

## ConsoleApp

- Setting up and controlling simulations
- Saving population
- Loading population
- Tracks current population
- Parsing user input

- Query
- Simulation

## Query

- Makes parsing of user input easier
- Convenient error handling

## Simulation

- Represents the current state of the simulation
- Provides control over the simulation
- Produces the results of the simulation
- Stores parameters of the simulation
  - - dimensions of the sim
  - - food generated per agent

- Results
- Agent
- Food
- SimulationState
- SimulationSetup

Abstract

## Entity

- Provides coordinates in a 2D space

## Food

Entity

- Represents food in the simulation

Agent Entity	
<ul style="list-style-type: none"> <li>• Represents an agent in a simulation</li> <li>• - Eats food</li> <li>• - Fights other agents</li> <li>• - Consumes energy</li> <li>• Moves to next position (NSWE)</li> </ul>	<ul style="list-style-type: none"> <li>• Wrapper</li> </ul>

GenotypeWrapper Wrapper	
<ul style="list-style-type: none"> <li>• Converts between simulation specific and genotype specific types</li> <li>• Returns the move the agent should make given the simulation state</li> <li>• Crossover(able?) and mutable</li> </ul>	<ul style="list-style-type: none"> <li>• Genotype</li> </ul>

Genotype Crossover, Mutable	
<ul style="list-style-type: none"> <li>• Stores the "solution" (binary string)</li> <li>• Evaluates and returns the result based on given parameters</li> <li>• Crossoverable and mutable</li> </ul>	

Interface Mutable	
<ul style="list-style-type: none"> <li>• Provides a general method for mutations</li> </ul>	

Interface Crossover	
<ul style="list-style-type: none"> <li>• Provides a general method for the crossover operation</li> </ul>	

## Results

- Stores all genotypes ranked by their fitness score

- Genotype

Abstract

## Wrapper

Crossover, Mutable

- Encapsulates solution specific behaviour

## SimulationState

- Provides a safe way to view its simulation's state

## Gui

- Graphical representation of the simulation
- Listens to key events
- Controls the speed of simulation
- Returns the results of the simulation after finish

- SimulationState
- Simulation
- SimulationSetup
- Results
- VisibleAgent

## VisibleAgent

Agent

- Has a unique color assigned

## SimulationSetup

- Stores unchangeable parameters for simulation