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Dial a Ride Problem

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I. INTRODUCTION

Generally we have seen in metro cities transport problem, even we have multiple options like city buses, metro trains, cab facilities, taxies etc. Every day cab and taxi organizations getting thousands of requests, due to the number of request they are not able to serve to all at a time and also they not able estimate to about their revenue like what request they would have to take so that they can make maximum revenue.

II. OBJECTIVE

Main objective to make this program is to generate maximum revenue for cab or taxi organizations by applying an algorithm.

III. DISCRIPTION

The Dial-A-Ride Problem with Transfers (DARPT) consists in defining a set of routes that satisfy Transportation requests of users between a set of pickup points and a set of delivery points, in the presence of ride time constraints. Users may change vehicles during their trip. This change of vehicle, called a transfer, is made at specific locations called transfer points. Solving the DARPT involves modelling and algorithmic difficulties. In this paper we provide a solution method based on an Adaptive Large Neighbourhood Search (ALNS) metaheuristic and explain how to check the feasibility of a request insertion. The method is evaluated on real-life and generated instances. Experiments show that savings due to transfers can be up to 8% on real-life instances. In public intracity transport system (like in metro city), the pick-up and drop-up locations are determined by the service provider, not by the passenger. On the other hand, a taxi (like merucabs, easy cabs in Pune, Bangalore, Mumbai) is a small vehicle with a driver, used by individual (or a small group of people) to travel between locations of their choice. The taxi service is the most comfortable, but the costliest mode of transport, where as the public/bus system is the cheapest, but least comfortable. Dial-a-ride is a form of public transport system which tries to achieve the comfort level of a taxi service at low cost. It is characterized by flexible routing and scheduling of small vehicles operating in shared-ride mode (there will be others who will share the vehicle with you during the journey) between pick-up and drop-up locations as requested by passengers. There are many variants of this problem, we will consider one such (simple) variant for this project.
A typical passenger request in Dial a ride problem will look like

< Magarpatta City Pune; International Airport Pune; (10 : 40AM; 11 : 15AM) >

Meaning the passenger wants to go from Magarpatta City to Pune International Airport and he would like to be picked up in Magarpatta city between 10:40 AM and 11:15 AM. Such requests are generally registered though telephone or Internet. It is not necessary that vehicle will take the shortest route, it might deviate from the shortest route in order to pick some other passenger, but the passenger will be charged based on the shortest distance between the locations that he is travelling.
This research studies a static and real-time dial-a-ride problem with time varying travel times, soft time windows, and multiple depots. First, a static DARP model is formulated as a mixed integer programming and in order to validate the model, several random small network problems are solved using commercial optimization package, CPLEX. Three heuristic algorithms based on sequential insertion, parallel insertion, and clustering first-routing second are proposed to solve static DARP within a reasonable time for implementation in a real-world situation. Also, the results of three heuristic methods are compared with the results obtained from exact solution by CPLEX to validate and evaluate three heuristic algorithms. Computational results show that three heuristic algorithms are superior compared to the exact algorithm in terms of the calculation time as the problem size (in terms of the number of demands) increases. Also among the three heuristic algorithms, the heuristic algorithm based on sequential insertion is more efficient than other heuristic algorithms that are based on parallel insertion and clustering first-routing second. For the case study, Maryland Transit Administration (MTA)'s real operation of Dial-a-ride service is introduced and compared with the results of developed heuristic. The objective function values from heuristic based on clustering first- routing second are better than those from

MTA's operation for all cases when waiting cost, delay cost, and excess ride cost are not included in the objective function values. Also, the algorithm for real-time DARP considering dynamic events such as customer no shows, accidents, cancellations, and new requests is developed based on static DARP. The algorithm is tested in a simulation framework. In the simulation test, we compared the results of cases according to degree of gap between expected link speeds and real link speeds. Also for competitive analysis, the results of dynamic case are compared with the results of static case, where all requests are known in advance. The simulation test shows that the heuristic method could save cost as the uncertainty in new requests increases. The main objective of the project is to schedule the cabs, in such a way as to maximize the revenue.

IV. PROPOSED PLAN OF RESEARCH WORK:

For this project we need to go those organizations that conducting such kind of business, We have to understand their realistic approaches, way of work, their requirement and techniques.

V. METHODOLOGY

We are given n(100) main locations of the city and distances to from each location to some of its neighboring locations. We can compute the shortest distance from this data (We may assume that every location is reachable from every other location). The amount of money that a passenger will pay to go from location A to B is proportional to the shortest distance from A to B. We can assume that the base rate is Rs.1 per KM.

We are given N(250) vehicles, each of capacity c(5). You can assume that the average speed of these vehicle is 2 minutes per KM. You are also given the location of these vehicles at midnight.

We are given R(5000) passenger requests. A request is of the form A; B; t1; t2 implying that the passenger would like to picked up at location A between time t1 and t2, and he should be dropped at location B. For simplicity, you can assume that all the locations are integers between 1 and n and the time is in minutes between 0 and 1440, with midnight as reference point. 10 : 40AM will be noted as 640. We have to write a program to schedule the N vehicles in such a way as to maximize the revenue. You can decide to reject a passenger request (it may not be possible to meet all the requests). The input will be given in the following format n N c R n n matrix indicating the distances to nearest locations. A sequence of N locations-indicating where the vehicle is at midnight. A sequence of R requests.

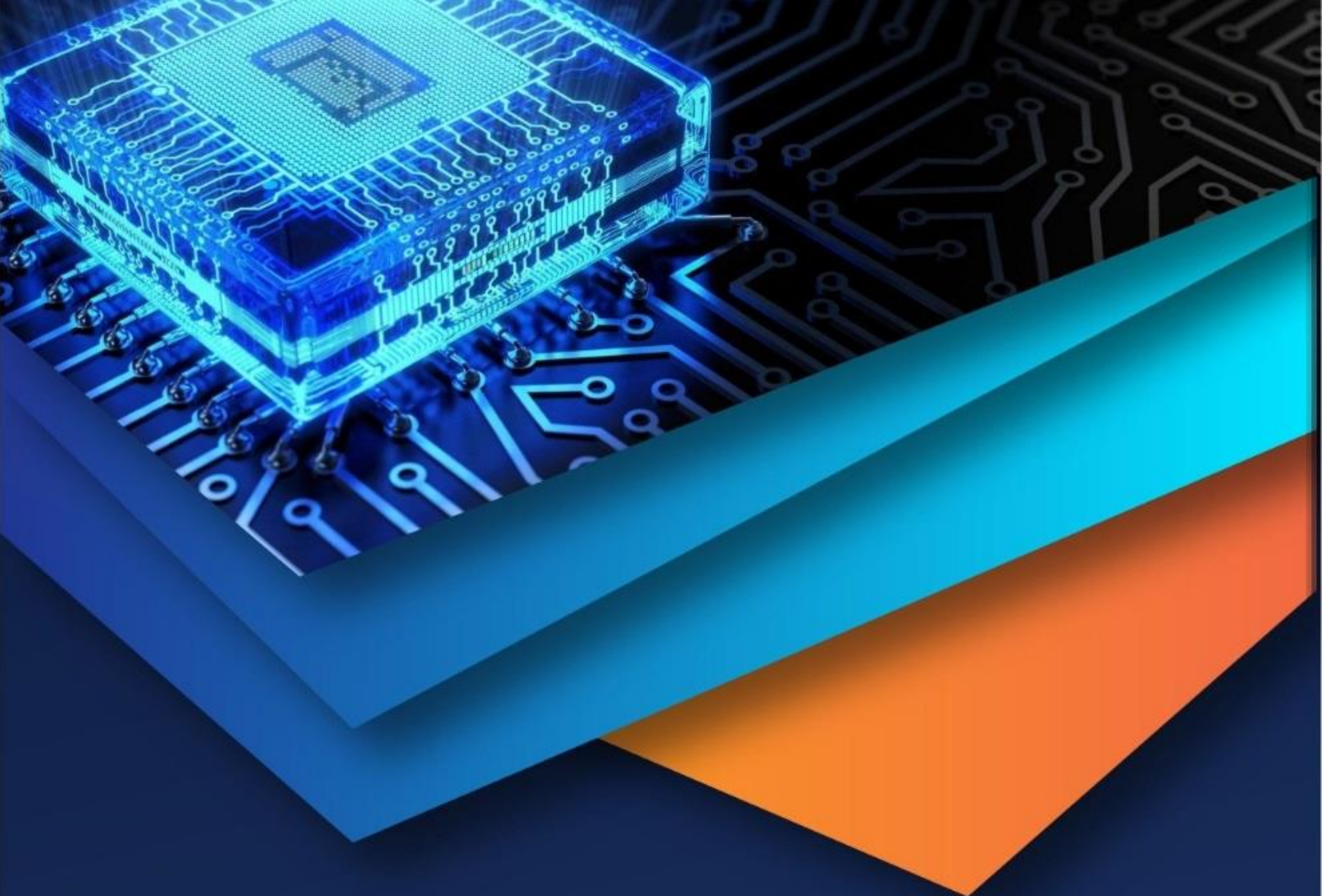
Expected output of the program is schedule for each vehicle and the total revenue generated.

VI. CONCLUSION

Moral of this project is to provide the better business way in terms of revenue and convenience for those organizations that provides transport facilities every day cab and taxi organizations getting thousands of requests, they not able to estimate about their revenue like what request they would have to take so that they can make maximum revenue. The main objective of the project is to schedule the cabs, in such a way as to maximize the revenue

REFERENCES

[1] https://www.reference.com/geography/services-dial-ride-offer-869e78deb80b4082?qo=cdpArticles
[2] http://dl.acm.org/citation.cfm?id=2537519
[3] https://github.com/graphhopper/jsprit/wiki/Dial-a-ride-problem
[4] http://drum.lib.umd.edu/handle/1903/11963



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