

Maximize It!

You are given a function $f(X) = X^2$.

You are also given K lists. The i^{th} list consists of N_i elements.

You have to pick exactly one element from each list so that the equation below is *maximized*:

$$S = (f(X_1) + f(X_2) + \dots + f(X_k)) \% M$$

X_i denotes the element picked from the i^{th} list . Find the maximized value S_{max} obtained.

$\%$ denotes the modulo operator.

Input Format

The first line contains **2** space separated integers K and M .

The next K lines each contains an integer N_i followed by N_i space separated integers denoting the elements in the list.

Output Format

Output a single integer denoting the value S_{max} .

Constraints

$$1 \leq K \leq 7$$

$$1 \leq M \leq 1000$$

$$1 \leq N_i \leq 7$$

$$1 \leq \text{Magnitude of elements in list} \leq 10^9$$

Sample Input

```
3 1000
2 5 4
3 7 8 9
5 5 7 8 9 10
```

Sample Output

```
206
```

Explanation

Picking **5** from the **1st** list, **9** from the **2nd** list and **10** from the **3rd** list gives the maximum S value equal to $(5^2 + 9^2 + 10^2) \% 1000 = 206$.