GENETIC ALGORITHMS

Team 1
(go/team1)
What are Genetic Algorithms?

- Mimic Natural Selection
- Search Algorithm
- Evolutionary Algorithm
Components of a Genetic Algorithm

- Individuals

- Solution to a Problem
  - Action Queue
  - Best Set of Choices
  - Physical Object (engineering)
Components of a Genetic Algorithm

- Fitness Function
- Evaluation for Individual
  - Win Percentage
  - Performance
  - Human Determined (aesthetic)
  - Maximize/Minimize some variable(s)
Components of a Genetic Algorithm

- Sample Individuals for Next Generation

- Breed Selected Individuals
  - Crossover
  - Randomly Sample Genes

- Mutation
Example 1: Succulent Soup

- Individuals?
- Fitness Function?
- How to sample?
- How to breed?
- Mutations?
Example 2: Mario Master

- Individuals?
- Fitness Function?
- How to sample?
- How to breed?
- Mutations?
Limitations / Disadvantages

- Local Maxima / Minima
- Time Complexity of Fitness Functions
- Limited Fitness Values
Genetic Algorithm Success Stories

- Muscle Based Locomotion
- Sudoku Puzzles
- Chess Endgame Strategy
- First-person Shooter Bots
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