

Problem

Dialogue Among Civilizations

The Dialogue Among Civilizations is a theory in international relations. The theory in its current form was first introduced by Mohammad Khatami, former President of Iran (http://en.wikipedia.org/wiki/Dialogueue_Among_Civilizations).

He wants to start the conversation but he does not know in which order he should start his dialogue. Since dialogue with a nation can affect the relations with others, he asks you and a civilization analyst to assist him in solving this problem.

After a long research, the analyst found a model for civilizations relationship. The relationship model among civilizations is given as a **complete weighted graph**. The weight on the edges represents the relationship. Weights less than zero refers to a conflict among the civilizations, and positive weight shows a friendly relationship between the Civilizations. See figure 1.

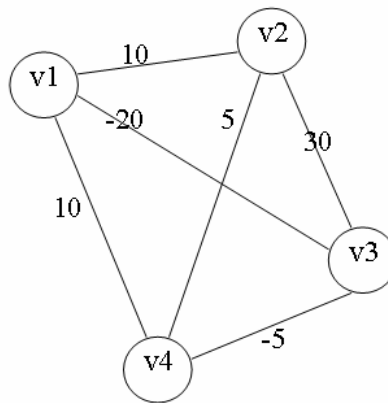


Figure 1

At first before any dialogue among civilizations the weight on the edges are between -100 and 100; And the graph has n vertices and $n(n-1)/2$ edges. For instance in figure 1, n is equal to 4.

n : number of vertices in graph

$1 \leq i, j \leq n$

initial condition : $\forall i, j : -100 \leq e_{ij} \leq 100$

When two civilizations start a dialogue, their weights will change as follows:

n : number of vertices in graph

$1 \leq i, j \leq n$

$$\forall k : 1 \leq k \leq n \wedge k \neq i \wedge k \neq j \Rightarrow e'_{ik} = e'_{jk} = \min\{e_{ik} + e_{jk}, 1000\}$$

for other edges : $e'_{ij} = e_{ij}$

For instance, if node 1 and 4 start the dialogue, the graph in figure 1 will change to left graph in figure 2. As you see this condition is worse than the first graph. The negative relations have got greater value, which means more conflict. On the other hand, if node 1 and 2 start a dialogue, the graph in figure 2 will change to right graph in figure 2. As you see this condition is better, and there is more friendly relations than first graph.

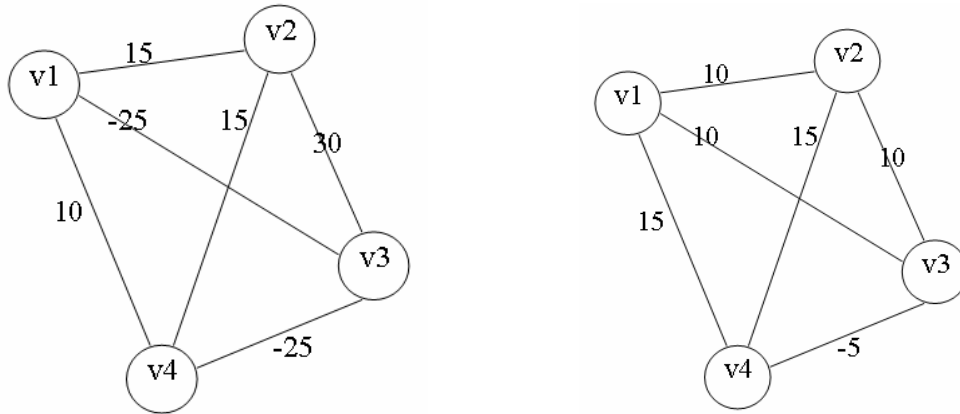


Figure 2

Now, let's assume that Mr Khatami is located on node 1, can you guide him in order to change all the relationships among civilizations to a friendly and a positive one. If yes, then in which order he has to initiate the dialogue with civilizations.

For instance to solve the graph in figure 1, there is two ways which follows:

1. Mr Khatami (node 1) first speaks to node 2, then speaks to node 3, see figure 3.

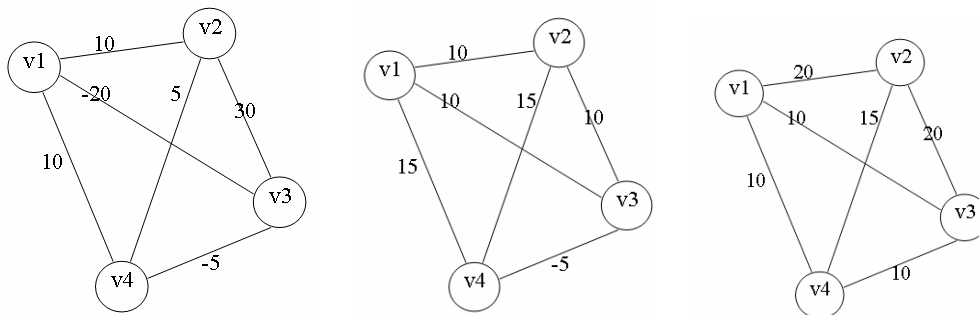


Figure 3

In figure 3, the left graph shows the initial graph, which is in figure 1. The middle graph shows the first graph after dialogue between node1 and node 2. The right graph shows the final graph which is in peace. This graph is resulted from dialogue among node 1 and node 3 in middle graph.

So the requested answer which is the order of nodes that Mr Khatami (node 1) should talk with is: 2 3.

2. Mr Khatami (node 1) first speaks to node 2, then speaks to node 4, see figure 4.

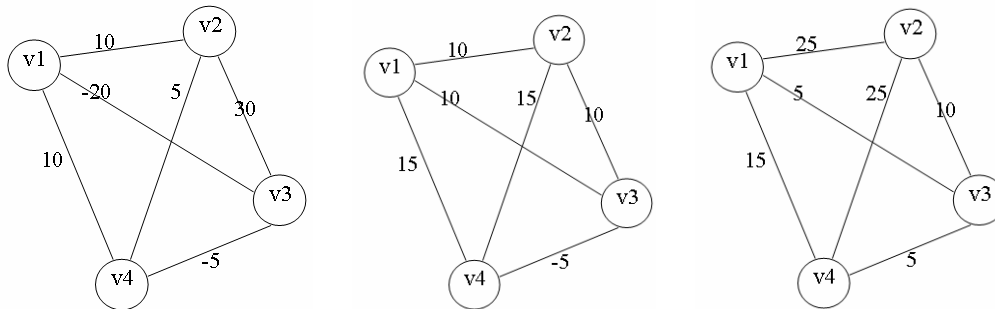


Figure 4

In figure 4, the left graph shows the initial graph, which is in figure 1. The middle graph shows the first graph after dialogue between node1 and node 2. The right graph shows the final graph which is in peace. This graph is resulted from dialogue among node 1 and node 4 in middle graph.

So the requested answer which is the order of nodes that Mr Khatami (node 1) should talk with is: 2 4.

As you can see, there is not a unique way for dialogue. The final graphs in answers are different but both of them contain only positive edges. Only thing that matter is Peace. We need a way to reach a final friendly graph.

Your program should solve a graph with number of nodes equal to countries in United Nations. (How many are them?!)

The graph is presented as a squared matrix in a text file. First line of file is n . The second line to $n+1$ th line of file is the rows of matrix. The columns of matrix are separated by *space* in each row. For instance, the graph in figure1 will be presented as follows:

```
>graph.txt
4
0 10 -20 10
10 0 30 5
-20 30 0 -5
10 5 -5 0
```

Your program should get the file as argument in console. Then it must write to console if the graph is solvable or not. If it is solvable, in the next line it have to write the sequence order. See the following example of our graph.

```
>program graph.txt
yes
2 3
```

Or may be:

```
>program graph.txt
yes
2 4
```

Here are two more examples:

```
>graph1.txt
3
0 -10 -10
-10 0 -10
-10 -10 0
```

```
>graph2.txt
3
0 10 -20
10 0 30
-20 30 0
```

```
>program graph1.txt
no
```

```
>program graph2.txt
yes
2
```