D. Santa Claus and a Palindrome

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Santa Claus likes palindromes very much. There was his birthday recently. k of his friends came to him to congratulate him, and each of them presented to him a string s_i having the same length n. We denote the beauty of the i-th string by a_i. It can happen that a_i is negative — that means that Santa doesn't find this string beautiful at all.

Santa Claus is crazy about palindromes. He is thinking about the following question: what is the maximum possible total beauty of a palindrome which can be obtained by concatenating some (possibly all) of the strings he has? Each present can be used at most once. Note that all strings have **the same length** n.

Recall that a palindrome is a string that doesn't change after one reverses it.

Since the empty string is a palindrome too, the answer can't be negative. Even if all a_i's are negative, Santa can obtain the empty string.

Input

The first line contains two positive integers k and n divided by space and denoting the number of Santa friends and the length of every string they've presented, respectively ($1 \le k, n \le 100\,000$; $n \cdot k \le 100\,000$).

k lines follow. The i-th of them contains the string s_i and its beauty a_i ($-10\,000 \le a_i \le 10\,000$). The string consists of n lowercase English letters, and its beauty is integer. Some of strings may coincide. Also, equal strings can have different beauties.

Output

In the only line print the required maximum possible beauty.

Examples

input
7 3 abb 2 aaa -3 bba -1 zyz -4 abb 5 aaa 7 xyx 4

output
12

input
3 1 a 1 a 2 a 3

output
6

input
2 5 abcde 10000 abcde 10000

output
0

Note

In the first example Santa can obtain `abbaaaxyxaaabba` by concatenating strings 5, 2, 7, 6 and 3 (in this order).