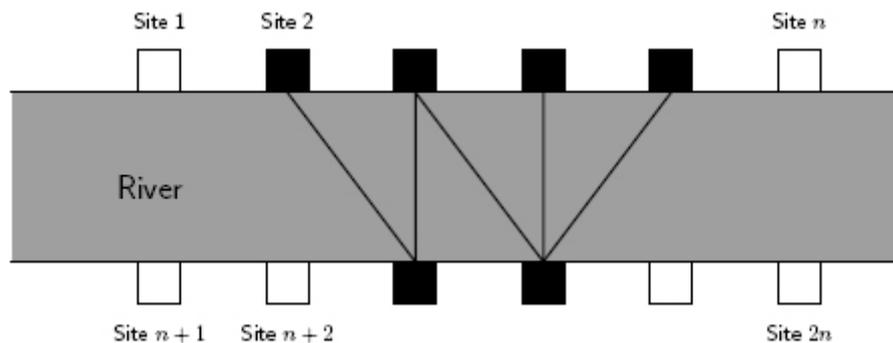


3714 Bridges

The Widget Corporation has developed the greatest technological advance of the century: the megawidget. The megawidget uses revolutionary new technologies, thus completely new factories have to be built. The megawidget consists of n subunits; each subunit will be produced in a different factory. Widget production requires large amount of water, thus the new factories will be located on the banks of the Purple River. Widget Corporation located $2n$ suitable sites where factories can be built and there are n sites on each bank of the river (see the figure below). During the production of a widget, certain subunits should be moved very quickly from one factory to another. Unfortunately, it is impossible to build roads between the factories, since the terrain is too rough. Therefore, the only way you can move subunits between two factories if you build a bridge connecting them. By definition, a bridge has to cross the river, thus you cannot build a bridge that connects two factories on the same bank. Furthermore, due to technological limitations, two bridges cannot cross each other. The figure shows a possible layout of 6 factories and 5 bridges.



You are given a list specifying which pairs of factories should be connected by bridges, and your task is to find a location for each factory such that the bridges can be built without crossing. If this is not possible, then you can reduce the number of bridges by using helicopters between two factories (the two factories connected by helicopters can be on the same bank or they can be on opposite banks). Helicopters are very expensive, so we can afford to replace at most 2 bridges with helicopters. Therefore, your task is to replace exactly 2 bridges with helicopters, and build the remaining bridges in such a way that they do not cross.

Input

The input contains several blocks of test cases. Each case begins with a line containing two integers: $1 \leq n \leq 10000$, the number of factories, $2 \leq m \leq 10000$, the number of pairs that have to be connected. The next m lines contains two integers each, separated by a space. A line containing i and j ($1 \leq i, j \leq n$) means that the i -th factory and the j -th factory have to be connected (either by a bridge or by a helicopter connection). It is not sufficient that j can be reached from i via a series of bridges, it is important to have a direct connection between the two factories.

The input is terminated by a block with $n = m = 0$.

Output

For each test case, if there is a solution, then you have to output 2 lines specifying the pairs of factories that are to be connected by helicopters. Each of these two lines contains a pair of integers, separated

by space. If it is not possible to solve the problem with 2 helicopters, then output the single line 'No solution.' (without quotes).

Sample Input

```
8 7
1 2
2 3
2 4
2 5
3 6
4 7
5 8
0 0
```

Sample Output

```
2 3
3 6
```