

Assignment 4.B

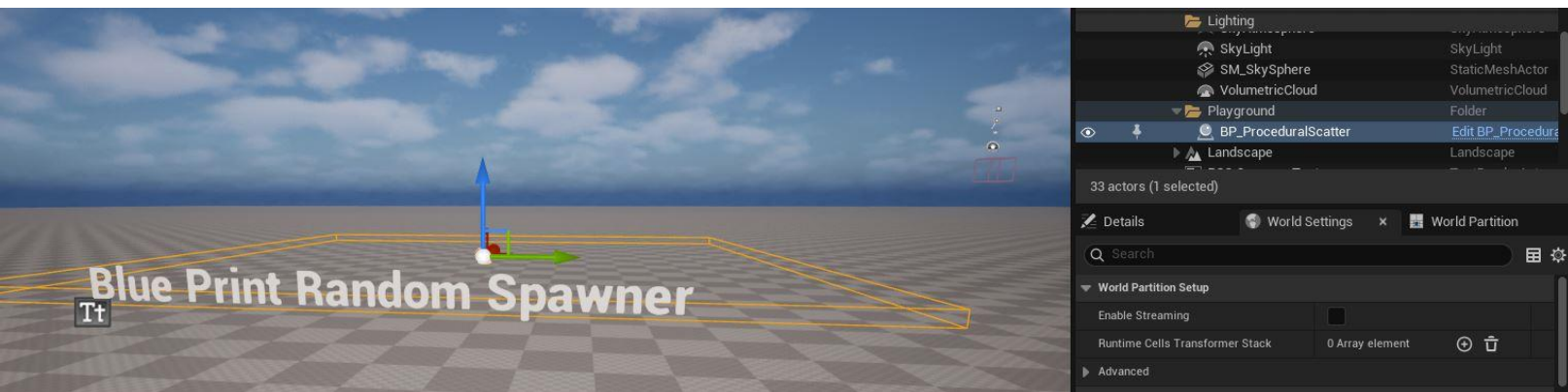
Reflective:

PCG Graph and C++ Random Spawning methods both feel the most flexible while designing but BP Random Spawning method feels the easiest.

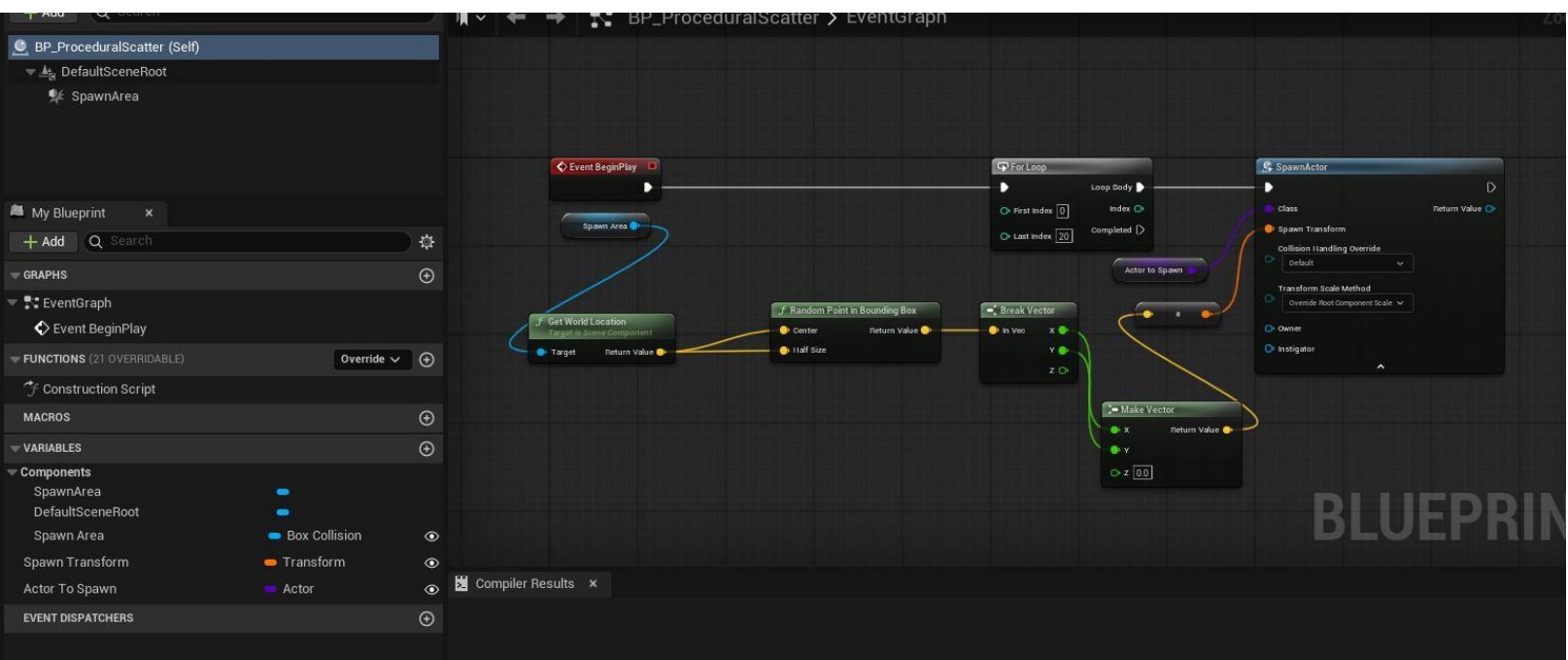
Part 2.1 ~ Blueprint Random Spawning.



Part 2.2



Part 2.3 ~ Blueprint Code

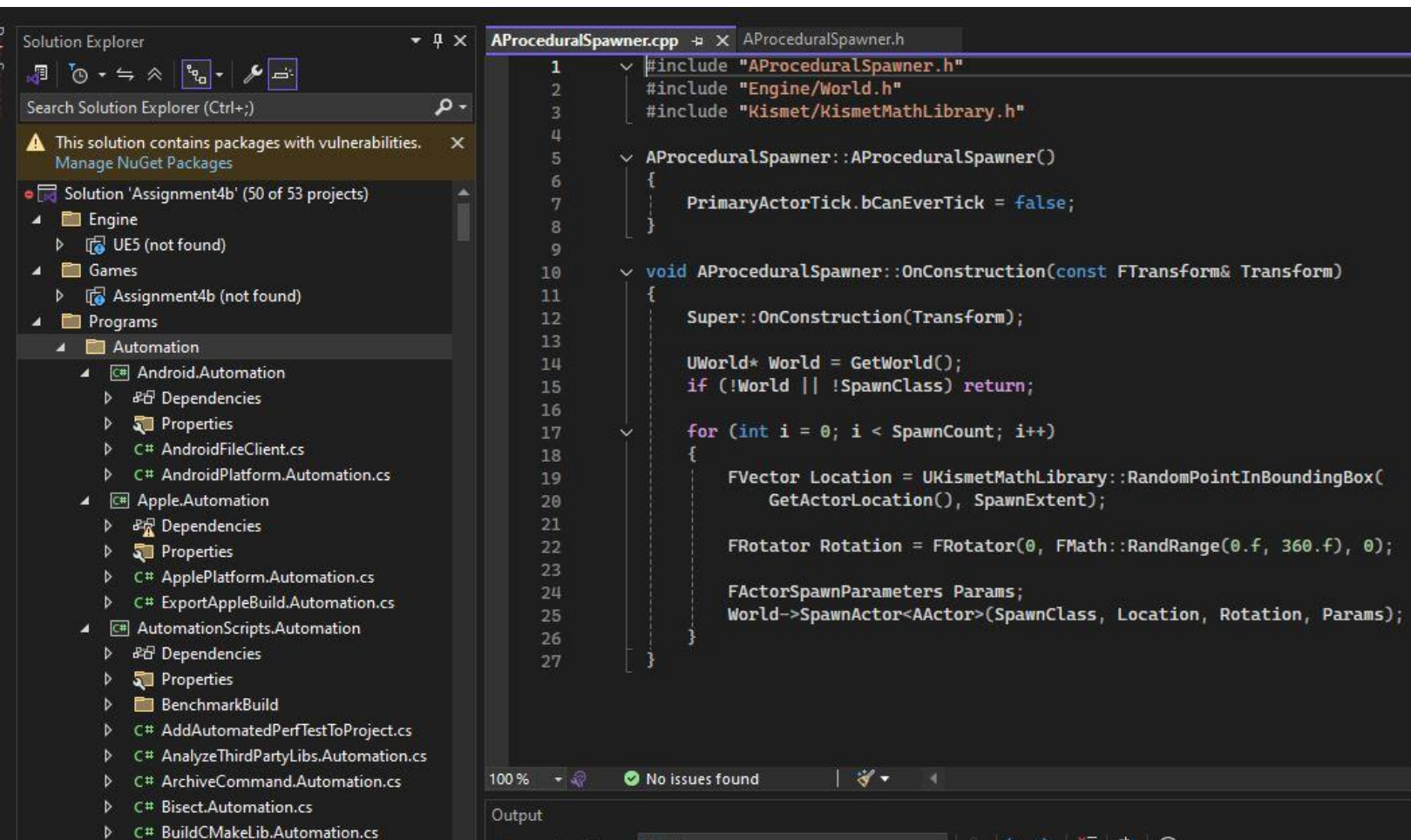


Part 3.1 ~ Header File

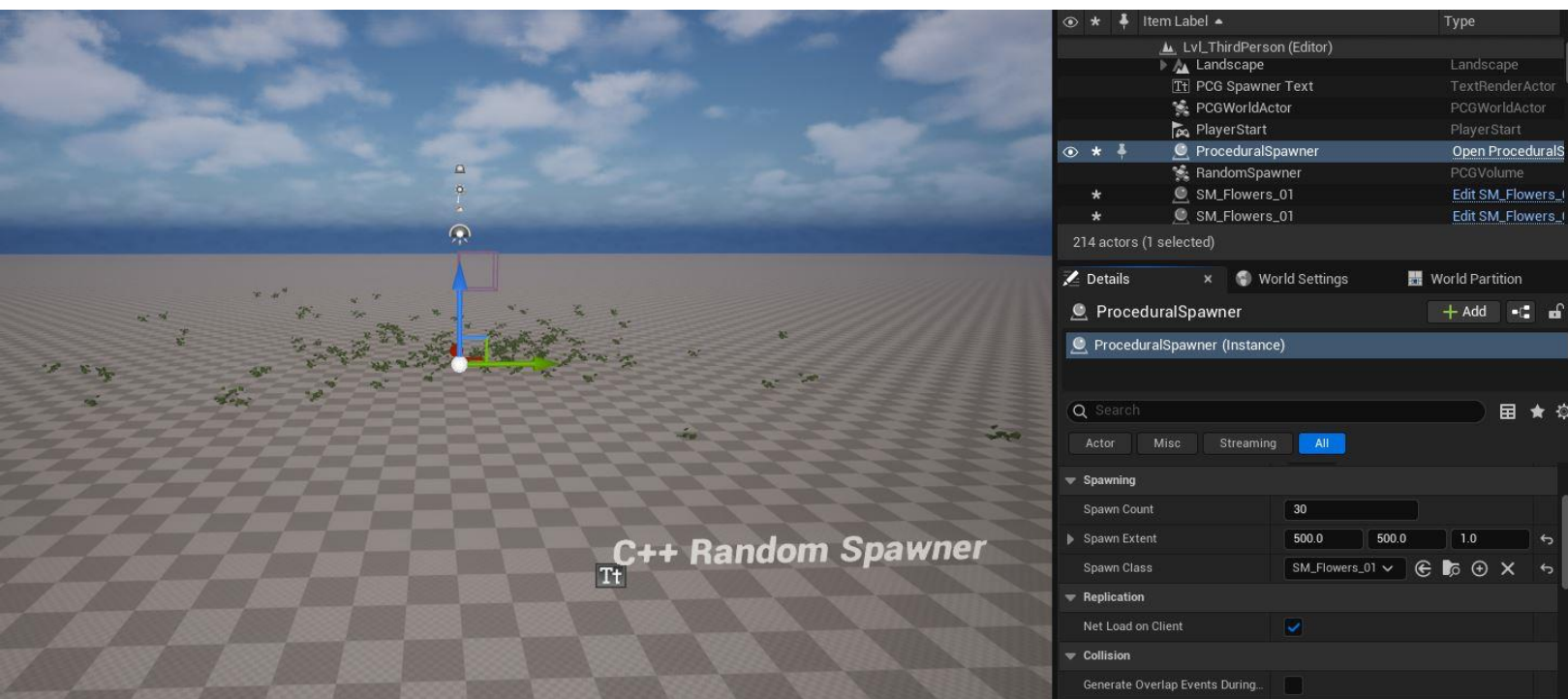
The screenshot displays the Visual Studio IDE interface. On the left, the Solution Explorer shows a project named 'Assignment4b' with a tree structure including folders like 'Engine', 'Games', and 'Programs', and a sub-folder 'Automation' containing various C# files. A warning message at the top of the Solution Explorer states: 'This solution contains packages with vulnerabilities. Manage NuGet Packages'. The main editor window shows the 'AProceduralSpawner.h' header file. The code includes preprocessor directives for '#pragma once', '#include "CoreMinimal.h"', '#include "GameFramework/Actor.h"', and '#include "AProceduralSpawner.generated.h"'. It defines a UCLASS for 'ASSIGNMENT4B_API AProceduralSpawner' which inherits from 'AActor'. The class contains a 'GENERATED_BODY()' macro, a 'public' section with a constructor 'AProceduralSpawner()', a 'protected' section with a virtual 'OnConstruction' method, and a 'public' section with three 'UPROPERTY' declarations for 'SpawnCount', 'SpawnExtent', and 'SpawnClass'. The bottom status bar indicates '100 %' zoom and 'No issues found'. The Output window at the bottom shows the command prompt path: 'C:\Users\austr\OneDrive - Athens State University\Documents\URP\CS\Asg4\Asg4.B\Asg4bCode\Intern'.

```
1 #pragma once
2
3 #include "CoreMinimal.h"
4 #include "GameFramework/Actor.h"
5 #include "AProceduralSpawner.generated.h"
6
7 UCLASS()
8 class ASSIGNMENT4B_API AProceduralSpawner : public AActor
9 {
10     GENERATED_BODY()
11
12 public:
13     AProceduralSpawner();
14
15 protected:
16     virtual void OnConstruction(const FTransform& Transform) override;
17
18 public:
19     UPROPERTY(EditAnywhere, Category = "Spawning")
20     int32 SpawnCount = 30;
21
22     UPROPERTY(EditAnywhere, Category = "Spawning")
23     FVector SpawnExtent = FVector(2000, 2000, 200);
24
25     UPROPERTY(EditAnywhere, Category = "Spawning")
26     TSubclassOf<AActor> SpawnClass;
27 }
```

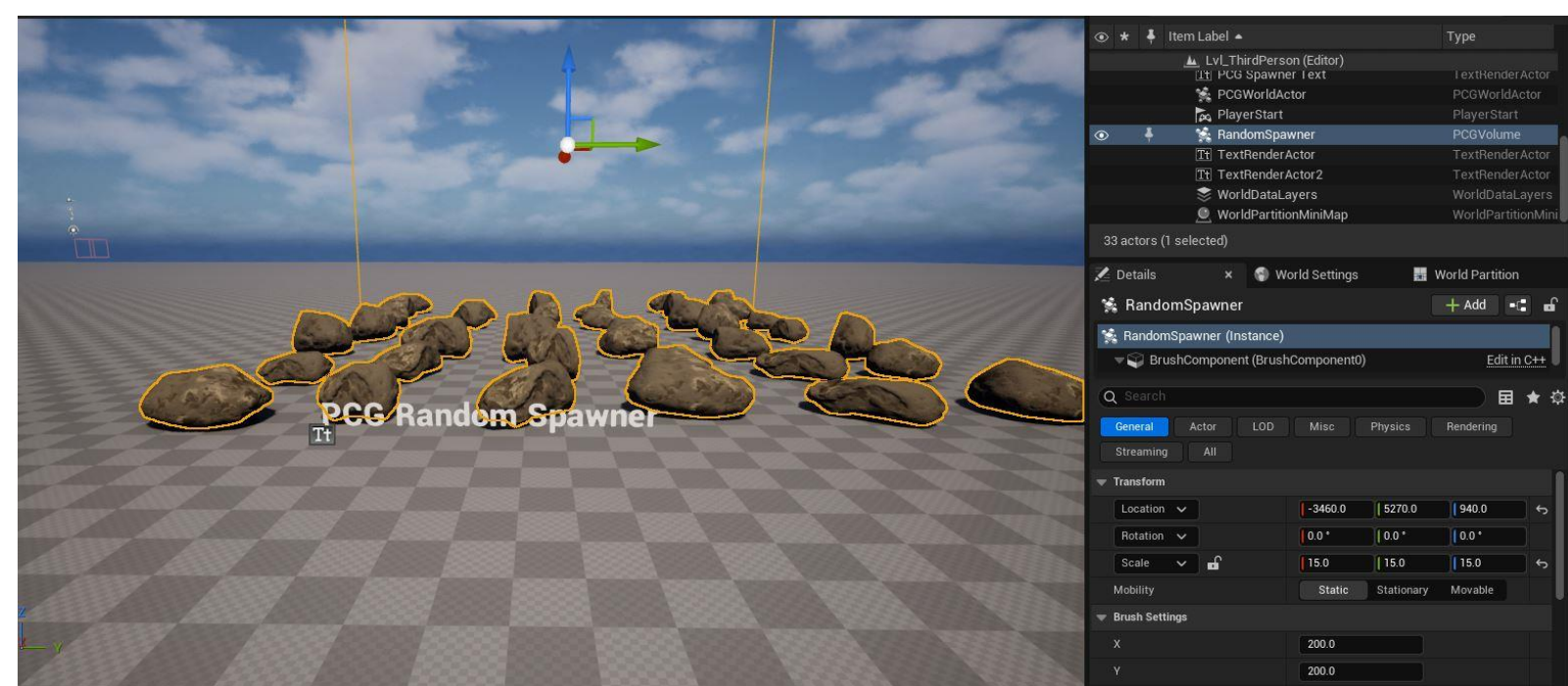
Part 3.2 ~ CPP file



Part 3.3 ~ Spawned objects



Part 4.1 ~ PCG Random Spawning



Part 4.2 ~ PCG Code

The screenshot displays the Houdini PCG (Procedural Content Generation) Graph interface. The main workspace shows a graph with the following nodes: **Input** (red), **Output** (red), **Get Landscape Data** (purple), **Surface Sampler** (green), **Transform Points** (blue), and **Static Mesh Spawner** (teal). The graph is connected as follows: **Input** → **Output**; **Get Landscape Data** → **Surface Sampler**; **Surface Sampler** → **Transform Points**; **Transform Points** → **Static Mesh Spawner**.

On the left, the **Data Viewport** shows a 3D perspective view of a procedurally generated landscape with a grid of points and a small building model. The **Details** panel on the right shows the properties of the selected **Static Mesh Spawner** node, including **Asset Info** and **Settings**.

At the bottom, the **Attributes** panel displays a table of data for the **Static Mesh Spawner** node. The table has 14 columns: **\$Index**, **\$Position.X**, **\$Position.Y**, **\$Position.Z**, **\$Rotation.Roll**, **\$Rotation.Pitch**, **\$Rotation.Yaw**, **\$Scale.X**, **\$Scale.Y**, **\$Scale.Z**, **\$BoundsMin.X**, **\$BoundsMin.Y**, **\$BoundsMin.Z**, and **\$BoundsMax.X**. The table shows 42 entries, with the first 9 rows displayed.

\$Index	\$Position.X	\$Position.Y	\$Position.Z	\$Rotation.Roll	\$Rotation.Pitch	\$Rotation.Yaw	\$Scale.X	\$Scale.Y	\$Scale.Z	\$BoundsMin.X	\$BoundsMin.Y	\$BoundsMin.Z	\$BoundsMax.X
0	-4.768.219	4.260.417	3.135	-0.178	1.03	4.24	1.778	1.755	1.375	-72.483	-92.074	-1.151	59.99
1	-4.298.579	4.281.325	2.399	0.885	0.352	172.449	1.979	1.336	1.026	-72.483	-92.074	-1.151	59.99
2	-3.786.011	4.178.21	3.509	0.387	0.639	-78.837	1.927	1.061	1.955	-72.483	-92.074	-1.151	59.99
3	-3.354.474	4.278.045	2.219	0.414	0.491	-75.772	1.339	1.724	1.883	-72.483	-92.074	-1.151	59.99
4	-2.911.191	4.265.627	4.64	0.972	0.835	65.001	1.535	1.951	1.591	-72.483	-92.074	-1.151	59.99
5	-2.482.408	4.189.882	3.202	0.898	1.085	96.778	1.77	1.563	1.662	-72.483	-92.074	-1.151	59.99
6	-2.004.51	4.176.883	4.63	0.72	-0.148	-120.289	1.97	1.727	1.443	-72.483	-92.074	-1.151	59.99
7	-4.725.76	4.643.925	3.373	0.638	0.174	172.56	1.817	1.177	1.549	-72.483	-92.074	-1.151	59.99
8	-4.229.088	4.662.918	2.377	1.115	0.941	104.846	1.478	1.933	1.233	-72.483	-92.074	-1.151	59.99