Genetic Algorithm Optimizer

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1 Introduction

This program implements genetic algorithm to minimize multivariable functions. The ten different functions that this code can minimize are the Griewank, Levy, Rastrigin, Schwefel, Trid, Dixon-Price, Rosenbrock, Michalewicz (with m = 10), Powell, and Styblinski-Tang. Genetic algorithm is a well-known optimization technique used to find values at which a function is minimized. It is based on the biological processes of evolution and natural selection, which can be seen in the code.

2 How to use the program

1. Download all of the files in one directory.
2. Open the `GA.c` and `OF.c` files in VS Code. You will need to comment and uncomment the code in these two files depending on which function you wish to optimize. Once you have made the appropriate commenting/uncommenting, proceed with the following steps.
3. In the terminal, ensure you are in the directory in which all of the files are located.
4. To compile the program, run the command `make` in the terminal.
5. To run the program, run `./GA <POPULATION_SIZE> <MAX_GENERATIONS> <crossover_rate> <mutate_rate> <stop_criteria>` in the terminal. Make sure you insert your chosen values.
6. To remove the executable from your directory, run the command `make clean` in the terminal.