Excercise 1.
Implementing a first Application in RePast: A Rabbits Grass Simulation.

Group №:74 Youssefi Dahn Samuel Darius, Mykyta Shulga

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1 Implementation

1.1 Assumptions

- A cell can have at most one grass.
- A cell can have at most one rabbit.
- A new born rabbit will be placed on a random cell.
- A rabbit can born on a grass, but he is too young to eat it. The rabbit will be able to eat grass at next step.
- When a rabbit gives birth, his energy is divided by two.
- The birth threshold, rabbit energy can be set in the parameters.
- The energy obtained by eating a grass can be set with the GrassEnergy parameter.
- A new born rabbit has the energy set in the InitialEnergy parameter.
- The growth rate of the grass can be set in the GrassGrowthRate parameter
- The simulation stops when all the rabbits are dead.
- The minimum initial number of rabbit is one.
- The minimum initial number of grass is zero.
- Each rabbit move will cost 1 energy.
- The grass is **green**
- The rabbits are **blue**

1.2 Implementation Remarks

Few parameters can be set to configure the simulation. Every setter asserts that the associated parameter has a correct value. The workflow of a step is explained bellow :

1. Check if there is still rabbits in the space. If not, stop the simulation.
2. At random for each rabbit :

(a) Choose a random direction

(b) If the move is possible, move the rabbit toward that direction. Remove one energy.

(c) If there is a grass on the rabbit's cell, add **GrassEnergy** to the rabbit.

(d) If the rabbit's energy is higher or equal than **BirdthTreshold**, divide the energy by two and add a new rabbit to the space.

(e) Remove the grass on the rabbit's cell.

3. Add **GrassGrowthRate** to the space

4. Remove all the rabbits with energy less than 1.

5. Display the changes on the animation.

2 Results

2.1 Experiment 1

2.1.1 Setting

2.1.2 Observations

2.2 Experiment 2

2.2.1 Setting

2.2.2 Observations

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2.3 Experiment n

2.3.1 Setting

2.3.2 Observations