UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

GENETIC ALGORITHM FOR VEHICLE ROUTING PROBLEM

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ABSTRACT

Vehicle Routing Problem (VRP) is a combinatorial optimization that consists of finding an optimal object from a finite set of objects. The objective of the VRP is to find a series of routes at a minimal cost which means by finding the shortest direction, minimizing the number of vehicles and others from the beginning and ending the route at the depot, so that the known demands of all nodes are fully occupied. We are using four step in methodology as determine of genetic algorithm characteristic, data input, the process by using operator selection and prediction. the results have been compares with two operator selection to determine the minimum routes in cities. Based on the study that have been conducted the minimum routes is equal to 3990. The selected order route is 1-2-3-4-5-6-7- 8-9-10-11-12-13-14-15-18-19-16-17-20-21-22-25-24-23. From the results of the studies that have been conducted, it can be concluded that GA method can be used in the routes of large city. But it is not the best method, in other words, we can't guarantee whether the table this is the best solution. Therefore, the solution obtained is regarded as approximations only. Normally this GA to obtain a solution that is almost the best solution quickly and easily. Therefore, a more thorough study could be done to improve the methods that have been discussed, in particular the GA method by setting conditions for the processes in the GA.

1 INTRODUCTION

1.1 Introduction

Vehicle Routing Problem (VRP) is a combinatorial optimization that consists of discover an optimal object from a finite set of objects. The objective of the VRP is to observe a series of routes at a least cost which means by discovering the shortest distance, reducing the number of vehicles and others from the beginning and ending the route at the depot, so that the identified demands of all nodes are fully occupied.

Therefore, the management should take an initiative to make the process proficient. The corporation or organization should take seriously all the factor including minimize the cost and maximize the profit. Vehicle routing problem should determine the optimum path for delivering to a (n) set total customer which known as nod. Therefore, in this research VRP will be solved by using Genetic Algorithm (GA) method.

Genetic Algorithm is a search heuristics that similarly to the process of natural selection. Heuristics is usually to produce usually solutions for optimization and search problems. Heuristic may not be the best way to solve all the actual solution for this problem, but it still worthy because it does not require a prohibitively long time to find the solution. Genetic algorithms generate solutions to optimize problems using some operators such as mutation, selection, crossover and inversion.

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