Introduction to Intelligent Systems: The Travelling Salesperson Problem

In this practical you can start from the TSP code provided in Nestor. Modify the code in such a way that your program:

- runs the Metropolis version of the optimization for a number of N cities, but at constant temperature parameter T.
- performs (at least) 100x100 single steps, i.e. set the parameter maxsteps=100 in the code.
- calculates the mean value $< l >$ and the variance $var(l)=< l^2 > - < l >^2$ where averages are computed over the last 50 measured values.
- outputs the results <l> and var(l)

Obtain $< l >$ and var(l) for (at least) the following values of T: 0.5, 0.2, 0.1, 0.05, 0.02, and 0.01. Generate a plot showing <l> vs. T with the standard deviation sqrt[var(l)] displayed as 'errorbars' around the mean. To this end, use the Matlab command errorbar(x,y,e).

A reasonable value for the number of cities should be N=50. If computational power and your patience allow, use larger values of N, perform several simulations per temperature to obtain better estimates, or consider more values of T.

You should hand in at least:

- one plot as described above
- a short discussion of the T-dependence in your own words