CMSC 471: Artificial Intelligence

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When applying the function

$$z = \frac{\sin(x^2 + 3y^2)}{0.1 + r^2} + (x^2 + 5y^2) * \frac{e^{1-r^2}}{2}, r = \sqrt{x^2 + y^2}$$

to hill-climbing, hill-climbing with random restarts, and simulated annealing, hill-climbing was the shortest. I think this is so because out of the other algorithms, hill-climbing is the simplest. Once it finds a minimum, the algorithm will stop, unlike hill-climbing with random restarts and simulated-annealing. Overall, however, simulated annealing produced the most accurate output. This may be because of the opportunities of exploration simulated-annealing are provided with. With the acceptance probability, there is more risk taking in finding a potential global minimum, instead of settling.

To find visual representations of these functions applied to these algorithms, run 'graphs.py.' No other command arguments are needed. The points a a little difficult to see, but if you rotate the image, at the right angle you can see them. They look like little red triangles.