



## Kanji Scam

Mouse Stofl has invited his friend on a vacation together to Japan. However, his friend is extremely frugal and doesn't want to go as he thinks it's too expensive there. Therefore, Stofl wants to convince him that Japan is not that expensive. Fortunately, his friend doesn't know Japanese numerals, and Stofl thinks he can take advantage of that. Can you help him?

Stofl's friend has written down some things they want to do on the vacation and their prices. The prices are written using Japanese numerals. They use a base- $k$  number system, so they have  $k$  symbols with values 0 through  $k - 1$ . This is a standard positional number system, so the string  $abc$  corresponds to the number  $a \cdot k^2 + b \cdot k + c$ .

Stofl's friend of course doesn't know which symbol has which value. That's where Stofl counts on your help: your goal is to figure out a mapping of symbols to values such that the total price of the trip (calculated using this mapping) is minimal.

Japanese are very minimalistic and therefore would never write start a number with a zero or have two symbols with the same value. There always exists a solution (so it is impossible that prices start with all symbols).

### Input

The first input line contains two integers:  $k$  and  $n$ , the base of the Japanese number system and the number of activities planned.

$n$  lines follow, each containing the description of a price: a string made from the  $k$  first ASCII characters starting from 'a' (see hint section).

### Output

Output a line with a single integer: the minimum total price you can achieve with a suitable mapping of symbols to digit values.

### Limits

There are 10 test groups, each of which is worth 10 points.

In all test groups:  $2 \leq k \leq 30$ ,  $n \leq 10^4$ . All prices are less than  $10^{12}$  with any choice of the symbol values.

- In Test group 1 - 2:  $k \leq 10$ ,  $n \leq 100$ .
- In Test group 3 - 5:  $k \leq 10$ .
- In Test group 6 - 8:  $k \leq 20$ .
- In Test group 9 - 10: no further restrictions.

### Hints

In C++ you can read a price with `iostreams` by reading into a `string`. A `string` behaves similarly to a `vector<char>`, so you can index it and take its length. You can use arithmetic operators on chars, for example `x - 'a'` is the index into the lowercase alphabet of `x` (starting with 0 for `a`).

In Python, `input()` returns a `string` which can be indexed. You can't do arithmetic on characters directly, but you can use the `ord()` function to retrieve a character's ASCII value, for example `ord(x) - ord('a')` is the index into the lowercase alphabet of `x` (starting with 0 for `a`).



## Examples

Input	Output
2 3 abba aabba ababb	54

*As a number can't begin with a zero, the only mapping allowed is  $a = 1$ ,  $b = 0$ .*

Input	Output
3 3 acca accb cacb	172