

18.095 PSet 4

January 2024

Problems

1

Create a Feigenbaum plot for the logistic map.

Hint: Recall that the plot describes the value of the periodic points of the system vs. the value of the parameter r in the logistic map

$$x_{n+1} = rx_n(1 - x_n).$$

One can get an approximate for the value of the periodic points by, for each choice of r , examining the values of x_N for large N .

2

Perform a linear stability analysis for the fixed points of the Lorenz system, by determining the eigenvalues of the corresponding Jacobian matrices.