COMPSCI 471: Project #2

Due on Saturday, March 19, 2016

Morawski 1:00pm

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Hill Climbing

The python program shows that **Hill Climbing** was the fastest at finding local minima. This is because the program ends as soon as a minima is reached.
The 2-dimensional Hill Climbing algorithm simply starts at a random point, checks the 4 points around it, then chooses whichever is lowest.
In this particular case the Hill Climbing Algorithm in it's simple form is best for discovering these local minima.

Hill Climbing With Random Restarts

The Python program shows that Hill Climbing with Random Restarts provides a better chance of finding the global minima. The algorithm iteratively finds a random point in the domain and runs the basic hill climbing algorithm. The lowest minima found out of all the hill climbs performed is returned.

This algorithms actual runtime depends on how many random restarts are used. This is slower than the standard Hill Climb algorithm but provides a better chance of finding the global minima.

Simulated Annealing

Simulated annealing proves to be faster at higher rates of accuracy. The equation provided in the Project directions with bounds [-2.5,2.5],[-2.5,2.5] allowed me to discover that simulated annealing becomes more accurate if the local minimas are very spread out. There is a chance that Hill Climbing with Random Restarts will not look in a certain section of the function. This could result in a global minima never being found. Simulated annealing is more likely to span the entire graph, especially at higher temperatures.