

Competition

1. Author and Contact Info:

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2. **Category:** Biology (Population Biology, Ecology)

3. Brief Description:

This application is used to simulate ecological competition between two species that share common resources (food, shelter, etc.). Of particular ecological interest are the conditions under which the two species can coexist. This application implements the classical Lotka-Volterra model of species competition.

4. How the Application Can be Used:

Competition was actually designed to be used in courses which cover introductory ecology. Most textbooks use the concept of *isoclines* to explain the various possible outcomes of competition. This app allows students to superimpose those isoclines on the graph and follow visually the trajectory of species numbers as competition occurs.

Examples can be assigned by the instructor and/or students can be allowed to explore on their own. The application can be used to illustrate the concepts of coexistence, competitive exclusion, phase planes, isoclines, stable *versus* unstable equilibria, local *versus* global stability, and domains of attraction.

5. Developed under NeXTSTEP 1.0

6. Detailed Instructions:

Parameter values are entered into the fields or changed by sliders and then the Start button is pressed. Initial population sizes are set by clicking on the graph. For detailed instructions and a description of the model, click on the CSLA icon in the Info Panel.

7. Comments:

This is one of the first apps I developed while learning how to program on the NeXT. With hindsight, I see that there is much that I could add or improve (e.g. printing). If you have any suggestions or find any bugs, please let me know.