

Intensive Computation – Homework 5

20th May 2016

Simulated Annealing

Exercise

Write a script that:

- Takes as input a set of towns distributed over an area, together with their coordinates
- Computes the shortest possible route that visits each city exactly once and returns to the origin city (Traveling Salesman Problem) by using the **Simulated Annealing** metaheuristic.

Follow the scheme below where **invert**, **InversionGain**, **insert**, **InsertionGain** and **Metropolis** are functions.

Plot the path obtained after a suitable block of iterations (an iteration corresponds to the change of the temperature value) using the command **subplot**.

```
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ntown  
xytown          % xyCitta matrix of coordinates of the towns  
  
compute the matrix of town distances  
generate a random permutation (representing the order used to visit towns)  
compute the length of the cycle  
  
plot the towns and the starting cycle  
  
Temp  
Tfinal  
Tfatt          % Tfatt<1 value used to decrease the temperature  
nstep  
  
while Temp>= Tfinal  
k=0  
  
while k<= nsteps  
    choose a sub-path consisting of at least three towns  
    choose the perturbation: inversion o insertion  
  
    if inversion then compute InversionGain  
    test Metropolis  
    if metropolis then invert  
    if insertion then calcola InsertionGain  
    test Metropolis  
    if metropolis then insert  
    k=k+1  
end  
  
Temp=Tfatt*Temp  
plot the towns and the obtained cycle (for block of iterations)  
  
end  
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```