

Box Cutting Problem Description

This document describes the Box Cutting Problem Instance used in the paper:

“An investigation into two bin packing problems with ordering and orientation implications” by R. Lewis, X. Song, K. Dowsland and J. Thompson

As described in the paper, to produce this problem we took the well-known one-dimensional instance “10a” from the work of Liang et al. (2002), which involves $n = 600$ items of 36 types. We then modified this instance by adding projections to each of the 36 item types. This was achieved by randomly selecting two projections p_j and q_j from the interval $[1, b_j/2]$, ensuring that the distance between these $b_j - (p_j + q_j)$ (i.e. the “central width” of the item) was always greater than 10% of b_j .

Problem Layout

The single problem file 10aModified.txt contains the following information.

1. Stock Width
2. Minimum Number of Stocks Required
3. Number of Items (n)
4. Number of Item Types (m)

There then follows m lines defining the properties of each item type. Specifically:

- a) Total length of the type
- b) Number of occurrences of the type
- c) Size of the left projection p_j
- d) Size of the right projection q_j

Note that the sum of all the b ’s above equals the number of items n .

Reference

Liang, K., Yao, X., Newton, C., and Hoffman, D. (2002). “A new evolutionary approach to cutting stock problems with and without contiguity”. *Computers and Operations Research*, 29:1641-1659.