Tutorial 7: Optimisation through Genetic Programming

In this tutorial we are going to use a GP algorithm to maximum the function

$$f(\mathbf{w}) = \sum_{i=1}^{n} x_i \; w_i$$

where $\mathbf{x}$ is given, see Tutorial_7_pre.ipynb.

(i) Go through the code and connect to the GP theory presented during class. What genetic operations are being performed here?

(ii) What is the fitness function used?

(iii) Identify the hyper parameters in this GP algorithm.

(iv) Fix the total number of generations to 100. Try to find the optimal values of the hyper parameters in this case. For the best values, plot the fitness function versus the number of generations.

(v) For the best values of the hyper parameters as in (iv), now study the fitness as a function of the number of generations (say up to 1000).