

Name: AJ Sung

User-ID: hkxx26

Algorithm A: Simulated Annealing

Algorithm B: Genetic Algorithm

Description of enhancement of Algorithm A:

Instead of using the Boltzmann distribution I have used the Cauchy distribution in my probability function. This has provided not only a quicker execution time but also a lower tour score which in turn has produced better quality tours in less time. Moreover instead of recalculating the total tour score each time, only the swapped cities distances are calculated since they are the only changing distances (scores) in the successor tours.

Both algorithms were tested on a 100 city tours with sub 2 minute times on a 2017 MacBook Pro

Description of enhancement of Algorithm B:

To enhance algorithm B I implemented the Island Method into my algorithm. I have two islands which migrate every 10 generations and the number of migrations is equal to the value of the pop_migrate variable. This was useful to reduce premature convergence and introduce diversity within the population. I also created two splits rather than one in the crossover which produced better results. The roulette wheel random selection method was replaced with a tournament mode which picked the fittest children out of a subset of the population.

I also set the iteration setting to 3500 iterations which is half of the basic algorithm. This is due to having two populations running concurrently hence having 3500 iterations overall still results in the same iterations as the basic algorithm.

Both algorithms were tested on a 100 city tours with sub 2 minute times on a 2017 MacBook Pro