About the data sets

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June 2, 2014

These files were generated and used in:

Paquay, C., M. Schyns, and S. Limbourg (2014). A mixed integer programming formulation for the three dimensional bin packing problem deriving from an air cargo application. *International Transactions in Operational Research.*

The procedure used to create these test instances is presented in the above paper.

There are two main directories:

- one for the container (Unit Load Devices -ULDs- in this case) data and
- one for the box data.

1 ULD data sets

Three files, one file for each series of tests. In the `*.csv` files, each line corresponds to a ULD. Here are the meaning of each value:

Length; Width; Height; Capacity; Volume; α_L; α_W; α_H; cut1a; cut1b; cut1c; cut2a; cut2b; cut2c; cut3a; cut3b; cut3c; cut4a; cut4b; cut4c;

For example, the lines of the file `uld1.csv` represents a ULD with a size $1250 \times 604 \times 640$, that has a maximal capacity of 3175 and a corresponding volume or cost of 262. The x-coordinate (resp. y-coordinate, z-coordinate) of the centre of gravity has to lie within the interval [1250-125; 1250+125] (resp. [604-60;604+60], [0;340]). This ULD has no cut, it is a full parallelepiped.

About the cuts, they are expressed on the form $az+bx = c$, where $a, b, c \in \mathbb{Z}$. Therefore, the values of cut1a, cut1b and cut1c describe the coefficients a, b, c of a type 1 cut. For instance, the ULDs described in the file `uld2.csv` have two cuts, one of type 1 and one of type 2:

$$1600; 604; 640; 3175; 322; 125; 60; 340; \underbrace{175; 166; 29050}_{\text{cut of type 1}}; \underbrace{175; -166; -23655}_{\text{cut of type2}}; 0; 0; 0; 0; 0; 0.$$

Their equations are respectively $175z + 166x = 29050$ and $175z - 166x = -23655$.

2 Box data sets

Each line of a file `box#.csv` represents a box. The eight values represent:

$$\text{length; width; height; weight; } l^+\text{; } w^+\text{; } h^+\text{; fragile.}$$

For instance, the box

$$688; 379; 415; 541; 1; 1; 1; 0$$

is a $688 \times 379 \times 415$ box that weighs 541 and whose length, width and height can be in a vertical position. This box is not fragile.