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Algorithm A: Genetic Algorithm

Algorithm B: Ant Colony Optimisation

Description of enhancement of Algorithm A:

Looking at the fitness of chromosomes produced by my basic algorithm, I saw that there was not much difference between most of the chromosomes. Therefore, to try and improve my algorithm I decided to increase the bias towards the fitter chromosomes by raising all fitnesses by the power of 50 as the higher the number the better the results seemed to be and any higher would round the fitnesses to zero in a float data type.

This meant the algorithm was more likely to pick fitter chromosomes than in the basic algorithm, causing it to be more likely to find a fitter chromosome. This meant it was more likely to find better chromosomes from then on.

Description of enhancement of Algorithm B:

For the ant colony optimisation, I implemented an elitist ant approach to enhance the algorithm. This improved the algorithm greatly on graphs with a smaller number of nodes than those with higher values. Possibly this is due to the decay rate not working so well on larger graphs or that the number of iterations taking place is too small. On the 12 node graph this was particularly effective, tending to halve the route found.

I also found that running one ant more times was more effective than having multiple ants, but again this could have been influenced by my decay rate and laying amount. However I found that the algorithm was quite sensitive to small changes of variables and could produce a much worse result with only a small change.