

PP GoL Ecosystem

Test design report

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Introduction

The Predator-Prey Game of life is a zero-player game, meaning that its evolution is determined by its initial state, requiring no further input. The ecosystem contains wolves, sheep, grass and mushrooms. The simulated agents are able to eat each other, reproduce, and die in every iteration. At every iteration of the simulation each agent steps forward. The plants (grass and mushroom) agents at each iteration grow their size up to the defined max size, sheep consume energy, reproduce with other sheep of the opposite sex, consume grass (which increase their energy) or mushrooms (decrease energy). Wolves reproduce as same as sheep and consume arbitrary sheep (which increase their energy). The project is implemented in a Julia language.

EQ classes

Animal - definition

Parameter	EQ 1	EQ 2	EQ 3
AnimalSpecies	Sheep	Wolf	Random symbol
Sex	Male	Female	Random symbol
Id	int	Non-integer number	Random symbol
Energy	Real positive number	Nonpositive number	Random symbol
D_energy	Real positive number	Nonpositive number	Random symbol
Reproprob	Float from (0, 1>	Number out of (0,1>	Random symbol
Foodprob	Float from (0, 1>	Number out of (0,1>	Random symbol

Input data combinations are generated using 2-way uniform strength coverage, mixed-strength coverage and 3-way uniform strength coverage. The mixed strength coverage has relations:

- strength 1 over all parameters.
- strength 2 over pairs (energy, D_energy) and (reproprob, foodprob).

Plant - definition

Parameter	EQ 1	EQ 2	EQ 3
PlantSpecies	Grass	Mushroom	Random symbol
Id	int	Non-integer number	Random symbol
Size	int	Non-integer number	Random symbol
Max_size	int	Non-integer number	Random symbol

Input data combinations are generated using 2-way uniform strength coverage, mixed-strength coverage and 3-way uniform strength coverage.

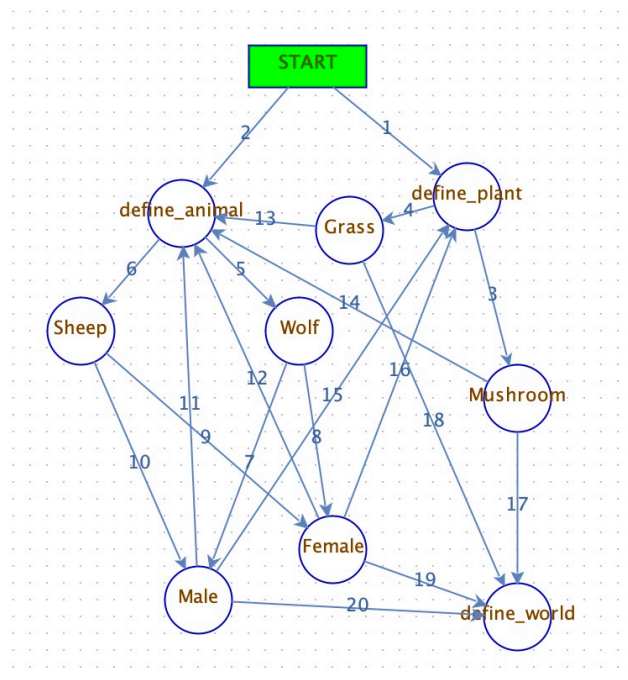
The mixed strength coverage has relations:

- strength 1 over all parameters.
- strength 2 over PlantSpecies, size and max_size.

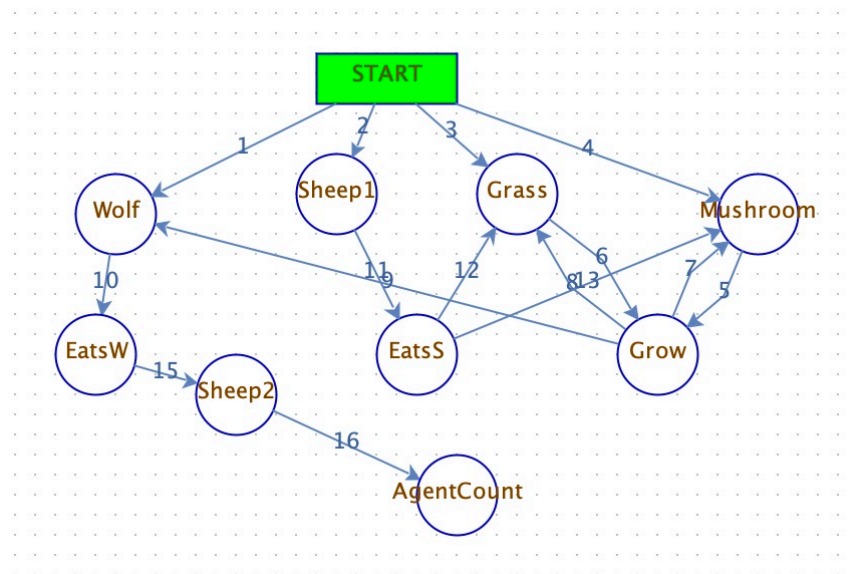
Process testing

The backend processes were design and simulated by path-based test scenarios using the Oxygen tool for TDL1 (edge coverage), TDL2 (edge-pair coverage) and TDL3.

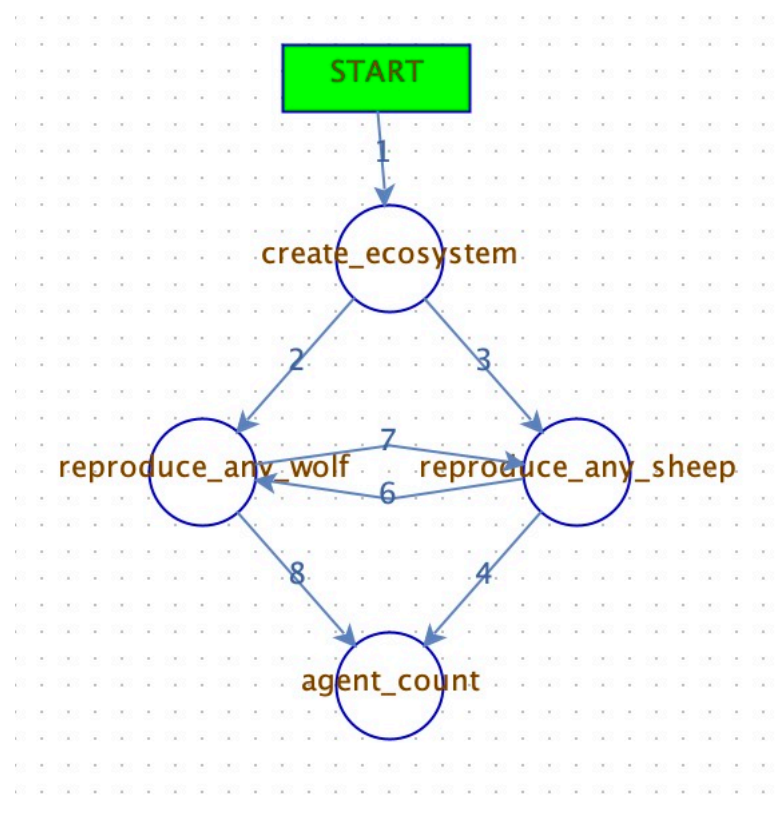
Ecosystem agents definitions



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Further tests

There are also tested:

- establishment of the world ecosystem by macros.
- mutual interaction of animals and plants.
- backend iteration and counting functions.
- terminal visualisation of the ecosystem state.