

# Lab 6 - Computational Statistics

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## Assignment 1

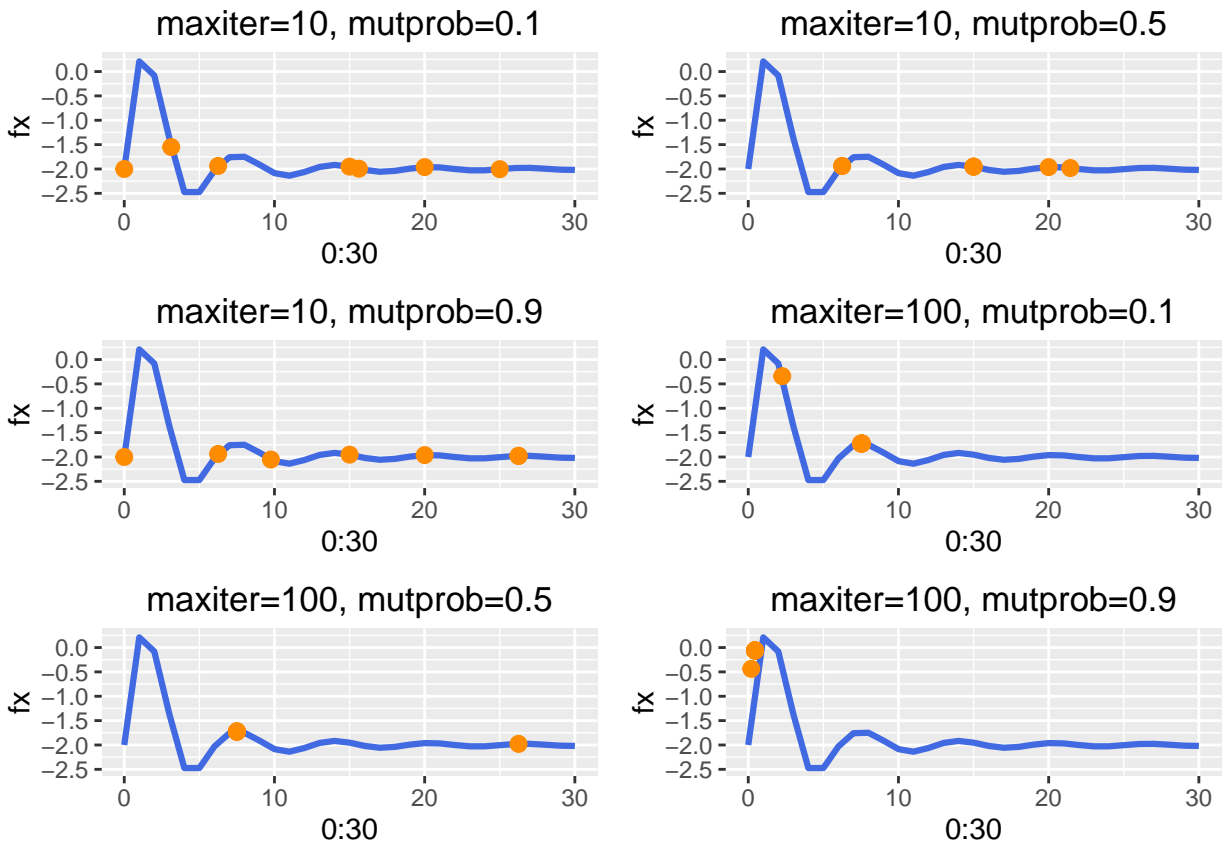
### 1.1-1.4

In 1.1 to 1.3 are the functions  $f(x)$ , *crossover* and *mutate* defined. All of these functions are used in 1.4 where a function that implements the *genetic algorithm* is written. The r-code used to define and write all the mentioned functions can be seen in the appendix.

### 1.5

The function written in 1.4 takes two different arguments, *maxiter* and *mutprob*. The first argument specifies the maximum number of iterations and the second argument defines the probability for a kid created by the crossover function getting mutated or not. The plots below visualises the obtained results when combinations of the following settings are tested:

*maxiter* = 10, 100, *mutprob* = 0.1, 0.5, 0.9



A low number of iterations results in a final population that is rather similar to the initial population, regardless the setting for *mutprob*. The function did not succeed to find the highest possible value for the

objective function. When the number of iterations is higher, the final population and the initial population are much more dissimilar.

## Assignment 2

### 2.1

