The Bin Spreading Problem
A Novel Application of Integer Linear Programming

Aderemi Adeyemo
Department of Industrial and Production Engineering
University of Ibadan
Ibadan, Nigeria
aderemiadeyemo1@gmail.com

Abstract

In recent years a lot of variants of the classical Bin Packing Problems (BPP) have evolved showing that the wide range applications of the problems have intrigued the interest of researchers. However, this paper considers a different problem, that somewhat looks like the opposite of the popular BPP. We denoted it as the Bin Spreading Problem (BSP). This according to our knowledge is a novel model of the integer linear programming applications. Problem of this kind arise in real life application especially in production planning and management, especially in blending operations where the aim is to maximize variety. It is also applicable in logistics, distribution and assignment problems. We focus on the case in which source bins have specific compositional contents which are to be blended into a maximum number of sink bins, maximizing variety while minimizing overdose. The bins are to be of fixed columns or sizes. The study presents a mathematical model and a heuristic which searches for solution, was developed and implemented manually for a small size problem. The results and analysis shows that another great application of ILP and combinatorial optimization has evolved.

Keywords
Bin spreading; Production planning; blending, Integer linear programming; blending

Biography
Aderemi Adeyemo is a M.Sc. student of the Department of Industrial and Production engineering, Faculty of Technology, University of Ibadan, where he also serves as a Tutorial assistant being a University Scholar. He holds a first class Honours degree in Industrial and production engineering. His research interests include applied optimization, logistics management, enterprise model development and Integer linear Programming and Biomedical engineering.