

Orbit diagrams for the logistic map $y = f(x) = r*(1-x)*x$;
done as described in the book and the lectures.

attractorsFull.png Shows the orbit diagram from $r = 3.2$ (when the
attractor is a period 2 cycle) to $r = 4.0$. See #1.

attractorsPeD.png Shows a blow up of the period doubling region from
 $r = 2.8$ to $r = 3.6$. See #2.

attractorsP3W.png Shows a blow up of the period 3 window, from
 $r = 3.82$ to $r = 3.86$. See #3.

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#1. Process to make the orbit diagram in attractorsFull.png

- Pick a value of r and some random $0 < x_0 < 1$.
- Compute $x_{n+1} = f(x_n)$ for $n = 1$ to some large number, $nb = 500$ in this case. Take the last x_n computed as the new x_0 --- which should now be on the attractor.
- Compute, again, $x_{n+1} = f(x_n)$ for $n = 1$ to some large number, $np = 500$ in this case. Then place a dot at each point (x_n, r) in the (x, r) plane.
- Do the above for many values of r , $r = 3.2 + 0.8*(0:500)/500$ in this case.

#2. Process to make the orbit diagram in attractorsPeD.png

Same as #1, except that here $nb = 20,000$ [near the period doubling bifurcations the convergence to the attractor is very slow], $np = 200$, and $r = 2.8 + 0.8*(0:30000)/30000$. Then only the region $0.3 < x < 0.9$ was plotted.

#3. Process to make the orbit diagram in attractorsP3W.png

Same as #1, except that here $nb = 2,000$, $np = 2,000$, and $r = 3.82 + 0.04*(0:500)/500$.

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