Ninth problem set

Due date: 2019.05.2, 9.00

Topic: real representation

You have to send your solutions via email (evolalghf@gmail.com). You have to solve them unassisted, unless it's marked with a star. The problems marked * can be solved in groups of two. You can get maximum 10 points.

1. (3 + 3 points) Calculate the probability density function which is used to generate the new points in simulated annealing. With the help of the probability density function determine the expected value and standard deviation of the added random variable.

2. (4 points) What might be the advantage of using global crossover compared to making offspring from two parents? Which leads to a higher convergence rate and why?

3. (3 + 3 points) The Rosenbrock function is defined as:

$$f(x, y) = 100\left(y - x^2\right)^2 + (x - 1)^2.$$

   Find every local and global extreme values by investigating the gradient. By examining the Hessian decide if it's a long valley type function or not.

4. * (10 points) Implement Rechenberg's algorithm for two variable functions. Your program has to plot the possible solutions and the function's surface. Test your program with the Rosenbrock function, choosing the origin as starting point.