Digits in optimal order — P46547_en

Given two natural numbers m and n, you must construct a number x using the digits $\{1, \ldots, n\}$ (exactly one of each) such that no (non-empty) prefix of x is a multiple of m. For example, with $m = 3$ and $n = 4$, $x = 2314$ is not a valid order, because 231 is a multiple of 3. In contrast, $x = 4312$ is a valid order, because neither 4, nor 43, nor 431, nor 4312 are multiples of 3.

Moreover, you have a matrix $M[1..n][1..n]$ such that $M[i][j]$ contains the prize that is obtained if digit j is placed immediately to the right of digit i. Maximize the total sum of the prizes.

Input

The input consists of several cases. Each case starts with m and n, followed by M: n rows, each with n natural numbers between 1 and 10^6, except for the diagonal, that is filled with zeros. You can assume that $3 \leq m \leq 1000$ and $2 \leq n \leq 9$.

Output

For each case, print the maximum possible prize. If no x can be constructed, print 0.

Sample input 1

```
10 2
0 4
3 0

6 2
0 1000000
1 0

3 3
0 7 7
7 0 7
7 7 0

3 4
   0  1  2    3
1000  0  4 2000
   5  6  0    7
   8  9  1    0
```

Sample output 1

```
4
1
0
18
```

Problem information

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