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## String concatenation

P52564\_en

Quinzè Concurs de Programació de la UPC - Semifinal (2017-06-29)

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How many different words of length exactly  $\ell$  can you build by concatenating  $m$  given words? You can use any word as many times as you wish.

### Input

Input consists of several cases, each with  $\ell$  and  $m$ , followed by  $m$  different words. Assume that  $\ell$  is between 1 and  $10^{18}$ , that  $m$  is at least 1, that the words only have lowercase letters, and that the sum of their lengths is at most 50.

### Output

For every case, print the result modulo  $10^9 + 9$ .

#### Sample input

```
1 3 a deu hol
4 3 a deu hol
100 2 a aa
4 3 a ab ac
8 3 hola lola la
10 3 ab abb bb
10 4 x y yy xyy
32 4 wo lo wolo wololo
3 4 ab c a bc
1000000000000000000 4 ab c a bc
```

#### Sample output

```
1
5
1
11
11
56
1024
65536
15
382802655
```

### Problem information

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