Encrypting Messages

Data encryption prevents data visibility in the event of its unauthorized access.

Consider the following encryption algorithm to encipher a given string input. Firstly, discard all spaces of the string. Then store all the characters within a matrix, according to the constraints below, to get the encoded string output.

Constraints

- `floor(squareRoot(stringLength)) <= matrixRows <= matrixColumns <= ceil(squareRoot(stringLength))`
- `matrixRows x matrixColumns >= stringLength`
- Choose the matrix with the smallest area.
- Print out the characters of the first column, then embed a space before printing out the following column, etc.

Input format

A string

Output format

An encrypted string

Examples

Example 1

Command line input:

```
coding
```

Output: `ci on dg`

i.e. The string length is 6. The square root of 6 is between 2 and 3. Thus, the string is rewritten as a matrix with 2 rows and 3 columns.

```
cod
ing
```

Example 2

Command line input:

```
its harder to read code than to write it
```

Output: `ideeoi teatwt srdhr htcai aoont rrdte`

i.e. The string length is 32. The square root of 32 is between 5 and 6. However, 5 x 6 is not >= 32, therefore, the string is rewritten as a matrix with 6 rows and 6 columns.

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