

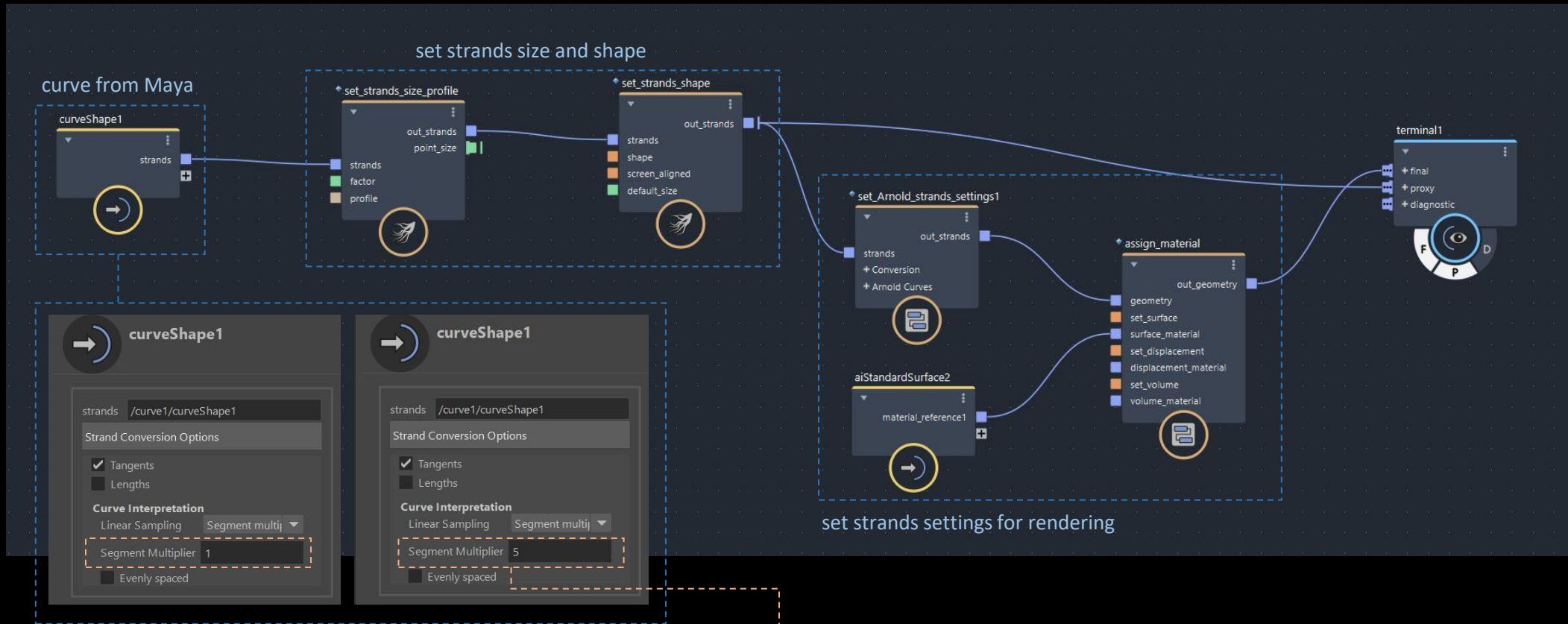
Bifrost Workshop

Lesson 3

- Strands
- Iteration
- Animation

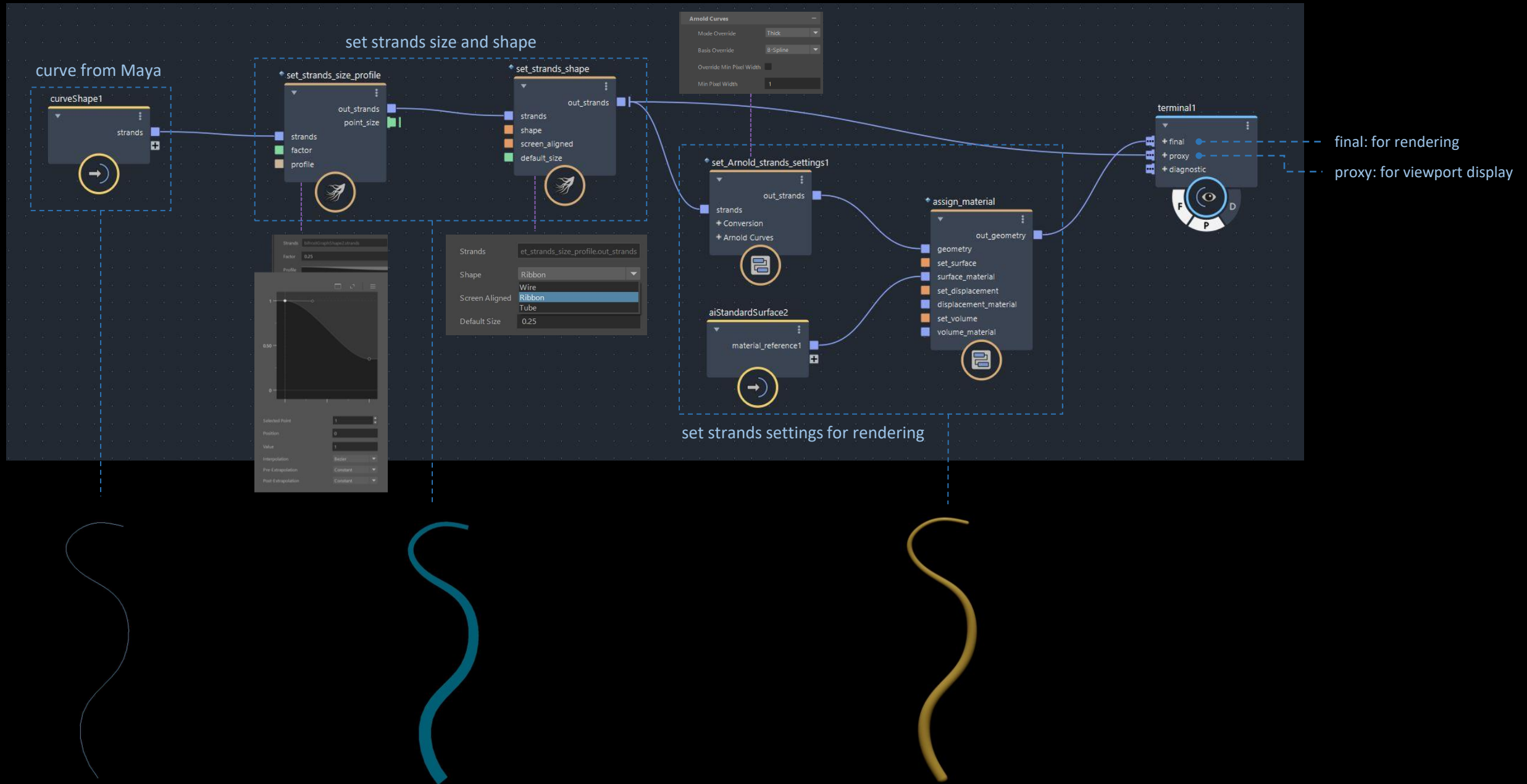


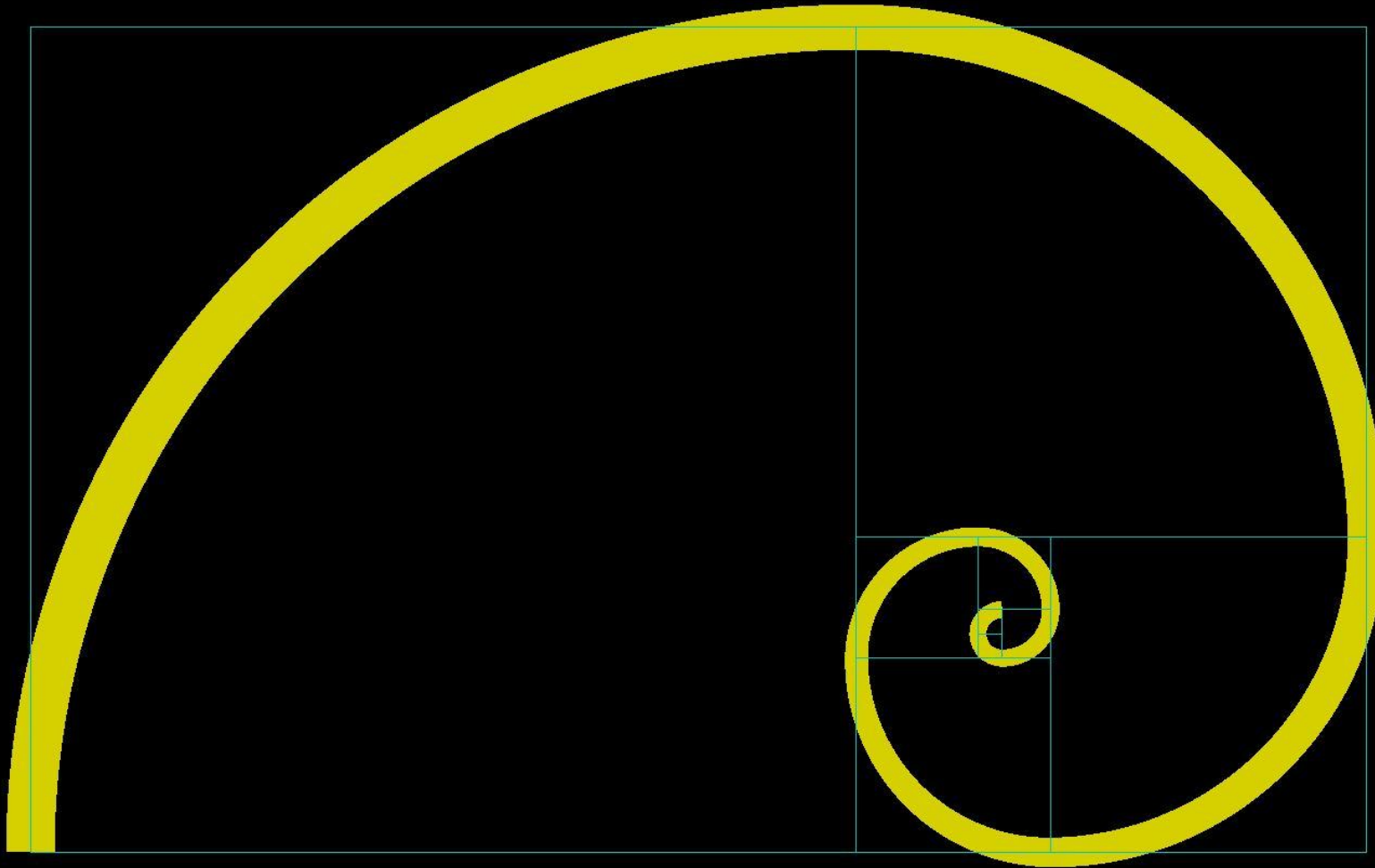
Strands

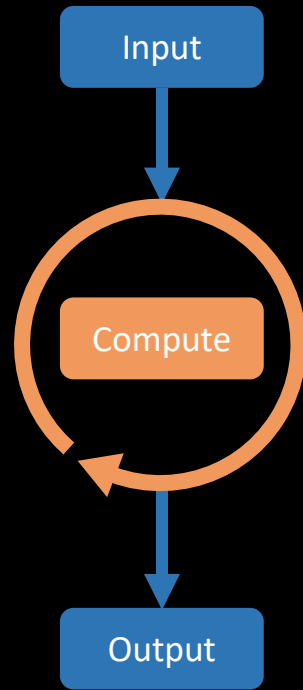


adjust the segment multiplier to change the resolution of the strand

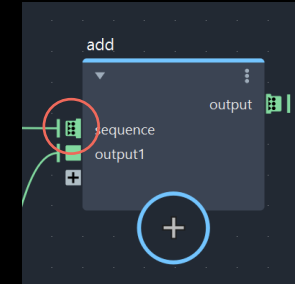
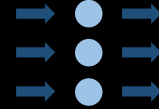
Strands



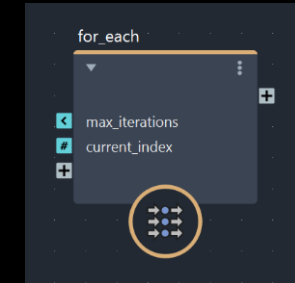
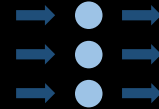




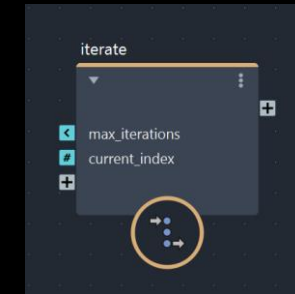
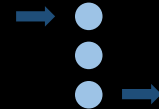
Auto-looping



For each



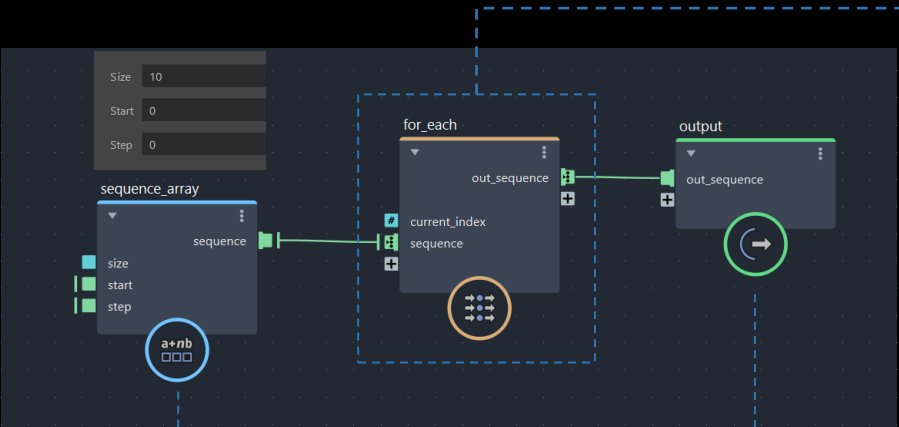
Iterate



Strands

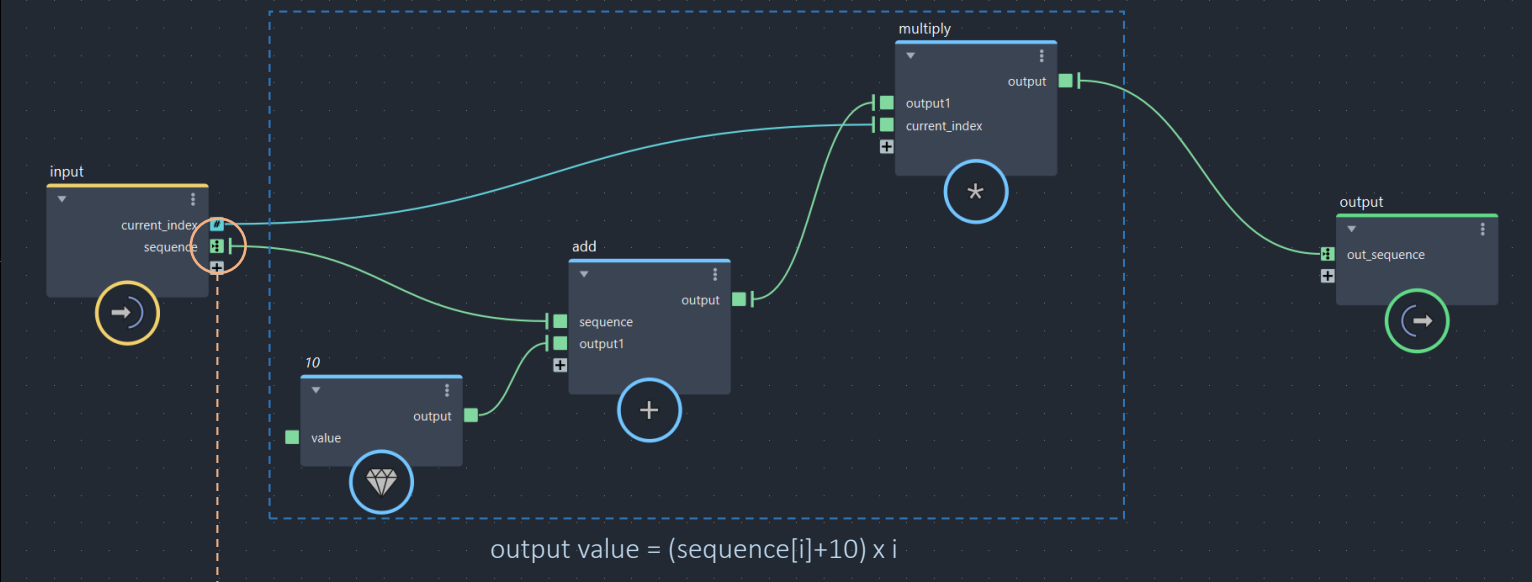
Iteration Basics

For each



0: 0	→	0: 0
1: 0	→	1: 10
2: 0	→	2: 20
3: 0	→	3: 30
4: 0	→	4: 40
5: 0	→	5: 50
6: 0	→	6: 60
7: 0	→	7: 70
8: 0	→	8: 80
9: 0	→	9: 90

inside “for_each” compound

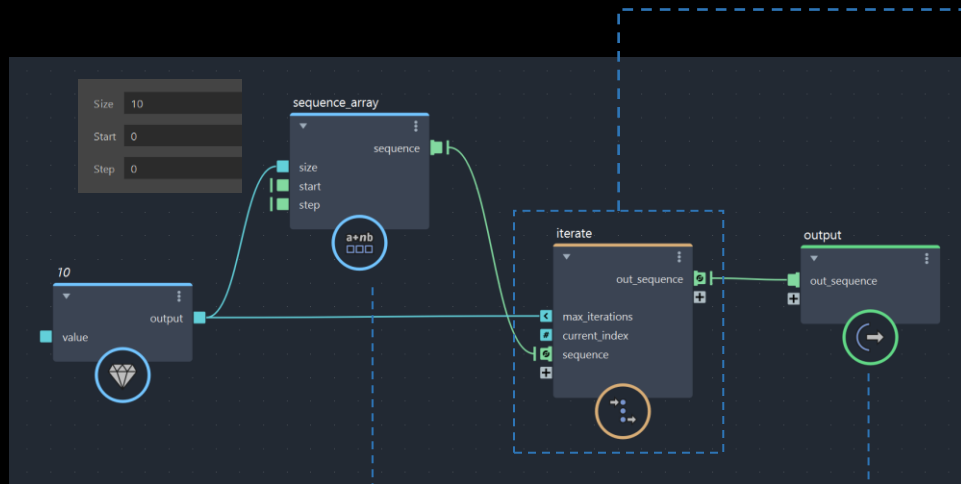


Rename Port	
Delete Port	
Move Port To Top	
Move Port Up	
Move Port Down	
Move Port To Bottom	
Set Port Type...	
Port Types	
Move To	
Set Port Iteration Counter	
Set Port Iteration Limit	
Set Port Iteration Target	<input checked="" type="radio"/> true <input type="radio"/> false

Set the port iteration target to true so that it automatically iterates over the sequence array. For each index, it gets the corresponding value from the array.

Strands

Iteration Basics



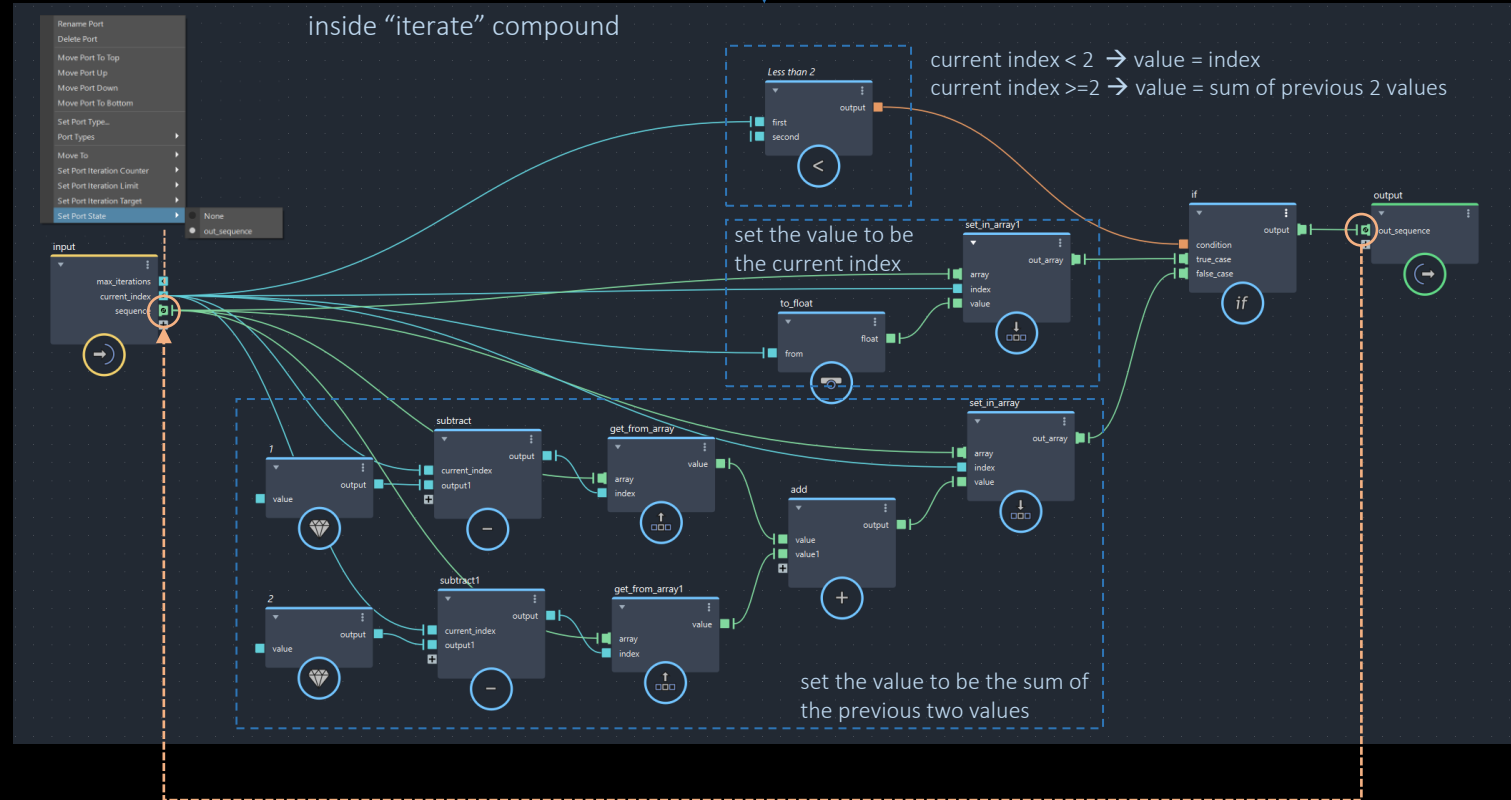
0: 0
1: 0
2: 0
3: 0
4: 0
5: 0
6: 0
7: 0
8: 0
9: 0

0: 0
1: 1
2: 1
3: 2
4: 3
5: 5
6: 8
7: 13
8: 21
9: 34

Fibonacci sequence:

$n_i = i \ (n < 2)$

$n_i = n_{i-1} + n_{i-2} \ (n \geq 2)$

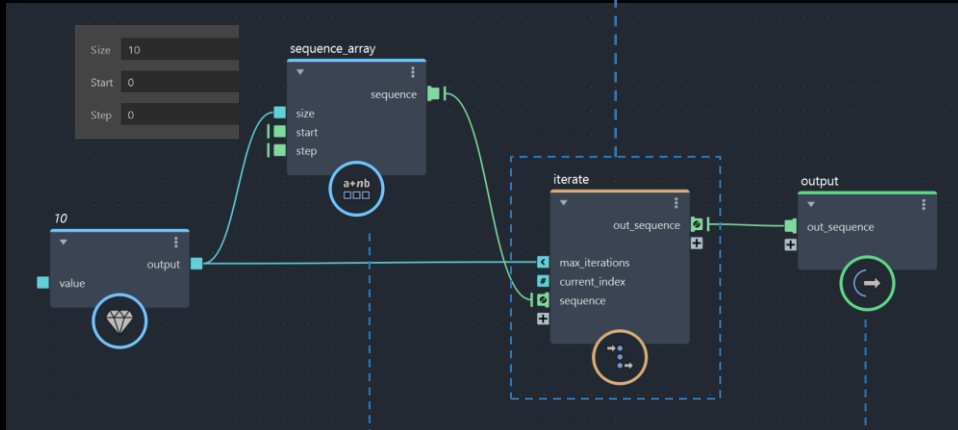


The output sequence from one iteration will become the input sequence for the next iteration

Strands

Iteration Basics

Iterate 



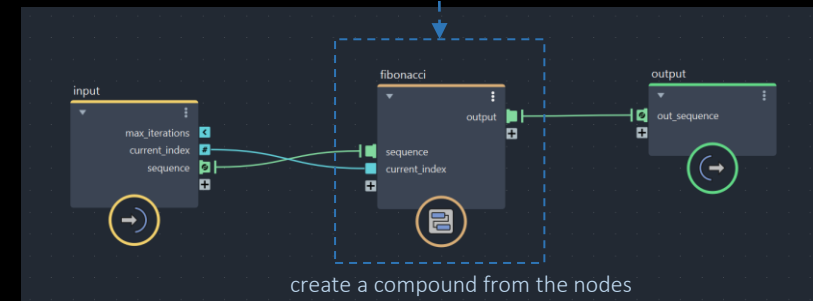
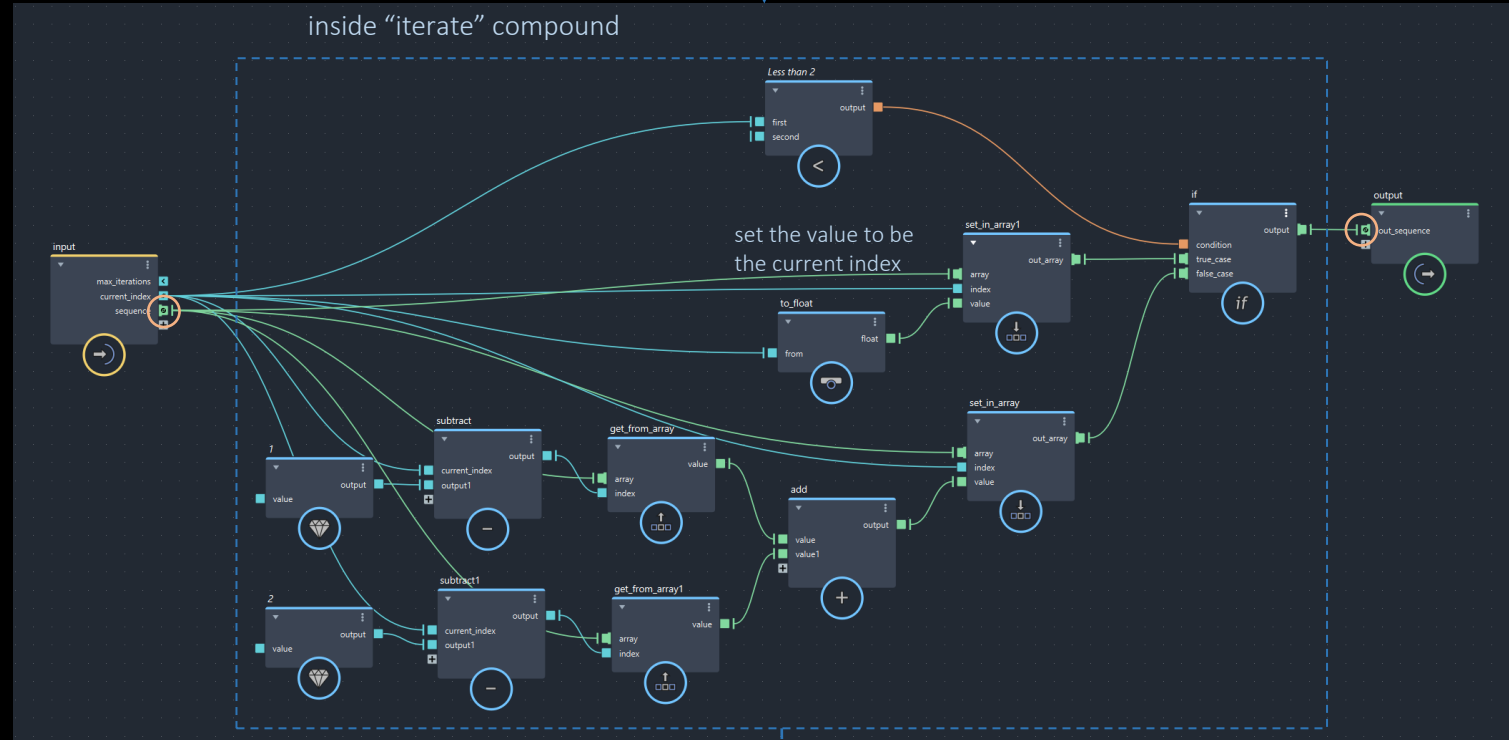
0: 0
1: 0
2: 0
3: 0
4: 0
5: 0
6: 0
7: 0
8: 0
9: 0

0: 0
1: 1
2: 1
3: 2
4: 3
5: 5
6: 8
7: 13
8: 21
9: 34

Fibonacci sequence:

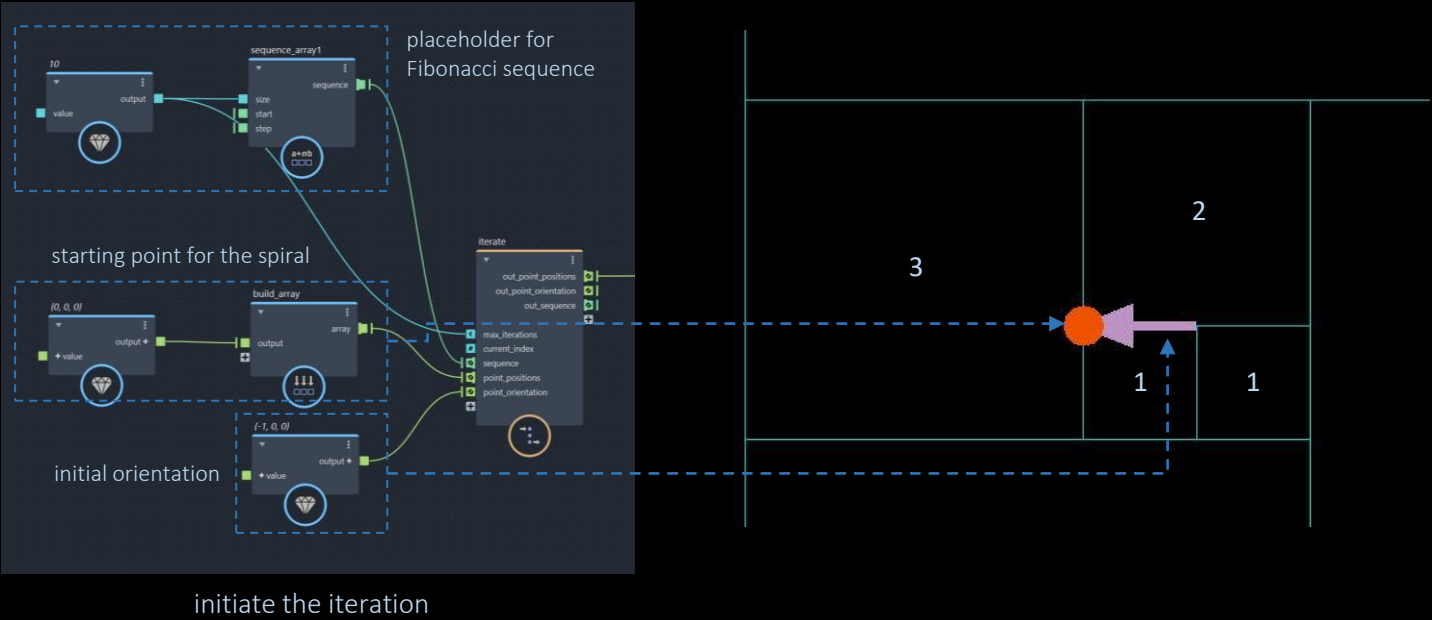
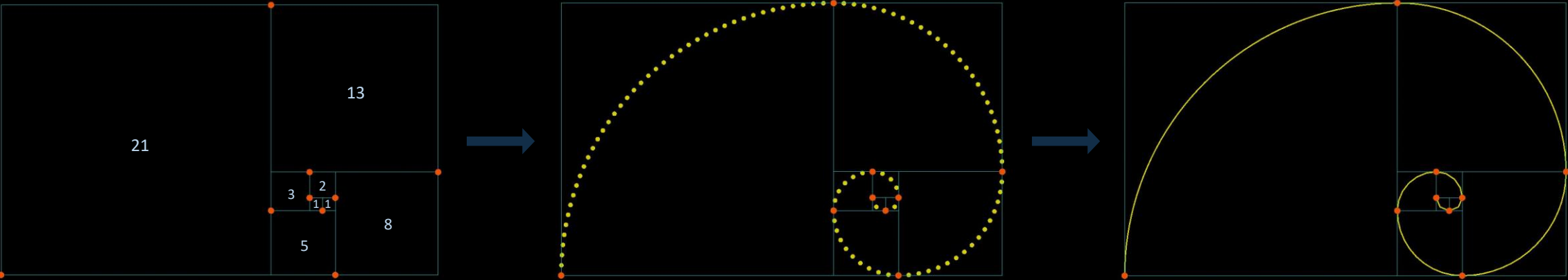
$n_i = i \ (n < 2)$

$n_i = n_{i-1} + n_{i-2} \ (n \geq 2)$



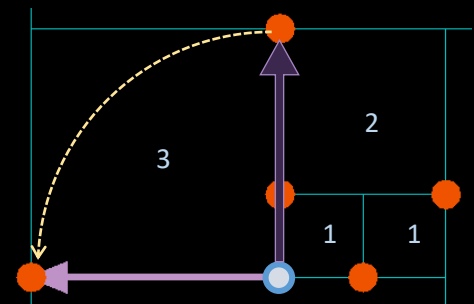
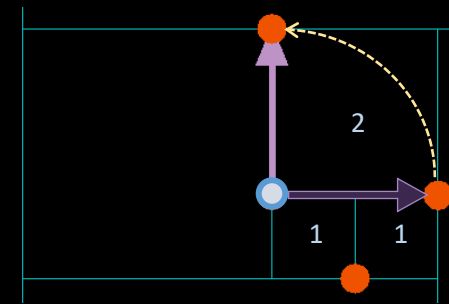
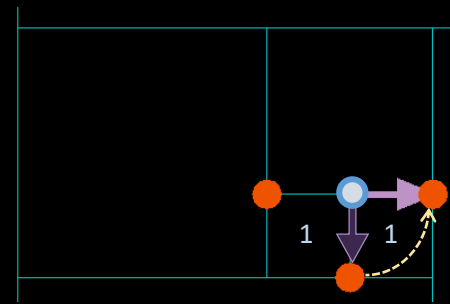
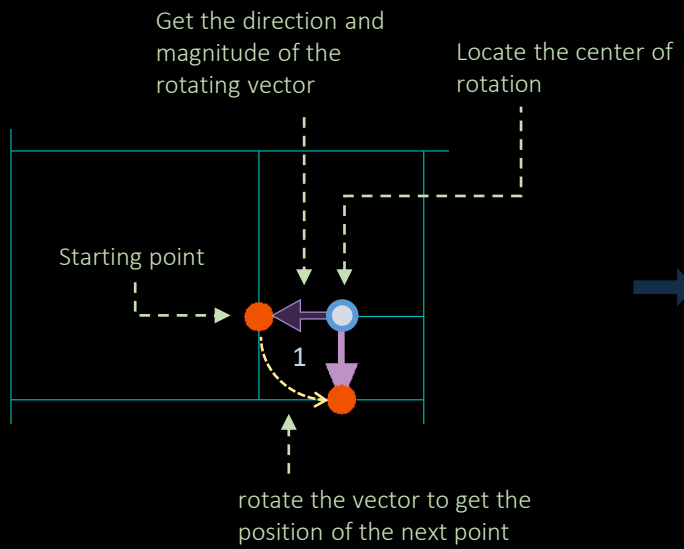
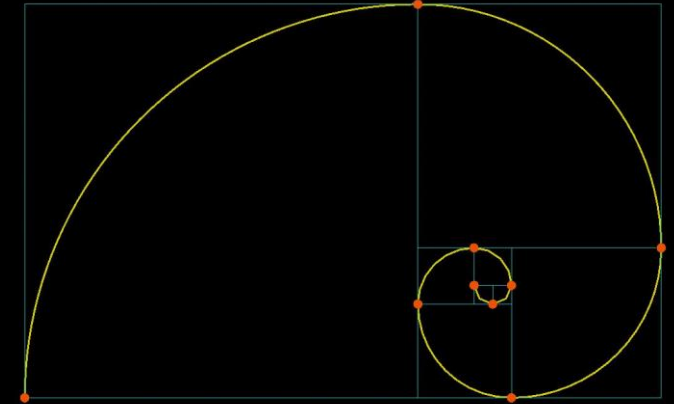
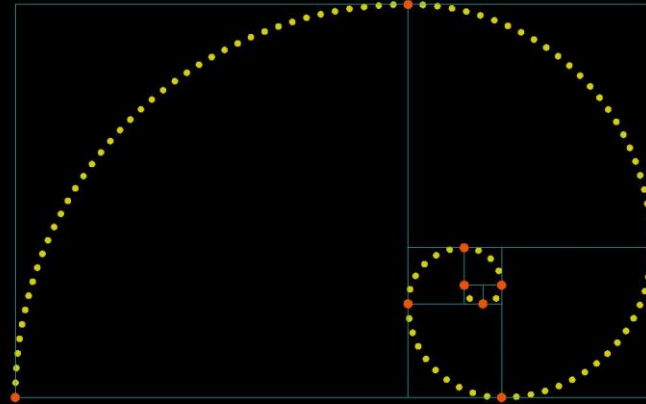
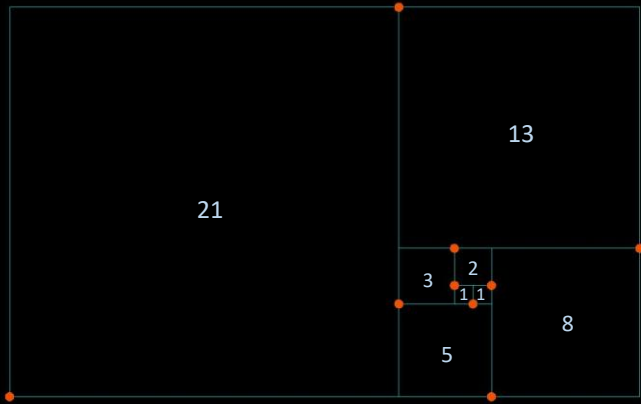
Strands

Fibonacci Spiral



Strands

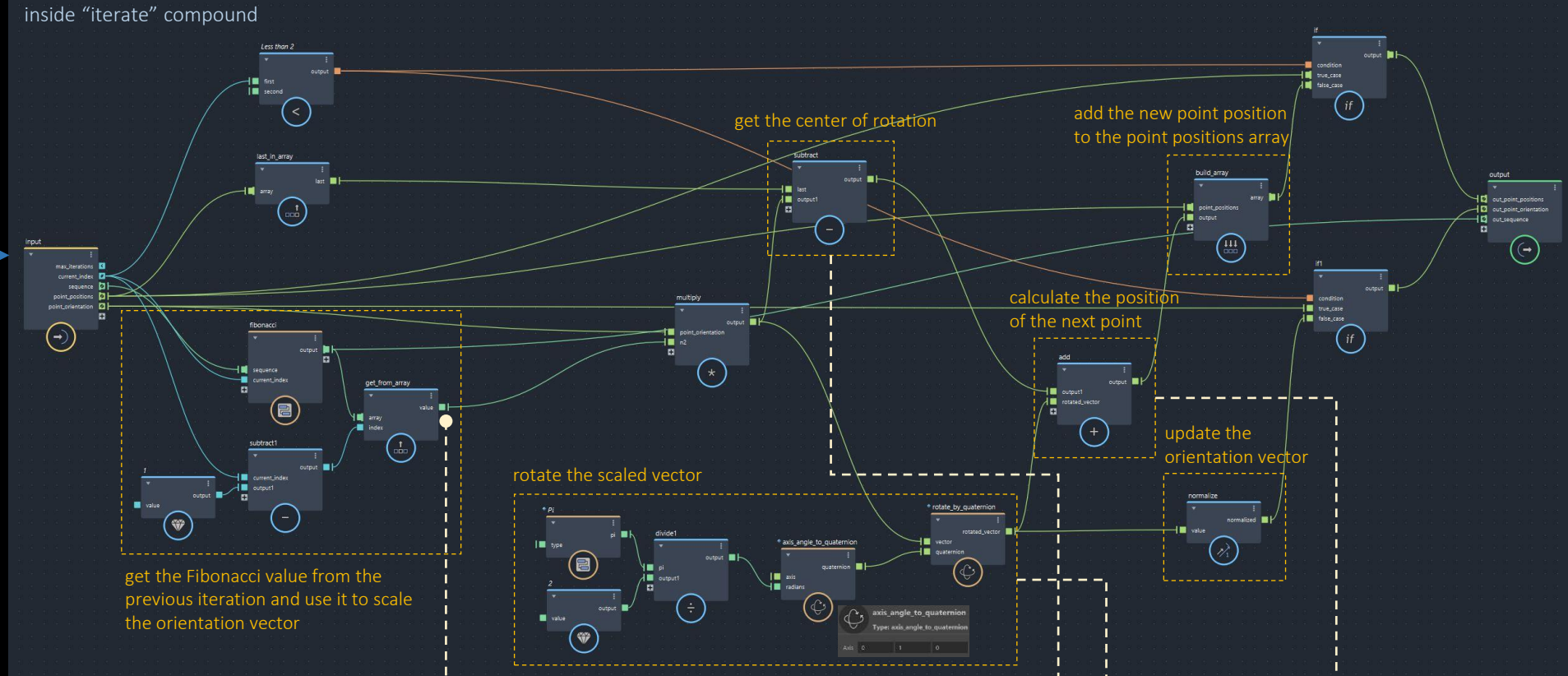
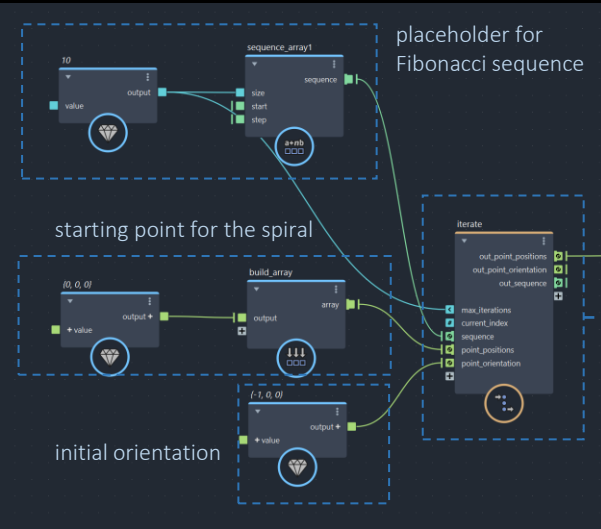
Fibonacci Spiral



Repeat the same process

Strands

Fibonacci Spiral

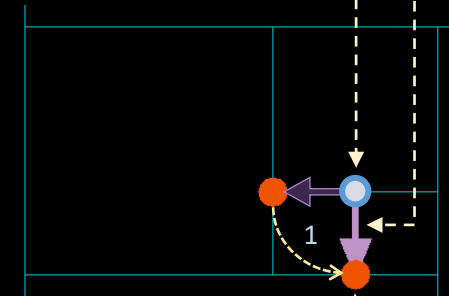
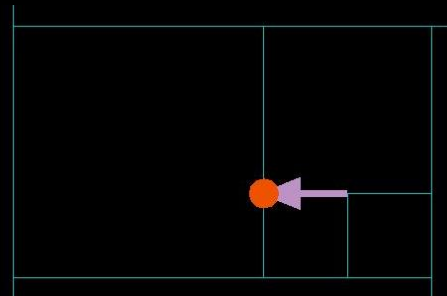
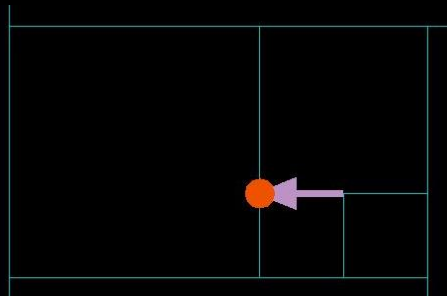


Fibonacci sequence

Iteration 0: [0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

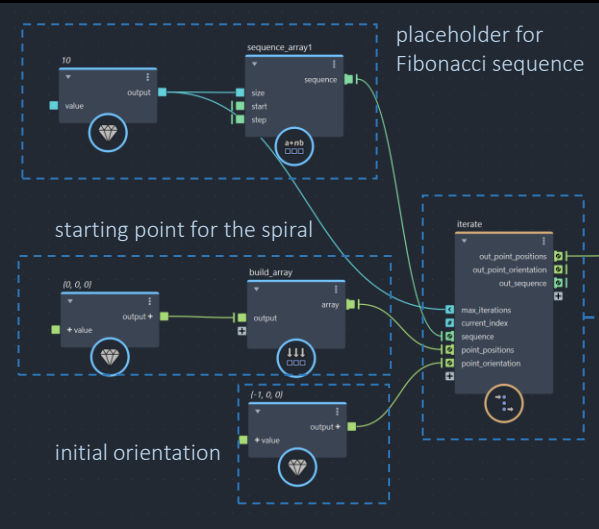
Iteration 1: [0, 1, 0, 0, 0, 0, 0, 0, 0, 0]

Iteration 2: [0, 1, 1, 0, 0, 0, 0, 0, 0, 0]

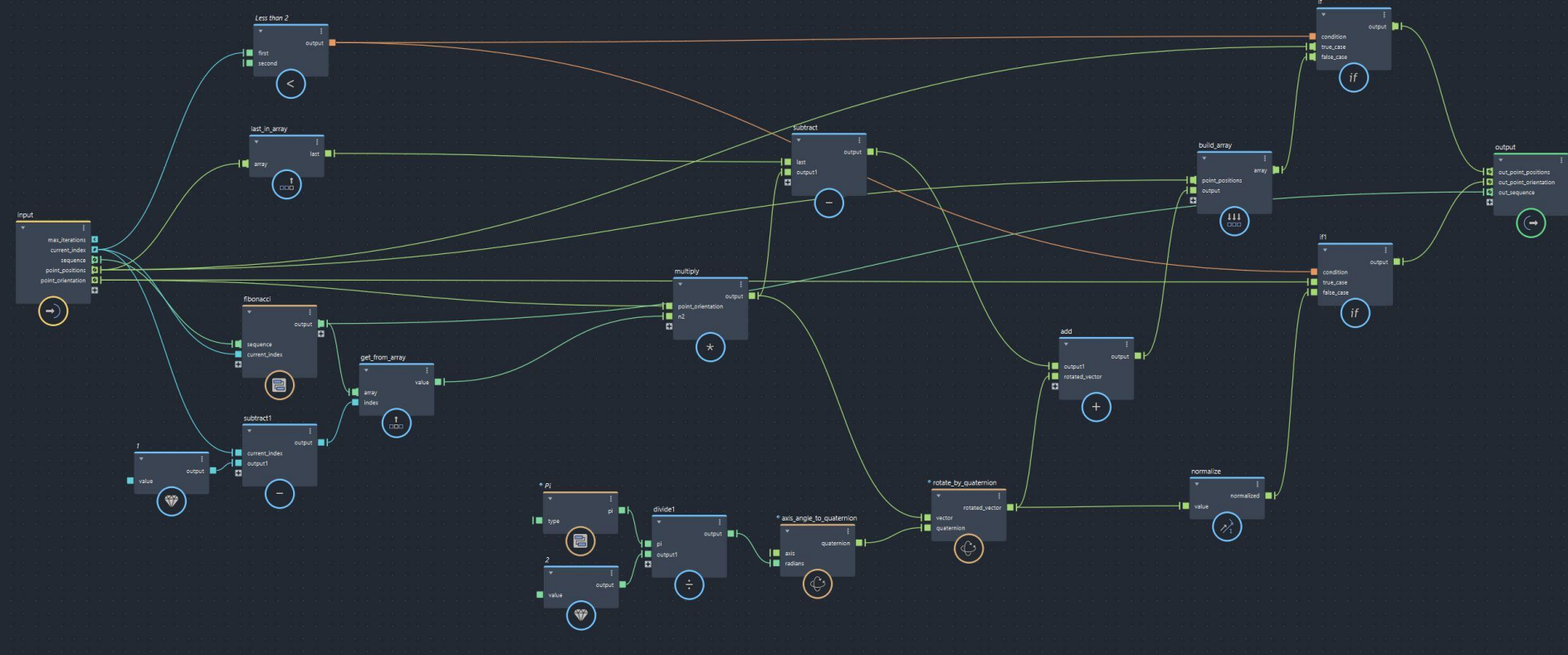


Strands

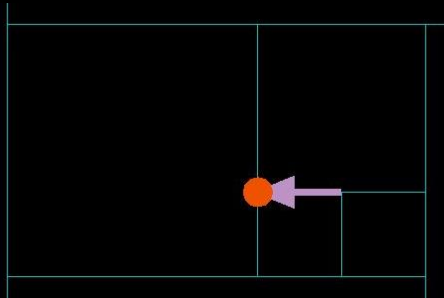
Fibonacci Spiral



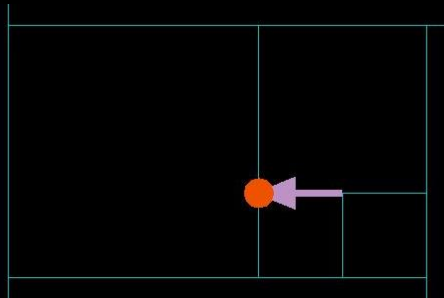
inside "iterate" compound



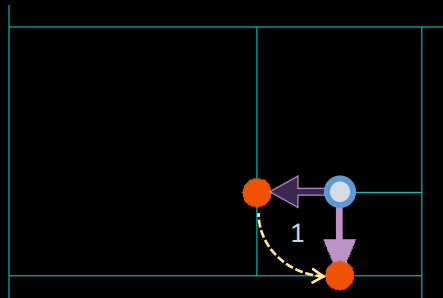
Iteration 0: [0, 0, 0, 0, 0, 0, 0, 0, 0, 0]



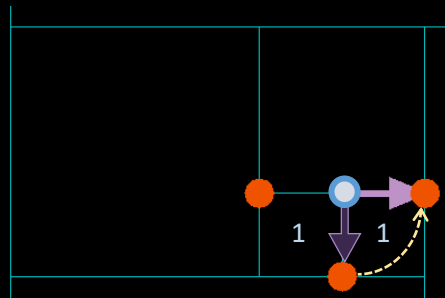
Iteration 1: [0, 1, 0, 0, 0, 0, 0, 0, 0, 0]



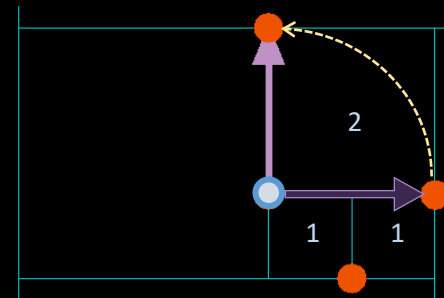
Iteration 2: [0, 1, 1, 0, 0, 0, 0, 0, 0, 0]



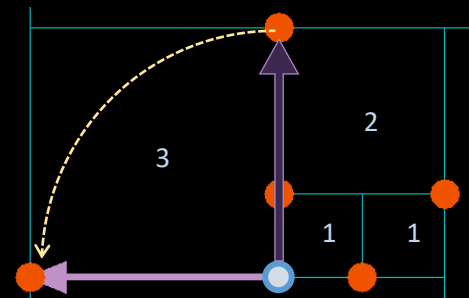
Iteration 3: [0, 1, 1, 2, 0, 0, 0, 0, 0, 0]



Iteration 4: [0, 1, 1, 2, 3, 0, 0, 0, 0, 0]

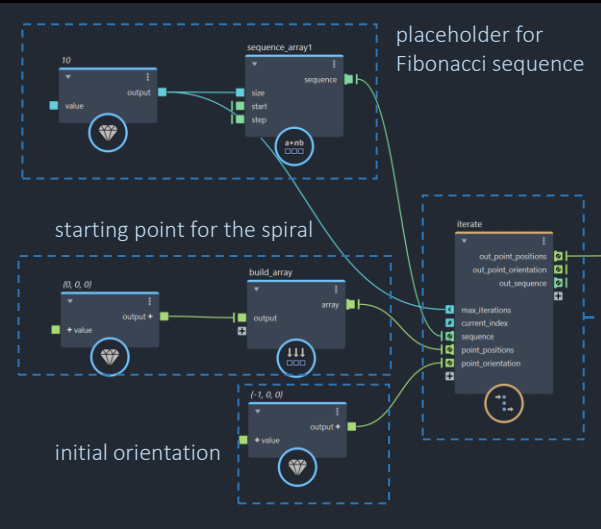


Iteration 5: [0, 1, 1, 2, 3, 5, 0, 0, 0, 0]

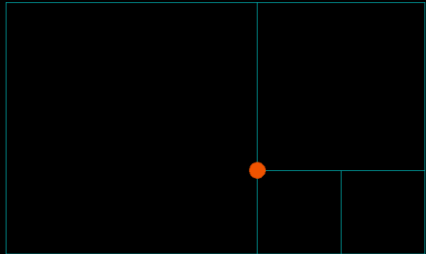


Strands

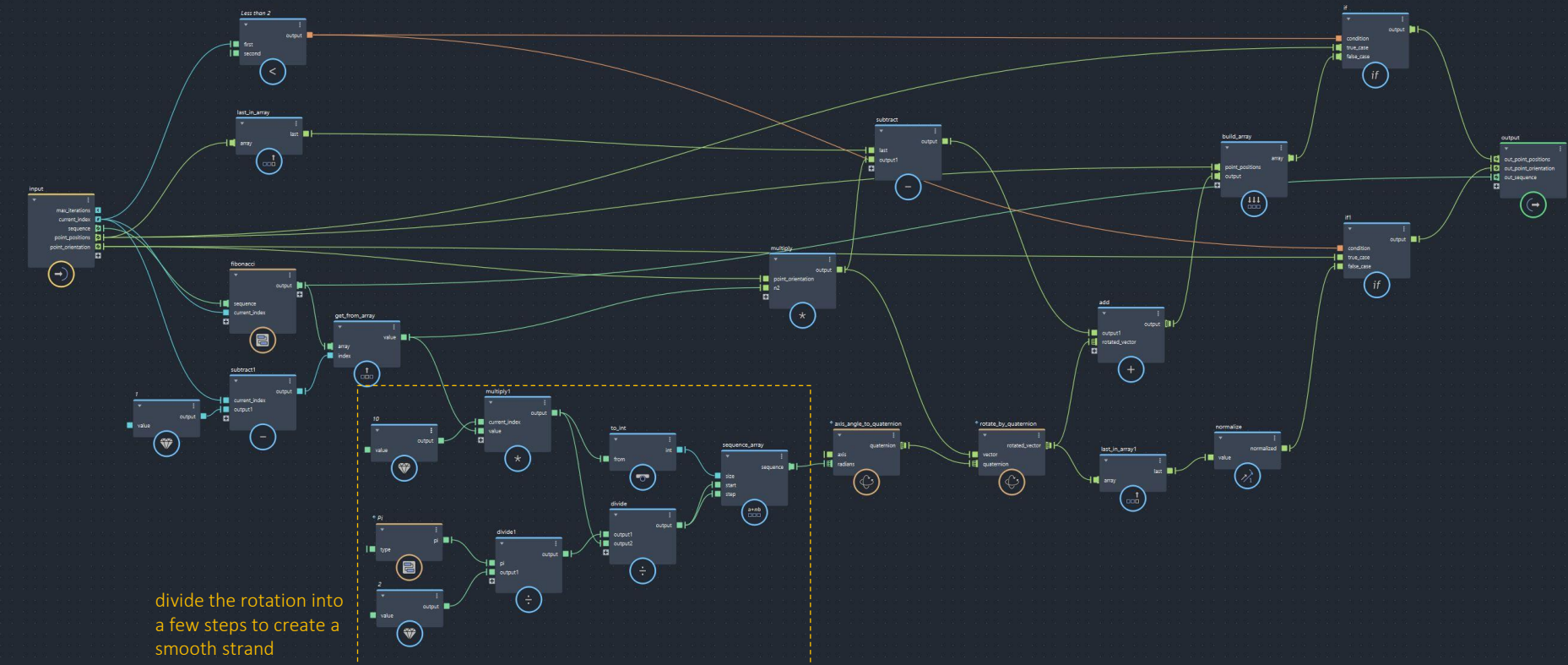
Fibonacci Spiral



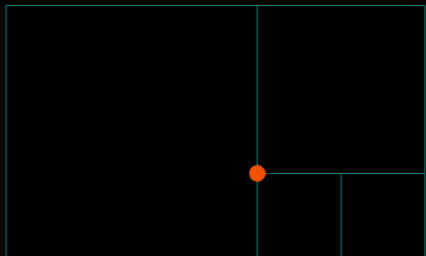
Iteration 0: [0, 0, 0, 0, 0, 0, 0, 0, 0]



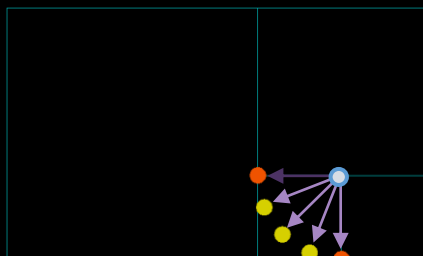
inside "iterate" compound



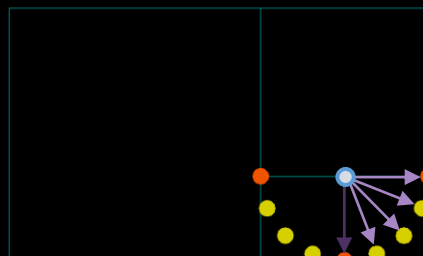
Iteration 1: [0, 1, 0, 0, 0, 0, 0, 0, 0]



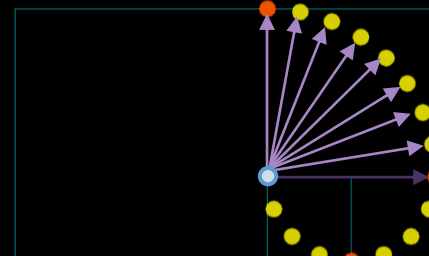
Iteration 2: [0, 1, 1, 0, 0, 0, 0, 0, 0]



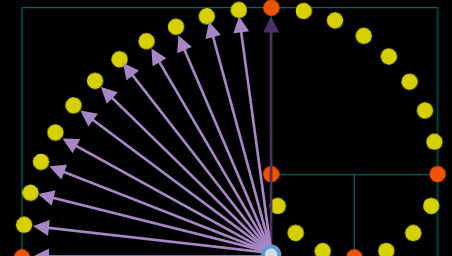
Iteration 3: [0, 1, 1, 2, 0, 0, 0, 0, 0]

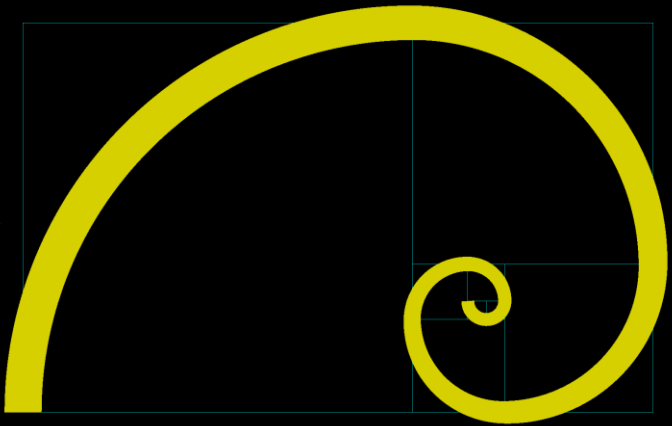
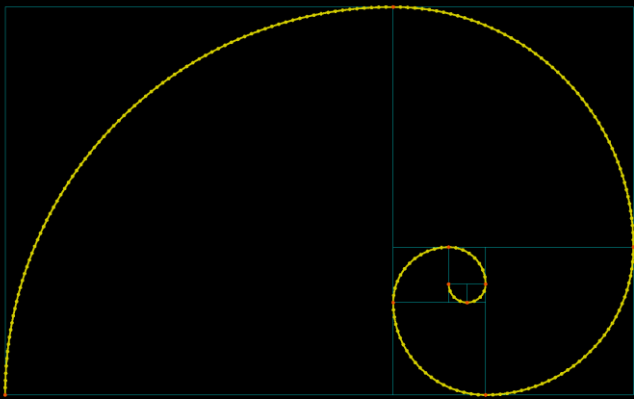
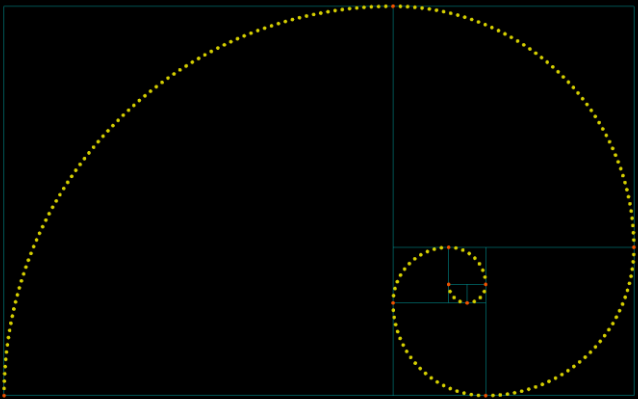
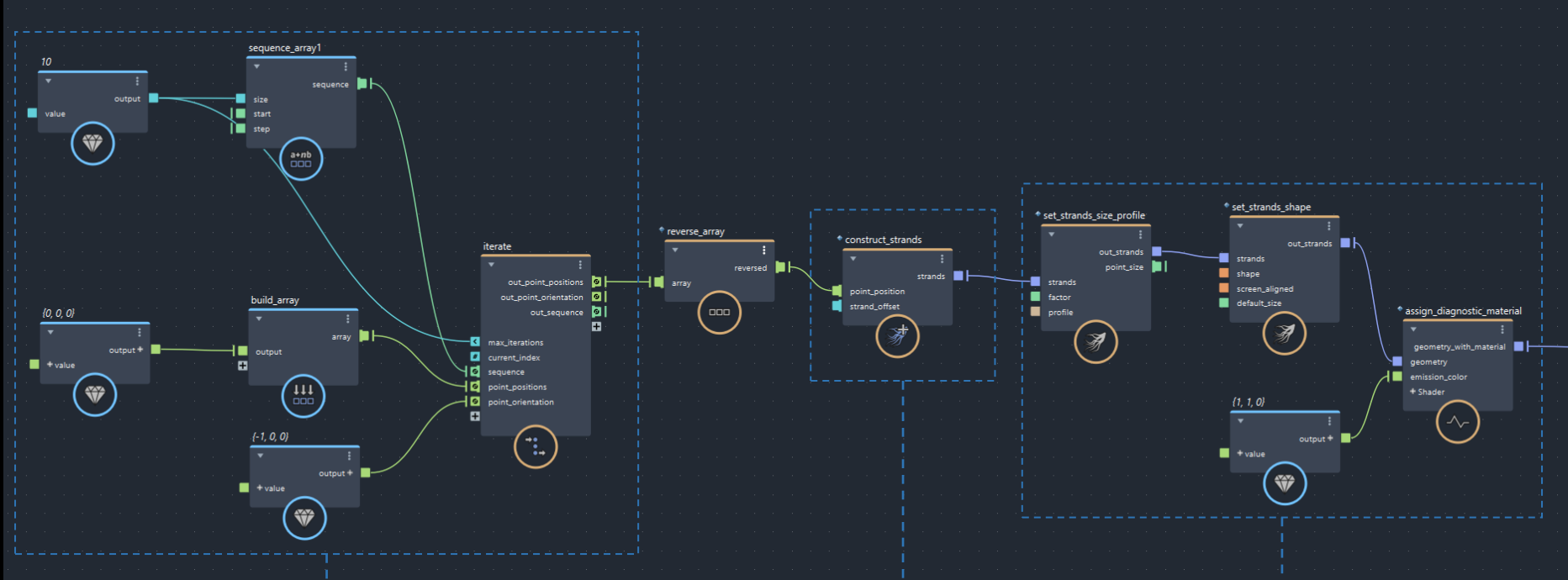


Iteration 4: [0, 1, 1, 2, 3, 0, 0, 0, 0]



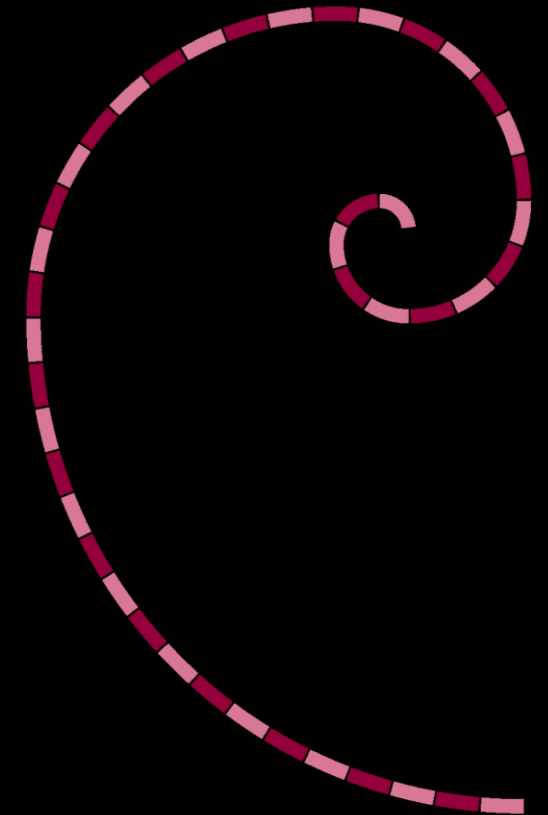
Iteration 5: [0, 1, 1, 2, 3, 5, 0, 0, 0]





Strands

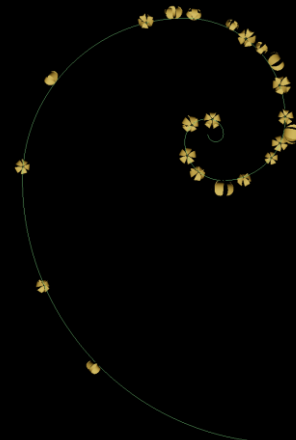
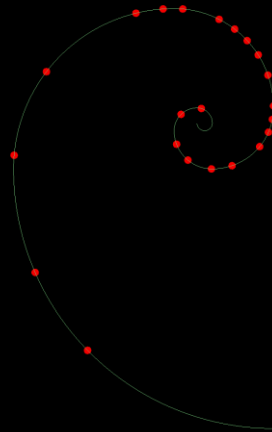
Multiple Strands



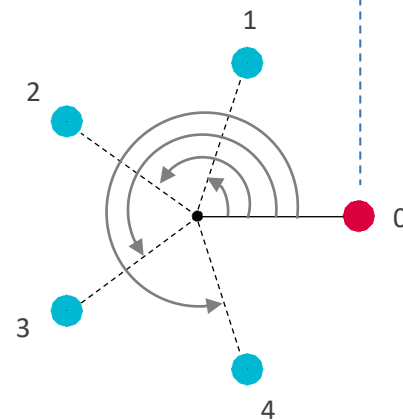
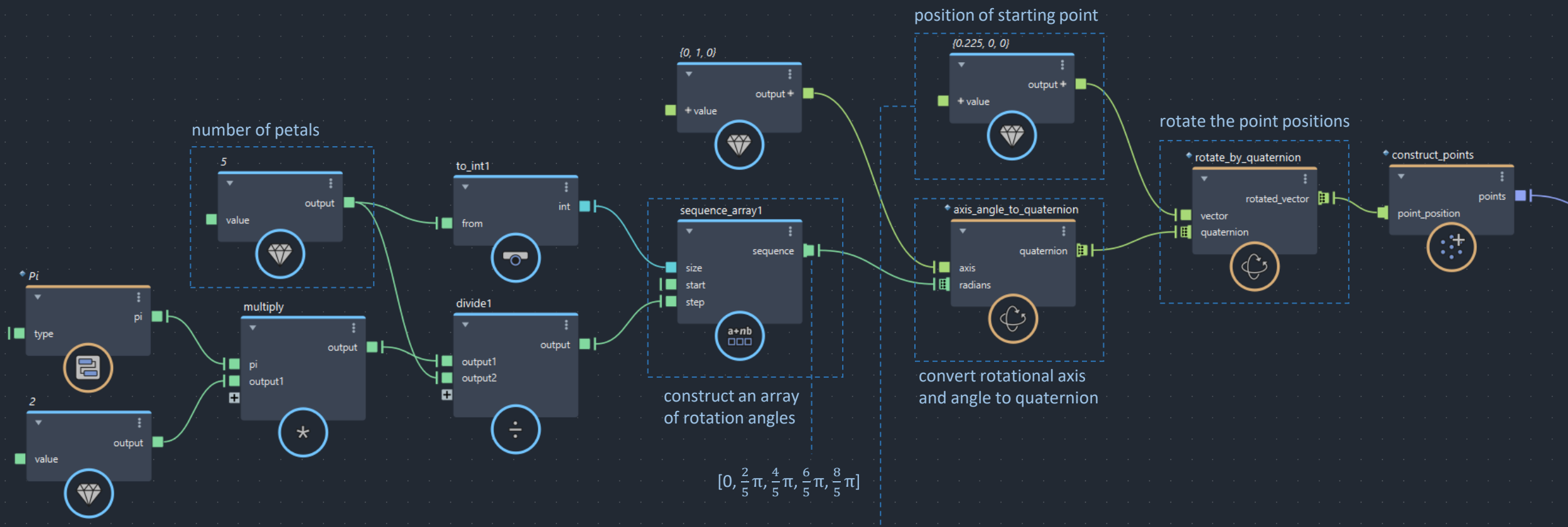
“strand_offset” is used for creating multiple strands. It takes an array that defines the start and end of each strand.

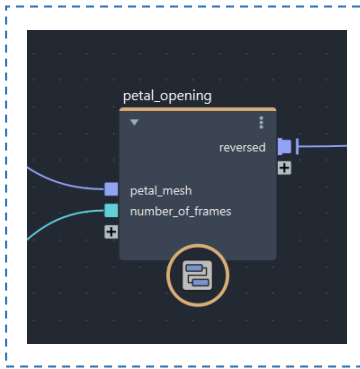
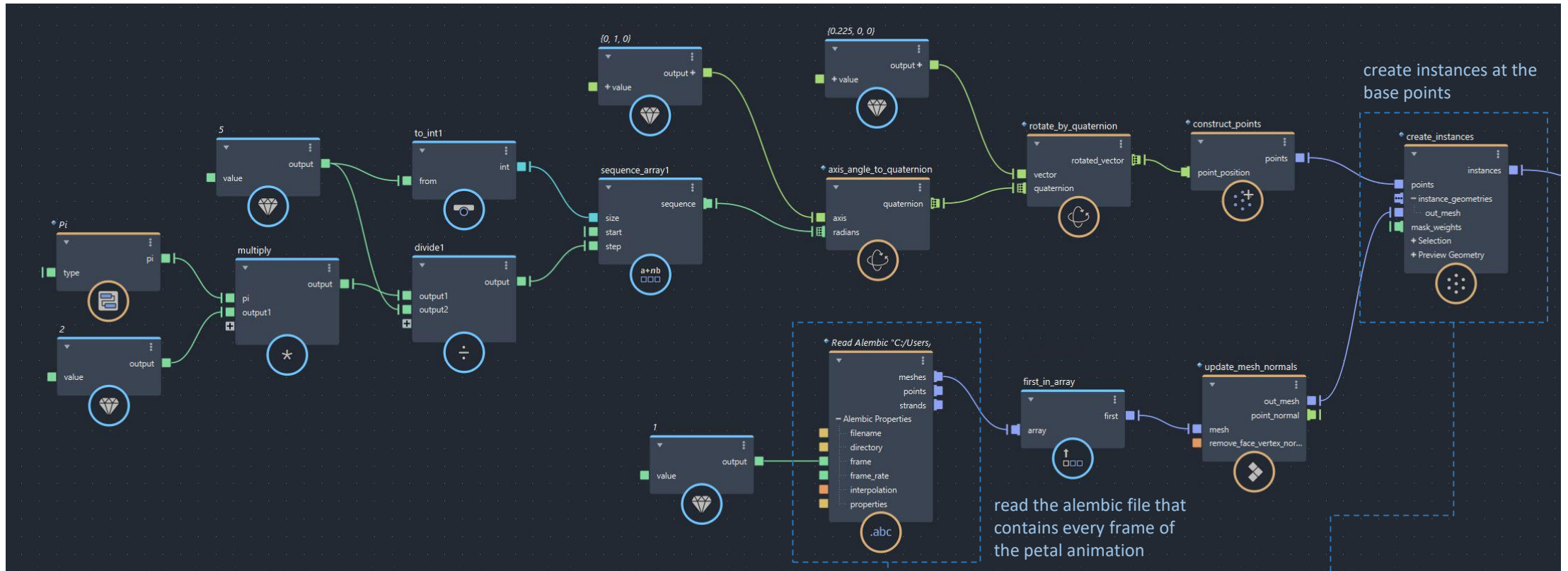
For example, if the strand offset array is [0, 20, 40, 80], it will create 3 strands that are constructed from points 0-19, 20-39 and 40-79.

Blooming Animation

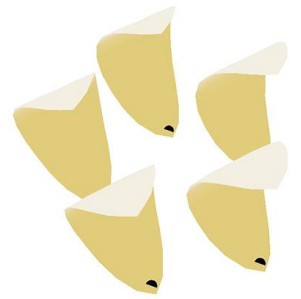
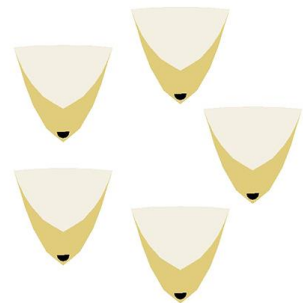


Part I: Creating a flower with instancing

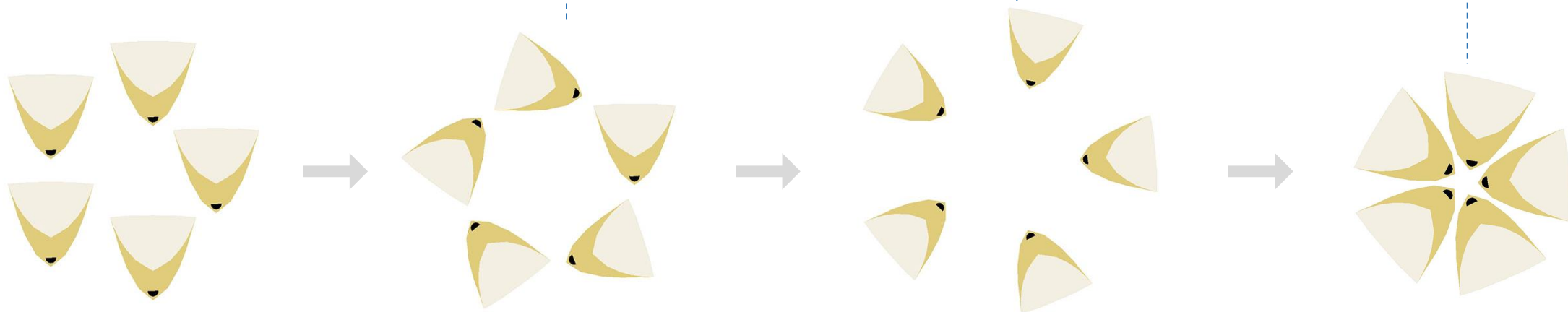
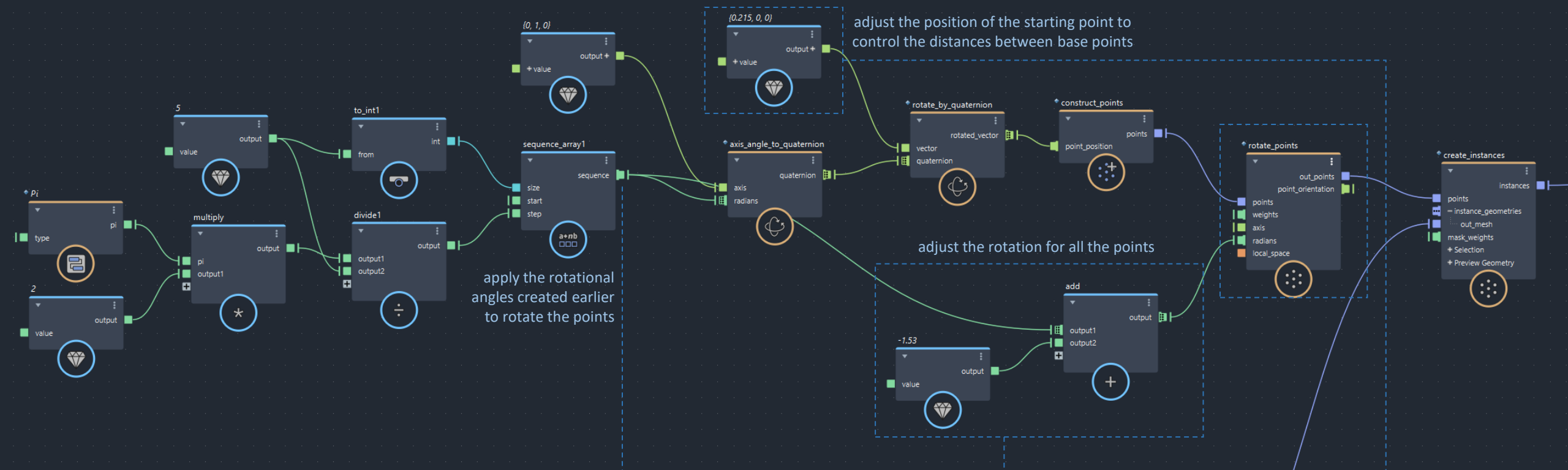




Alternatively, we can use this “petal_opening” compound to automatically generate the petal animation instead of manually creating the rigging in Maya (details included in the scene file)

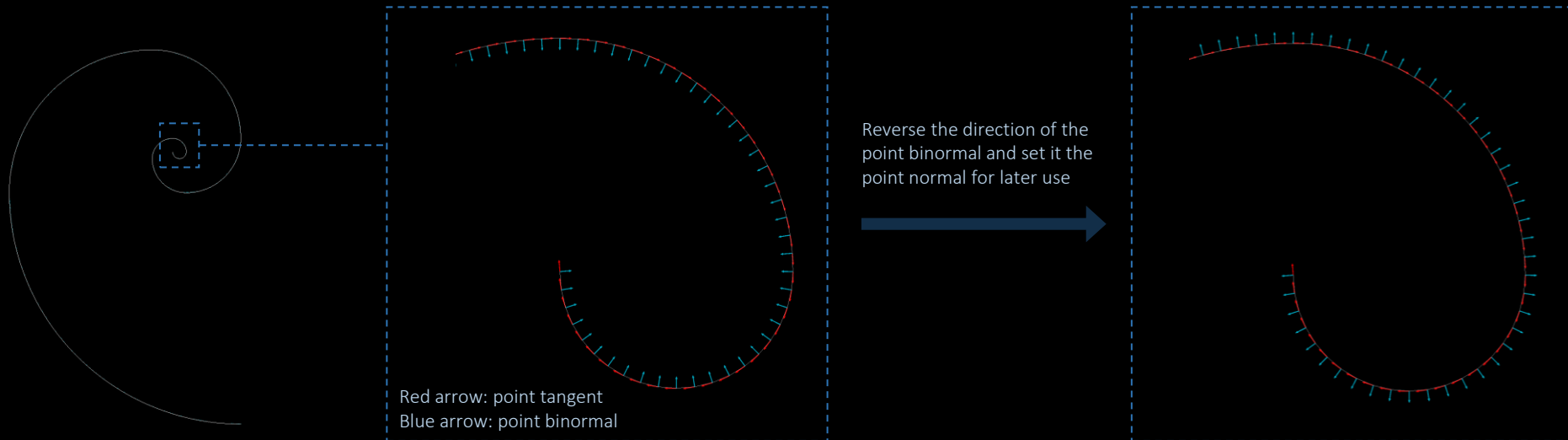
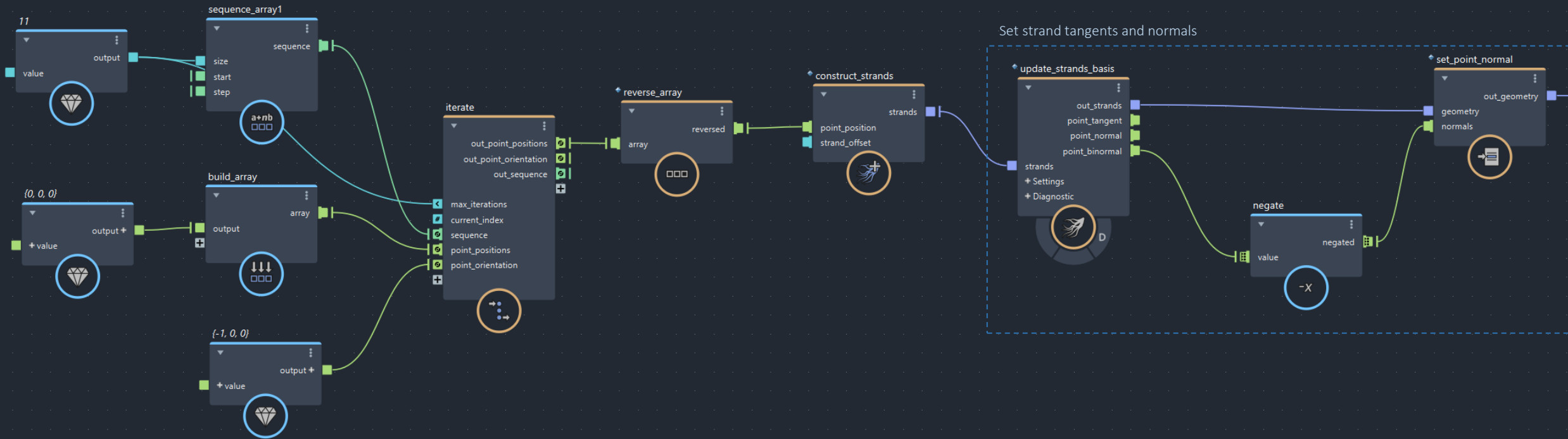


Rotate Points

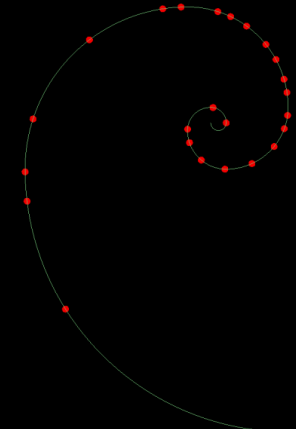
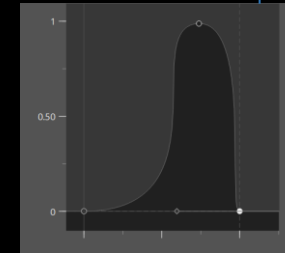
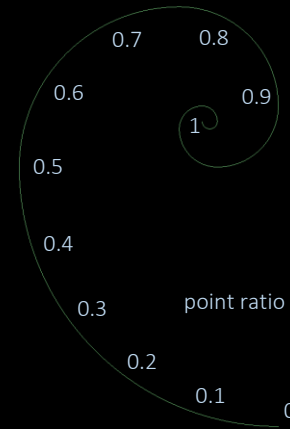
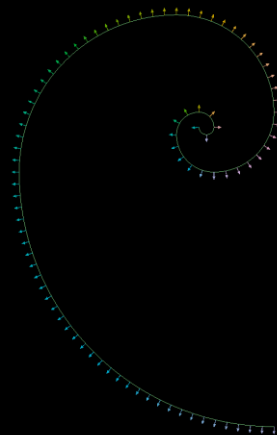
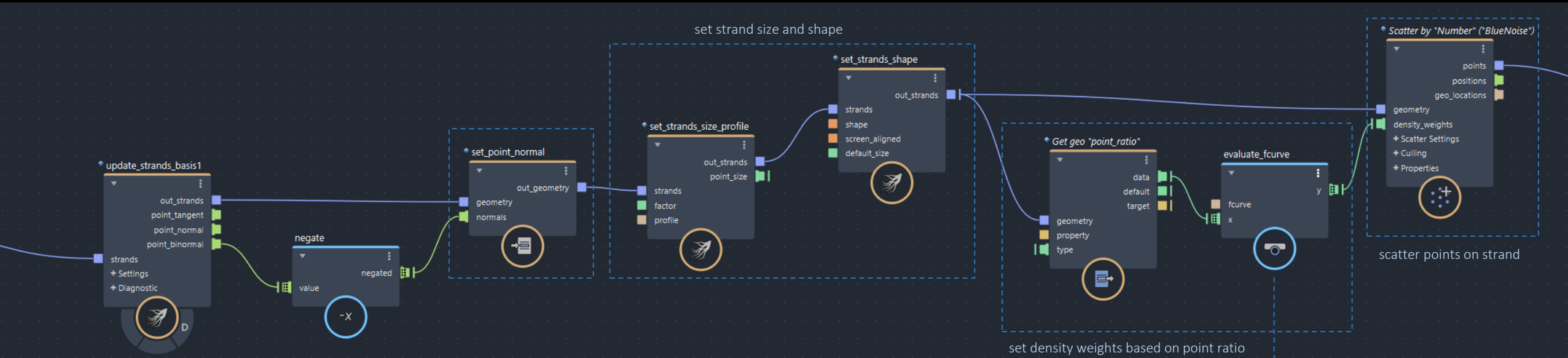


Part II: Blooming Animation

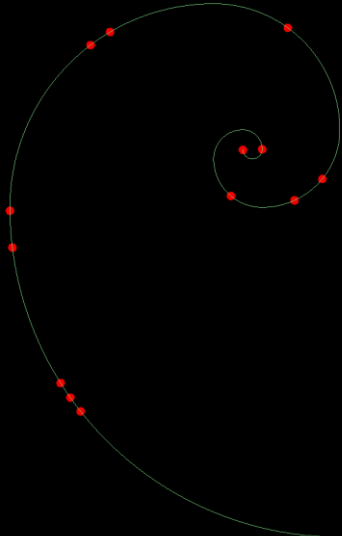
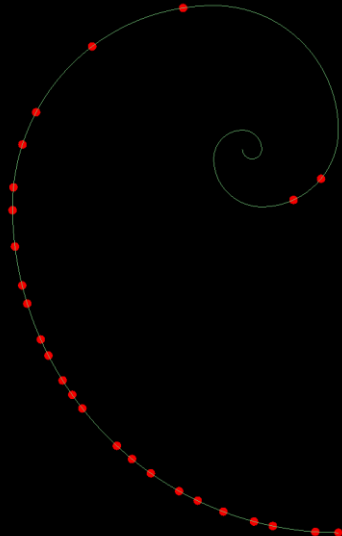
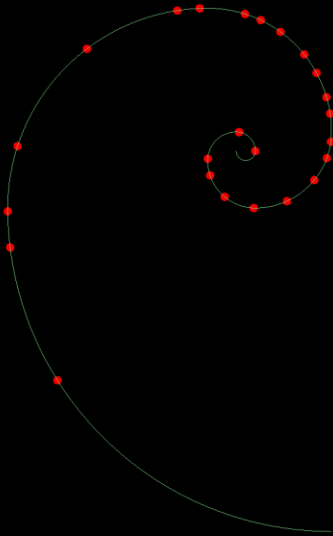
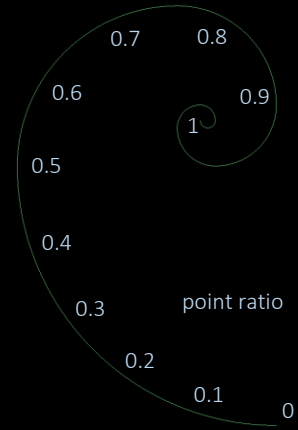
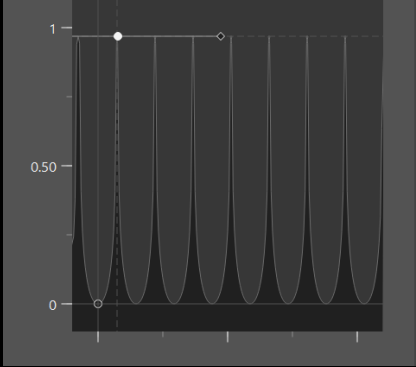
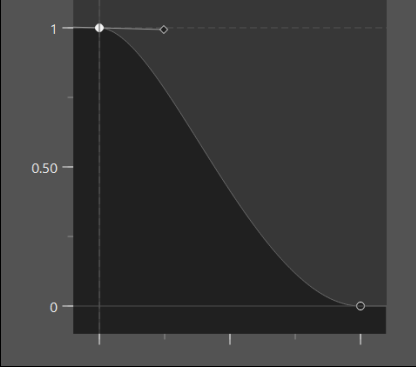
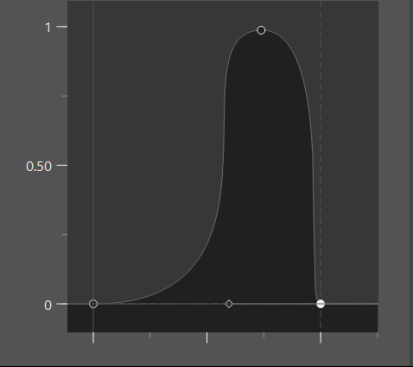
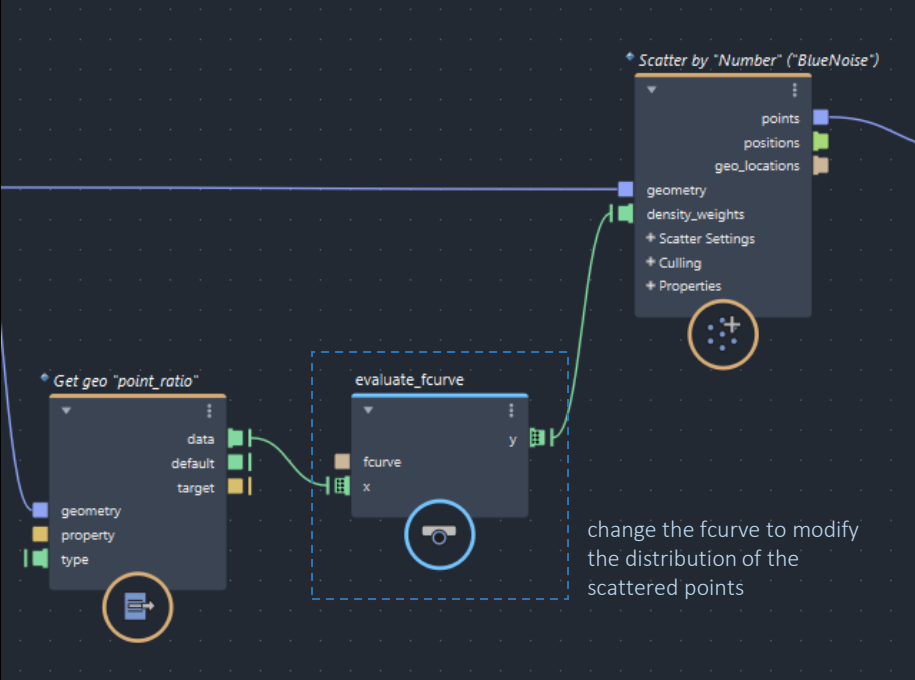
Blooming Animation



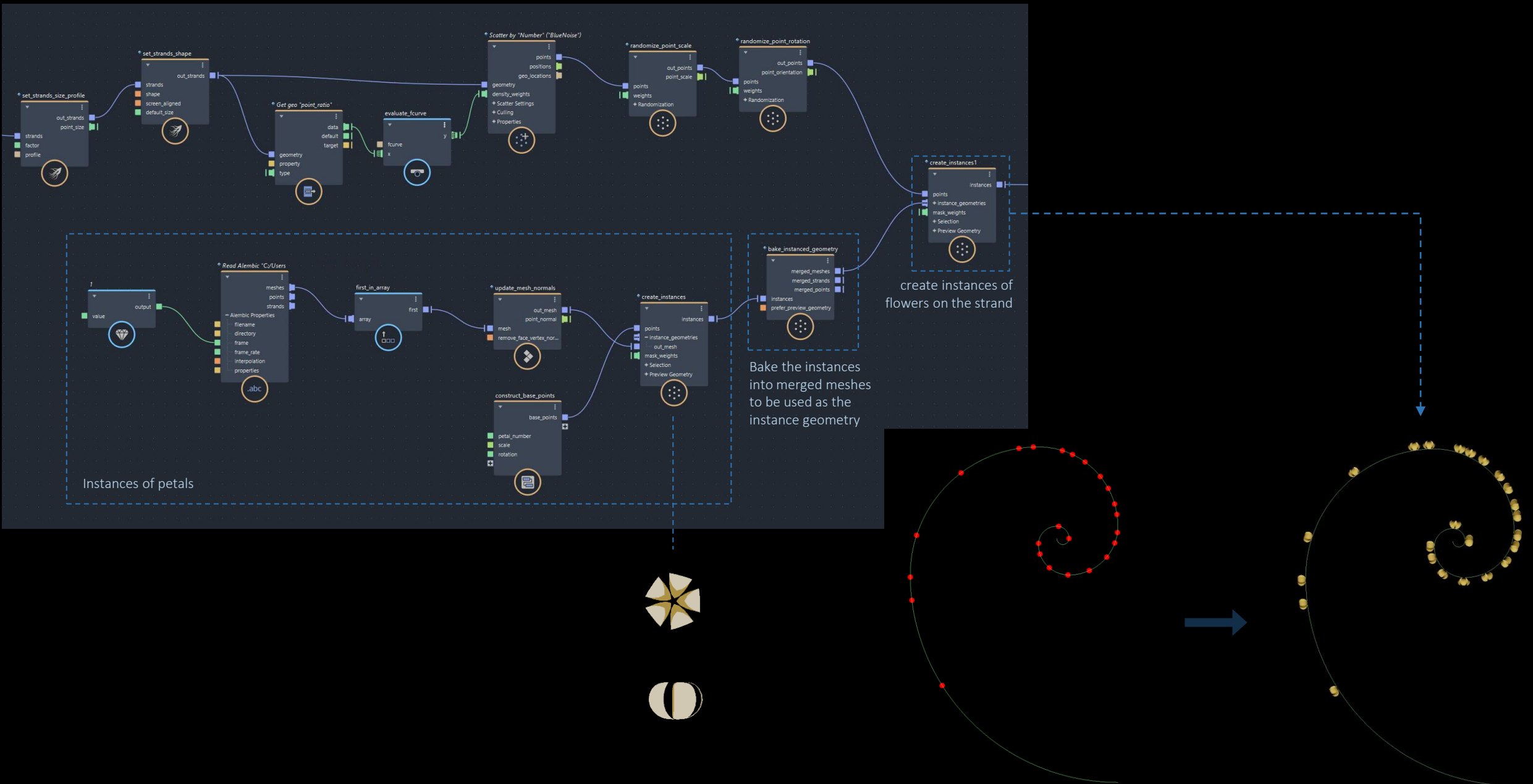
Blooming Animation



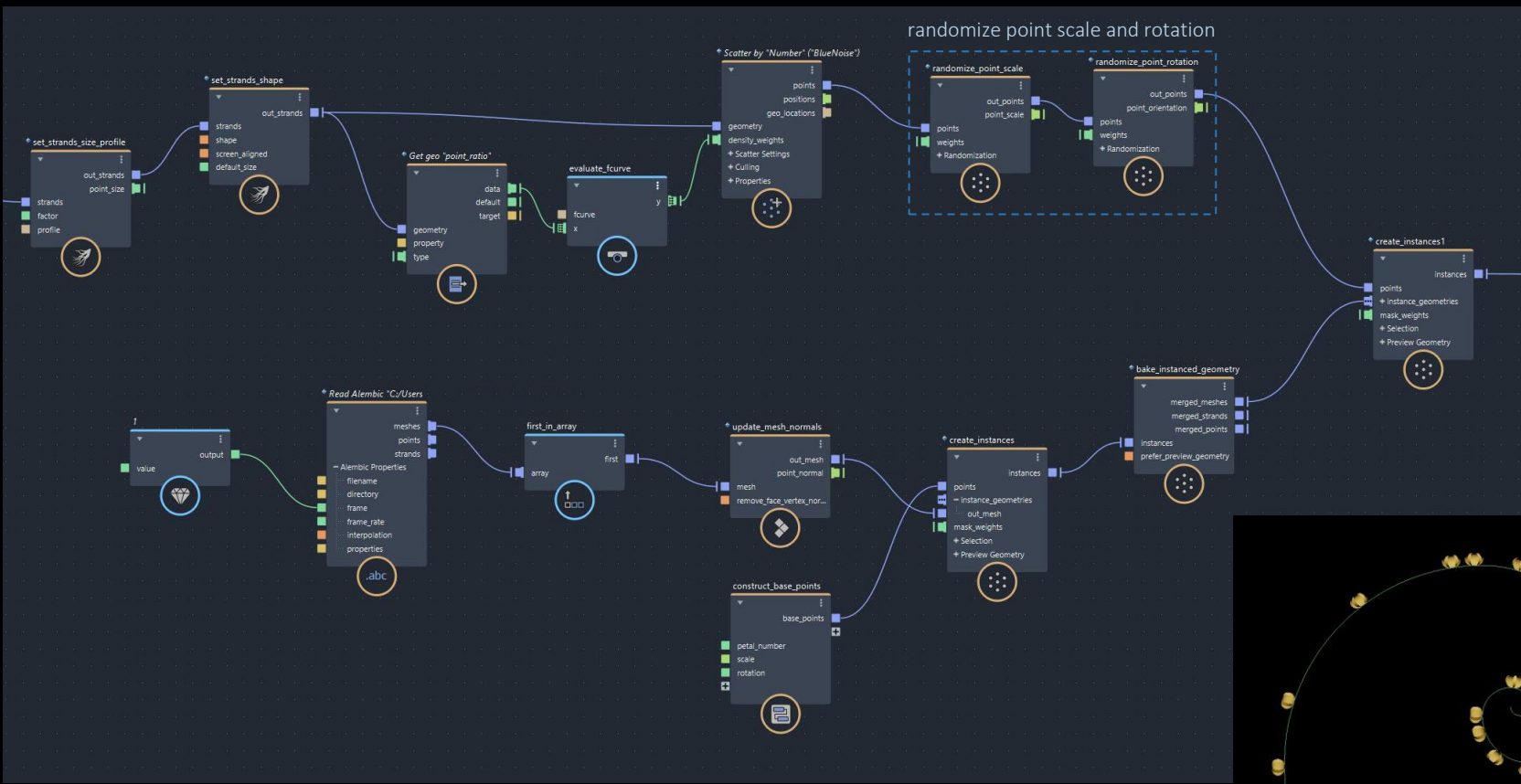
Blooming Animation



Blooming Animation



Blooming Animation



randomize_point_scale
Type: randomize_point_scale

Points: scatter_points.points

Randomization

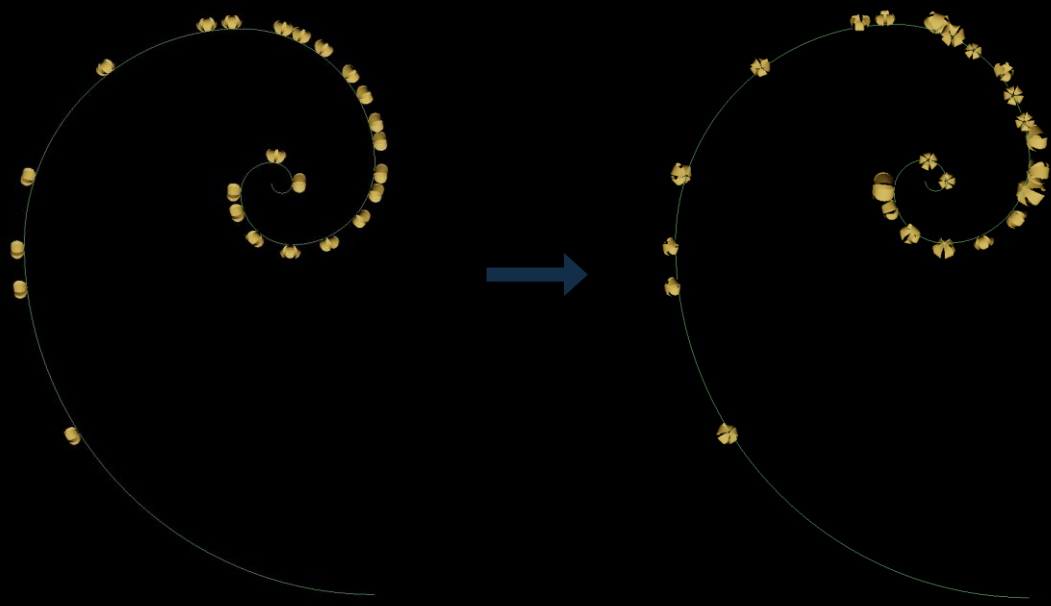
Min	1.5
Max	2.8
Seed	122
Axis To Scale	XYZUniform
Scale Existing Values	<input checked="" type="checkbox"/>
Distribution	

randomize_point_rotation
Type: randomize_point_rotation

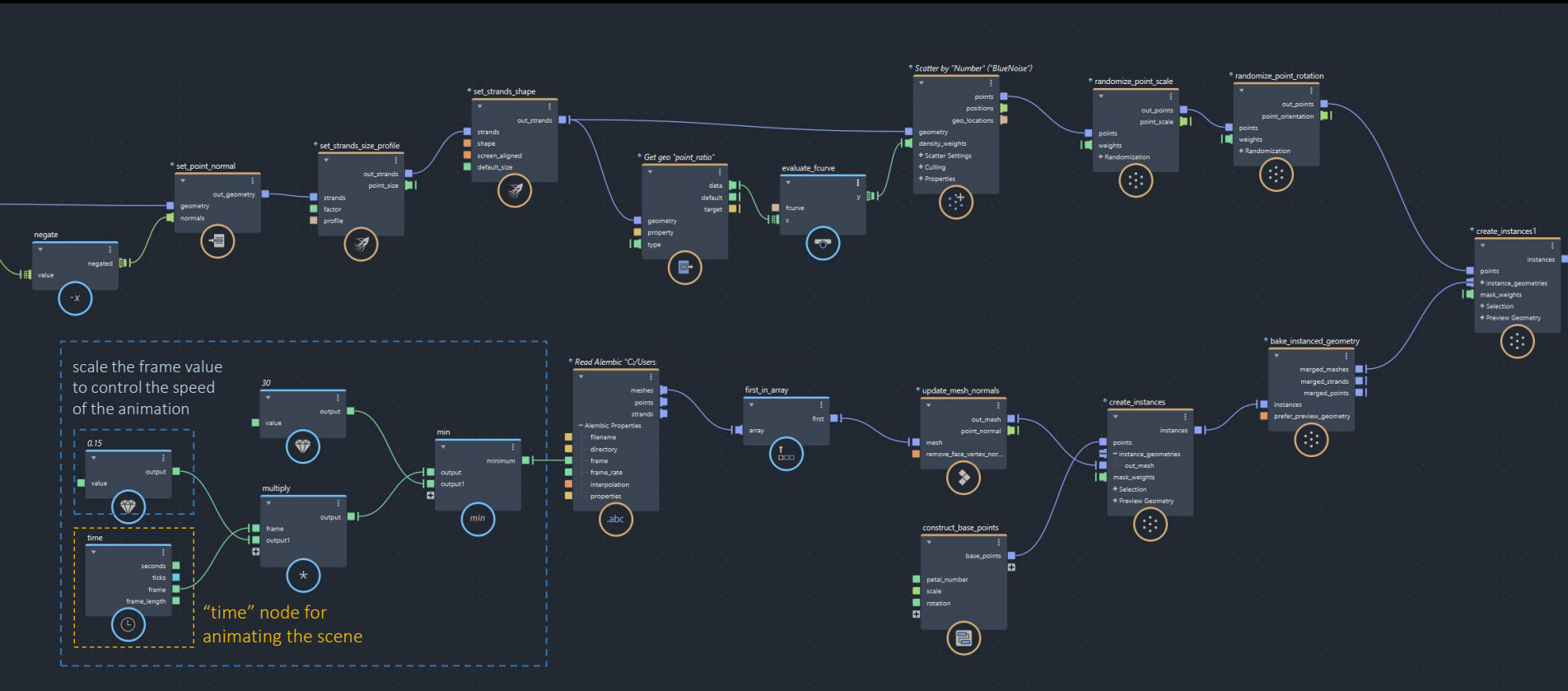
Points: e_point_scale.out_points

Randomization

Min Radians	0	-3.141	-1.7
Max Radians	0	3.141	1.7
Seed	345		
Rotate Existing Values	<input checked="" type="checkbox"/>		
Local Space	<input checked="" type="checkbox"/>		
Rotation Order	XYZ		
Distribution			



Blooming Animation



Blooming Animation



Frame 1



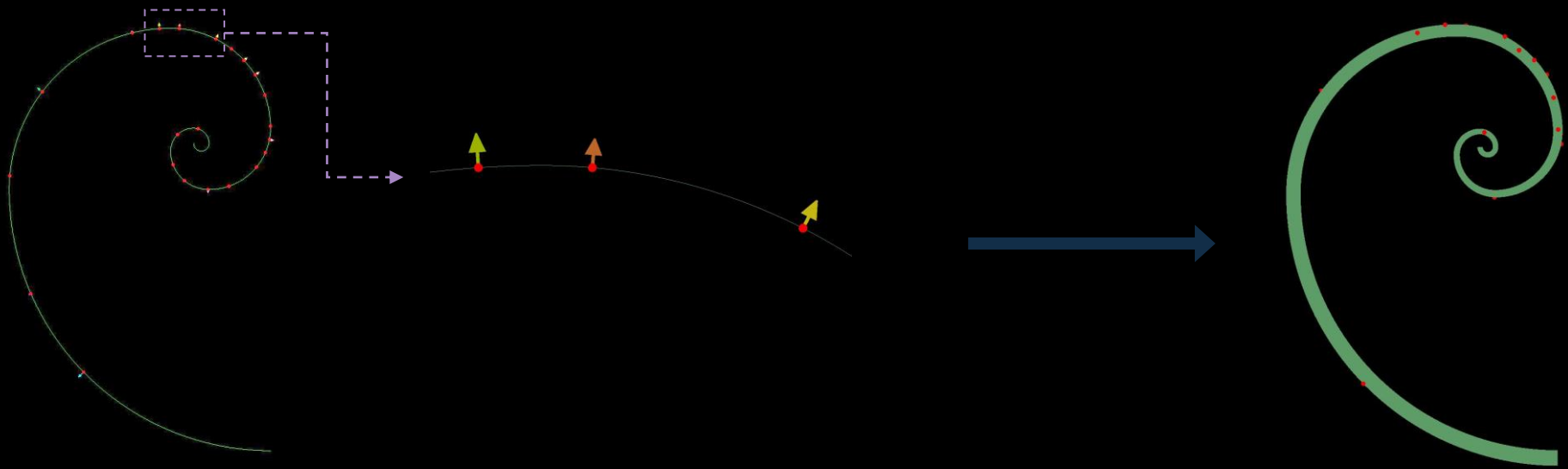
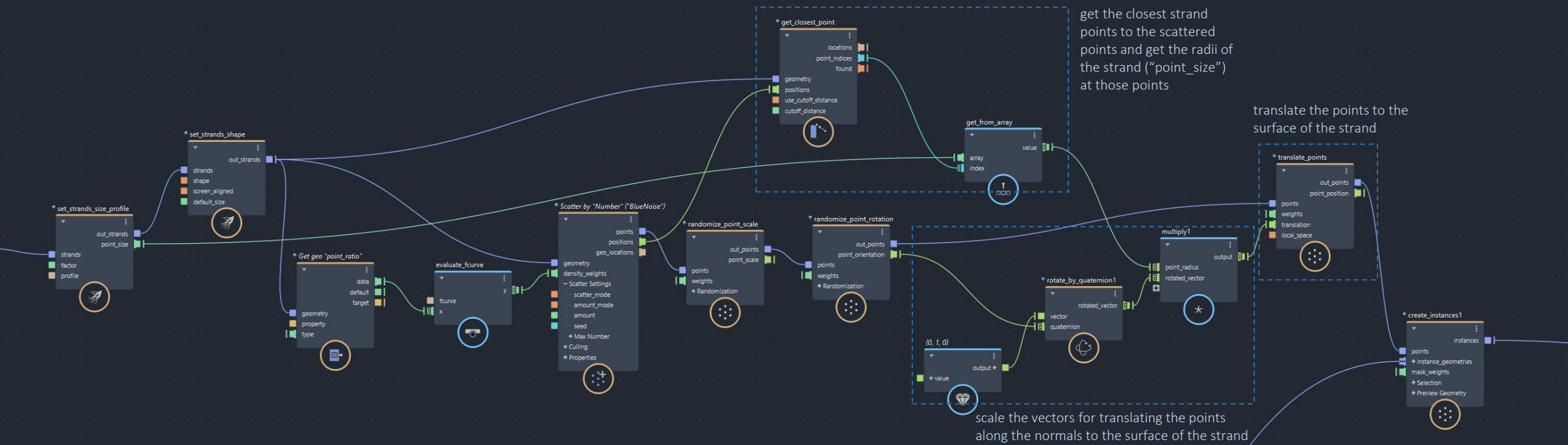
Frame 90



Frame 180

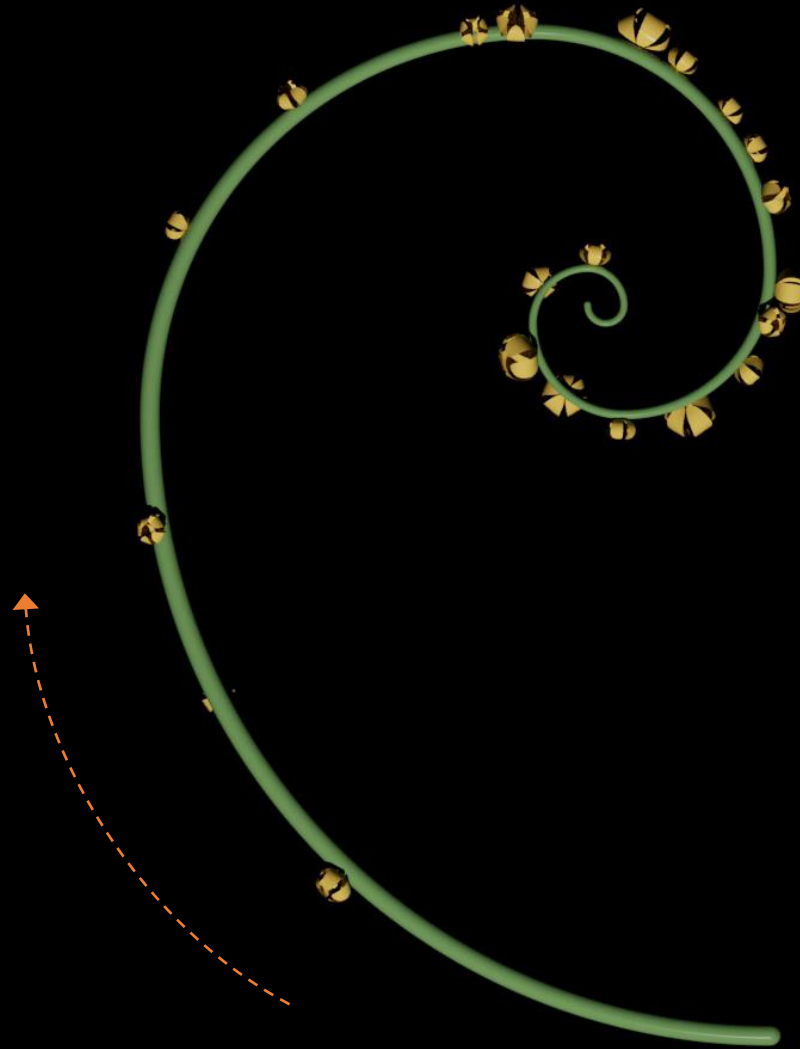
Blooming Animation

Include thickness of the strand



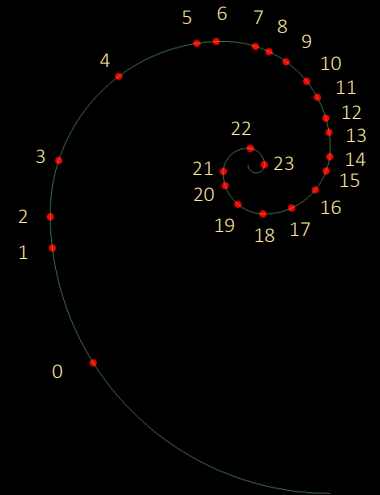
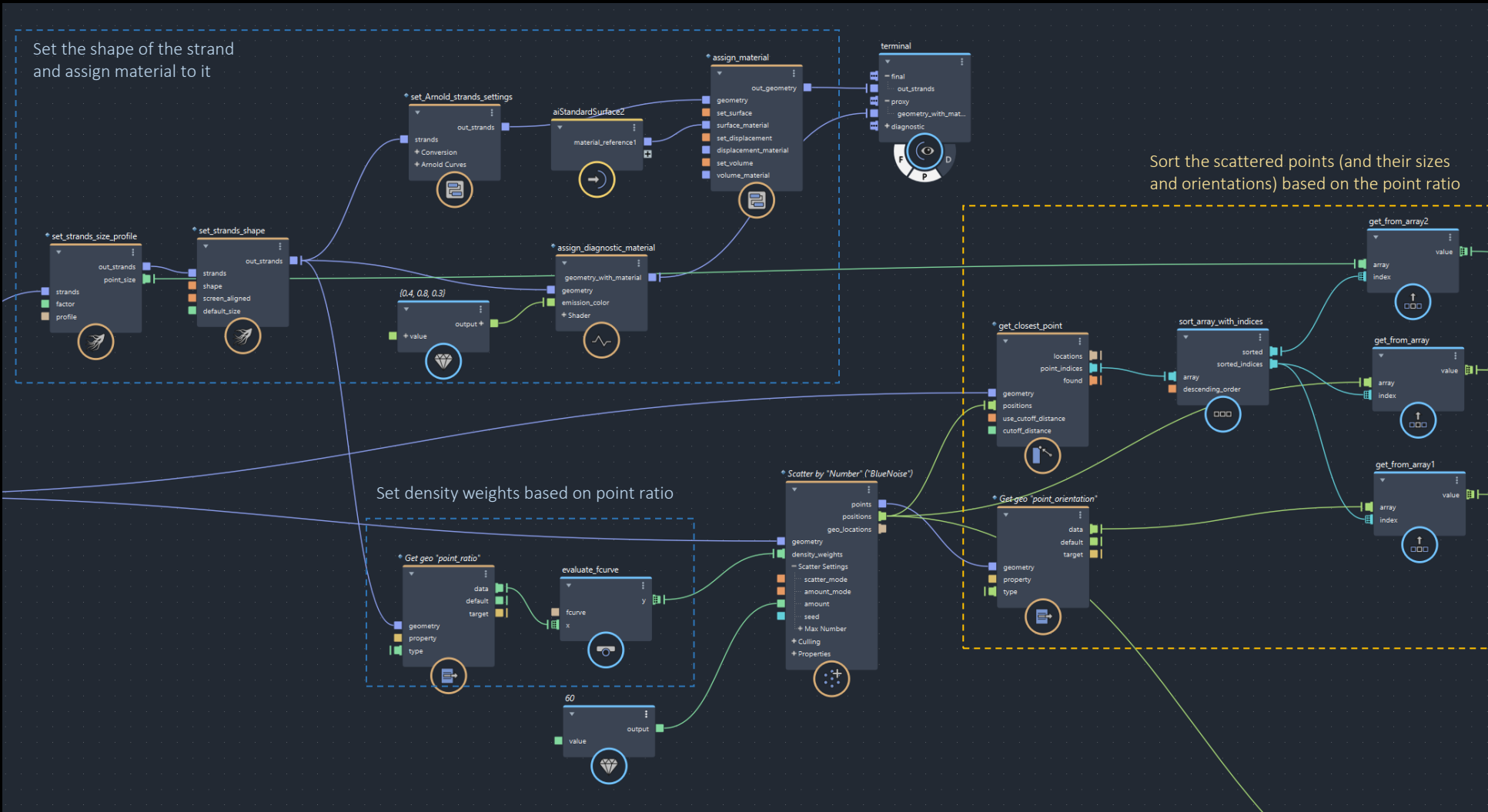
Blooming Animation





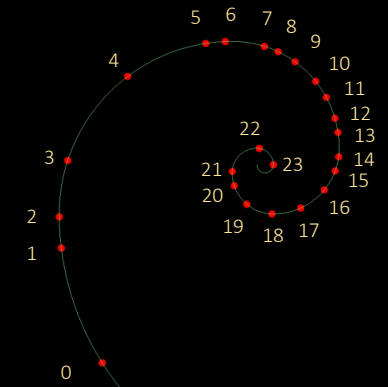
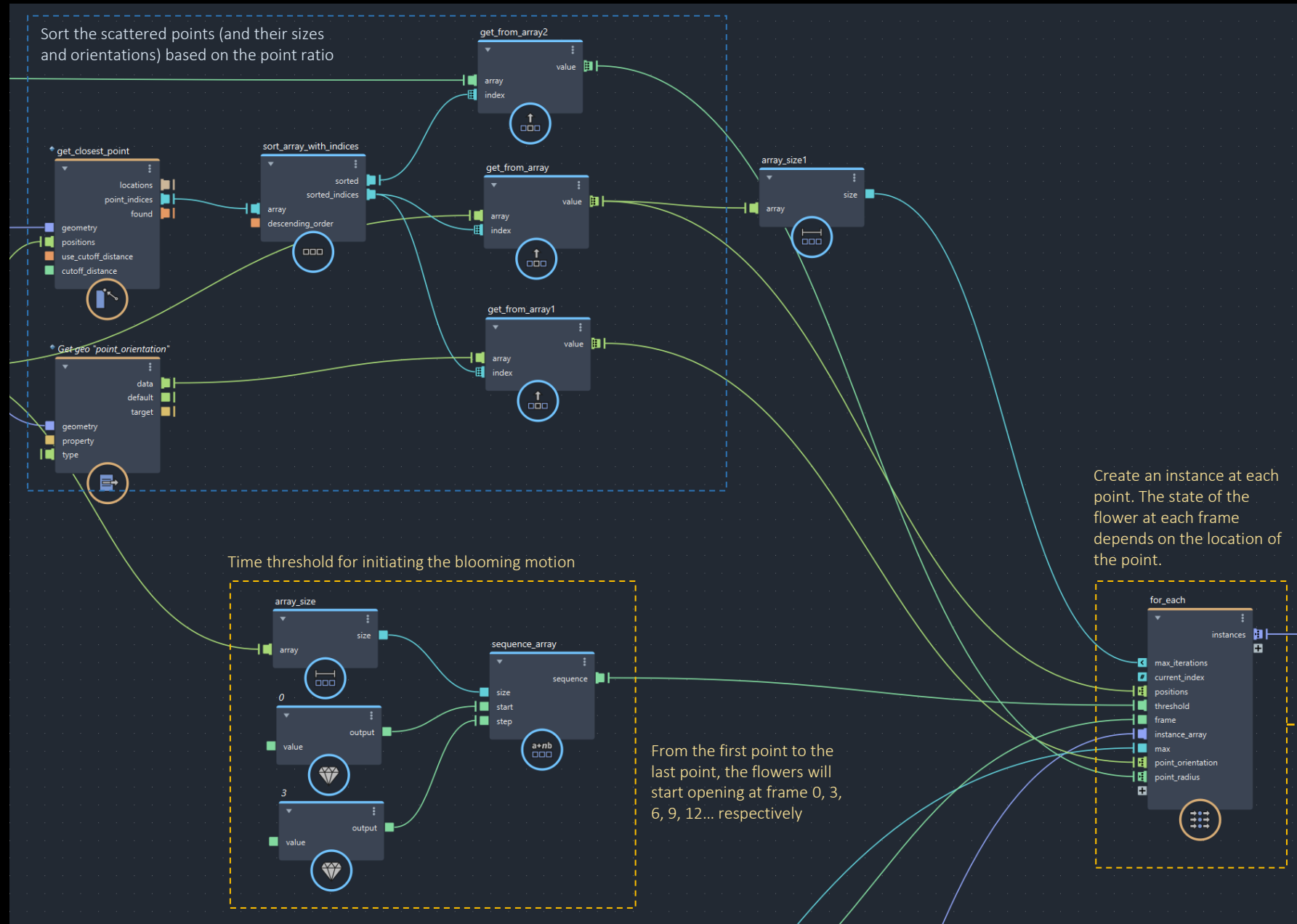
Blooming Animation

Sequenced Animation



Blooming Animation

Sequenced Animation



*View the scene file for more details