Genetic Algorithms

- Genetic algorithms are used to exploit a search space for the best solution.

1. Pool of hypotheses is iterated.
2. Every hypothesis is evaluated on a fitness function
3. A new population is generated with most fit individuals from current population. Some of them are passed intact & some of them are used for crossover & mutation.

Basic Algorithm

Chromosomes

Chromosomes are solutions encoded in strings.

ex: 1 0 0 1 1

Crossover

11100101 > 11111101
01011101 > 01000101

Mutation

11100101
↓
turn this into a 0

Selection Strategies

- Roulette wheel

A	B	C	D
0.4	0.3	0.2	0.1

Total Fitness

} Every chromosome has chance of being picked according to it's fitness value

- Tournament Selection

Choose k individuals at random
Then choose the best individual from the pool.

Schema Theorem

Characterizes evolution of population (collectively)

Schemas → 1**0* → 1101, 1001, 1100, 1000

** : don't care