

## 12.990: Problem set 1

Numerically calculate an estimate of the box counting dimension for:

- a) A fixed point in a 2D state space
- b) A circle with radius = 1 in a 2D state space
- c) One of the 2D maps found at as found on the Tools Section of this course.

Produce dimension estimates by plotting the log of the number of filled boxes against the log of the inverse of the box size, and estimate the slope of the resulting line. Explore the sensitivity of your estimate to the number points on the attractor that went into estimating the dimension.

Hand in your code, plots of  $\log(N())$  vs  $\log()$ , and a brief write-up of your results.

For extra credit, calculate the correlation dimension of the 2D attractor and compare it to the box counting dimension.