**Task 3. Genetic algorithms (01.11.2022 (2 practicals), 08.11.2022)**

1. Genetic algorithm

1.a. Implement a genetic algorithm (something like [this](https://machinelearningmastery.com/simple-genetic-algorithm-from-scratch-in-python/)) to find the minimum location(s) of any multivariable function f(x, y) of your choosing.

1.b. Implement the tournament selection and roulette wheel selection for the task 1.a. Add the screenshots of the results to show how the algorithm works in both cases.

1.c. Implement the single-point crossover and uniform crossover for the task 1.a. Add the screenshots of the results to show how the algorithm works in both cases.

2. Particle swarm optimization

2.a. Use [the PSO algorithm](https://github.com/PacktPublishing/Hands-On-Genetic-Algorithms-with-Python/blob/master/Chapter12/03-pso-himmelblau.py) to find the minimum location of any multivariable function f(x, y) of your choosing.

2.b. Run the PSO algorithm with different parameter values (RANDOM\_SEED, MIN\_START\_POSITION, MAX\_START\_POSITION) to find several minimum locations of f(x, y). Add the screenshots of the results to show how the algorithm works in these cases.