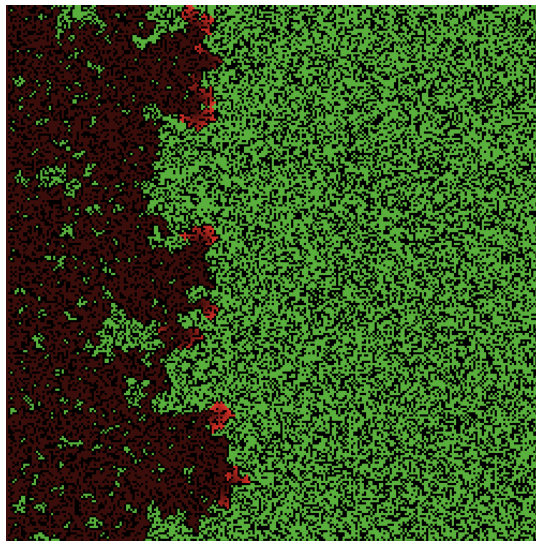


Project 3

Model Modification & Analysis with Forest Fire Model



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Prepared for

Math 314: Agent-Based Modeling

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In this lab you will (with a group) modify the forest fire model in the NetLogo models library to add a component of realism, and then analyze the model using skills developed in our last project combined with new methods for displaying and summarizing the results of our analysis.

Assignment

You will start with the fire model we worked with in class. Complete the following within your assigned group (there will be time dedicated in class to working on this project, though some elements will need to be completed outside of class time):

1. Decide on what element of realism your group would like add to the Forest Fire model.
 - (a) Create flow diagrams of the modified GO procedure, and all of the procedures executed by the GO procedure.
 - (b) Modify the code of the `fire.nlogo` ABM to implement your modifications.
2. Decide on two measures to “observe” when running simulations of your modified model. Making any additions/changes necessary to the code to allow these measures to be recorded in an Behavior Space experiment.
3. Design a Behavior Space experiment which records your two measures (preferably at the end of each simulation only). Run at least 25 simulation repetitions for each parameter combination. If you have introduced more than two new global parameters, choose to vary only one or two of those parameters in addition to the forest density; set the remaining global parameters to a constant value.
4. Create a Mathematica file which imports the data generated from your Behavior Space experiments. Create appropriate graphs showing how the variation in 1–3 global parameters impacts the value of your two measures. Show both the mean and variance (or standard deviation) for each measure over the parameter space covered in the experiment.
5. Create Word document which contains a brief description of the modifications your group made to the model, the flow diagrams, a brief description of the experiment your group ran in Behavior Space, and the graphs of your results created in Mathematica.
6. **Submit via Box:**
 - Your NetLogo file (`P03_Group?.nlogo`)
 - Your Mathematica file (`P03_Group?.nb`)
 - Your Word document (`P03_Group?.docx`)

Note, you do not need to upload the images created from io.draw or Mathematica, they will be included in the Word document.