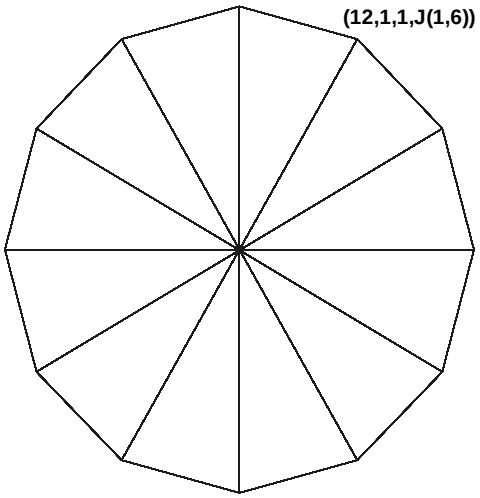
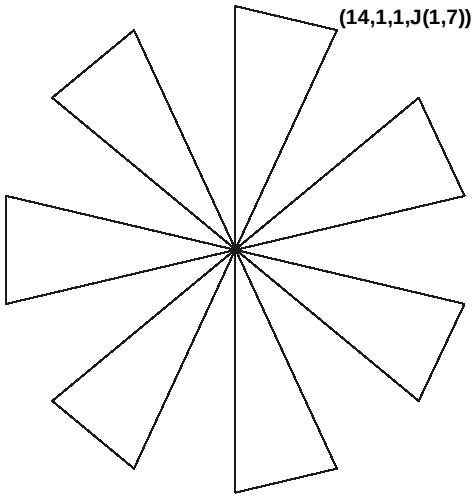
Functionally Related Double Jump Models

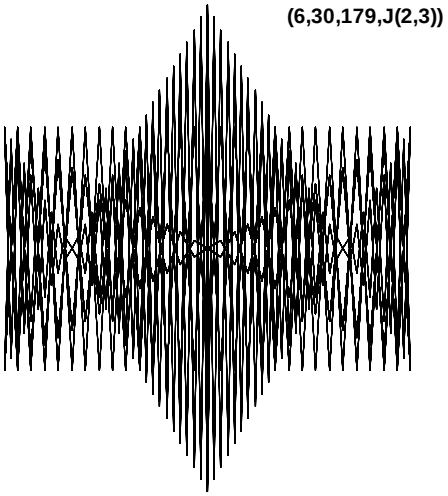
There are multiple versions of the Double Jump *Excel* file but the first is the general version. To understand why there are three versions, it is worth considering the vertex frame (so set ***S*** = ***P*** = 1) if ***n*** is even and one jump is 1 and the other is ***n***/2. In this instance, the frame that looks like fractions of a pie like at right for ***n*** = 12, but for ***n*** = 14, every other piece of the pie is already eaten.



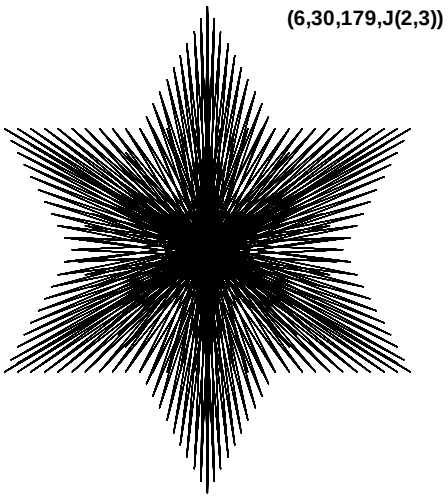
In this instance, if you set ***P*** near but not at half of ***S***, flower images result. All petals are visible when ***n*** is divisible by 4 but half are missing if ***n*** is divisible by 2 but not 4 because VCF = 2 in this instance.



The smallest ***n*** version with missing petals is ***n*** = 6 which results in 3 petals. Since ***n*** = 6 you can think of a clock face with only even numbers showing. In this instance, the frame goes from 12 o'clock to 2 to 8 to 10 to 4 to 6 and back to 12 o'clock where the circuit is completed. Such values of ***n*** may be written as ***n*** = 4***k***+2 where ***k*** is a whole number. The other two versions allow you to examine functional relationships between parameters in a fashion similar to that proposed in functionally enabled ***n S P J***.



Version 2. The second version focuses strictly on even-petaled flowers from 4 to 24. It is initially set with ***Jump 1*** = 1 and with ***Jump 2 = n/2*** but you can adjust ***Jump 1*** via scroll arrows and ***Jump 2*** by entering a number or an equation in place of its initial equation. There is a click box that allows you to fill in the other petals when ***n*** = 4***k***+2 by counting the last half of jumps counterclockwise rather than clockwise via a click box. **This click box produces images that cannot be replicated by the web version since that version does not count backwards.** (It is worth noting that when this box is checked and VCF = 2 (or a multiple of 2), the resulting image will appear as VCF = 1 (or half as large).) Many images beyond flowers are possible by varying the parameters via scroll arrows. All images created using Version 2 can be obtained using the Version 1 except when ***n*** = 4***k***+2 and the counterclockwise click box is checked. The top porcupine at right is checked, the bottom is not.



Version 3. The third version returns to clockwise counting of jumps by adjusting the first jump to 2 when ***n*** = 4***k***+2, otherwise the first jump is 1. The second jump is set to be the closest whole number to ***n***/2. The automations provide the ability to have 3 to 25 petal flowers just by changing ***n*** as long as ***P*** is near but not half of ***S***. This version also allows you to override the scroll arrows controlling ***S*** and ***P*** by putting equations in place of those numbers. For example, by putting the equation =B1*L1-1 in place of ***P*** in cell C1 you obtain maximally sharp star bursts if ***n*** is even (especially when ***n*** = 4***k***) but more complex images when ***n*** is odd. The reason these are maximally sharp is that there are 2***nS*** subdivision points in this instance (there are ***nS*** subdivision points, but each point is counted twice, once as part of the first jump and the second time as part of the second jump). If ***P*** = ***nS*** is put in cell C1, a single line results, but if ***P*** = ***nS***-1 a 2***nS*** image emerges (the same image as when ***P*** = ***nS***+1 but drawn the other way around) both of which are examples of porcupine images.