

Experiment 5

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Aim: To implement genetic algorithms to solve optimization problems.

Theory: Inspired by Charles Darwin's theory of evolution and natural selection a genetic algorithm is a search heuristic reflecting the process of survival of the fittest for producing the next generations

There are 5 phases.

- 1) Initialization - A set of individuals called a population each being a solution to the given problem.
- 2) Fitness Assignment - To determine the ability of an individual to compete with the others and probability of selection for reproduction.
- 3) Selection - The selection of individuals for reproduction of the next generation
- 4) Reproduction - The creation of children in next generation is done in next steps. This variation operators can be applied for a crossover.
- ⑤ → Crossover - A crossover point is selected at random within the genes and the parts of both parents are swapped to create new individuals.
- Mutation - Inserting Random genes in the offspring to increase their diversity vs the population. It is also done by flipping some bits in the genes.

5) Steps 2, 3, 4 are repeated for a specific no. of times
Once a condition is met, it ends.

Conclusion:- Genetic Algorithms can be used to find solutions
using local moves or renewing population with the best
solutions