Chapter 13: Histograms of Chaotic Orbits

Worksheet to accompany

David Feldman, *Chaos and Fractals: An Elementary Introduction*,
Oxford University Press, 2012

In this exercise you will again use `http://hornacek.coa.edu/dave/Chaos/ time_series.html` to iterate the logistic equation is: $f(x) = rx(1-x)$. We will consider the parameter value $r = 4$.

1. Do this exercise in groups of two.

2. If you have blue-ish post-its, use the initial condition $x_0 = 0.200$. If you have a yellow-ish post-its, use the initial condition $x_0 = 0.201$.

3. Use the program to make 2000 iterates.

4. You will write down iterates on your post-its. But not all 2000 iterates! Instead, write down around a dozen iterates: one iterate on each post-it. Start on the iterate that corresponds to the birthday of the oldest person in your group. For example, if that person's birthday was May 23, start with iterate 523[1].

5. Then take your post-its-with-iterates and stick them on the histogram on the board that corresponds to your initial condition.

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[1]Or, if you're from outside the US, you could start with iterate 235. It doesn't really matter.