Daniel loves graphs. He thinks a graph is *special* if it has the following properties:

- It is undirected.
- The length of each edge is 1.
- It includes *exactly* P different *lovely triplets*.

A *triplet* is a set of 3 different nodes. A triplet is *lovely* if the minimum distance between each pair of nodes in the triplet is *exactly* Q. Two triplets are different if 1 or more of their component nodes are different.

Given P and Q, help Daniel draw a *special graph*.

Input Format

A single line containing 2 space-separated integers, P (the number of different lovely triplets you must have in your graph) and Q (the required *distance* between each pair of nodes in a lovely triplet), respectively.

Constraints

- $1 \leq P \leq 5000$
- $2 \leq Q \leq 9$

Output Format

For the first line, print 2 space-separated integers, N (the number of nodes in the graph) and M (the number of edges in the graph), respectively.
On each line i of the M subsequent lines, print two space-separated integers, u_i and v_i, describing an edge between nodes u_i and v_i.

Your output must satisfy the following conditions:

- $0 \leq N, M \leq 100$
- $1 \leq u_i, v_i \leq N$

If there is more than one correct answer, print any one of them.

Sample Input

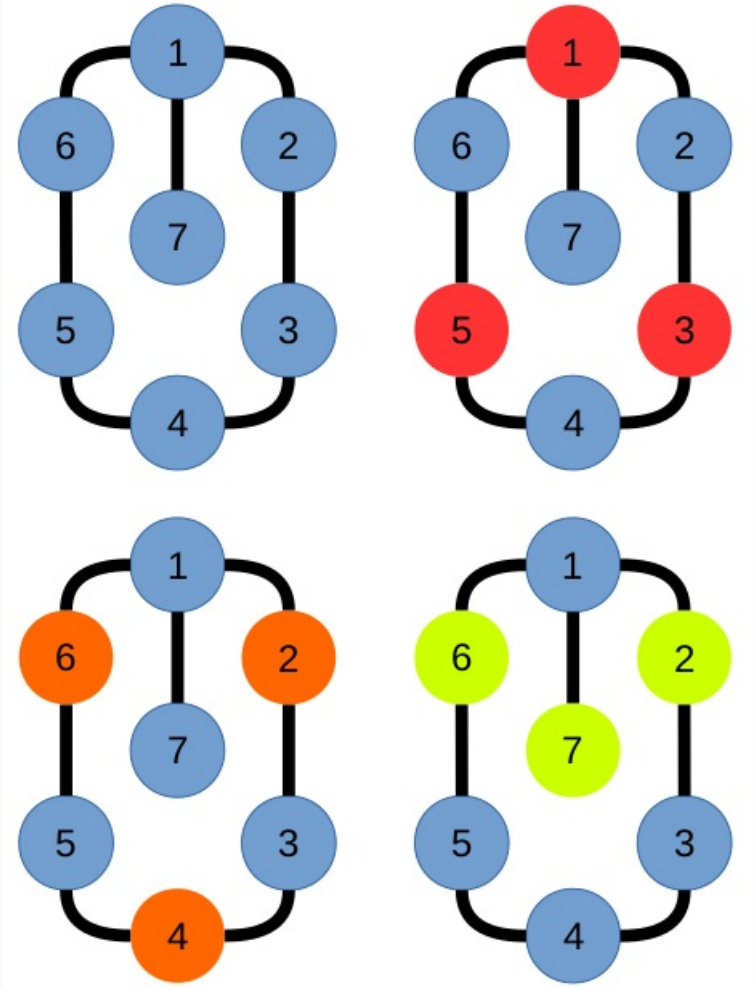
```
3 2
```

Sample Output

```
7 7
1 2
2 3
3 4
4 5
5 6
6 1
1 7
```

Explanation

There are exactly $P = 3$ lovely triplets in this graph: $\{1, 3, 5\}$, $\{2, 4, 6\}$, and $\{2, 6, 7\}$.



Observe that each node in a lovely triplet is $Q = 2$ edges away from the other nodes composing the lovely triplet.