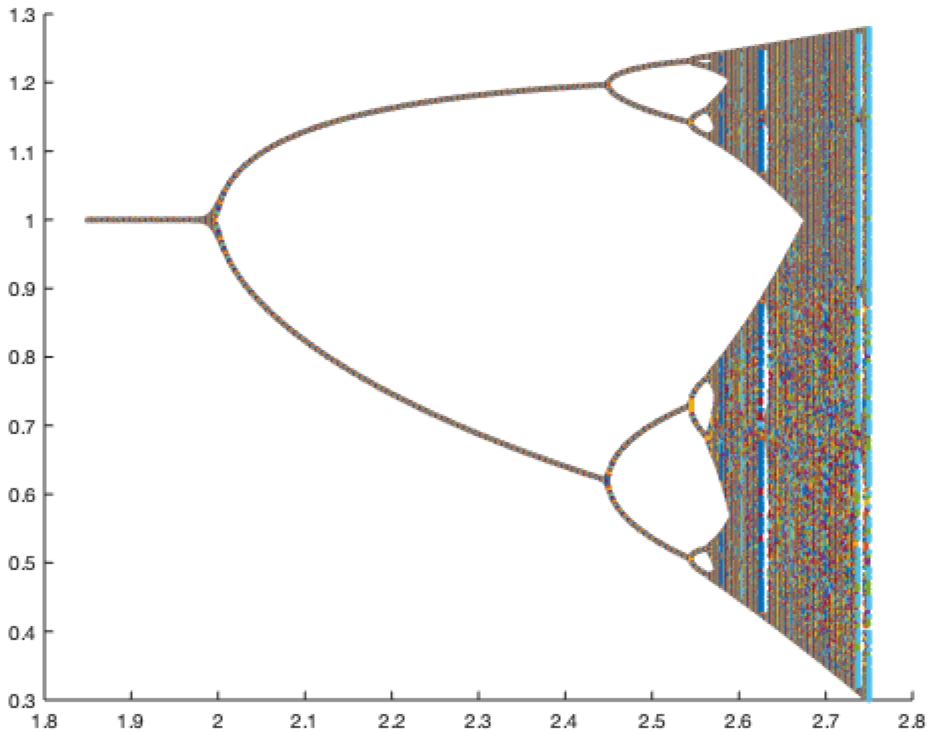
```
%~~~~~~~~~~~~~~    Andrew Hibbs 2021    ~~~~~~~~~~~~~~
%This bifurcation plot is incredibly interesting to me b/c of the
%unimaginable complexity that happens with a seemingly simply equation
 such
%as the chaos eqn. This eqn has applications in all sorts of dynamical
%systems such as population, pendulum problems, and nonlinear/quantum
%optics

clear
format long

    %Specifies how many inputs you want...how "filled" you want the
    %bifurcation diagram to be
    Inputs=1000;

    tf=500;

    %Time
    t=linspace(0, tf, tf+1);

    %Parameters for the input
    r=linspace(1.85, 2.75, Inputs);

    %an initial condition
    x_i=0.6;

    %Loop fopr inputs -> right b4 Plots
    for i=1:Inputs
        X(i,1:(tf+1))=populationSeries(x_i,tf,r(i));

    end %end of Inputs loop

    %plot loop begins
    figure
    hold on
    for j=1:Inputs
        thisParameter=r(j)*ones(1,tf+1-200);
        plot(thisParameter(:),X(j,200:tf),'.')
        colormap default
    end %end of plot loop
```



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Appendixed Function Below

```
function rSeries=populationSeries(x0,tf,r)

 %initial condition
    x(1)=x0;

    %iteration to start the "chaos" equation to map
    for n=1:tf
        x(n+1)=x(n)+r*x(n)*(1-x(n));
    end %end of n value for loop

rSeries=x;
```

```
Not enough input arguments.
Error in populationSeries (line 4)
    x(1)=x0;
```

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