**Group Members**

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**Report**

We were given a research paper to implement, with the main two Algos

* Algorithm 6
* Algorithm 7

These were both almost same, except for the fact that for clustering different techniques are used in both.

To test the implementation of algorithms, we were given twelve functions having different dimensions. Due to shortage of time, we were able to use only the first function to show that the implementation of the algorithms works.

First, the user is asked which function they want to implement, and according to that choice a population size and domain is set.

A random array of the population is constructed within the domain; and its fitness evaluated for the particular function. The maximum and minimum fitness is found.

A clustering size is randomly chosen from a set G which has the integers 2 through 20, as the clusters should neither be too large, nor too small.

In Algo 6, the population and cluster size are sent to Algo 1, whereas these parameters are sent to Algo 2 in Algo 7.

Algo 1 makes the new clusters based on Euclidean distance taken from a randomly chosen reference point, whereas Algo 2 makes the clusters based on their fitness values in descending order.

The new clustered array achieved through crowding is returned to Algo 1, whereas one achieved through speciation is returned to Algo 2.

This new population is then passed to Algo 4, which takes all the niches and generates a new population with some operations having been performed on each index of the initial population.

The new population is then returned. A new seeded array with best solutions is created by comparing each index of the old population with the new one and choosing the best one each time based on the fitness values.

The returned population is passed to Algo 5 which conducts a local search on each niche, and chooses best solutions in every niche to calculate new even better solutions.

With the seeding and optimizing of the multiple solutions finally reached, we can then compare the two Algos 6 and 7 to see which one provided better fitness values (more optimum solutions).