Report Assignment 3.2
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1- Explain the important operations of the Employed algorithm.

- **visibility_genesis():**
  - This function calculates the visibility between each pair of cities using 1/distance.
- **set_visibility_zero():**
  - This function updates the visibility matrix to avoid revisiting the same city again by setting the visibility of the city to zero
- **t_n_genesis():**
  - This function calculates the value of t_n, which is used to determine the probability of choosing the next city. The value of t_n is calculated using the pheromone level and the visibility between the current and the next city.
- **probability_genesis():**
  - This function calculates the probability of choosing each city as the next city based on the t_n values.
- **next_city_genesis():**
  - This function generates a random number to determine the choice of cities to be visited by comparing it with the value of the cumulative probability.
- **phermones_update():**
  - This function updates the pheromone level of each edge based on the distance traveled by an ant on its path.
- **calc_distance():**
  - This function calculates the total distance traveled by an ant.

2- Illustrate how the performance of the population evolves with generations (with a figure.) Write text with the figure as well.
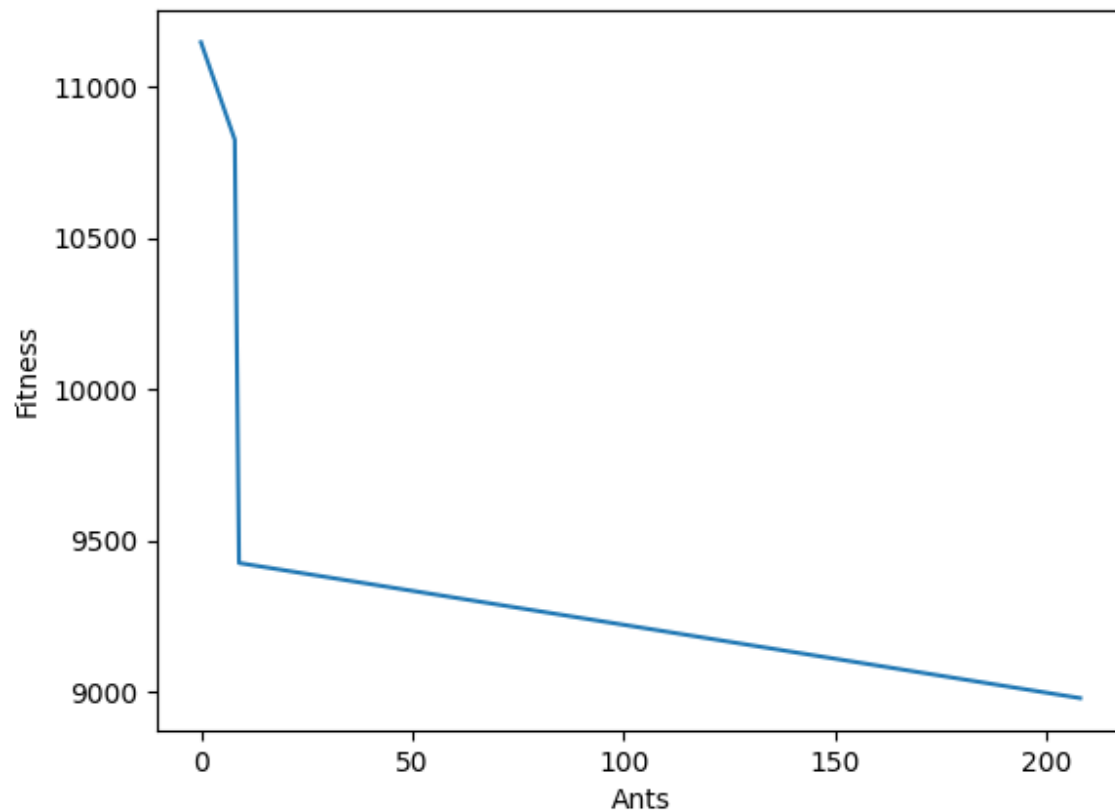
3-Compare the results found by this algorithm with the results found with GA. Analyze the differences between the algorithms and the difference in the performance between both.

- Both Genetic algorithm and Ant colony optimization were able to find an optimal solution in the end. However, After comparing the final solutions between Genetic algorithm and Ant colony optimization it seems that the ant colony optimization algorithm was more efficient and more accurate than the genetic algorithm. Also the computation time and iteration taken by ant colony optimization algorithm to find the optimal solution is smaller than genetic algorithm.