:

> WECRL TEERD SOEEF EAOCA IVDEN

Your have to write a program that reads the number of rows in the fence and a text and writes the ciphered text separated in blocks of 5 letters, except for the last one that might be shorter.
Your program has to use the following definition:

> **struct** Coord {
>
>   **int** x,y;
>
> };

and also has to define, implement and use the function:

> **Coord** nextR (**const Coord**& p, bool& up, int n, int m);

that, given the coordinates of a position in a matrix $n \times m$, computes the next position moving diagonally, up or down depending on the value of the parameter up, according to the rules of the traversal of the rail fence cipher. In the case that the given coordinate fell in the top row going up or in the bottom row going down, the final value of up must correspond to the correct direction for arriving to the next position. In the case that the given position is in the last column the function must return the given coordinate and should not change the value of up.
When $n = 3$ and $m = 7$, the function when $p = (0,0)$ and up = *false* has to return the coordinates $(1,1)$ and keep up = *false*, when $p = (2,2)$ and up = *false*, the return coordinates should be $(1,3)$ and $up = true$.

Input

The input consists of several lines, each line containing the number of rows in the fence and a text. The number of rows is an integer bigger than one. The text is a non empty sequence of words, without punctuation signs, separated by the symbol $.
You can assume that he symbol $ never appears at the beginning or at the end of a text.

Output

For each line of input, the output is formed by the fence arrangement and the text, written by rows. Followed by the ciphered text written with with words with 5 letters (except possibly the last one) separated by one blank.

Follow the format specified in the examples.

Sample input

```
2 Hello$Maria
3 Hello$Maria
3 WE$ARE$DISCOVERED$FLEE$AT$ONCE
5 Anthony$did$not$come$yesterday
```

Sample output

```
H.l.o.a.i.
.e.l.M.r.a

Hloai elMra

H...o...i.
.e.l.M.r.a
..l...a...

Hoiel Mrala

W...E...C...R...L...T...E
.E.R.D.S.O.E.E.F.E.A.O.C.
..A...I...V...D...E...N..

WECRL TEERD SOEEF EAOCA IVDEN

A.......i.......e.......a.
.n.....d.d.....m.y.....d.y
..t...y...n...o...e...r...
...h.n.....o.c.....s.e....
....o.......t.......t.....

Aiean ddmyd ytyno erhno cseot t
```

Problem information

Author : Maria Serna i Maria J. Blesa
Translator : Maria J. Serna
Generation : 2014-07-15 15:01:35

© *Jutge.org*, 2006–2014.
http://www.jutge.org