

Week 7 - Training exercise using Ecolab predator-prey simulator

The purpose of this non-assessed short exercise is to allow you to get used to running and editing an example agent-based model coded in Matlab. You should then be able to modify this code more extensively in order to adapt it in order to complete your group assignment.

You should aim to finish this exercise before the end of this session.

Download the file called *eco_lab.zip* from the Matlab Sessions folder on MOLE. Unzip the directory and install somewhere under your networked drive, or locally. Make sure that you are working in the main *eco_lab* folder in Matlab.



READ THE USER GUIDE BEFORE GOING ANY FURTHER!



Some interesting emergent behaviour has been observed using this model with the following parameters:

```
Environment size =50;

No. rabbits=120
No. foxes =30

PARAM.R_SPD=2;      speed of movement - units per itn (rabbit)
PARAM.F_SPD=5;      speed of movement - units per itn (fox)
PARAM.R_BRDFQ=10;    breeding frequency - itns
PARAM.F_BRDFQ=20;
PARAM.R_MINFOOD=0;   minimum food threshold for death
PARAM.F_MINFOOD=0;
PARAM.R_FOODBRD=10;  minimum food threshold for breeding
PARAM.F_FOODBRD=10;
PARAM.R_MAXAGE=50;   maximum age allowed
PARAM.F_MAXAGE=50;
```

(These are the default parameters set in *create_params.m*).

Try running this simulation for at least 100 iterations and see what happens.

Carry out an investigation into how the behaviour of the system changes according to different initial population sizes or densities of the agent populations. In what circumstances do populations become extinct, or grow out of control?

The default situation is that the two agent populations are generated at random locations across the whole environment. What happens if you confine the two initial agent populations to particular regions of the environment? (Hint, the code you need to change in order to do this is at the beginning of the function *create_agents.m*).