The goal of this homework is to understand how Genetic Algorithm work. For that purpose, we have to train a GA algorithm with different combination of parameters. In order to find the best combination of parameters I try many different combinations thanks to multiple loop. For each combination I run the algorithm 20 times in order to have a representative average of the behavior of the algorithm with those parameters.   
  
You can find my original output in the file with the same name. As we can see in this document there is some parameters show. The list of all parameters is show only if the result achieves the goal. Otherwise it displays the changing of parameters.  
  
As we can see the best result, I can get is **79%** of succeed fitness with those parameters:

* **String Length: 40**
* **nEpochs: 202**
* **Population size: 300**
* **Mutation prob: 0.1**
* **Cross Over: SP**
* **Nelite: 4**
* **Tournament: False**

We can also find a summary of percentages in the file original\_score\_list. Each line starts with the line number in the file original\_out in order to retrieve the original output and the parameters

**How to run the code:**

* Open a terminal
* Type “python(.exe) run\_ga.py”

**How to save the output in a file:**

* Open a terminal
* Type “python(.exe) run\_ga.py > out”

**How to extract line number and percentage value:**

* Open a terminal
* cat out | grep -n “Percentage reaching bonus:” > out\_score\_list