Universiti Teknologi MARA

Adjusted 0-1 Knapsack Problem in Cargo Flow by using Artificial Bee Colony algorithm
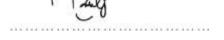

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STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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ABSTRACT

This research describes the problem with the knapsack that occurred in the cargo flow. The problem of the knapsack is the problem of optimisation used to illustrate the problem and the solution in which each set of items has its own specific value and weight. With its total value as much as possible, the number of items that may become less or at least equal to or equal to the limit. The aim of this research is to determine the flow of the shipment based on volume and to determine the total cost based on the flow of shipment by using Artificial Bee Colony (ABC) algorithm. The ABC algorithm consists of four phases of initialisation, employed bees, onlooker bees and scout bees. Data are obtained from Lin et al (2017). There are 30 shipments included in this research and shipments can start with any number of shipments. The result shows, the shipment starts with a Shipment 25 which the volume is 2 560 000 tons per year with cost 0.111 tons per km and ends with a Shipment 21 which volume is 2 250 000 tons per year with cost 0.129 tons per km. The flow volume of the shipment can be defined for the purpose of the finding. Next result for the total cost of the shipment is 402.377 tons per km.

Keywords: Knapsack problem, flow volume, total cost, ABC algorithm

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