Mixed Words

You are given a string containing Latin letters. Write a program that finds the number of all words with no two consecutive equal characters that can be generated by reordering the given letters. The generated words should contain all given letters. If the given word meets the requirements it should also be considered in the count.

Input

- The input data should be read from the console
- On the only input line, there will be a single word containing all the letters that you should use for generating the words
- The input data will always be valid and in the format described. There is no need to check it explicitly

Output

- The output data should be printed on the console
- On the only output line write the number of words found

Constraints

- The number of the given letters will be between 1 and 10, inclusive
- All given letters will be small Latin letters ('a' – 'z')
- Allowed working time for your program: 0.35 seconds. Allowed memory: 32 MB.

Examples

Input	Output	Comments
xy	2	Two possible words: "xy" and "yx"
xxxy	0	It is impossible to construct a word with these letters
aahhhaa	1	The only possible word is "ahahaha"
pizza	36	There are 36 possible words.

Commentary

How many arrangements of the letters in the word **CALIFORNIA** have no consecutive letters the same?
We can arrange the six distinct letters C, L, F, O, R, N in 6! ways. This creates seven spaces, five between successive letters and two at the ends of the row.

Case 1: We choose two of these seven spaces in which to place the two A's, thereby separating them.
We now have eight letters. This creates nine spaces, seven between successive letters and two at the ends of the row. We choose two of these nine spaces for the I's. The number of such arrangements is $6!\binom{7}{2}\binom{9}{2} = 544\,320$

Case 2: We place both A's in the same space.
We again have eight letters. This again creates nine spaces. The space between the two A's must be filled with an I. Therefore, there are eight ways to choose the position of the other I. The number of such arrangements is $6!\binom{7}{1}\binom{8}{1} = 40\,320$

Total: These two cases are mutually exclusive. Hence, the total number of arrangements of the letters of the word CALIFORNIA in which no two consecutive letters are the same is

$$6!\left[\binom{7}{2}\binom{9}{2} + \binom{7}{1}\binom{8}{1}\right] = 584\,640$$