Predator – Pray Simulation

1.0 About

This project is to simulate the equilibrium between population of predators and population of pray in a ecosystem. It shows the relation between this populations and the changes in them through time.

2.0 Implementation

In the environment there are two kinds of animals foxes (yellow) and rabbits (green). A rabbit has unlimited food source and it contently watches for the nearby foxes. When a one or more foxes in its field of vision it runs away from them.

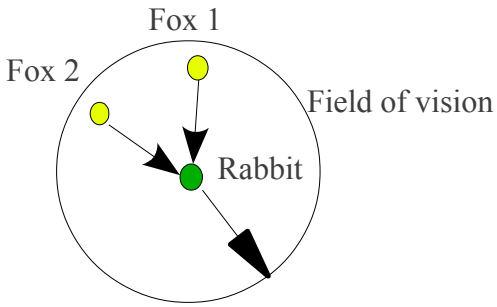

Figure 2.0

The foxes tries to catch rabbits. A fox always run behind the nearest rabbit. And it can only survive certain number of steps without catching a rabbit. Both rabbits and foxes have a maximum speeds and a breeding rate.

3.0 Running

This script is written in python. Install 'python' and 'Tkinter' to run the script. (use synaptic package manager in Ubuntu to install them) .
use command ,

python pp_sim_main.py

You can change the these parameters in the script to change the simulation,

- number_of_rabbits – initial population of rabbits.
- rabbit_multiply_rate – population of the newly breded rabbits as a proportion to old population.
- rabbit_max_speed – the max speed the a rabbit can run.
- rabbit_range_of_vision – the range that a rabbit can see.
- number_of_foxes - initial population of rabbits.
- fox_multiply_rate - population of the newly breded rabbits as a proportion to old population.
- fox_max_speed - the max speed the a rabbit can run.
- fox_max_steps – maximum cycles that a fox can live with out eating a rabbit

There is also a graph which plots two populations. Red is for rabbits and blue is for foxes.

4.0 Screen Shots

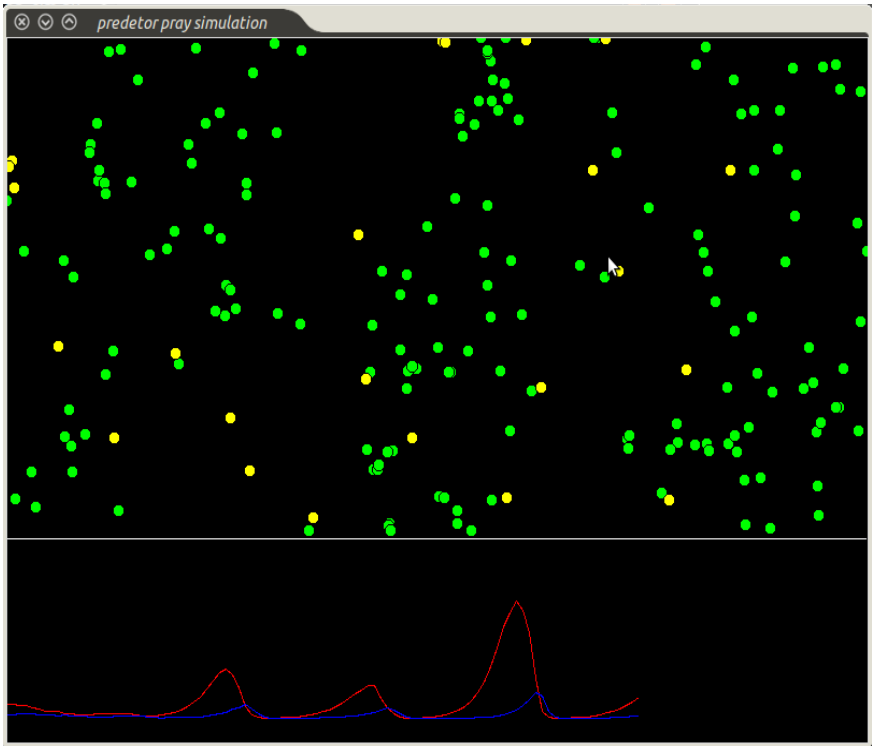

Figure 4.1

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