1. Assignment - Custom NetLogo Model

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10 min read

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Collective Intelligence

Task Description

This assignment requires you to create a **custom NetLogo model** based on a social, biological, or physical phenomenon that you find interesting or wish to explore further. Carefully read the requirements below to complete the assignment successfully:

1. **Objective**:
   - Develop a unique NetLogo model to simulate a phenomenon of your choice.
   - You may use pre-defined models in the NetLogo library for ideas, but **you must not use them as a solution**
2. **Model Requirements**:
   - The environment must be a **2D grid map** with **horizontal and vertical wrapping** enabled
     - **Map size**: Choose between 20x20 and 128x128
   - The interface must include:
     - At least **5 adjustable hyperparameters** (e.g., Sliders, Switches, Choosers, Inputs)
     - Buttons for `go`, `go-once`, and `setup`
     - At least **3 reporters** (via Monitors or Plots) to display model data
   - Your code should incorporate:
     - **Agent breeds**
     - At least **3 agent attributes** and **3 global variables**
     - **Helper functions** to improve code readability and structure.
   - Provide **minimal documentation** following the markdown format in the NetLogo Info Tab (`Info -> Edit`).
3. **Experiment Requirements**:
   - Use the **BehaviorSpace tool** to run an experiment:
     - Vary a chosen hyperparameter across an interval where you predict a **phase transition** or **tipping point** may occur.
     - Measure **2 reporters** of your choice for the experiment.
     - Set **repetitions** to 10.
   - Export experiment results to a CSV file.
   - Create visualizations (plots) of the experiment results.

PowerPoint Presentation

While presenting your work is not mandatory, **not presenting will limit your maximum grade to 3**. If you choose to present, follow these guidelines:

1. **Duration**:
   - Your presentation should last **5–6 minutes** and include approximately **5-6 slides**.
2. **Content**:
   - **Introduction**: Explain your model idea and the reason for choosing the topic.
   - **Implementation Details**: Highlight key elements of your code, including:
     - Interface elements (e.g., buttons, hyperparameters).
     - Code structure and design decisions.
   - **Demonstration**: Include a **GIF** or **short video** of your model in action.
   - **Experiment Results**: Show additional runs, experiments, and dynamic changes in your model.
     - Present plots from BehaviorSpace results and explain their significance.
3. **Submission Requirements**:

- Save all work into a single `.nlogo` file.
- Include the **BehaviorSpace configuration file** (`.xml`).
- Convert your PowerPoint presentation into a **PDF** and include it in your submission.

Assignment Submission and General Rules

- **Submission Files**:
  - `.nlogo` file (model).
  - `.xml` file (BehaviorSpace experiment configuration).
  - Your PowerPoint presentation converted to a `.pdf`.
  - Submit a **zipped file** containing the `.nlogo` file, `.xml` file, and the converted `.pdf` presentation to **Canvas**.
- **Deadline**:
  - **March 12th Wednesday 11:59 PM** (strict, no late submission)
- **Important Notes**:
  - Copying others' code will make you fail the assignment automatically, resulting in a 0
  - Not submitting anything results in a 0
  - Submitting something, as long as it is not an empty NetLogo project, might result in a 1

By completing this assignment, you will enhance your understanding of NetLogo, gain hands-on experience with modeling complex systems, and improve your analytical skills through experimentation and visualization.

Tamás Takács

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