**ABM – Week 5 – Seminar – LVL3**

**Purpose**

This task will allow you to learn how to use BehaviorSpace to systematically investigate model behaviour.

**Model**

This task uses the Fireflies model (Wilensky, 1997), from the NetLogo Models Library. From the Info tab of the model:

“This model demonstrates a population of fireflies which synchronize their flashing using only the interactions between the individual fireflies. It is a good example of how a distributed system (i.e. a system with many interacting elements, but no ‘leader’) can coordinate itself without any central coordinator.”

Read the “How it works” and “How to use it” sections of the Info tab to get an idea of the model and its variables.

Wilensky, U. (1997). NetLogo Fireflies model. <http://ccl.northwestern.edu/netlogo/models/Fireflies>. Center for Connected Learning and Computer-Based Modeling, Northwestern University, Evanston, IL.

**Task**

* Save the model under a new filename to avoid overwriting the original.
* Edit the model code so that it records how long it takes for the fireflies to synchronise their flashing (if they ever do).
* Conduct experiments using BehaviorSpace to systematically examine how the parameters cycle-length and flash-length affect the time to synchronisation. (You should carefully consider the range over which each parameter will be investigated, and choose an appropriate number of replicates for each set of parameters.)
* Use Excel (or similar) to present the results of these experiments in a two-way table, colour the cells by the time to synchronisation, and provide a colour bar to aid interpretation. Present a second table to communicate the variation in the time to synchronisation across the replicates, for each set of parameters.
* Run the model again for the pair of parameters corresponding to the shortest time to synchronisation. Export the data from the plot in the interface and recreate the plot in Excel (or similar) with improved presentation.

**Extensions**

Extend your investigation to consider other parameters.