The Knapsack Problem

A Survey of Solution Approaches

Sayak Biswas
UNIVERSITY *of* **FLORIDA**
UFID: 54584911

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Abstract

This paper surveys exisitng literature for different approaches to solve the knapsack problem. The knapsack problem is a combinatorial optimization problem in which one has to maximize the profits gained by packing a set of objects in a knapsack without exceeding its capacity. The problem is ***NP***-complete, thus there is no known polymial time algorithm for a large input.

Specifically, we take a look at the fractional and the 0/1 Knapsack Problem and provide a qualitative comparison between the three well-known approaches towards solving the problem: greedy, dynamic programming and branch & bound algorithms.