Assignment 2

Implement the generational GA algorithm, with the user supplying the following parameters: population size, probability of crossover, probability of mutation, and number of generations. In your testing, use a population of 100, Pc=0.5, Pm=0.001, and number of generations equal to 100 thousand.

Your algorithm will optimize (maximize) the attached black box function. You will be given two files:
- a Java class file named `BlackBoxFunction.class`,
- and a Java source file named `BlackBoxFunctionInterface.java`.

You will not be given the source code for `BlackBoxFunction`; however, you can make use of the following information:
1. The `BlackBoxFunction` class implements the `BlackBoxFunctionInterface` interface.
2. The method `function` in the `BlackBoxFunction` class always returns positive values.

The file `rndw.txt` is used by `BlackBoxFunction` and must be placed in the current working directory.

Another file you will be given is TrialAndError.java. This file implements a simple trial and error algorithm to optimize the black box function. You are given this file as an illustrative example of how to work with the black box function. This file is not part of the genetic algorithm, and you are not required to do anything with it.

You will also be given the file `GA.jar`. This file is a full solution to the assignment. You can run it with the command `java -jar GA.jar <command line parameters>`. You are not required to do anything with this file; it is provided only to give you a reference as to what the performance would be with various options. The allowed command line parameters are the following and can be specified in any order (case-insensitive):

- `uniform`   uniform crossover (single-point crossover is default).
- `elitist`   turns on elitism (turned off by default)
- `pc value`   specifies the probability of crossover to the specified value
- `pm value`   specifies the probability of mutation to the specified value
- `gens value`   specifies the number of generations (default is 100,000)

Note that you are not required to include all of these options in your implementation.