**OPTIMIZATION**

Genetic and evolutionary algorithms, which are known as population-based search algorithms, use a pool of candidate solutions instead of just a single search point. Because of this, population-based methods tend to require more calculations when compared to simpler local methods, although they tend to work better as global optimization methods, quickly finding regions that are interested in the search space.  
  
Population-based methods have the tendency to explore the most distinct regions of the search space, as compared to single-state methods. Therefore, these algorithms can achieve greater diversity in terms of configuration of new ones. The solutions, which can be created not only by changing each individual search point slightly but also by combining attributes related to two (or more) search points.  
  
Evolutionary computation is distinguished by several optimization algorithms inspired by the phenomenon of natural selection and that include a population of competing solutions. Although it is not always clearly defined, how these methods are distinguished, are mainly based on how to represent a solution and how new solutions are created.  
  
Genetic algorithms often have applications that are focused on the solution of global optimization problems. It is because this is used as optimization algorithm, and considering that I wasn´t provided with real data in the Coding Challenge.

So, this algorithm, based in its characteristics, that I have already mentioned, could lead to the solution of the second part of the Coding Challenge.

Ahora con respecto al ejercicio numero 2 del Coding Chalenge, se convirtieron las variables categóricas a numéricas de forma que la optimización funcionara de manera mas rápida.

Realice el ajuste de la función para el algoritmo genético, en la línea 290 del documento “Coding Chalenge”, es donde podemos apreciar que la función es lineal de 14 variables, para esto se consideró la eliminación de algunas variables y se conservaron el resto de forma normalizada (procedimientos realizados en la sección “exploratory analysis of the variables”). Considere una función lineal debido a que es un método simple para iniciar un estudio de predicción, adicionalmente al contener 14 variables de predicción y considerar que se tendría pocos datos no es conveniente utilizar una función mas compleja ya que esto podría causar un sobreajuste del modelo y por tanto realizar una mala predicción en un caso real.

I never meant that this algorithm, necessarily is, always, the best solution. The best algorithm to choose depends on the characteristics of the data provided by the client.  
  
I currently have mastery in modern optimization methods, such as:

* Blind Search
  + Full Blind Search
  + Grid Search
  + Monte Carlo Search
* Local Search
  + Hill Climbing
  + Simulate Annealing
  + Tabu Search
* Population Based Search
  + Genetic and Evolutionary Algorithms
  + Differential Evolution
  + Particle Swarm Optimization
  + Estimate of Distribution Algorithm
* Multi-Objective Optimization.
  + Weighted-Formula Approach
  + Lexicographic Approach
  + Pareto Approach