Assignment 5

For this assignment form groups of two. The assignment is worth 40 points. Solutions must be submitted by 22.5.2023. Use the link on e-ucilnica to turn in your work. The report must be in .pdf format. You should also submit source code of your implementation and results in .txt format.

Continuous optimization of BBOB functions

The aim of this assignment is to find the best result for 24 optimization (minimization) functions that are available as BBOB (Black-Box Optimization Benchmark) functions in package *smoof*.

Instructions

To test the results use all 24 functions with 40 dimension with bounds in range (-5, 5). Use *iid* of 2023.

To access the functions use the following snippet of code:

```r
for(f in 1:24){
  cat("Creating function", f, "\n")
  obj_fun <- makeBBOBFunction(40, f, 2023)
}
```

See instructions for assignment 4 for details on how to use *smoof* package in R and Python. You can use any programming language of your choice if you know how to embed R to call the same package.

As a team you need to implement at least two optimization programs. One of the optimization programs must be local search (best descent local search, tabu search, guided local search, variable neighborhood search, simulated annealing, etc...) and the second one can be any optimization approach (genetic algorithm, differential evolution, whale algorithm, ant colony optimization, etc...). The second approach can also be local search.

Reporting

Write your results into the spread sheet available here. Each group is encouraged to fill their results as soon as it has them available so that peers can see what are currently the best obtained results.

Write a report with your results and description of used approaches. Report should include results for each tested method separately and a short description of each method (1-2 pages for each method). Submit your code and report on e-ucilnica.

You should also submit coordinates of the found minimums for each method in a .txt file. The file should contain 24 line, each line representing its own function. The values of coordinates should be separated by tabulator. See example on e-ucilnica.

Grading

Final grade will be based on quality of results, quality of report, oral presentation, number of methods tested and code quality.