Homework No. 7

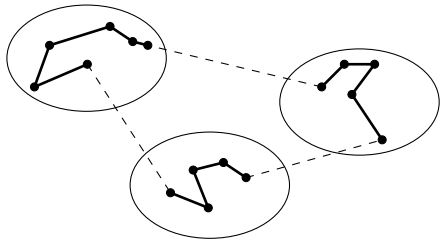
Self-Organizing Map

A Self-Organizing Map is an unsupervised machine learning technique and a type of artificial neural network but is trained using competitive learning rather than the error-correction learning (e.g., backpropagation with gradient descent) used by other artificial neural networks.

Implement an SOM to try to solve the Travelling Salesman Problem (TSP) for the required test cases. The number of lines in each test case corresponds the number of cities of that test case. Each line contains 3 numbers i x y: this indicates that the ith city is located at position (x, y). Prepare a summary of what your code does and the way you managed to solve TSP using SOM.

You can also implement an SOM, not to solve the TSP, but to solve an other arbitrary problem. If you choose this option for this homework, you are required to provide the details of the problem you have chosen. Also, be sure *not* to choose a problem that can be solved in polynomial time using a "simple" algorithm; it is advisable to choose an NP-Hard (or NP) problem.

Upload a zip file containing your source code along with the summary.



Extras

Your homework will receive extra points for each of the following parts:
Extra $\mathbb{N}$**.** choosing an arbitrary problem – instead of TSP.
Extra $\mathbb{R}$**.** visualizing the graph and the formation and the boundaries of the clusters.

Test Cases

Download the test cases here.

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