Wolf Sheep Predation: Reimplementing a Predator-Prey Ecosystem Model as an Instructional Exercise in Agent-Based Modeling

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Abstract

The NetLogo Wolf Sheep Predation model is well suited for instructional use due to its use of familiar agents, concise source code, and simple graphics. As part of graduate course surveying modeling and simulation methods, a team of four students reimplemented the Wolf Sheep Predation model, treating the NetLogo version as the simuland, or system their model should simulate. The reimplementation used the Python programming language and the Mesa framework. Mesa is a framework for agent-based modeling written in Python, with features that are roughly equivalent to NetLogo. This paper documents their implementation process, compares the reimplemented Python/Mesa version to the original NetLogo version, and reports the students' and instructor's assessments of Wolf Sheep Predation as an instructional exercise.

References

[1] Jackie Kazil, David Masad, and Andrew Crooks. Utilizing python for agent-based modeling: The mesa framework. In Robert Thomson, Halil Bisgin, Christopher Dancy, Ayaz Hyder, and Muhammad Hussain, editors, *Social, Cultural, and Behavioral Modeling*, pages 308–317, Cham, 2020. Springer International Publishing.