UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

A CASE STUDY OF MINIMISING TRAVEL TIME FOR WASTE MANAGEMENT PROBLEM WITH LIMITED PICKING CAPACITY IN TAMAN SEREMBAN 3

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Report submitted in partial fulfilment of the requirement
for the degree of
Bachelor of Science (Hons.) Management Mathematics
College of Computing, Informatics and Mathematics

JANUARY 2024

ACKNOWLEDGEMENTS

Firstly, we thank God that we have finally completed our assignment successfully and exactly at the given time. Even though we have faced some difficulties, we have tried our best to overcome them all and solve them completely.

Special appreciation to our supervisor, Puan Noraimi Azlin Mohd Nordin and our MSP660 lecturer, Dr. Noorehan binti Awang, for their guidance and willingness to spend her time with us just to ensure we were able to complete this task. Without her, we would not be able to complete this report properly. Plus, special thanks to our parents and siblings for always giving us moral support during our whole studies, for our friends and classmates, who stick together and help each other to complete this project.

Not to forget, we also like to express our special thanks and gratitude to all those who intentionally or unintentionally were a part of this study. We appreciated all the fun times we had working and socializing together. May all your kindness and support be rewarded and bring a lot of benefits to us.

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ABSTRACT

Waste is an unneeded item that is discarded by humans when it is no longer required. The amount of waste is always rising due to the fast increase of the human population. As a result, solid waste companies must discover an effective method to collect waste by reducing the time it takes each garbage truck to gather waste in each location. There are three major issues highlighted in this study that can lead to inefficiencies in the waste collection process which are all garbage trucks used to collect waste have limited picking capacity, routes with penalties that slowing down the garbage truck and longer time taken for the garbage truck to collect waste. This study has two objectives that must be achieved. Using Dijkstra's algorithm, this project will create a travel network for garbage trucks to collect waste in Taman Seremban 3 and calculate the minimum travel time for the waste collection problem with limited picking capacity. There are four procedures that must be used to accomplish the objectives of this study. To begin, data will be gathered in Taman Seremban 3. The data will be utilised in a subsequent procedure. Second, the study will describe the model using Dijkstra's algorithm and software. Third, the model will be implemented in this study by doing data analysis using Dijkstra's method, which will be done using both math operations and software. Finally, the study will determine the minimum travel time for a garbage truck to collect waste in Taman Seremban 3. Using the Dijkstra's algorithm in Python, the minimum travel time for the garbage truck to collect waste in Taman Seremban 3 was 2.55 hours. Last but not least, this study wishes to assist other researchers in improving their research on this topic, and it is suggested that in the future, this study use a larger region as their area of study, use alternative software or programming languages, and involve more organisations.