1. Calculate the third iterate of the logistic map with $r = 2.5$ starting from $x_0 = 0.5$. Do this by hand. What is the third iterate you calculated? (choose the one that's closest; different computers and calculators do arithmetic slightly differently, so your answer may vary a bit).

   $x_3 = 0.586$

   $x_3 = 0.606$

   $x_3 = 0.625$

2. Write a simple program that uses a loop to compute a specified number $n$ of iterates of the logistic map, starting from a specified initial condition $x_0$, with a specified $r$ parameter. Your program should take $n$, $x_0$, and $r$ as inputs or arguments. Check your program against the answer to the first problem above.

   Using your program, compute the tenth iterate of the logistic map starting from $x_0 = 0.2$, with $r = 2.6$. What is the tenth iterate? Again, choose the value that's closest to what your program produced.

   $x_{10} = 0.6149$

   $x_{10} = 0.5999$

   $x_{10} = 0.6157$

3. Point your browser to:

   `http://tuvalu.santafe.edu/~jgarland/LogisticTools.html`

   Use the application to compute and plot the first 50 iterates of the logistic map from $x_0 = 0.2$ and $r = 2$. *Hint: you'll need to hit the "restart simulation" button after entering those values in the dialog boxes.* For now, ignore the plots on the left and the bottom of the window; we'll come back to those. Does the orbit (top right plot) reach a fixed point?

   Yes

   No

4. Using the same application, plot the first 50 iterates of the logistic map with $r = 2.7$ starting from $x_0 = 0.2$. Does the orbit reach a fixed point?

   Yes

   No

5. If the orbits in questions 3 and 4 both reached a fixed point, is it at the same value of $x$, *i.e.*, is it the same fixed point?

   Yes

   No

   One or both did not reach a fixed point.