

Homework #1

Solving the Generalized Assignment Problem using Construction and Improvement Heuristics

In this homework, you are going to solve the generalized assignment problem for four data sets given in the text file called "gap-data-3instances.txt". The number jobs (items) and agents (boxes) are different in these data sets. For the first three of them the optimal objective values are also given. Note that they are cost minimization instances.

I would like to remind you the following points which you should consider when you submit your homework. It will consists of two parts: your **code** and **report**. First, your code must be clear and you should define the following using comment lines in the code: **variables names** and their **purpose**, **function names** and their **purpose**. For example, you should write "X is the assignment variable", "CompObj calculates the objective value", etc. Or, you can use a function name that is self explanatory e.g., ApplyMove.

In the report part, you have to provide the **pseudocode** of a **construction heuristic** and an **improvement heuristic** you developed. You should also mention which **solution representation** and **neighborhood structure** you used as well as other pertinent and tiny **details** worth pointing out. You can use the following table for the **output** of your solutions. An example row has been provided.

Instance	Solution (jobs assigned to each agent)	Obj. Value Construction Heuristic	% Gap from optimal objective value	CPU Time (s)	Obj. Value Improvement Heuristic	% Gap from optimal objective value	CPU Time (s)
5-25	1: {1,2,3,4,5} 2: {6,7,8,9,10} 3: {11,12,13,14,15} 4: {16,17,18,19,20} 5: {21,22,23,24,25}	500	14.15	50.25	470	7.31	90.52
8-40							
10-50							

Finally, for the sake of easy grading, you are expected to submit **the table also as an excel file** on the moodle using the filename name-surname-hw1results (e.g., Necati-Aras-hw1results.xlsx)

Note: You can use comma for decimal points in this excel file but for tables in original report, you ought to use point, i.e "." for decimal digits and round your results up to two digits.