# CS312: Artificial Intelligence Laboratory
# TSP Trial Round Report

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## OVERVIEW

This report elaborates on the methodology used for solving the Travelling Salesman Problem and the improvements done vis-à-vis the previous lab.

## I. METHODOLOGY

Comparing the results from previous experiment, among Simulated Annealing, Genetic Algorithm and Ant Colony Optimization, Simulated Annealing had given the best results. Therefore, we implement Simulated Annealing with some tweaks for this experiment.

## II. IMPROVEMENTS

After experimenting with a few more cooling schedules, we discovered a new cooling schedule which was giving better results than our previous cooling schedule (Linear with slope -0.01). Hence, we use the new Geometric Cooling Schedule.

$$T_{new} = 0.999 * T_{old}$$

| | **euc_100** | **euc_250** | **noneuc_100** |
|---|---|---|---|
| **Linear Cooling** | 4100.93 | 10029.4 | 6010.51 |
| **Geometric Cooling** | 3652.09 | 9614.25 | 5826.1 |

## III. FURTHER IMPROVEMENTS

We further intend to experiment with more cooling schedules, as virtually, there is an infinite range of schedules possible. A point to be noted is that Ant Colony Optimization also gives almost the same results as Simulated Annealing but takes a lot of time to do so. Hence we also intend to further optimise our code for ACO, as execution time is a restriction.