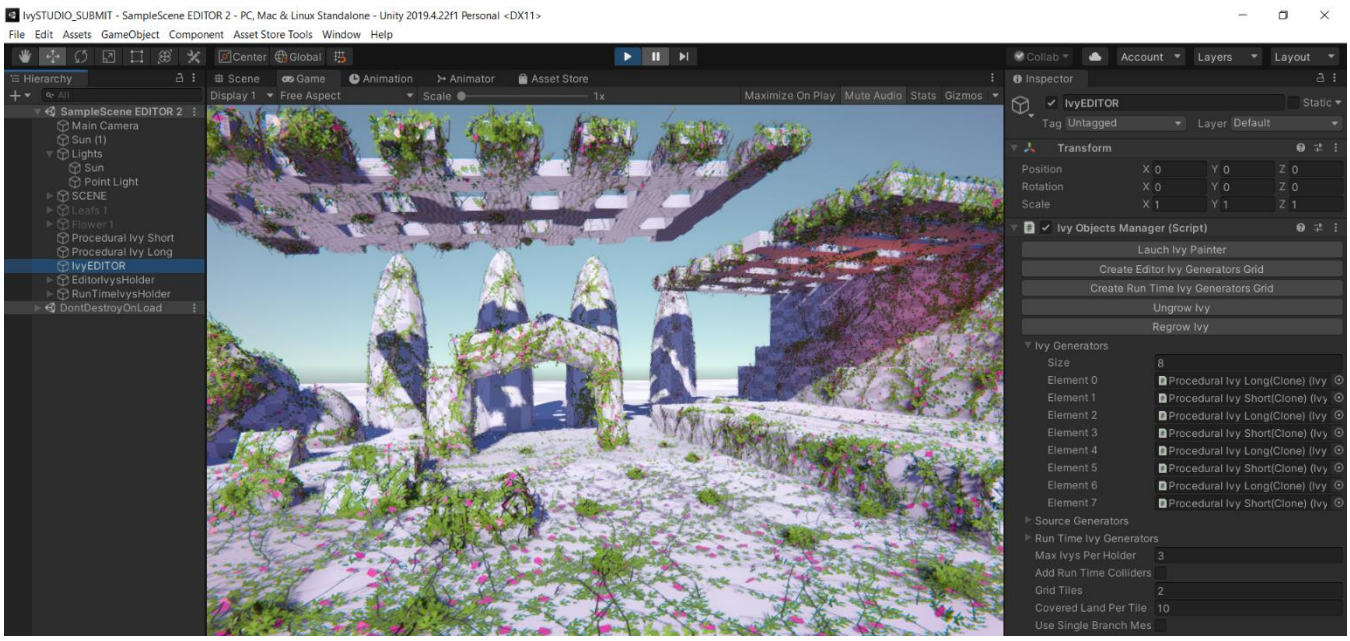
Ivy Studio Setup Guide

Overview

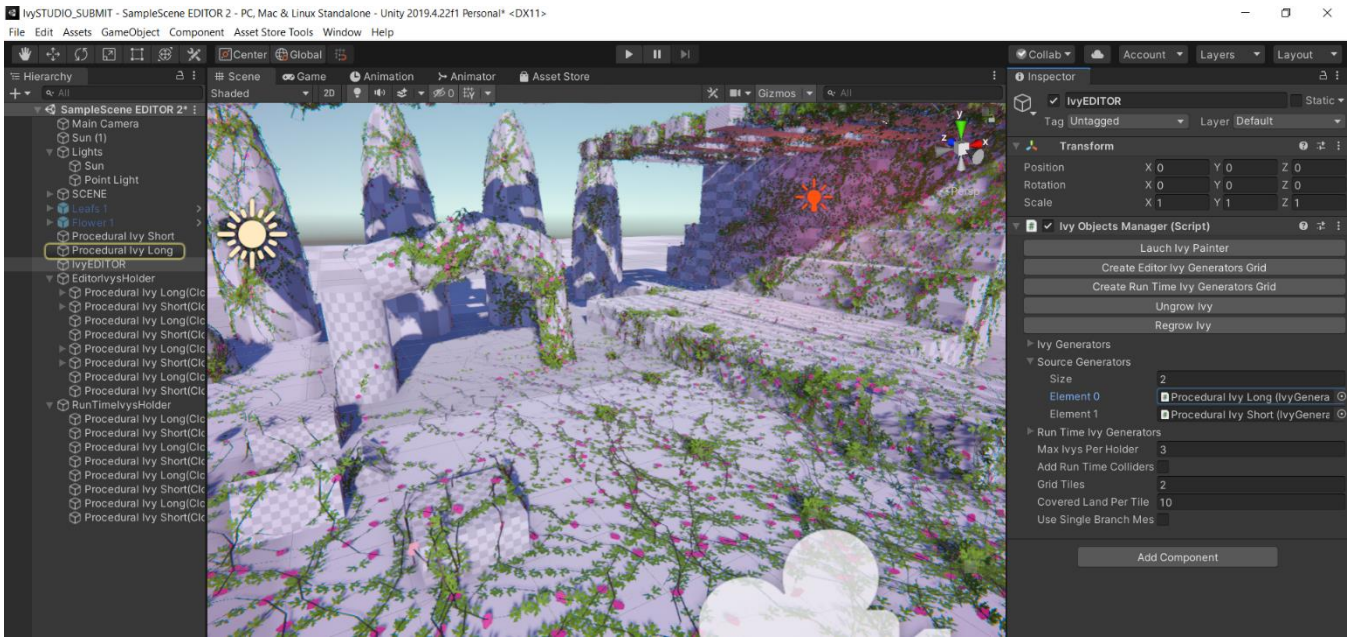
The system is an Ivy creation and optimization framework, which allows advanced grouping and batching of complex Ivy formations to enhance performance and a unique Ivy growing system. The system is made for the Standard Pipeline, URP and HDRP and can be used with any shader as needed as well. For help with using the system and using it with other **ARTnGAME** assets, including **Sky Master ULTIMATE** Weather suit that can affect the Ivy based on weather, please visit **ARTnGAME Discord channel**, **Tutorial videos** and the **Ivy Studio Forum** thread. **The system can be upgraded to Sky Master ULTIMATE Suit**.

Setup steps

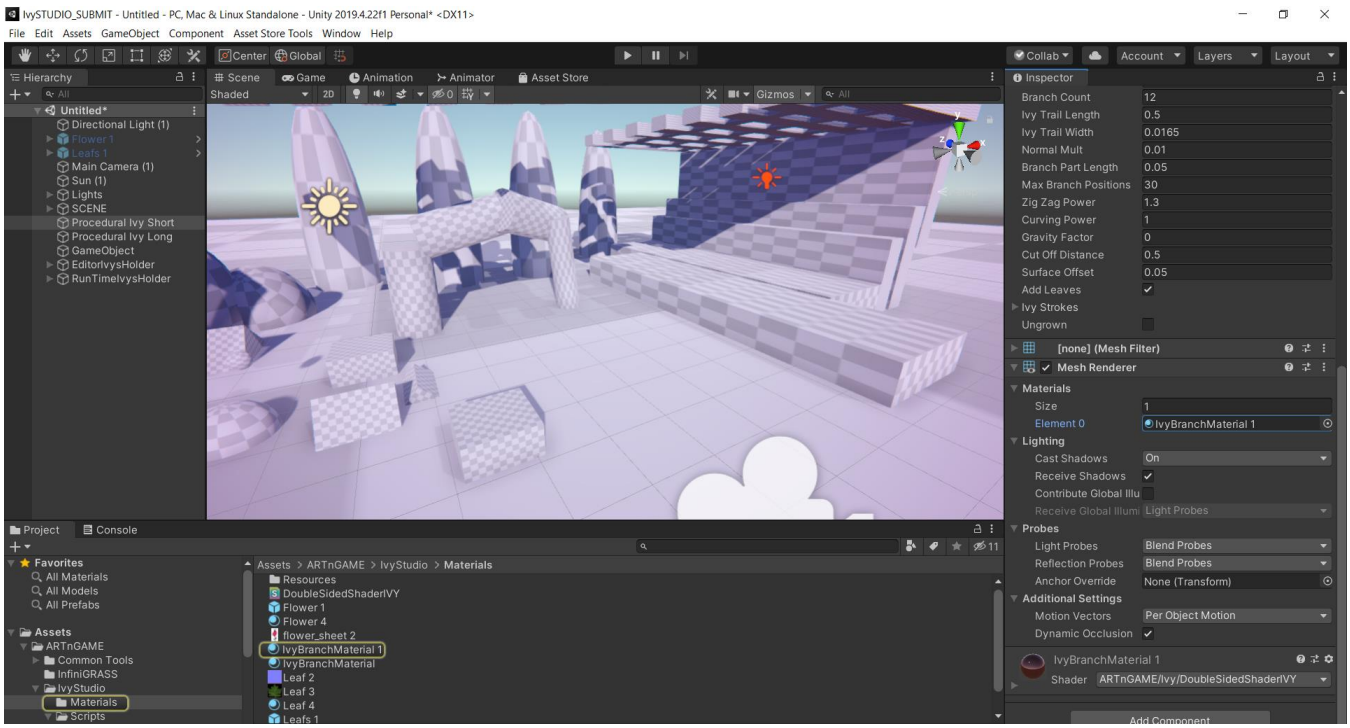
To setup the system, first step is to add the **“Ivy Objects Manager”** component to an empty gameobject in the scene, and name the object as **“Ivy Editor”**.



Then insert in the scene the prefabs of sample source ivy generators as shown in photo below or create one by adding the “Ivy Generator TREANT” script in an empty gameobject. Then reference the source creators to the “source Generators” list in the Ivy Objects Manager.



Make sure to have the Branch material in the mesh in the sample managers



This will create the base setup of the Ivy manager.

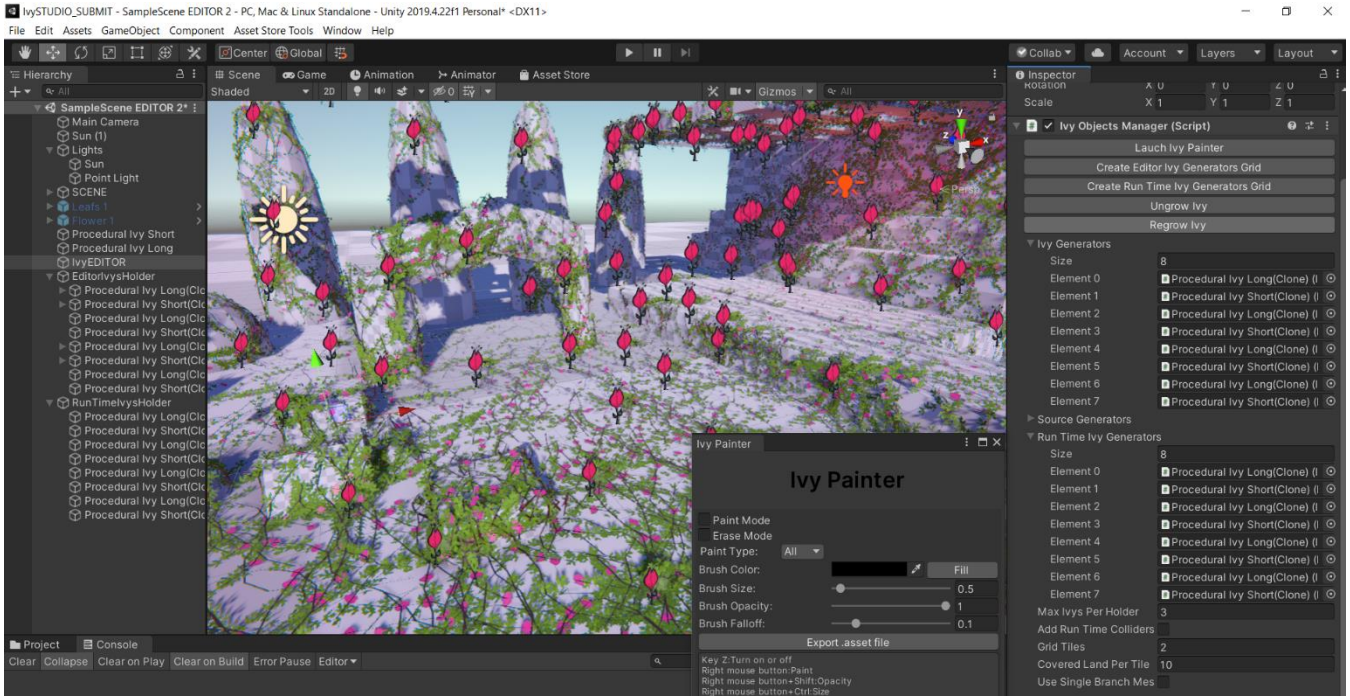
Usage of Ivy Objects Manager

1. Add editable Ivy in editor time

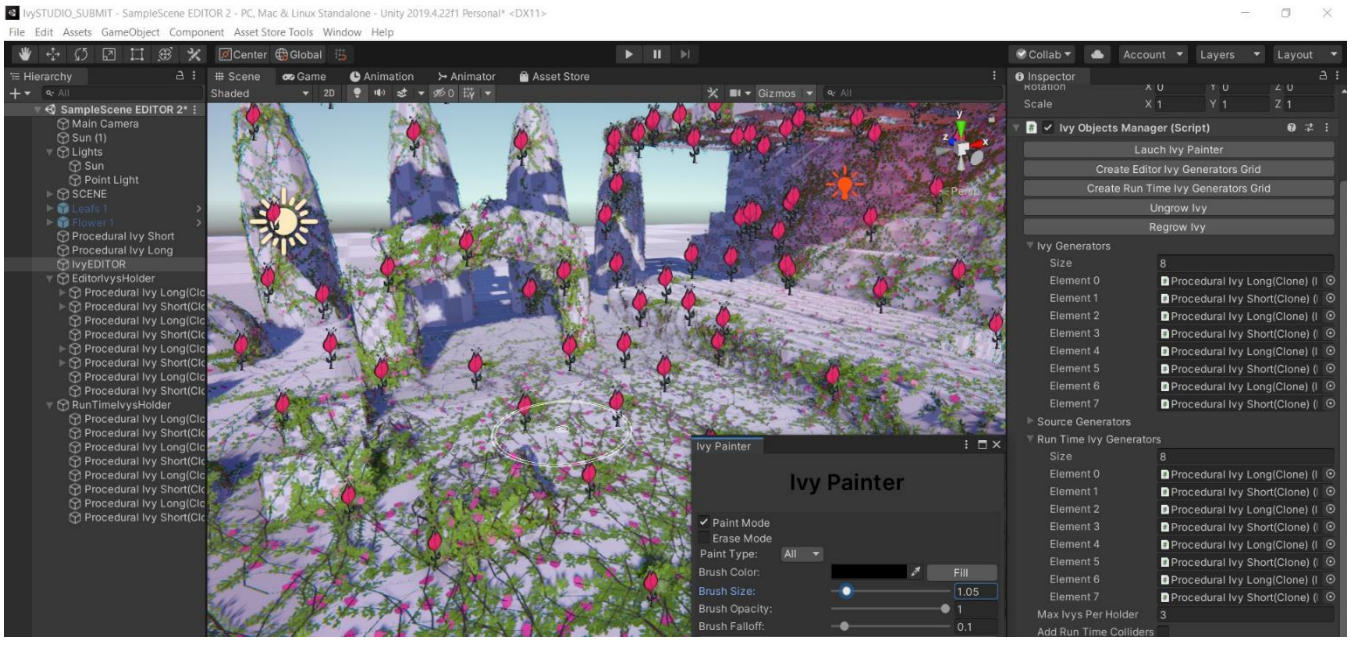
To start of creating Ivy, first set the Grid Tiles and Covered Land per tile variables, in order to create a group if Ivy generator scripts that each will be assigned a part of the terrain. This was can optimize the effect and limit it per region, so is suggested to use a grid than a single manager.

Then press the “Create Editor Ivy Generators Grid” to create the Ivy generators and assign them to the Ivy Object Managers for control of the Ivy generation.

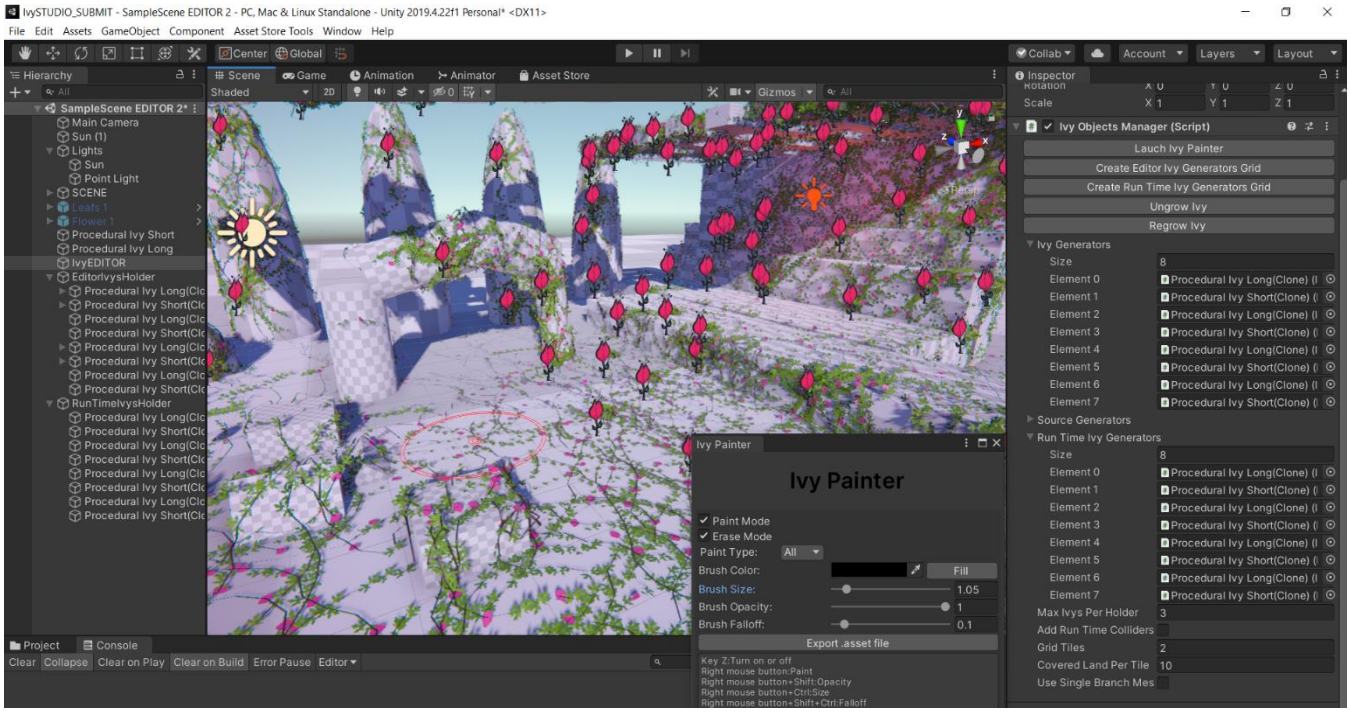
To paint Ivy press the “Launch Ivy Painter” button to open the Ivy Painter as shown below



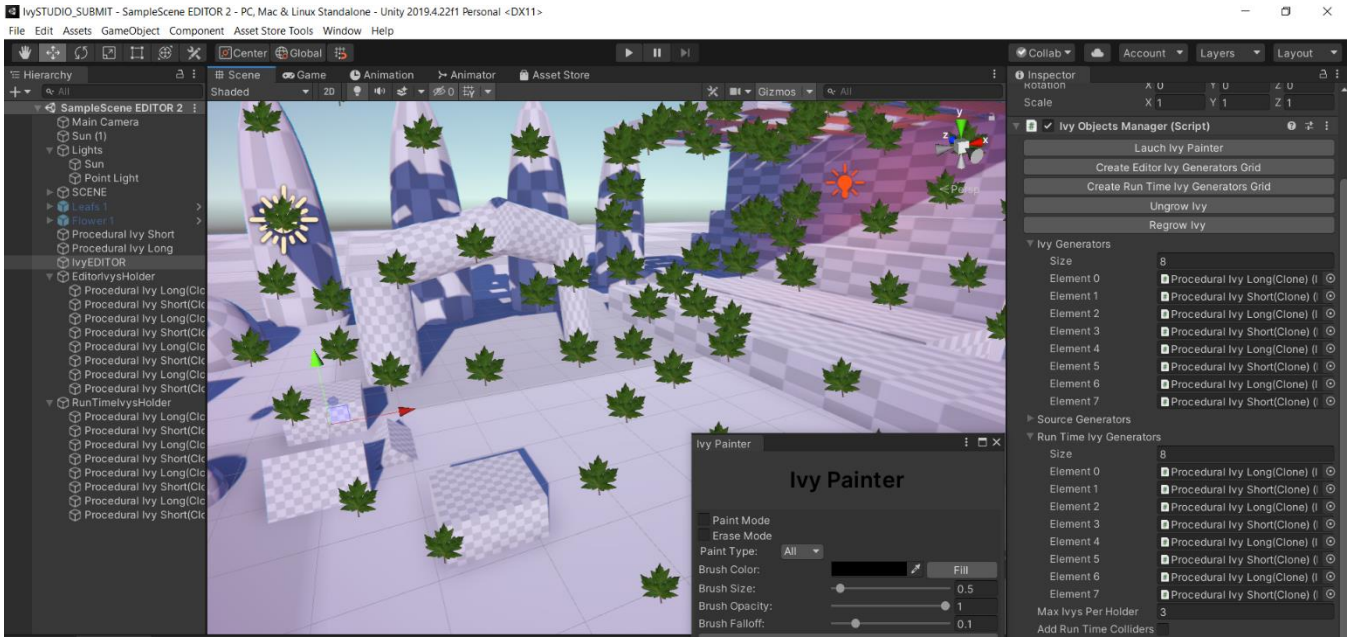
Then to paint enable the “Paint Mode” checkbox.



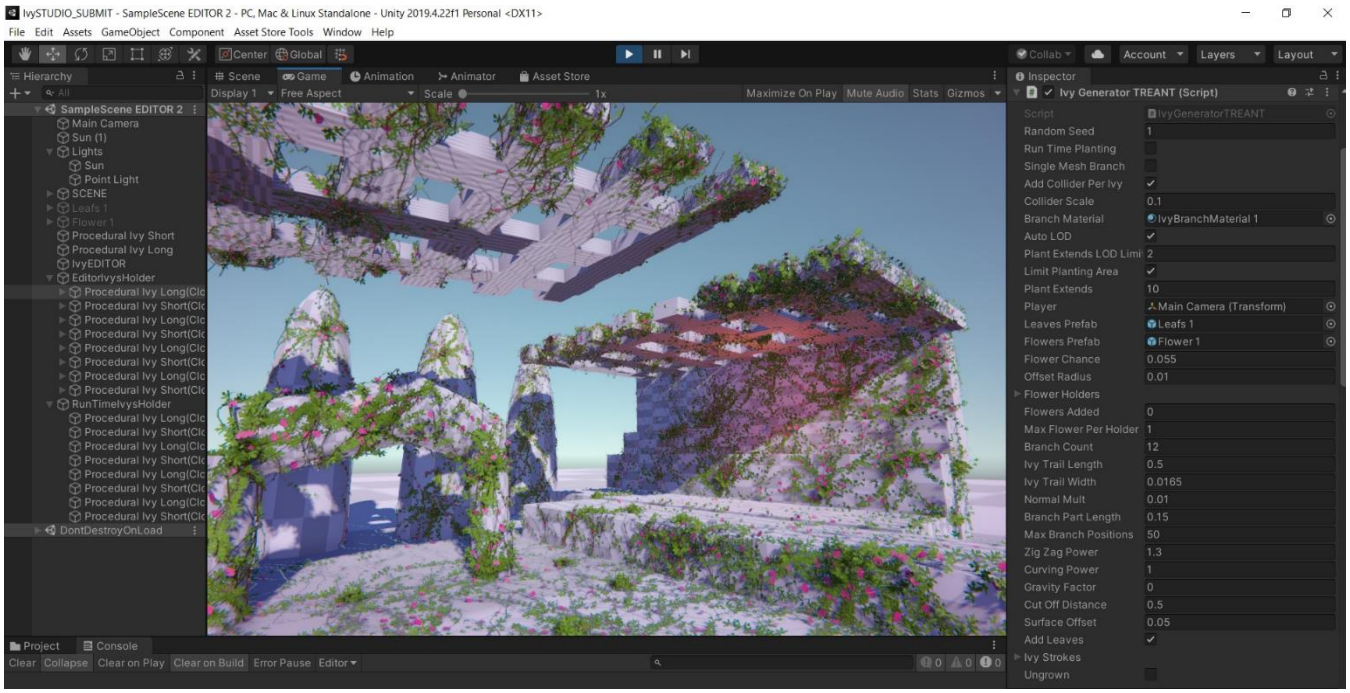
To erase, enable the “Erase Mode” checkbox and use the Left Mouse button to erase where the red circle points.

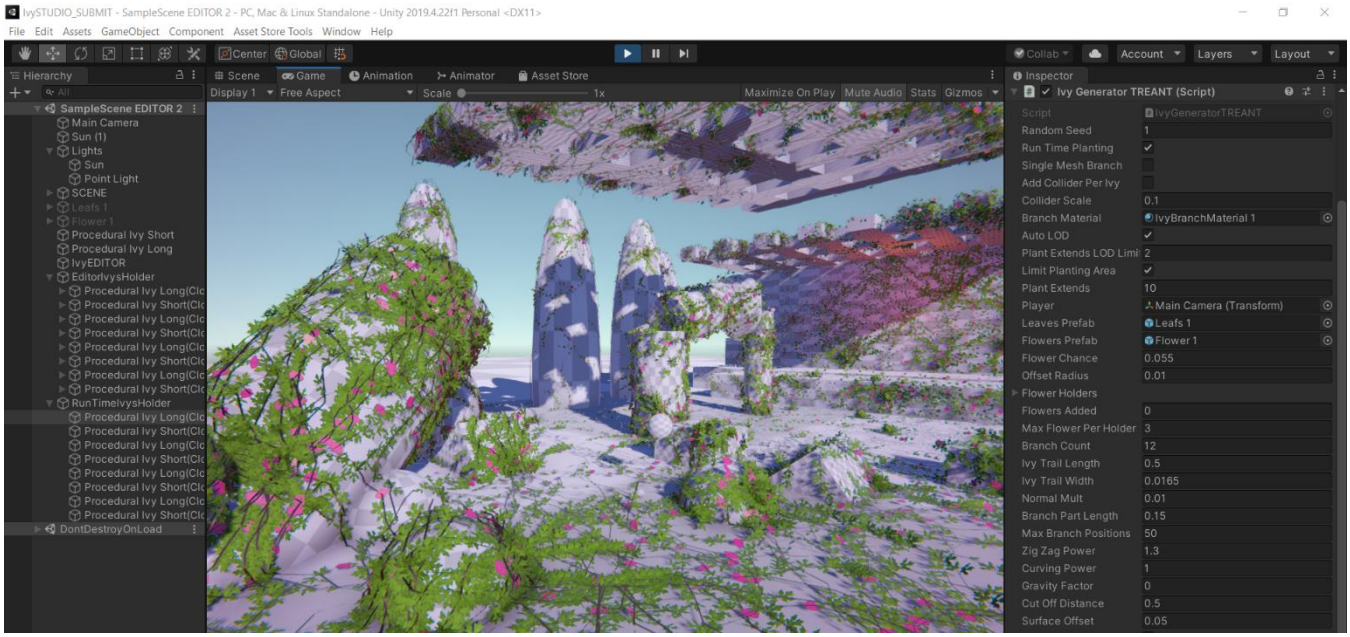


After planting the Ivy, it is possible to use the “Ungrow” button to remove it from the scene, so the scene can be saved without increasing the scene size. Then can use the “Regrow” button to grow it again for editing. Also when ungrown, the Ivy will be automatically created on game start, so there is no need to save the actual Ivy with the scene. The ungrown Ivy positions will be shown with a different icon in the editor when the Paint window is active.



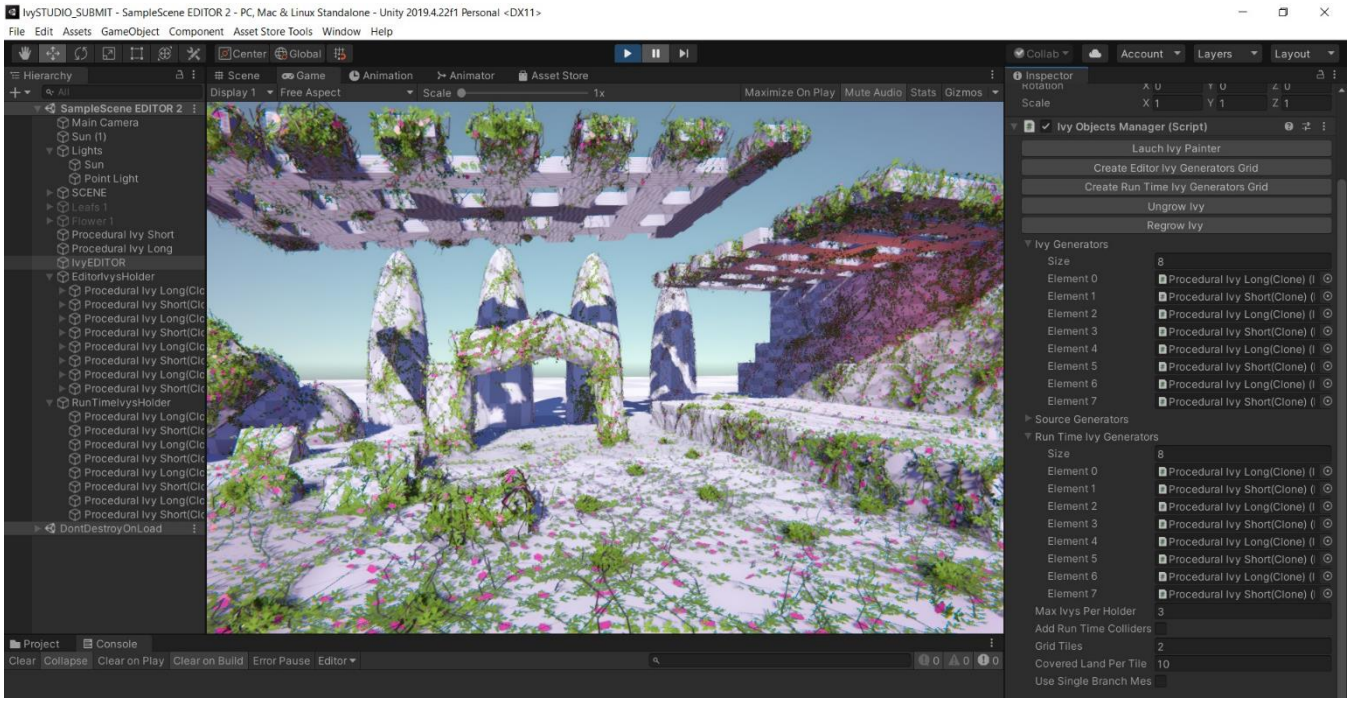
The two sample Ivy Generators can be sampled below





2. Creating run time Ivy

After perform the setup steps of the Source Ivy Generators and grid variables as described in the above section, then press the “Create Run Time Ivy Generators Grid” to create the run time Ivy generators and assign them to the Ivy Object Managers run time generators list, for control of the Ivy generation during the gameplay.



The default painting in game time is with the left mouse button. Enable the “Use Single Branch Mesh” to enable the creation of a single mesh for the Ivy brances of each Ivy Generator, than the default per stroke branch mesh creation. This mode is faster than creating the more individual meshes per stroke and batching them.

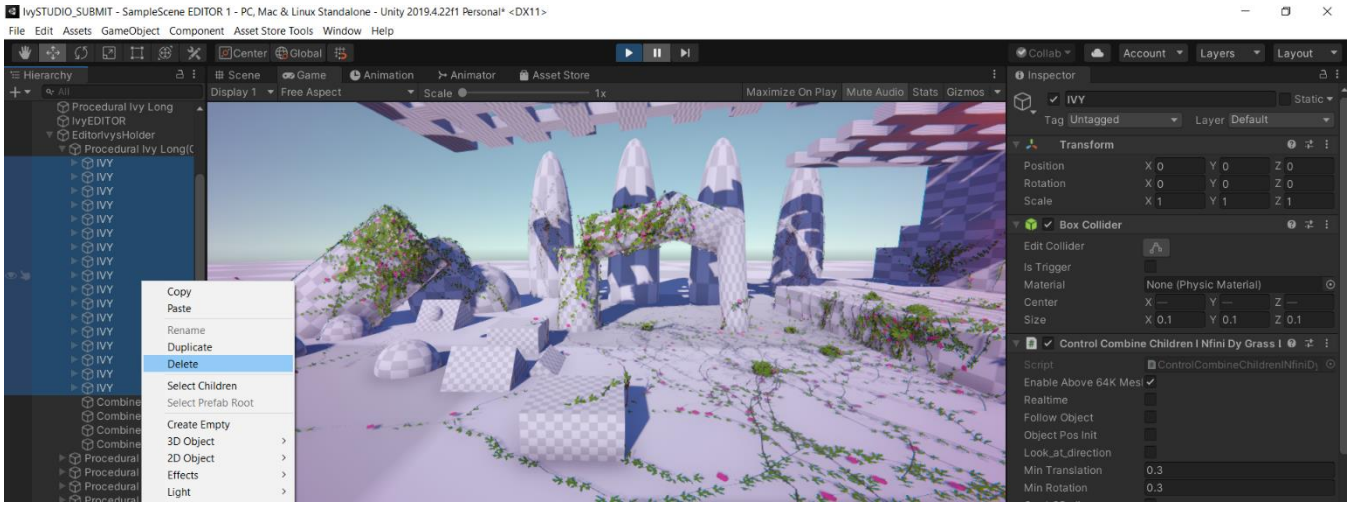
During play time the play mode created Ivy can be LODed by disable the Ivy on a user selected distance from the player.

NOTE: The system can be used in run time without the Ivy Objects Manager, by setting up the Ivy Generator as standalone.

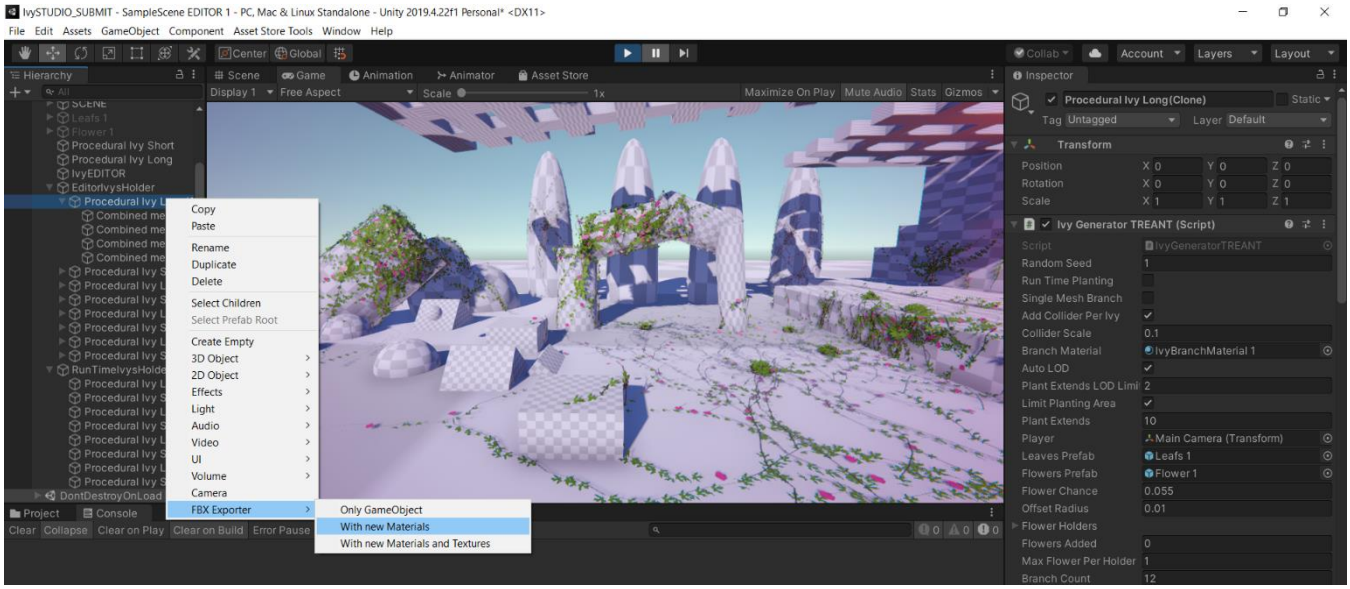
NOTE: The system will do a global batching of the Ivy that comes from the editor time, per Ivy Generator.

Exporting Ivy meshes as prefab

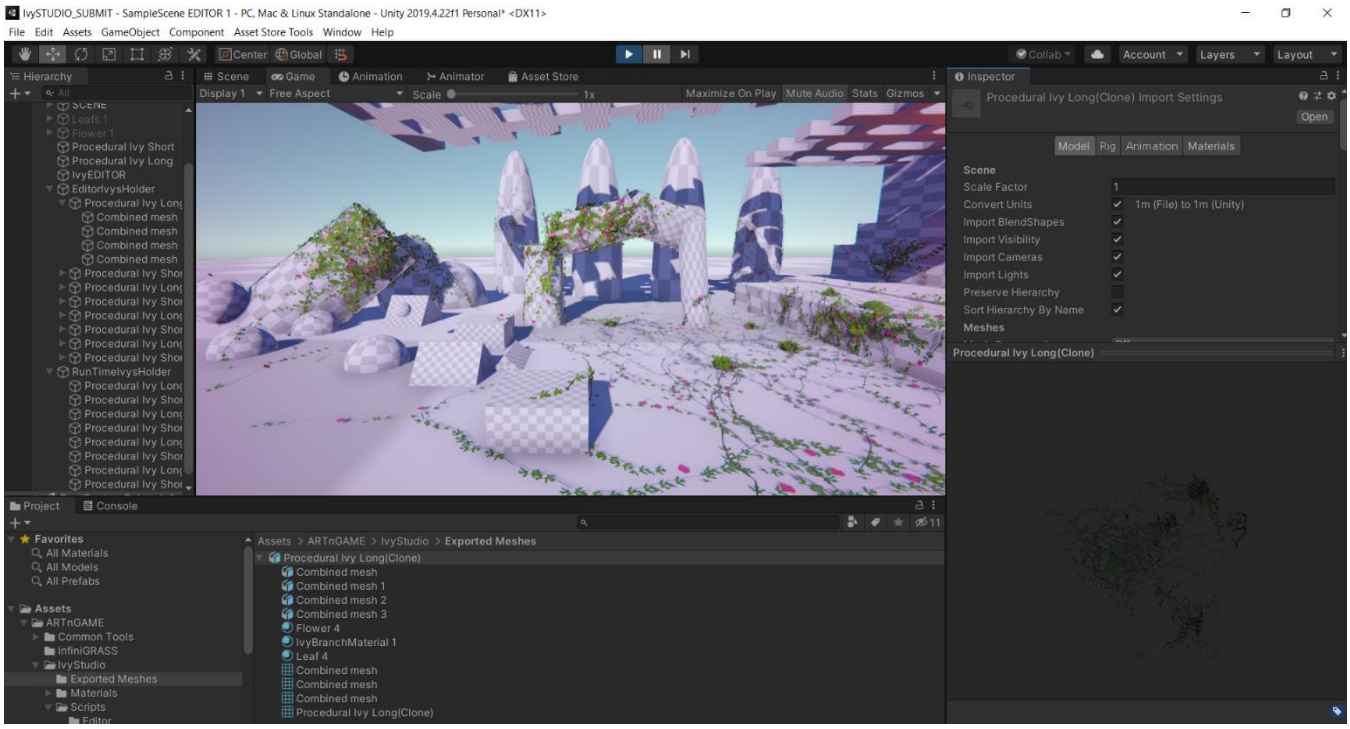
The Ivy can be saved per batched group, by enabling the play mode and then grab the batched models and save as FBX with the included exporter. First must enter play mode, then erase all individual meshes inside the Ivy Generator to leave only the batched overall models.



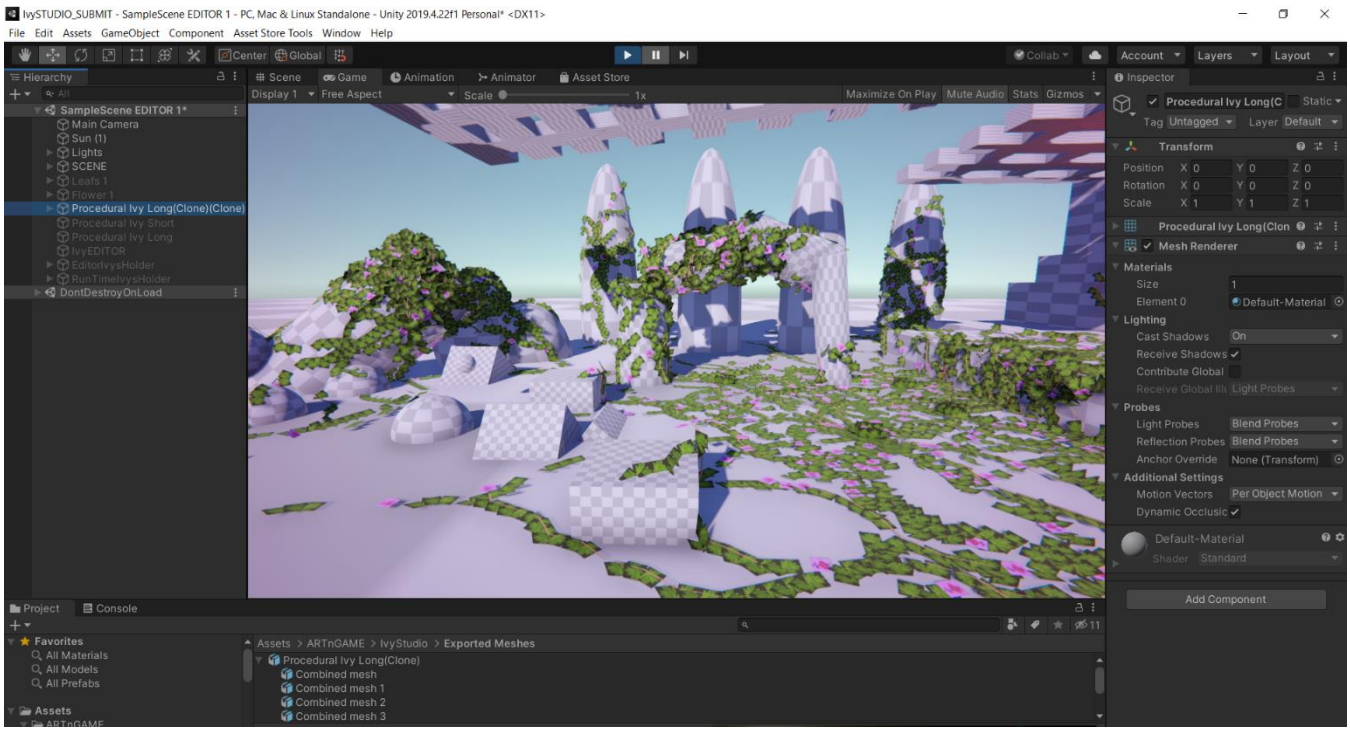
Then select the parent object of the batched models and use the FBX exporter to save to disk.



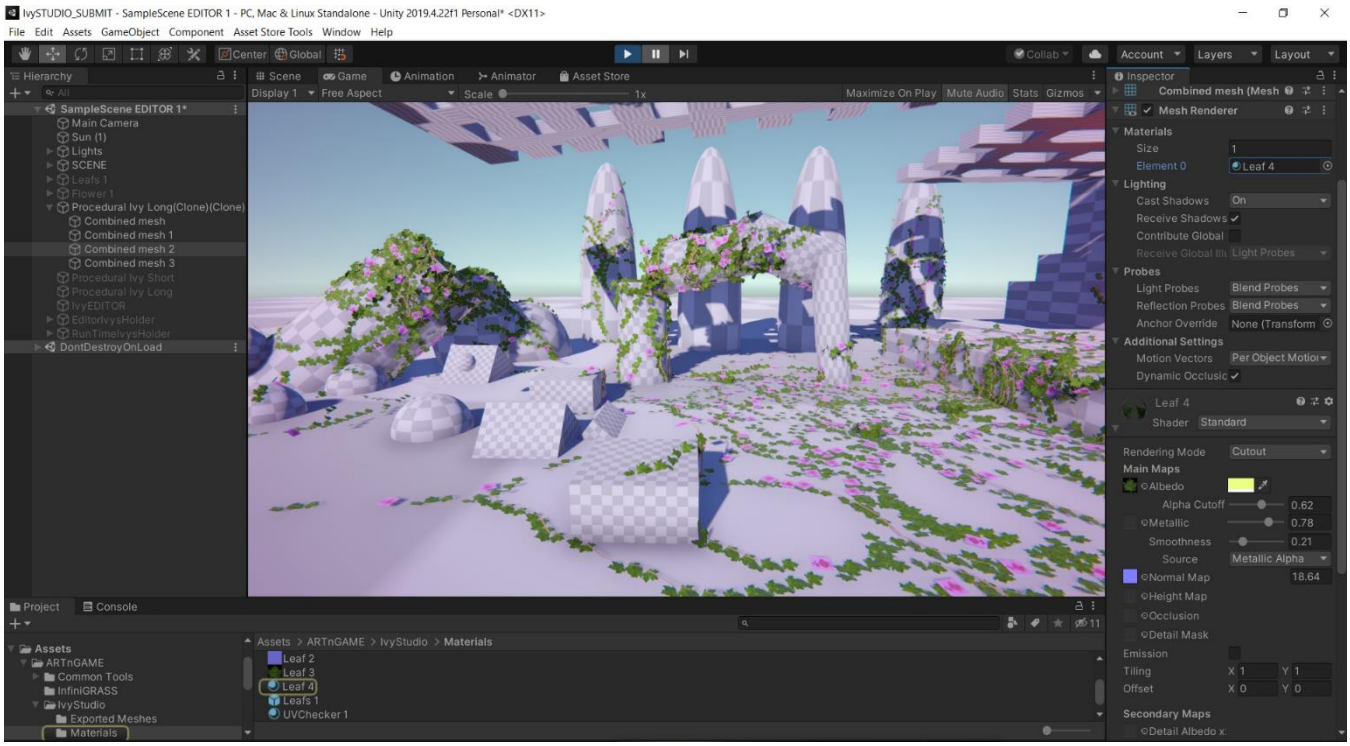
After saving the mesh can find it in the assets as shown below. The mesh is assigned materials that may require to be changed to the ones used for the Ivy.



Inserting the saved mesh in the scene results in the following, the mesh is directly adapted to the scene and since is an object in scene can be used like any other Unity object, this can be useful if need to lightmap the model or use with static mode.

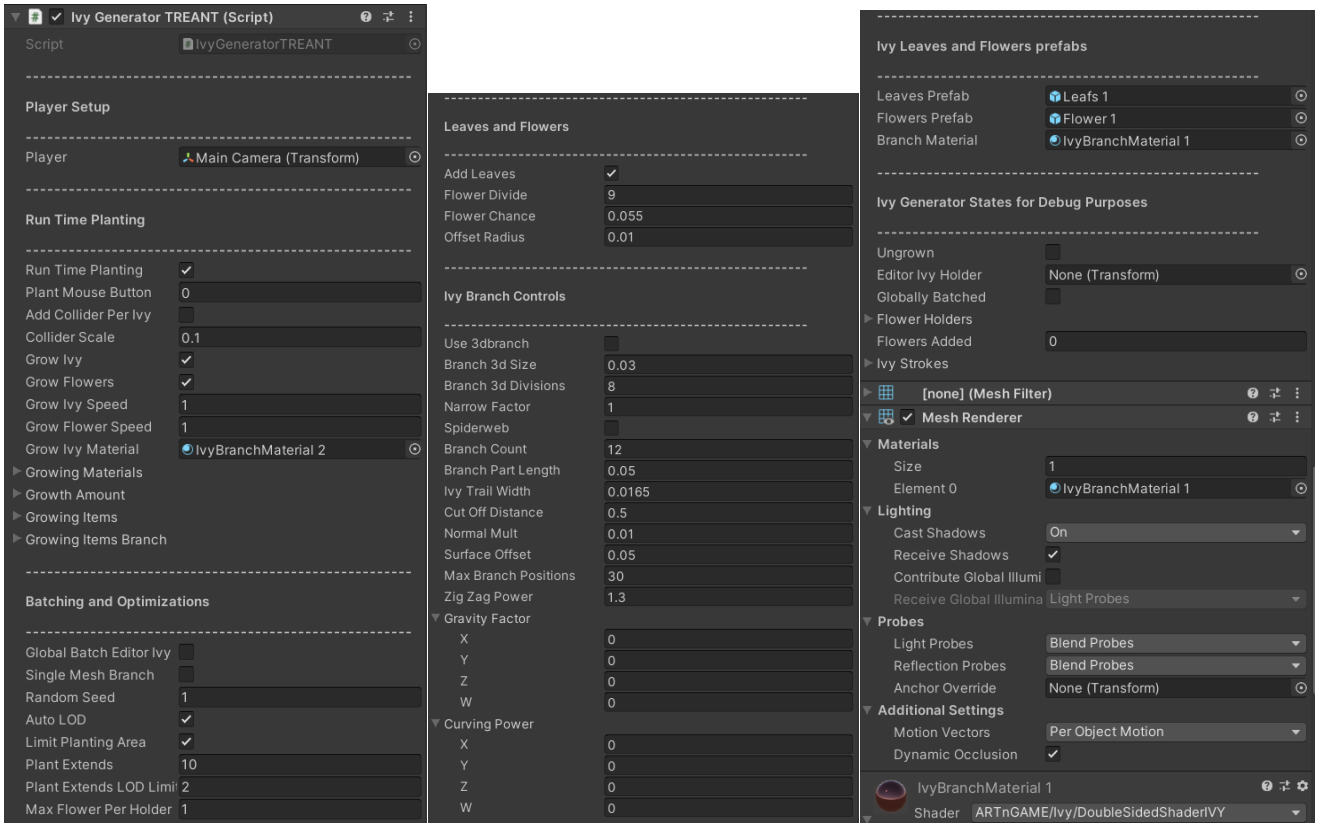


Replacing the leaves material with the proper leaf material results in the same look as the original Ivy.



Ivy Generator Script Guide

The Ivy Generator script can be configured with various options, if used with the global editor some of the properties like run time planting enable will be set by the Ivy Object Manager as described in the setup section.



GENERAL OPTIONS

Player Setup

Select player where LODs will be calculated from. If not assigned Camera.Main is used.
player

RUN TIME PLANTING

Run Time Planting

Enable Run time planting
runTimePlanting

Run time planting mouse button choice (0 left, 1 right)
plantMouseButton

Run time planting addition of collider in Ivy plant point
addColliderPerIvy

Run time planting collider scale
colliderScale

Enable the gradual Ivy growth mode
Grow Ivy

Enable gradual Ivy Leaves – Flowers growth mode, if not enabled leaves will grow at full scale directly, otherwise their scale will increase gradually.
Grow Flowers

Speeds at which the branches and flowers will grow
Grow Ivy Speed
Grow Flowers Speed

Material with the gradual shader applied during the growth, currently the grow system is SRP only, HDRP and URP versions will come in next updates.
Grow Ivy Material

Lists where the growing items are registered for growth tracking, before finish grow and are batched.
Growing Materials – Items – Items Branch
Growth Amount

OPTIMIZATIONS

Batching and Optimizations

Batch all the individual IVY batched models used during edit time, when game starts.
globalBatchEditorIvy

Use a single mesh for all Ivy of an Ivy generator script. Not applies to 3D branch case.
singleMeshBranch

Set seed for randomize of branches, use same when regrow the Ivy to get same branch positions
randomSeed

Enable LOD disable of distant Ivy generators, disable after a number of plantExtends
autoLOD

Limit planting around Ivy generator
limitPlantingArea

Distance Limit of planting around Ivy generator
plantExtends

Enable LOD at this variable, times plantExtends, distance
plantExtendsLODLimit

How many strokes of run time Ivy plant strokes before batch them for optimization
maxFlowerPerHolder

LEAVES - FLOWERS

Leaves and Flowers

Add leaves and flowers to the Ivy.
addLeaves

Higher will give less leaves and flowers.
flowerDivide

Lower chance of a flower appear.
flowerChance

Offset of flowers - leaves above the branch center.
offsetRadius

BRANCH OPTIONS

Ivy Branch Controls

Use fully 3D Branch model. If disabled will use a more optimized 2D model.
use3dbranch

Size of 3D Branch model.
branch3dSize

Radial Detail of 3D Branch model mesh.
branch3dDivisions

Make branch more narrow near edges.
narrowFactor

Choose spider web like branch spreading.
Spiderweb

Number of branches to spread from the plant point
branchCount

Length of Ivy branch parts, larger will make trail longer
branchPartLength

Width of Ivy branch when 2D mode is active
ivyTrailWidth

Stop connecting last branch point to plant origin by check for this distance, when 2D mode is active
cutOffDistance

Move raycast points above surface along its normal by this factor when planting.
normalMult

Move branch points above surface along its normal by this factor, when 2D mode is active.
surfaceOffset

Ivy branch parts count, larger number will make for a bigger Ivy model
maxBranchPositions

Branch angle randomizer factor
zigZagPower

Branch gravity factor, can use plus or minus to move Ivy up or down
gravityFactor

Branch curving factor, curve branches mid way, use in combination with gravity for various shapes.
curvingPower

MATERIALS - PREFABS

Ivy Leaves and Flowers prefabs

Leaves prefab to be placed in certain intervals along the Ivy mesh.
leavesPrefab

Flowers prefab to be placed in certain intervals along the Ivy mesh.
flowersPrefab

Material to be used for the Ivy mesh.
branchMaterial

IVY CREATOR STATE PREVIEW

Ivy Generator States for Debug Purposes

Ivy generated by this creator has been ungrown and no actual Ivy exist on scene.
Regrow will recreate the Ivy based on IvyStrokes struct.
ungrown

Ivy from editor time parented to this holder so can be globally batched in game start.
editorIvyHolder

Ivy has been globally batched at game start.
globallyBatched

Ivy batching groups, one Ivy stroke per group for editor Ivy
maxFlowerPerHolder strokes for run time.
flowerHolders

Ivy strokes added currently, when reach maxFlowerPerHolder batch and create new batch group
flowersAdded

Ivy strokes information saved for regrowing the Ivy, after an Ungrow operation.
ivyStrokes

Gizmos

The system uses a number of scene indicators, as described below
Red Box: Run time planting Ivy Generator, with infinite plant distance limit.
Magenta Box: Run time planting Ivy Generator, with horizontal plant distance inside the box.
Yellow box: Editor time planting Ivy Generator, with infinite plant distance limit.
White Box: Editor time planting Ivy Generator, with horizontal plant distance inside the box.

Leaf Icon: Ungrown Ivy
Red Flower Icon: Ivy planting position