A Large Neighborhood Search Algorithm and Lower Bounds for the Variable-Sized Bin Packing Problem with Conflicts

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This file explains the instance files for the VSBPPC instances used in the computational study. There are two sets of instances: (i) Set-1 instances, and (ii) Set-2 instances.

There are 1440 Set-1 instances. Each Set-1 instance is solved with two bin type settings: (i) 3 bin types with capacities 100, 120 and 150, and (ii) 5 bin types with capacities 60, 80, 100, 120 and 150. Cost of a bin is equal to its capacity. Each instance file is named according to the "Correia_Random_x_y_z_t.txt" format where (i) x specifies the number of items in the instance (1 → 100, 2 → 200, 3 → 500, 4 → 1000), (ii) y specifies the interval the item sizes are generated from (1→ [1,100], 2 → [20,100], 3 → [50,100]), (iii) z specifies the average conflict graph density (0 → 0.0, 1 → 0.1, 2 → 0.2, 3 → 0.3, 4 → 0.4, 5 → 0.5, 6 → 0.6, 7 → 0.7, 8 → 0.8, 9 → 0.9, 10 → 0.95, 11 → 0.99), and (iv) t specifies the instance number (1, 2, …, 10).

There are 480 Set-2 instances. Each Set-2 instance is solved with seven bin types with capacities 70, 100, 130, 160, 190, 220 and 250, and three bin cost settings are considered: (i) convex, (ii) linear, and (iii) concave. For the linear bin cost setting, the cost of a bin is equal to its capacity. For the convex and concave bin cost cases, we have the cost of a bin with capacity W_k equal to $\lceil 0.1W_k^{3/2} \rceil$ and $\lceil 10W_k^{1/2} \rceil$, respectively. Each Set-2 instance file is named according to the "HS_Random_x_y_z.txt" format where (i) x specifies the number of items in the instance (1 → 100, 2 → 200, 3 → 500, 4 → 1000), (ii) y specifies the average conflict graph density (0 → 0.0, 1 → 0.1, 2 → 0.2, 3 → 0.3, 4 → 0.4, 5 → 0.5, 6 → 0.6, 7 → 0.7, 8 → 0.8, 9 → 0.9, 10 → 0.95, 11 → 0.99), and (iv) z specifies the instance number (1, 2, …, 10).

In each instance file, the first number in the first line is the number of items. Each of the following lines correspond to an item. In each line, the first entry is the item index, the second is the item size, and the following numbers are the indices of the items that are in conflict with the current item.