## Laboratory exercise 3: GAs

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## Results

Global minima is supposed to be close to:

* x = (1.000041e+00, 1.000081e+00)
* fval = 1.740492e-09

Corresponding parameters to find this value were:

* Initial range: [ 2.9 .. 3 ]
* Population: 300
* Generations: 150
* Crossover fraction: 0.8

Mathematically the global minima is at f(1, 1) = 0.

## Parameter sets used

* Initial ranges = [ [ 2.9 3 ] [ 0 2 ]; [ -1 1 ] ]
* Populations = [ 50 100 150 200 250 300 ]
* Number of generations = [ 20 50 150 ]
* Crossover fractions = [ 0.05 .. 0.95] in 0.05 steps

Initial range parameter seems to be the most influential parameter. With correct range it is possible to come faster and closer to the global minimum. Three different points has been chosen for the descent over the function values.

When using wider initial ranges, then with help of much higher populations (> 1000) it was possible to find direction of minima, but with far worse final values.

Number of generations seems not to have had high influence on the results.

When using higher *StallGenLimit* parameter it is possible to come more close to global minima, e.g. with StallGenLimit = 1000 => fval = ca. 10-10

## How to run code

The following file contains the main file to run the experiments:

main\_lab3.mlx