British Informatics Olympiad Final

30 March – 2 April, 2000

Sponsored by Data Connection & SkillIT

Town Planning — Part Two

Having carefully designed a user-friendly town, it is time to attract tourists and promote business. Roads have been built between all the adjacent districts and the town council has decided to plan a route through this historic town. This route needs to include every road, so that the entire town is visited, and should finish where it started, creating a circular route. Furthermore the council wishes to promote the businesses on either side of the roads, so each road must be traversed twice (and only twice), once in each direction. Districts can be entered as many times as necessary.

Write a program which reads in a list of adjacent districts and calculates a satisfactory route. The first line of input will be an integer n ($1 < n \leq 5000$) giving the number of districts. This will then be followed by a list of roads, given by the two districts they connect, one road on each line. This will be terminate with the line `-1 -1`. No road will be duplicated.

You should output a suitable route, given as a list of the districts the route passes through (in order), one per line. This route should start and end at district 1.

The town has been planned using the same methods as given in of part one. Hence you can assume, for example, that the town is connected and every district is connected to between 1 and 3 roads. There is always a solution and only one is required.

Sample Input

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

Sample Output

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