

4914 One-Way Streets

In FlowerTown, every street connects two intersections and does not pass through any other intersections — FlowerTown has very short streets. Currently, cars can travel on all streets in both directions and one can reach any intersection from any other intersection.

FlowerTown is battling a serious parking problem. A highly paid consultant suggested converting certain streets into one-way streets in order to create more parking spaces. To maximize the increase in revenue, city officials want to convert as many streets as possible; however, the good citizens of FlowerTown must still be able to reach any intersection from any other intersection.

The officials ran out of money for the consultant and are asking for your help: what is the maximum number of streets that can be converted into one-ways so that all intersections can still be reached from each street?



Input

The input file contains several test cases, each of them as described below.

The first line contains two positive integers, n , the number of intersections, and s , the number of streets, separated by white space ($n \leq 1,000$, $s \leq 10,000$).

Each of the next s lines contains two positive integers, separated by white space. The integers specify two intersections connected by a street; the intersections are numbered from 1 to n .

Output

For each test case, the output must follow the description below.

The first line contains a single number k , the maximum number of streets that can be converted into one-way streets.

The following k lines describe the one-way streets. Each line contains two positive integers, separated by white space; the first integer is the intersection where this one-way street starts, and the second integer is the intersection where this one-way street ends.

Sample Input

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

Sample Output

```
5
```

2 3
3 4
4 5
5 2
3 5