Working Principles

Before getting into GAs, it is necessary to explain few terms.

− Chromosome : a set of genes; a chromosome contains the solution in form of genes.

− Gene : a part of chromosome; a gene contains a part of solution. It determines the solution. e.g. 16743 is a chromosome and 1, 6, 7, 4 and 3 are its genes.

− Individual : same as chromosome.

− Population: number of individuals present with same length of chromosome.

− Fitness : the value assigned to an individual based on how far or close a individual is from the solution; greater the fitness value better the solution it contains.

− Fitness function : a function that assigns fitness value to the individual.

It is problem specific.

− Breeding : taking two fit individuals and then intermingling there chromosome to create new two individuals.

− Mutation : changing a random gene in an individual.

− Selection : selecting individuals for creating the next generation.

Working principles :

Genetic algorithm begins with a set of solutions (represented by chromosomes) called the population.

− Solutions from one population are taken and used to form a new population. This is motivated by the possibility that the new population will be better than the old one.

− Solutions are selected according to their fitness to form new solutions (offspring); more suitable they are, more chances they have to reproduce.

− This is repeated until some condition (e.g. number of populations or improvement of the best solution) is satisfied.