Metaheuristics, 2024/2025
Problem assignment 3

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Assignment details

- Grading: this assignment is worth 60% of the practical grade.

- Submission deadline: 13/Dec/2024, until 23:59.

- Submission procedure: submit a ZIP file via the tutoria at `https://tutoria.ualg.pt/2024/` . The ZIP file must contain the source code that you wrote, and a file named `Report.pdf` reporting the results that you obtained. (Email submissions won't be accepted)

- Discussion: individual discussion of the assignment will take place on the lab lectures the following week: 17/Dec and 19/Dec. These discussions are mandatory.

Description

In this assignment you will continue to work with the same MAXSAT instances that you worked in the previous assignment. In addition to the algorithms that you implemented and tested during the previous assignment (i.e. Next-Ascent Hillclimbing, Variable Neighbourhood Ascent, and their multistart versions), you are requires to implement and test 2 other metaheuristcs of your choice (among the ones covered in class) and apply them to MAXSAT instances.

Requirements

You should run your algorithms on the following DIMACS instances, available at the tutoria:

- At least one of the metaheuristics has to be a multi-state method.

- For each algorithm and parameter setting, you should do a number of independent runs, each starting with a different random seed. I suggest you do 30 independent runs. (Note that some metaheuristics have several tuning parameters that the user can manipulate, and depending on the parameter setup the algorithm's performance on a given problem instance can vary substantially.)

- You should give approximately the same total number of objective function evaluations to each independent run. I suggest 10 million, the same budget used during the last assignment.

- You should make a comparison of the tested algorithms using a performance assessment study, and present a detailed report of your study, with a maximum of 10 pages.