

## Abstract

Knapsack problems are among the most widely studied problems of discrete optimization. These are known to be difficult. As a result, the design of good heuristics for these problems has received much attention.

In this dissertation, we carry out a comparative survey of heuristics for three classes of knapsack problems — 0-1 Knapsack, Subset Sum and Number Partitioning. The heuristics studied include several well-established ones as well as some which we propose here. We evaluate their computational performance using randomly generated data. We also analyze their performances on difficult problem classes and derive some analytical results.

Sensitivity analysis is another established and important concept in operations research. General procedures for sensitivity analysis of optimal solutions to linear and some non-linear programming problems are well-established but relatively little work has been done on sensitivity analysis of heuristic solutions to discrete optimization problems. In the present dissertation, we study in detail, sensitivity analysis of heuristic solutions for the above-mentioned knapsack problems.