A Distances

You are given integers n and k. Your goal is to pick n distinct integer points on the xy-plane such that for exactly k pairs of points, the Euclidean distance between the points is an integer. Recall that the Euclidean distance between points (x_1, y_1) and (x_2, y_2) is

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}.$$

It can be shown that a solution always exists under the constraints of this task.

Input

The only line contains two integers, n and k.

Output

Print n lines with the ith line containing two integers: the x and y coordinates of the ith point. The absolute value of every coordinate must be at most 10^9.

If there are multiple solutions, you can print any of them.

Constraints

- $1 \leq n \leq 100$
- $0 \leq k \leq n(n-1)/2$

Example

Input:
```
3 2
```

Output:
```
1 1
1 2
2 2
```

Explanation: The Euclidean distance between $(1, 1)$ and $(1, 2)$ is 1. The distance between $(1, 2)$ and $(2, 2)$ is also 1. However, the distance between $(1, 1)$ and $(2, 2)$ is $\sqrt{2}$, which is not an integer.

Scoring

Subtask	Constraints	Points
1	$n \leq 4$	11
2	$k = n(n-1)/2$	4
3	$k = 0$	6
4	$k \leq n$	19
5	$k \leq n(n-1)/8$	22
6	No additional constraints	38