Modeling Project #3

Your main goal in this project is to model a system of interacting species. Start by describing a real-world scenario in which two (or more) species interact. Develop a mathematical model for your scenario that uses differential equations. Analyze your mathematical model to reach conclusions or get insight on the real-world scenario. Finally, write a report describing your scenario, model, results, and conclusions.

A summary of your scenario and model is due on Monday, April 24. I may ask for or recommend modifications. Your report is due Wednesday, May 3.

1. The scenario you describe will be artificial to some degree. Here are some factors that you might want to consider in setting up your scenario: limited resources for one or both species, the nature of interactions, the relative value of relevant birth or death rates. You can think of specific species (e.g. fox and rabbit) or work with generic species (e.g. "predator" and "prey").

2. You should avoid a scenario or model for which you've seen or have access to some analysis in our text or other source.

3. You can have a scenario with more than two species. It will be harder to get results, but there may be results that are more interesting.

4. You can work with parameters or specific values. One question you can ask is how behavior of the model system changes as one or more parameters change. Are there values of the parameter at which the behavior of the system changes signficantly?