Inaho XI

Time limit: 2.0s **Memory limit:** 64M

Given M points in N dimensional space, find the minimum "surface area" of a hyperrectangle required to contain all M points modulo $10^9 + 7$.

As an example, the "surface area" of a 2-dimensional hyperrectangle (rectangle) is the sum of its 4 side lengths. The "surface area" of a 3-dimensional hyperrectangle (rectangular prism) is the sum of the areas of the 6 sides of the hyperrectangle.

Input Specification

The first line will contain two space-separated integers, N, M $(2 \leq N \leq 10, 1 \leq M \leq 10^5)$, the number of dimensions and the number of points respectively.

The next M lines will each contain N integers, $a_{i_1}, a_{i_2}, \ldots, a_{i_N}$ $(-10^9 \leq a_{i_j} \leq 10^9)$.

Output Specification

Output the minimum "surface area" of a hyperrectangle required to contain all M points, modulo $10^9 + 7$.

Subtasks

Subtask 1 [10%]

$N = 2$

$M \leq 100$

Subtask 2 [20%]

$M \leq 100$

Subtask 3 [70%]

No additional constraints.

Sample Input 1

```
2 4
1 1
3 3
-1 2
0 0
```

Sample Output 1

```
14
```

Sample Input 2

```
5 3
1 4 2 3 4
0 -129 6 9 0
0 0 -10 9 5
```

Sample Output 2

```
183436
```