

# Hyperspace Travel



A group of  $n$  friends living in an  $m$ -dimensional hyperspace want to meet up at some central location. The hyperspace is in the form of an  $m$ -dimensional grid, and each person can only move along grid lines. For example, to go from  $(0, 0) \rightarrow (1, 1)$  in a 2-dimensional space, one possible route is  $(0, 0) \rightarrow (0, 1) \rightarrow (1, 1)$  for a total distance traveled of 2 units.

Given the coordinates,  $(X[0, 1, \dots, m - 1])$ , for  $n$  friends, find a point at which all  $n$  friends can meet such that the total sum of the distances traveled by all  $n$  friends is minimal. If there are multiple such points, choose the lexicographically smallest one. The point  $P_1[0, 1, \dots, m - 1]$  is lexicographically smaller than  $P_2[0, 1, \dots, m - 1]$  if there exists such  $j < m$  that  $\forall i < j P_1[i] = P_2[i]$  and  $P_1[j] < P_2[j]$ .

## Input Format

The first line contains two space-separated integers describing the respective values of  $n$  and  $m$ . Each line  $i$  of the  $n$  subsequent lines contains  $m$  space-separated integers describing the respective coordinates (i.e.,  $x_0, x_1, \dots, x_{m-1}$ ) for friend  $i$ .

## Constraints

- $1 \leq n \leq 10^4$
- $1 \leq m \leq 10^2$
- $-10^9 \leq x_i \leq 10^9$

## Output Format

Print  $m$  space-separated integers describing the coordinates of the meeting point.

## Sample Input

```
3 2
1 1
2 2
3 3
```

## Sample Output

```
2 2
```

## Explanation

There are  $n = 3$  friends (we'll call them  $a$ ,  $b$ , and  $c$ ) located at points  $a = (1, 1)$ ,  $b = (2, 2)$ , and  $c = (3, 3)$ . The minimal solution is for friends  $a$  and  $c$  to meet at friend  $b$ 's current location; this means  $a$  travels 2 units from  $(1, 1)$  to  $(2, 2)$ ,  $c$  travels 2 units from  $(3, 3)$  to  $(2, 2)$ , and  $b$  stays put at  $(2, 2)$ . The total distance traveled by all friends is  $2 + 0 + 2 = 4$ , which is minimal. Thus, we print  $m = 2$  space-separated integers describing the coordinate where the  $n = 3$  friends meet: **2 2**.