

Models and Simulations: Problem Set 7

Exercise 1: Seeding the Random Number Generator

Open the model you designed in Week 4, and save a copy of it. In the `setup` function, add the following two lines of code directly below `reset-ticks`:

```
let birthday [[[your birthday as a six-digit number in the format ddmmyy ]]]
random-seed (behaviorspace-run-number * birthday)
```

Exercise 2: Using the Behaviorspace

Create an experiment in the Behaviorspace; name the experiment however your please. Vary the variables of the model as follows:

- `p-edge` should vary between .02 and .1 in increments of .02.
- `num-agents` should take the values 100, 140, and 200.

Run 20 repetitions of each parameter setting, and measure the value of the variable `divergence` during each run. Unclick the box “measure runs at each step.” Click “Ok.” The resulting experiment should have 300 runs. Run the experiment on however many processors you choose (the default is the maximum number of processors in your computer), and output the results in **table format**.

Exercise 3: Analyzing the Results

When the experiment has finished running, you should have a `.csv` file containing the data from your simulations. Save a copy of the data file. Open the copy of the file that you have created in a spreadsheet program (e.g., Microsoft Excel).

- Create a new column in the spreadsheet. Use the spreadsheet program to calculate, for each value of `p – edge`, the percentage of runs with 100 agents that ended in a consensus, i.e., the percentage of runs that stopped in fewer than 1000 steps.
- Use the spreadsheet program to calculate, for each value of `p – edge`, the mean number of total steps of runs with 200 agents. Use the

spreadsheet program to graph the relationship between $p - edge$ and the mean number of total steps of runs with 200 agents; the variable $p - edge$ should be on the x -axis.

Submission Instructions: Submit your NetLogo file and the output .csv file from the simulation. You should also submit the calculations and graphs from the last exercise. To do so, you may submit any of the following: (i) a Microsoft Excel with embedded graphs, (ii) an Open Office file with embedded graphs, or (iii) an image file (any format is fine) that contains a screen shot of your calculations and graphs.