

Chaos Simulation Assignment
Psychology 465A
Dr. Lawrence Ward

This assignment has two parts, both of which refer to the logistic difference equation.

(1) Using the logistic difference equation, demonstrate an approximation to chaos by iterating the function with an appropriate value for the a parameter to produce sequences that are unpredictable. Use some appropriate technique to demonstrate their unpredictability. Use the same equation to produce sequences that are predictable first by using low precision (e.g., rounding off to three digits, using single versus double precision, etc.) and second by using a value for a that gives a small number of periodic points (i.e. $a \ll 3.58$).

(2) Simulate the Clayton-Frey model of working memory, demonstrating both the dynamics of the competitive behavior of the model and the chaotic behavior of the final stage when one process dominates the other. Do several simulations with different starting values for x and y (sampled randomly?), using the results to describe how the model works.

Write up the results of this work in 2 double-spaced pages or less (graphs ok) and submit along with the results of your simulations and a printout of your program. This assignment is worth 20% of the term mark.