Praktikum Diskrete Optimierung

Due Date: Monday, 24th June 2013, 14:00

Aufgabe 1 (Traveling Salesman Problem `tsp`)

The goal in the Traveling Salesman Problem (TSP) is to find the shortest round trip visiting all nodes of a given graph. Implement an algorithm based on *Simulated Annealing* to find a preferably short round trip through the nodes. Output the length of the tour together with the sequence of node identifiers according to the computed tour.

The goal is to tune the parameters and the algorithm to find the shortest possible tour. We hope you have some fun tweaking and tuning the configuration. Feel free to use another definition of neighborhood, because this could also lead to better solutions. Keep in mind that your solutions are supposed to produce stable results between different runs of your program.

Hints

For testing you can use the sample problems `tsp1.in` and `tsp2.in`. The solutions for these two problems are given in the files `tsp1.out` and `tsp2.out`, containing the length and also the node sequence. However, these solutions are not optimal, you might be able to find a better tour. You don't need to use LEDA for this problem.

Your program should use the following formats:

Input format: The first line contains the number of nodes. The following lines contain the distances between the nodes, stored in lower triangular matrix.
Example:

```
4
0
3 0
4 2 0
5 5 5 0
```

Output format: The first line contains the length of the tour. The second line contains the list of nodes in the order of the computed tour. The starting node is not supposed to be repeated in the last position.
Example output for the input above:

```
15
1 2 3 0
```