Sets:

Set for all boxes.

Set for all the permutations possible.

Set for the number of boxes a permutation can have .

Set for box positions in permutation .

Set for boxes that are included in the permutation

Set for all boxes that are included in the permutation in which the first box of the permutation is taken into consideration.

Set for all boxes that are included in the permutation in which the boxes from the second position to the last position are taken into consideration.

Sets for all boxes that are included in the permutation in which the box is taken into consideration.

Set for all the permutations in which the box is present.

Set for all the permutations in which the box is present with a permutation size of .

Indexes:

= Index for the box used.

Index for the permutation used.

Index for the position of the element in the permutation.

Parameters:

Height of box .

Weight of box .

Load capacity of box .

Variables:

Boolean variable for box used in permutation .

Boolean variable for the usage of any permutation of size .

Target variable:

Total height for all boxes used in any permutation.

Objective function:

Subject to:

} Constraint for limiting each box to only one permutation.

} Constraint to limit each box to only one permutation in which the first member of the permutation is considered, and summing in increasing sizes. It limits each box to only one set size.

} Constraint to make sure that if a box in permutation located in the 1st position is used, then all the other boxes in that permutation are used too.

} Constraint to limit the weight of all the boxes from the position and up of permutation and not go beyond the weight allocation of the previous box in the position.

} Constraint to make sure all boxes in the permutation in which there is only one box, are not used together.

} Constraint to limit the usage of boxes in every permutation size.

} Constraint to make sure only one permutation size is true.