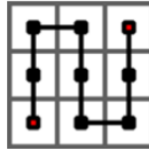


A. Curve

Description

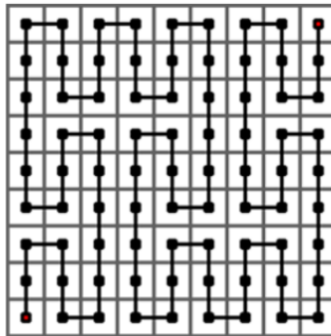
CC is a specialist in geometry. Recently he found a wonderful curve, known as Peano curve, which can recursively fill square areas.

Peano curve is defined recursively. This is the case of an 1-order Peano curve:

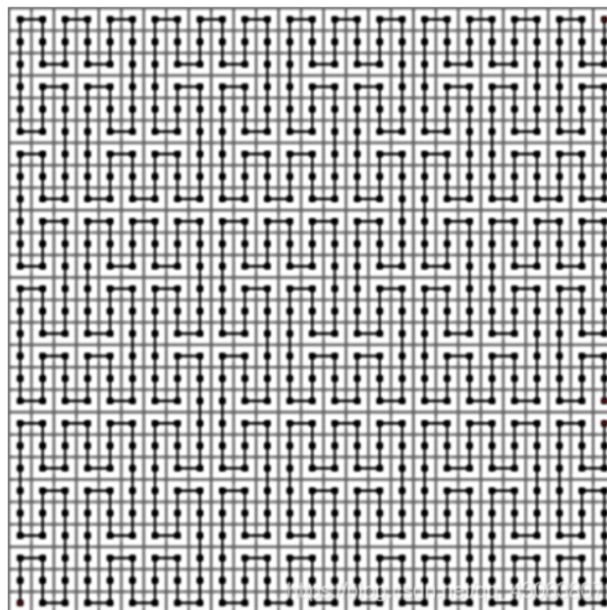


It starts from $(1, 1)$ and ends at $(3, 3)$. Note that the second step is at $(1, 2)$.

Then this is the case of a 2-order Peano curve, which is made up of 3×3 1-order Peano curves:



If you still cannot get it, this is the case of a 3-order Peano curve, which is made up of 3×3 2-order Peano curves:



Now CC enters a square park of length 3^N . He wants to visit every block in a N -order-Peano-Curve way. His starts his first step at $(1, 1)$ and finishes his walk at $(3^N, 3^N)$. Please tell him the position of his K^{th} step.

Input format

The first line contains two integers N, K .

Output format

Output two integers x, y , indicating the position is at (x, y) .

Samples

Sample 1 Input

1 2

Sample 1 Output

1 2

Sample 2 Input

2 59

Sample 2 Output

8 2

B.Tree

Description

Given an array of N integers a_1, a_2, \dots, a_N .

Please support M sequential operations, each of which is one of the 2 types:

1. change a_x to y
2. calculate $\sum_{i=l}^r a_i$

Input format

The first line contains two integers N, M .

The second line contains N integers a_1, a_2, \dots, a_N , denoting the initial array.

For the following M lines, each line follows one of the 2 formats:

- **1 x y**, denoting a type 1 operation
- **2 l r**, denoting a type 2 operation

Output format

For each type 2 operation, output the answer in one line.

Samples

Sample Input

4 4
2 -1 2 -4
2 1 3
1 2 4
2 1 3
2 2 4

Sample Output

3
8
2

