22 A New Hope

13 points

Introduction

The galaxy is under the menace of the Empire. R2-D2 must protect the message of the Princess Leia from the clutches of Darth Vader using an encrypting algorithm.

Example:

```
s = help me obi wan kenobi you are my only hope
```

Note that s will only contain characters in the range ascii[a-z] and space, which is ascii(32).

In order to encode the message, the characters are written into a grid, whose rows and columns have the following constraints, being L is the length of this message.

$$\lfloor \sqrt{L} \rfloor \leq row \leq column \leq \lceil \sqrt{L} \rceil, \text{ where } \lfloor x \rfloor \text{ is floor function and } \lceil x \rceil \text{ is ceil function}$$

After removing the spaces, the string is 34 characters long, and the sqrt of 34 is between 5 and 6, so it is written in the form of a grid with 6 rows and 6 columns.

```
helpme
obiwan
kenobi
youare
myonly
hope
```

Note:

- Ensure that rows columns >= L

- If multiple grids satisfy the above conditions, choose the one with the minimum area, i.e. rows columns.

The encoded message is obtained by displaying the characters of each column as a word, with a space between column texts. The encoded message for the grid above is:

```
hokymh ebeoyo linuop pwoane mabrl eniey
```

You are asked to write a program to encode a message as specified.

Input

The input will be a single line of text, that will be the string s.

Note thet the length of s will be no longer than 81 characters.

Output

The output will be a single line of text, that will show the encrypted message.

Example 1

Input

```
have a nice day
```

Output

```
hae and via ecy
```

Explanation

- *L* = 12, sqrt(12) is between 3 and 4

Rewritten with 3 rows and 4 columns:

```
have
anic
eday
```