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Homework 1 Report

1. Did the hill-climbing algorithm find the globally optimum solution to the function?

Why or why not?

Hill climbing algorithm did not find the global optimum solution to the objective function. The algorithm searches the highest value of the objective function. Algorithm finds it by moving to neighboring solutions that have a higher value. Nevertheless, the algorithm does not always find the global maximum.

2. Did the random restart algorithm find the globally optimum solution to the objective function?

Why or why not?

Random restart doesn't always find the global optimum. But in this case in it found the global optimum close to -0.01 and 1.58. It is the algorithm is designed to perform hill climbing from multiple random starting points and return the best solution found across all the restarts.

3. Did the simulated annealing algorithm find the globally-optimum solution to the objective

function? Why or why not?

Not always, but simulated annealing is approximating to global optimum. Simulated annealing is designed to find the solution in complex and large spaces.

4. Discuss anything else you have observed about the strengths and weaknesses of each algorithm.

Which algorithm performed the best overall?

Hill climbing is easy to implement, fast and effective. However, it can get stuck on local minima, dependent on initial state and does not consider the entire search space

Random Restart is overcomes getting stuck, faster in some cases, and simple to implement. But, it is computationally expensive, gets stuck in local minima.

Simulated annealing can find solutions in in complex and large spaces, doesn't get stuck, robust, can be edited according to the problem. However, it is computationally expensive, dependent, requires large iterations.

Random restart performed the best overall.