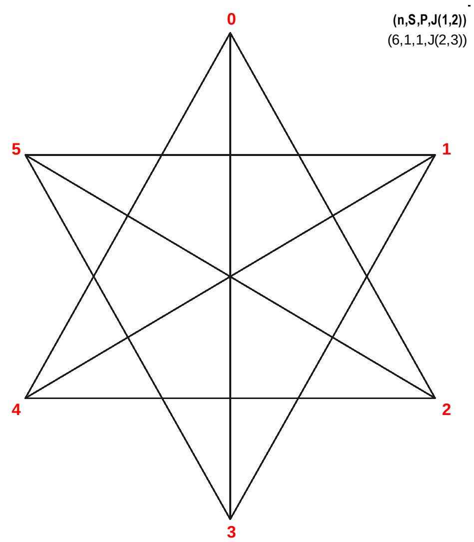
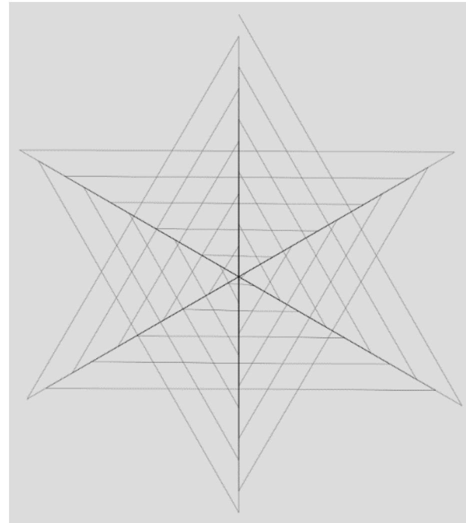


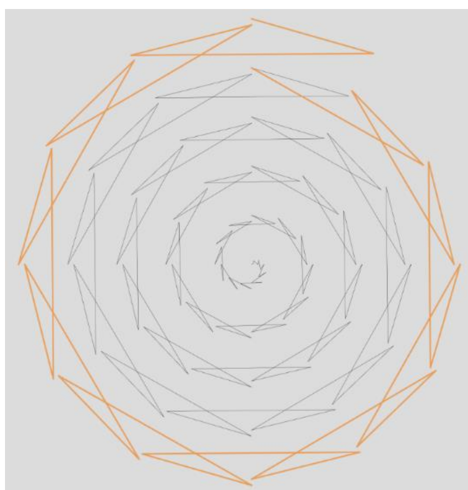
An Introduction to Jump Sets

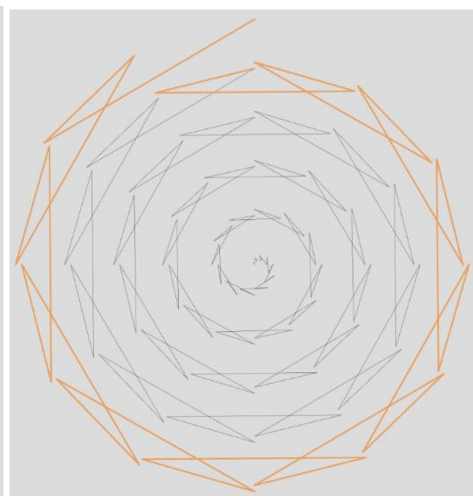
Jump sets can be employed to create variations on spirals, just like they were used in Part III of ESA. E16.2 introduced jump sets to create a 6,2-star by alternating jumps of 2 and 3 on a 6-gon. The vertex frame, VF, for that star shown to the left is created in 12 lines connecting vertices **0-2-5-1-4-0-3-5-2-4-1-3-0**. E2.2.1 notes why ***n*** = 6 is the only value of ***n*** > 4 for which one could not produce at least one ***n***-point *continuously drawn* star via a single-jump model.



The image to the right is a spiral version of a 6,2-star based on this same jump set of 2 then 3. Like all spirals (without mirror clicked on), the image on the right has no line of symmetry. Nonetheless, it appears quite similar to the 6,2-star achieved via web mirror with horizontal line of symmetry discussed elsewhere.

When ***n*** = 12 we can talk in terms of hours (with 12 = 0). The string-art VF at bottom left is based on a jump set of (1,10). It is counterclockwise drawn (the first 5 lines of the VF are 0-1-11-0-10-11-…) but it could have been created three other ways. Switching the first and second jump to (10,1) maintains the counterclockwise drawn nature of the image since the first 5 lines are then 0-10-11-9-10-8-… . Subtracting ***n*** from each jump (for jump set pairs of (11,2) and (2,11)) produces images drawn clockwise since the first 5 lines of (11,2) are 0-11-1-0-2-1-… , and the first 5 lines of (2,11) are 0-2-1-3-2-4-… . In the spirals context, each produces a different image because the order of radius reduction changes.





The first and second shown above are counter-clockwise, ↺. The third and fourth shown below are clockwise, ↻. (Compare to these ***n***=12, ***J***=11 ↺ and ***n***=12, ***J***=1 ↻ single-jump versions.)

All four highlight the first 24 lines (which is how many lines are required to complete the string-art VF below). All four spirals are 5-times around because ***r*** = 120 = 5·24.