

## **New Approach to Problems with One-dimensional Bin Packing**

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The Bin Packing Problem is a well-known optimization problem that is renowned for its applicability and complexity. It belongs to a special class of problems called NP-hard and entails trying to fit a set of items of varying sizes inside fixed-size containers while attempting to minimize the number of containers needed to fit the maximum number of items. The dimensions in bin packing problems refer to the number of characteristics or attributes used to describe the items and bins. Bin packing problems can be classified as One-Dimensional, Two-Dimensional, or Three-Dimensional depending on the dimensions. Among these, the One-Dimensional Bin-Packing Problem is one of the best-known optimization problems, and it has a significant number of applications. In order to pack all the products while keeping the bin capacity in mind, the challenge calls for determining the bare minimum number of bins. In this study presents a new algorithm for the ODBPP and provides comparative examples with Heuristic algorithms such as Next-Fit, First-Fit, Best-Fit, Worst-Fit, First Fit Decreasing and Best Fit Decreasing. These Heuristic algorithm techniques aim to strike a balance between computational complexity and solution quality. Through extensive computational experiments, it demonstrates superior performance in terms of the number of bins used and packing efficiency compared to other algorithms and the optimal solution. The objective is to minimize the number of bins used, thus maximizing space utilization and reducing resource waste. This algorithm contributes to the field of bin packing and provides a valuable tool for optimizing resource allocation and minimizing waste in practical applications.

**Keywords:** Bin-packing problem, Heuristic algorithms, New algorithm, One-dimensional, Optimal solution