

### **1: [REQ-1]Providing schema**

User should be able to define a schema of all objects which are going to be optimized inside text file in json format. This schema must be further used to validate all objects provided as input. Schema must define all parameters that are going to be used, whether this parameter is constant or variable and, optionally, types of parameters and their ranges.

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### **2: [REQ-2]Providing inputs**

The program must provide two ways to transfer input parameters.

1. Via Json file inside the program
2. Via implemented API endpoint.

Input parameters must be validated against the provided schema.

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### **3: [REQ-3]Configuring optimization algorithm**

The program should make it possible to control the main parameters of the optimization engine that affect the calculation speed. Default configuration must include default values for such parameters. The list of parameters and their default values:

1. num\_generations=500
2. num\_parents\_mating=4
3. parent\_selection\_type="sss"
4. keep\_parents=1
5. crossover\_type=single\_point
6. mutation\_type=random
7. mutation\_percent\_genes=50
8. mutation\_probability=0.5
9. parallel\_method=thread

Description can be found here: [pygad Module — PyGAD 3.3.0 documentation](#)

Control should be carried out with the help of the configuration file.

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### **4: [REQ-4]Optimization requirements**

Optimization engine must meet the following criteria:

1. Optmization engine must use genetic algo

in the version 1.

1. Optimization must be carried out in finite amount of time
2. Results of optimization must be stored inside the program and as a file

User must have access to the results of the optimization

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### **5: [REQ-5]Logging**

The program must log all the errors happeing in the code and all information which can be used further for debugging pu or be useful to the end-user of the program. Such information can include:

- Initializing of classes and modules
  - Results of data processing
  - Start and/or end of the critical process
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### **6: [REQ-6]Testing**

Unit tests must be implemented to cover at least 90 % of the code in the long-term. The first version of the program allows the writing of several (at least 10) unit tests to test deployment and speed up development.