BUILDING A PADOVAN CUBOID SPIRAL

You can create spirals for both of these sequences:
A Fibonacci spiral of Squares and a Padovan Spiral of Equilateral Triangles

DIAGRAM OR EXAMPLE OF STIMULI

Why does the Spiral lie in a plane?

Equation of the spiral plane:
\[ x - y = 0 \]
Each diagonal is such that either:
\( x = y \) OR \( x = -y \) OR \( x = z \) OR \( y = z \)

Notice that the Padovan Triangular 2D spiral is the same as the Cuboid Spiral!

HOW TO PROGRAM?

Starting Simple with the Fibonacci Spiral:

Keeping track of starting corner (star) and direction of diagonal movement (arrow)
- The magnitude of the direction is the Fibonacci number
- The signs of the direction are determined by a modulus 4 pattern
- The starting corner is the sum of the last starting corner
- The magnitude of the direction is the Fibonacci number

For the Cuboid Spiral:

Needed to figure out patterns for how to determine the next starting point, direction of motion, and dimension of the diagonal from that information from previous squares
- The pattern repeats based on modulus 6
For example:
\[ d = 1 \]
\[ p = 5 \]
\[ k = 1 \]
\[ n = 2 \]

For this method I stored previous values of starting point, direction of motion, and dimension of the diagonal in lists so there was no need for a Padovan function because you are storing the values instead of having to recalculate them recursively each time. This is good because it keeps the program from going too slow.

ACKNOWLEDGEMENTS

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I also looked at a few websites:
http://mathworld.wolfram.com/PadovanSequence.html