

CS312 Assignment-4 Report

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TSP Problem Description:

Given a set of cities (coordinates) and distances between them, we need to find the best shortest tour possible by visiting all cities exactly once and returning to the origin city in the given amount of time (300 sec).

Methodology:

We took the help of Simulated Annealing and Genetic Algorithm to solve the given problem. In the beginning $0 \rightarrow 1 \rightarrow 2 \rightarrow \dots \rightarrow N$ (where N is the number of cities) is considered as a solution. Two numbers (a,b) are generated randomly using a built-in function. Then all the numbers between 'a' index and 'b' index are reversed and then simulated annealing is applied to this path. If the present path cost is greater than the highest cost obtained till now then the present path is printed.

Probability in simulated annealing is calculated using below formula

$$P = 1/(1 + e^{(best\ cost - present\ cost)/T}).$$

Conclusion:

First we solved this problem using Greedy Algorithm and Genetic Algorithm but a more optimal solution is observed when we used Simulated Annealing and Genetic Algorithm.