Fractal LAC - Some in class fun

Monday, October 24

1. Compute the first few iterates for each of the following functions and initial values. Can you tell the long term behavior?
   (a) Function: $f(z) = z^2$, Initial seed: $z_0 = i$.
   (b) Function: $f(z) = z^2$, Initial seed: $z_0 = i/2$.
   (c) Function: $f(z) = z^2 + i$, Initial seed: $z_0 = 0$.
2. Figure 1 shows a Julia set from the 5/11 bulb. Draw the critical orbit.

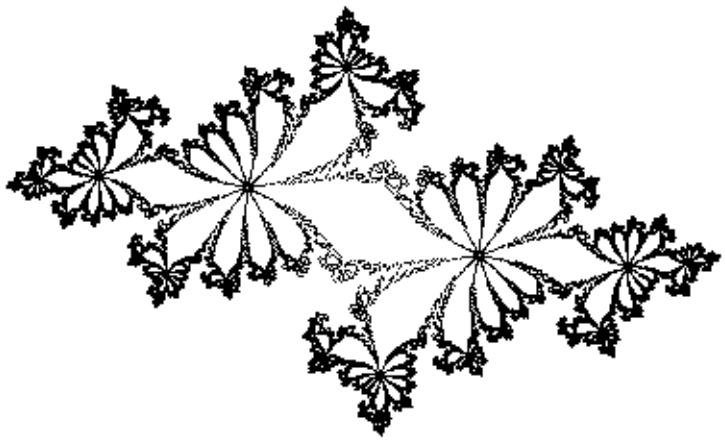


Figure 1: A 5/11 Julia set

3. Figure 2 shows a close up of the Mandelbrot set with some bulbs labeled by their orbit classification. What are the labels associated with the question marks?

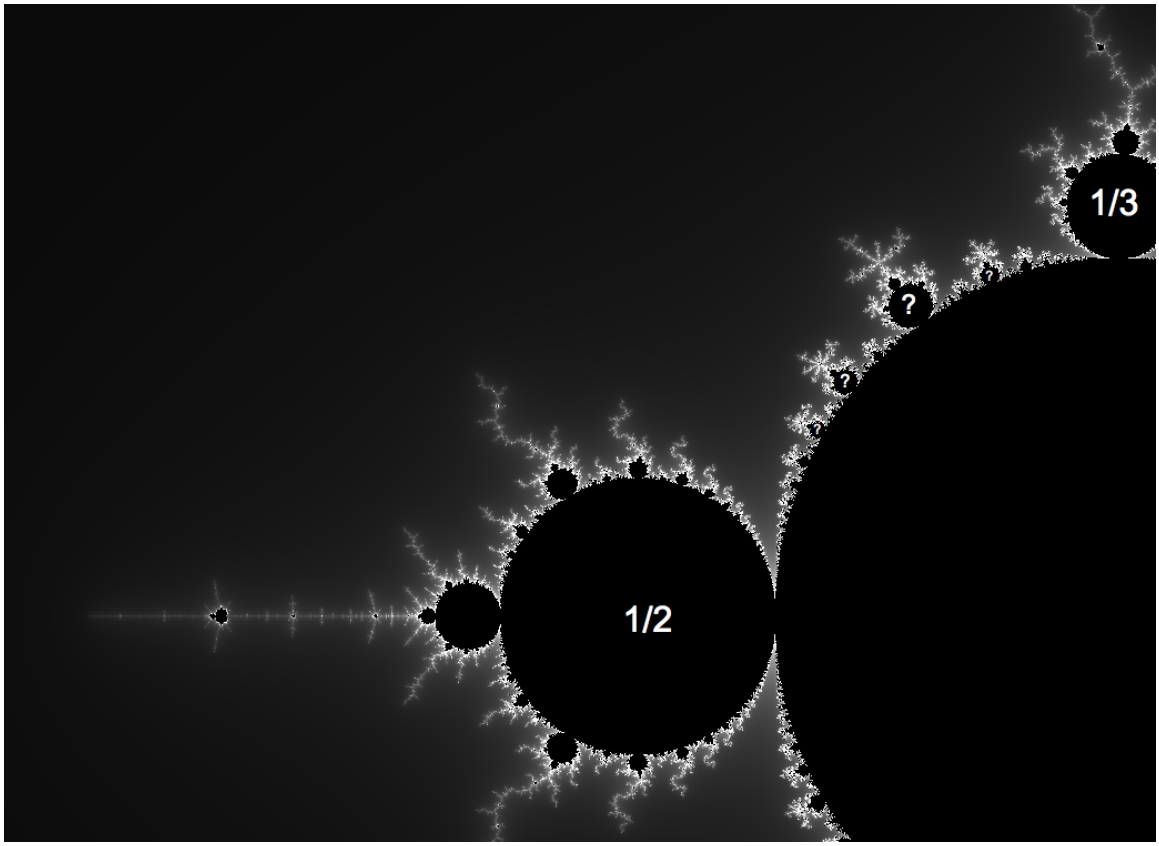


Figure 2: The Mandelbrot set with a few c values

4. Figure 3 shows the Mandelbrot set with a few marked c values. Match those c values with the corresponding Julia set shown in figure 4. (Note that one of those Julia sets is not actually a quadratic Julia set.)

5. What are the periods associated with the Julia sets in figure 4?

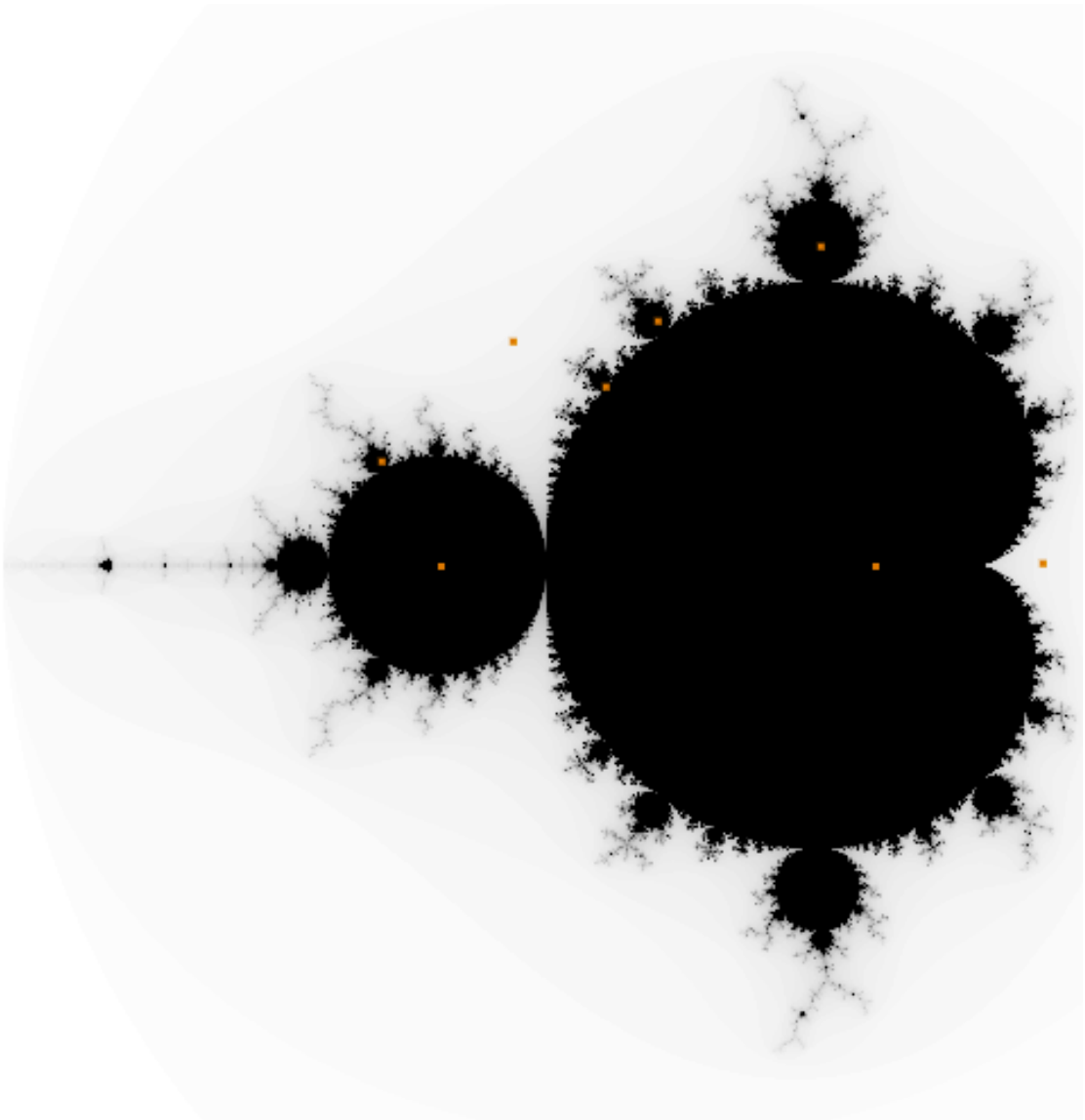
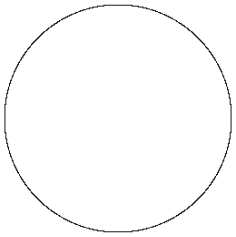
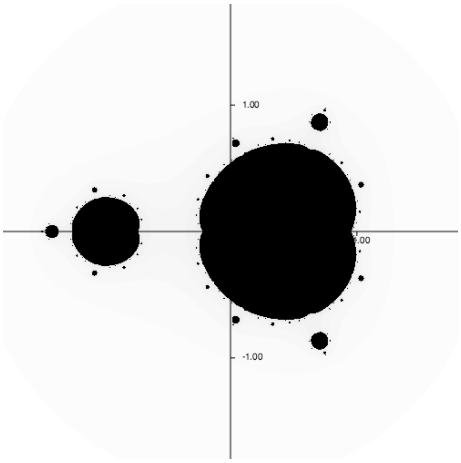


Figure 3: The Mandelbrot set with a few c values

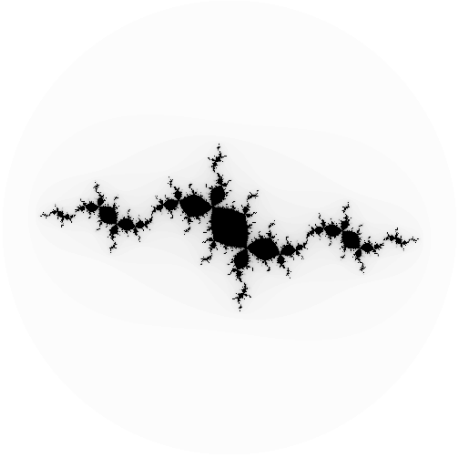
(a) Julia set 1



(b) Julia set 2

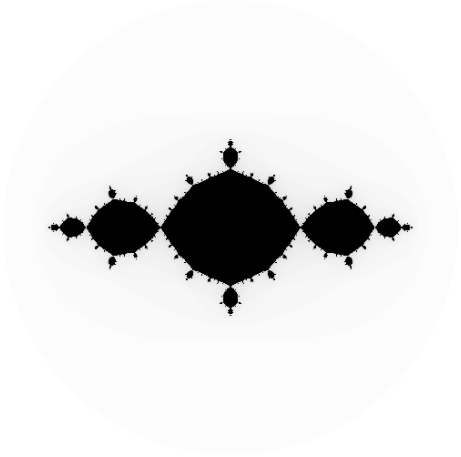


(c) Julia set 3

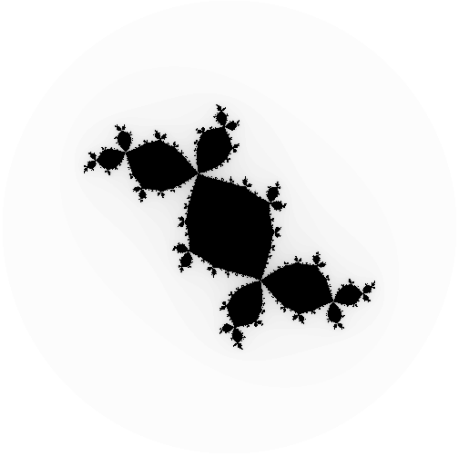


(d) Julia set 4

(e) Julia set 5



(f) Julia set 6



(g) Julia set 7

(h) Julia set 8

(i) Julia set 9

Figure 4: Some (mostly) quadratic Julia sets