

# Absolute Beginners Unity Book

## Chapter – III

### FRACTALS

So what exactly are fractals and how are these utilized in game Environments and Animation . o most readers or general case viewers of fractals , fractals are synonymous with Fractal Art . While mathematicians may not have a very strict definition of fractals , the academic definition of fractals on Wikipedia itself is quiet verbose. I quote what I found relevant as below –

“Fractals **exhibit similar patterns at increasingly small scales** called self similarity,[5] also known as expanding symmetry or unfolding symmetry; if this replication is exactly the same at every scale, as in the Menger sponge,[6] it is called affine self-similar. Fractal geometry lies within the mathematical branch of topology.” Source WikiPedia -

<https://en.wikipedia.org/wiki/Fractal>

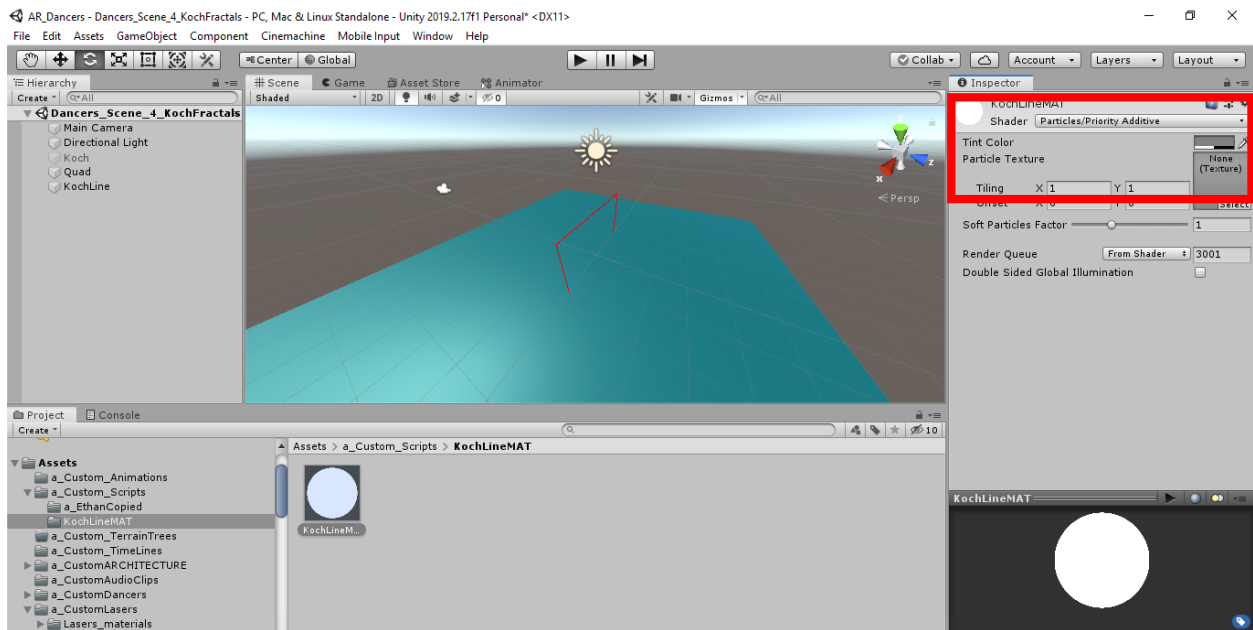
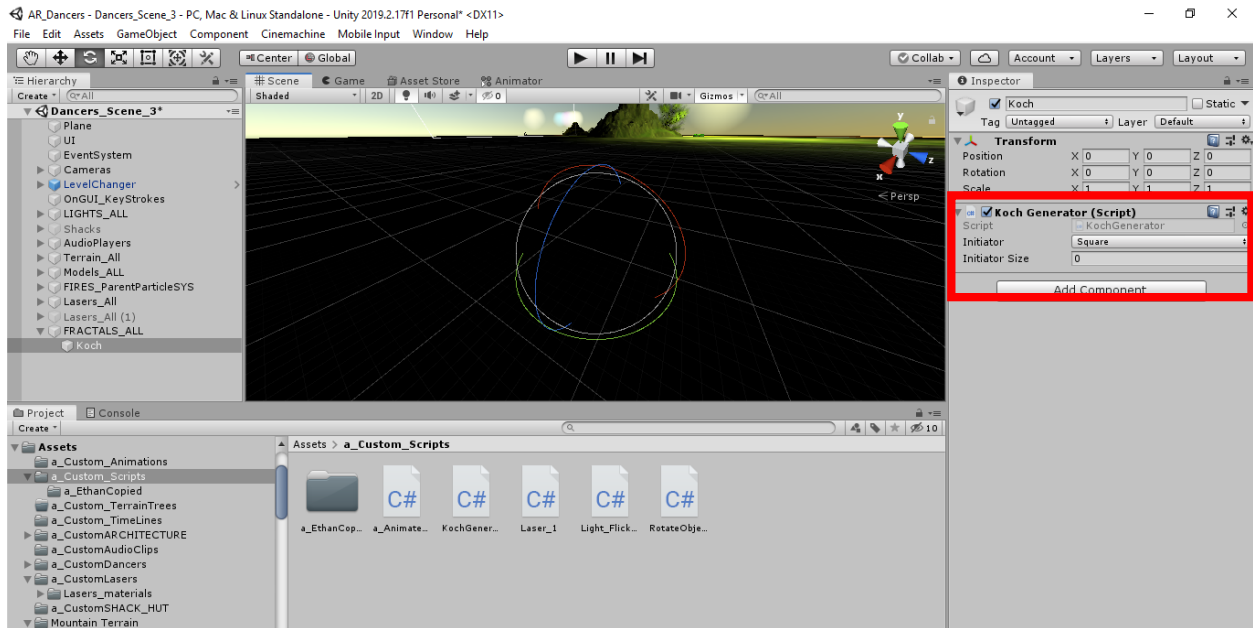
KOCH FRACTALS ,

The code in this Chapter is derived as is from the Series of Video's of the YouTuber – PEER PLAY --- Code Source and YouTube Video link -- <https://www.youtube.com/watch?v=pdOEM7hgGX4>

I have extensively commented the C# scripts and have written some scanty commentary / comments in this PDF document . The C# code will be shared on Github ==

[https://github.com/RohitDhankar/Unity3D\\_2020\\_UnrealGamelabs\\_Dancers](https://github.com/RohitDhankar/Unity3D_2020_UnrealGamelabs_Dancers)

Its is the same Old Repository being used as is for this entire project as on date . I may split up this repo at a later stage and end up refactoring / reorg , of the code later.



KochLine material –named – KochLinemAT , shader changed from STANDARD to – **Particles/Priority Additive**

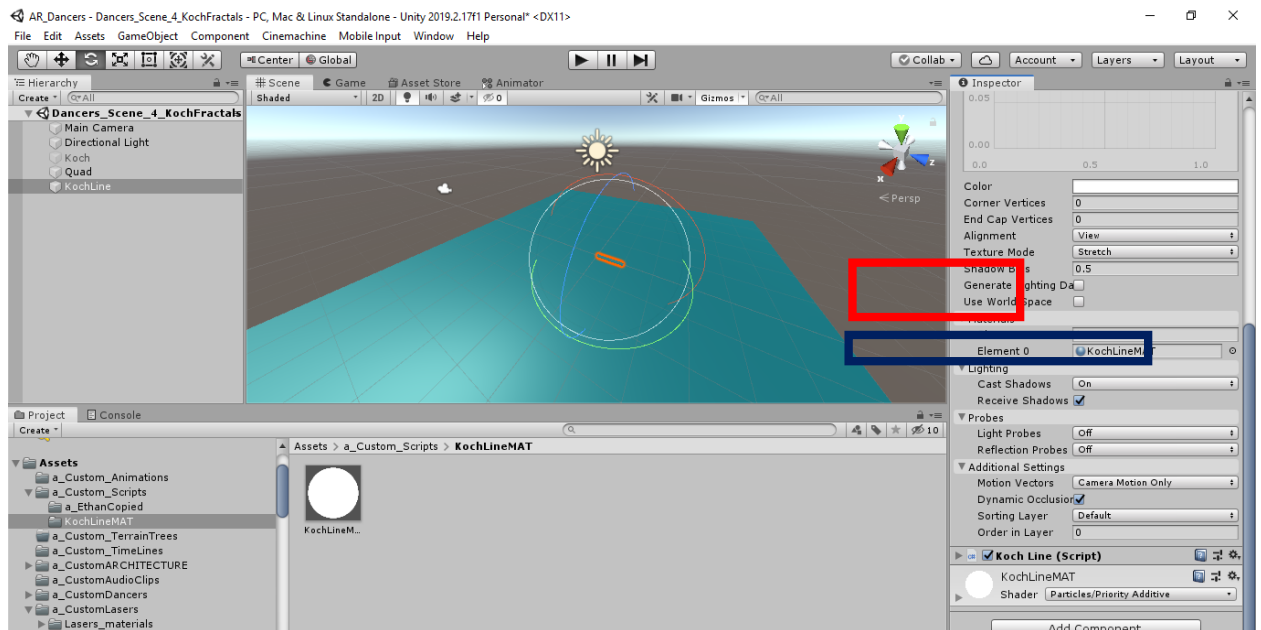
The C# script at this stage is as seen below , will keep adding C# script screenshots as and when there are substantial updates to this code . Also the final C# scripts shall be pushed to my Github Repo == [https://github.com/RohitDhankar/Unity3D\\_2020\\_UnrealGamelabs\\_Dancers](https://github.com/RohitDhankar/Unity3D_2020_UnrealGamelabs_Dancers)

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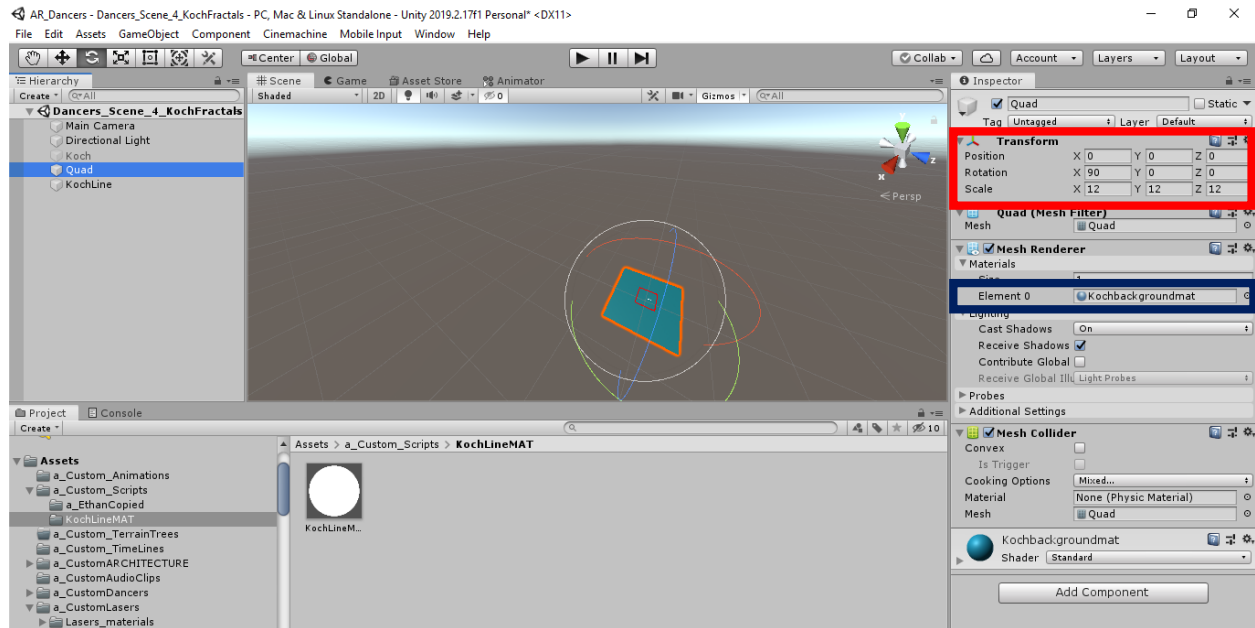
1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4
5 [RequireComponent(typeof(LineRenderer))]
6 //public class KochLine : MonoBehaviour
7 // this KochLine class doesnt derive from - MonoBehaviour , it derives from - KochGenerator
8 public class KochLine : KochGenerator
9 {
10     3 references
11     LineRenderer _lineRenderer;
12
13     // Start is called before the first frame update
14     void Start()
15     {
16         _lineRenderer = GetComponent<LineRenderer>();
17         _lineRenderer.positionCount = _position.Length;
18         _lineRenderer.SetPositions(_position);
19     }
20
21     // Update is called once per frame
22     void Update()
23     {
24     }
25 }
26
27

```

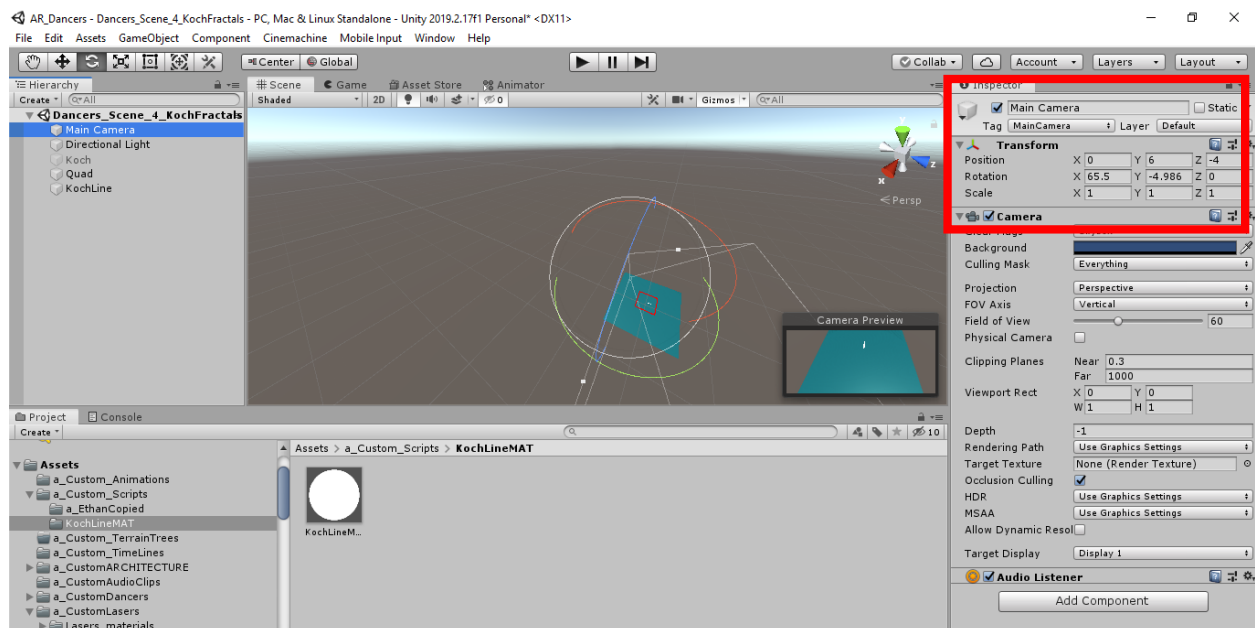
- Add Material to the KochLine renderer
- Also UNCHECK UseWorldSpace – we will Not use World Space
- ...



d.



- Seen below - MainCamera transforms and Angle of Rotation – otherwise LineRenderer wont be visible
- Also the LINE\_Renderer – transform , needs to have Y as 1 ... cant be as same level as QUAD ... otherwise Not visible



- As seen below – three Objects seen in the SCENE , the KOCH\_Line is the White thingie in the middle.
- The QUAD outer Blue
- The Actual KOCH FRACTAL - SQUARE Figure , is just seen as a RED LINED Square in the SCENE Mode , this in the GAME Mode becomes a BRIGHTER white Lined SQUARE

