

**COMPUTER ENGINEERING FACULTY**

**ANALYSIS OF ALGORITMS HOMEWORK 3**

**TRAVELLING SALESMAN PROBLEM**

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PURPOSE OF THE PROJECT

The Traveling Salesman Problem aims to find the shortest path to travel all the cities on his route.

PREPARING

Fort his project, first we look the algortihms that we can use to implement the code. In the inputs that are given to us there are both big and smaller datas. So we should use an algorithm that is proper for all data sizes. We selected Nearest Neighbor Algorithm and 2-Opt Algorithm for writing the code.

IMPLEMENTATION

We use Java for implemeting the code. We constructed an arraylist in type of “şehir” and read the input files. Then we constructed an adjacency martice with the distance between cities. Then we applied Nearest Neighbor Algorithm.

* Nearest Neighbor Algorithm

The main idea of Nearest Neighbor Algorithm is to find the nearest neighbor city of the current city and getting close to the optimal solution. The steps of this algorithm is to choose a arbitrary city to start. Then making it visited.Then we find the nearest neighbor of this city then wemove to that city and add this edge to our route. Then we maket he second city as visited. This algorithm goes like that until we get back to our starting city.

Then we applied 2-Opt Algorithm for finding more close solution to optimal solution.

* 2-Opt Algorithm

The main ideaof 2-Opt Algortihm it is to take a route that crosses over itself and reorder it so that it does not. The steps of this algortihm is; first we write a for loop for generating all possible swapping actions. Then, if the edge that obtained by NNA algorithm is longer than the edge that we obtained form

2-Opt, we change the edges.

CONCLUSION

The code generates a proper route for Travelling Salesman Problem. For the first inputs that are sent with the homework ;

Text1 = 150393

Text 2 =3205

Text 3=1964679

For the inputs that are sent 15th June

Text 1=3205

Text 2=338417

Text 4 =12597

When we run the code, it works for all inputs except “text-3.txt”. this txt file gives an out of memory error.

DIVISION OF LABOR

Rümeysa ÖZTÜRK: Algorithms and report

Berra MERCAN: Algorithms and report