ALGOLYMPICS 2023

Sample Problem

Song of GluGlu

Time Limit: 1 second

The legendary beast GluGlu roams around the galaxies, blessing all those who encounter it with a song, its rich and deep melody reverberating outwards from its entire body. Inexplicable power is imparted to anyone immersed in its song. The Song of GluGlu is an endless composition, constituted by some order of (possibly repeated) words. In total, there are N unique words which can make up the Song of GluGlu.

The power imbued by the Song of GluGlu doesn't come from the words themselves, but from the transitions from one word to another. The amount of power contained in the transition between two words A and B is the absolute difference (in terms of position in the alphabet) between the last letter of A and the first letter of B. For example, for the sequence of words `abah iemu youtah`, the power it contains from its two transitions is 1 from `h-i`, plus 4 from `u-y`, totalling 5.

Different orders of the same words could generate different levels of power. For example, given the same three words in our previous example, we can rearrange the sequence to `iemu youtah abah` which contains 11 units of power instead. Note that sequences could have repeated words, for example `iemu iemu abah`.

Through the research efforts of the Intergalactic Federation, they have made a device that could record a sequence of up to M words. Now they only need to know how much power can resonate out of it.

Given N unique words which can make up the Song of GluGlu, what is the maximum power contained within a sequence of M words?

Input

There is a single test case per file. The first line of the input contains two integers N and M. The second line of the input contains N space-separated words. Each word is composed of only lowercase alphabet characters.

Output

Output a single line containing an integer, denoting the maximum power contained within a sequence of M word.

Constraints

$1 \le N \le 10^5$
$1 \le M \le 10^{15}$
The length of any word is at most 10.

Sample Input	Sample Output
`3 3` `iemu youtah abah`	`37`

Sample Input	Sample Output
`3 6` `alab yaz xoog`	`121`

Explanation

For the first test case, the optimal word sequence is `iemu abah youtah`. The first transition generates 20 power, while the second transition generates 17, giving a total of 37.