Python Challenge using Genetic Computing

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| Change Date | Comments |
| 7-May-2020 | Initial Version |
| 18-May-2020 | Revised version |
| 21-May-2020 | Revised version (updated Challenge submission section) |
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# Python Challenge

## Description

The eight queens puzzle is the problem of placing eight chess queens on an 8×8 chessboard so that no two queens threaten each other; thus, a solution requires that no two queens share the same row, column, or diagonal. The eight queens puzzle is an example of the more general n queens problem of placing n non-attacking queens on an n×n chessboard. (Source : <https://en.wikipedia.org/wiki/Eight_queens_puzzle> )

## Challenge

The challenge is to generate one right sequence through Genetic Programming. The sequence has to be 8 numbers between 0 to 7. Each number represents the positions the Queens can be placed. Each number refers to the row number in the specific column

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 3 | 4 | 5 | 6 | 1 | 2 | 4 |

* 0 is the row number in the column 0 where the Queen can be placed
* 3 is the row number in the column 1 where the Queen can be placed

## Challenge Submission

1. The python code should be stored in <https://github.com>
2. The python code should have the following components
   1. Code must follow Object Oriented program standards with appropriate Unit tests
   2. Function to generate the initial population
   3. Function to score the population
   4. Function to do cross over and mutation of the selected gene pool
   5. Main function to identify the right sequence
3. Maximum number of submission attempts is restricted to 3
4. A valid sequence is submitted using the following code

import requests

url='https://lf8q0kx152.execute-api.us-east-2.amazonaws.com/default/computeFitnessScore'

x=requests.post(url,json={"qconfig":"<<config parameters>>","userID":<<emp id>>,"githubLink":"<<git hub link>>"})

print(x.text)

qconfig is the result to be submitted

EID is the employee id

githubLink is the link to the code

## Learning References

|  |  |  |
| --- | --- | --- |
| # | Topic | URL |
|  | Introduction to Genetic Algorithm | <https://youtu.be/9zfeTw-uFCw?list=PLRqwX-V7Uu6bJM3VgzjNV5YxVxUwzALHV> |
|  | How does Genetic Algorithm works | <https://youtu.be/RxTfc4JLYKs?list=PLRqwX-V7Uu6bJM3VgzjNV5YxVxUwzALHV> |

## Sample Codebase

The following is a sample code base for solving text generation using Genetic Computing

<https://github.com/datasigntist/deeplearning/blob/master/Introduction_to_Genetic_Computing_2.ipynb>

# FAQs

## Can I use any other language?

The solution has to be developed only using Python preferably version 3.x

## 

## What platform can I use?

Google Colab , Jupyter notebook can be used to build the solution. If you want to use the toolwire labs please use the below course codes

## How do I submit the code?

This will be captured as part of the API call where there is a provision for giving the GIT Hub link and is mandatory.

## 

## What is the duration of the challenge?

The duration of the challenge is 2 weeks.

## 

## Is there a specific type of Crossover and Mutation?

One is free to adopt any type of Crossover and Mutation to solve the problem

## Is this a Group challenge?

This is an individual challenge

1. Is there a maximum attempt count for submission of results?

Yes. Maximum of 3 attempts. Post that the data will not be saved and a message will be shown to the associate