

## Bird Beak Challenge Questions

1. The Bird Beak image discussed in [Fibonacci](#) is based on extensive use of 13s. Can you alter  $n$ ,  $S$ ,  $P$ , and jumps so as to create a Bird Beak image based on 14s?

**HINT.** The final image has 196 lines and is a porcupine.

2. How was the image shown below, a bird beak using 15s, created? There are 210 lines total, and this is a close porcupine with  $SCF = 1$ . What are the values for  $n$ ,  $S$ ,  $P$ , and jumps?

**HINTS.** This started with Fibonacci but then jumps were altered in a symmetric fashion to obtain this image. An important part of figuring out how this was done is deciding how many zero jumps are in the middle of the jump set that create the spray of lines that define the beak.

