# 100 Steps along Fibonacci Nautilus Spirals

The **_n_ = 53, _r_ = 800** image below is an example of the 8 jump Fibonacci spiral first examined here. Since *r* = 800, the image is created by 100 8-jump sets The jump set of (1, 1, 2, 3, 5, 8, 13, 21) involves 54 total jumps so the first set ends at vertex 1, 54 = *n*+1. The 8th line in the first set is a jump of 21 vertices, from a point 7/800 in on the vertex 33 radius to a point 8/800 = 1/100 in on the vertex 1 radius. The last part of this line that creates the first "step" along the clockwise spiral staircase. The second step is created by the last part of the last line of the second 8-jump set (from 34 to 2) which ends 2/100 in on the vertex 2 radius, and so on. Notice that as each set is added, the railing of the staircase gets a bit thicker.

Three radii are provided with **dots** at the corner of the steps associated with those radii. They show the 25th, 50th and 75th steps. These dots are 25/100 = ¼, 50/100 = ½ and 75/100 = ¾ of the way in on each radius. The first two are self-explanatory because *n* > 50. The third is the vertex 22 radius because 22 is 25 more than 50 given *n* = 53, 22 = 75 mod 53. Overall, the spiral is just shy of two times around because the 100th set would end at the center on vertex 47 = 22+25.
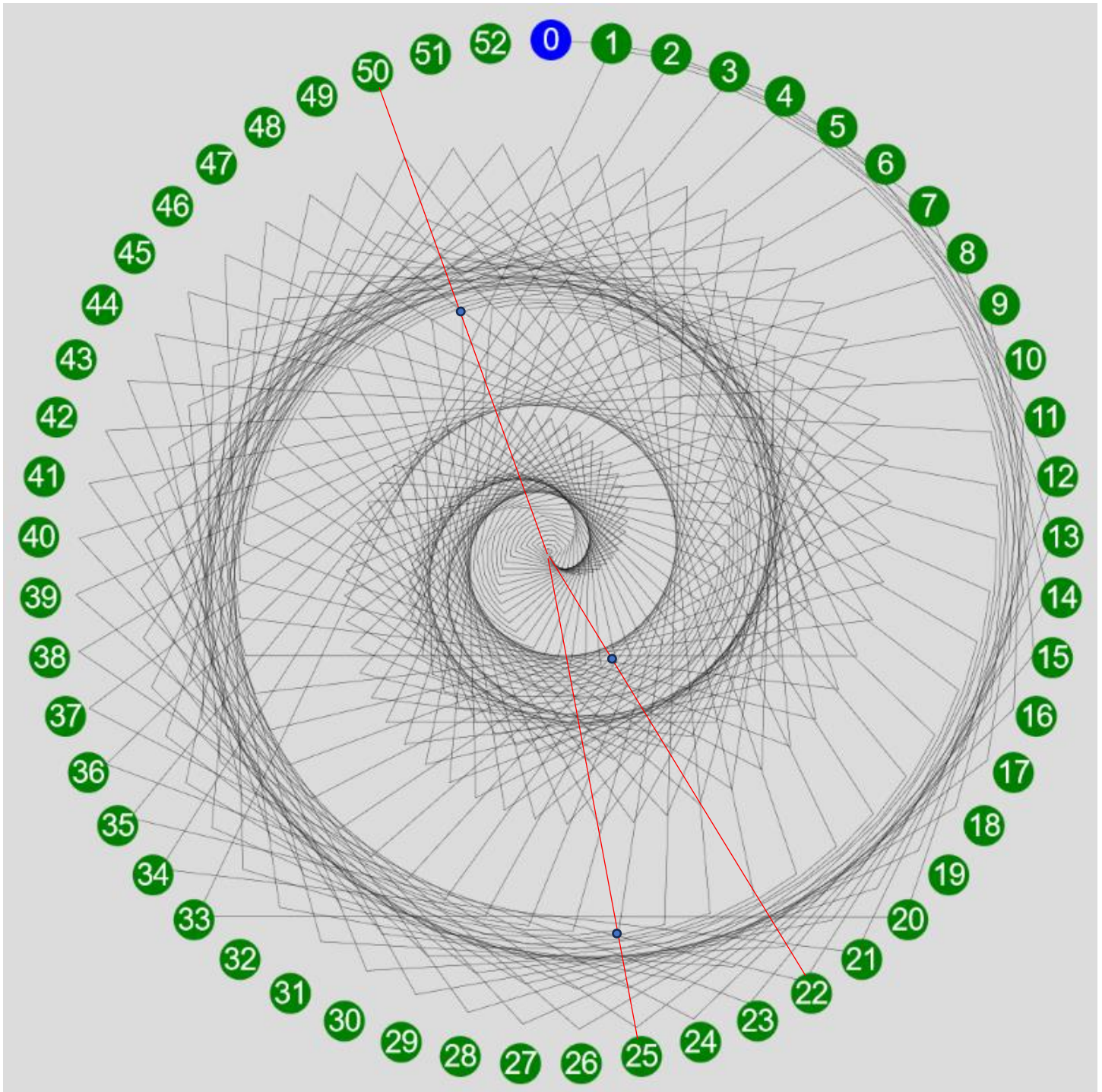
The Fibonacci sequence bakes in the clockwise giant spiral. By reversing the sequence to (21, 13, 8, 5, 3, 2, 1, 1) and adding 1 to *n* = 54 we obtain a counter-clockwise counterpart to the spiral shown on the previous page.

Once again there are 100 steps, but the first step is the start of the first line, the one starting at vertex 0 and going to a point 1/800 in on the vertex 21 radius. The second step starts at the start of the 9th line from 8/800 = 1/100 in on the vertex 54 radius to 9/800 in on the vertex 20 radius, and so on. Just like on the clockwise version, as each step is added, so is the size of the railing.

Like before, **three radii** are provided with **dots** at the corner of the steps associated with those radii. They show the 25th, 50th and 75th steps. These dots are 25/100 = ¼, 50/100 = ½ and 75/100 = ¾ of the way in on each radius. The first is at vertex 31 (if you think it should be at 30, count backwards from the top and you will see that 51 is the 5th), the second is at 6 and the third is at 36. Overall, the spiral is just shy of two times around because the 100th set would end at the center, all of the way in on the vertex 11 = 36-25 radius.