

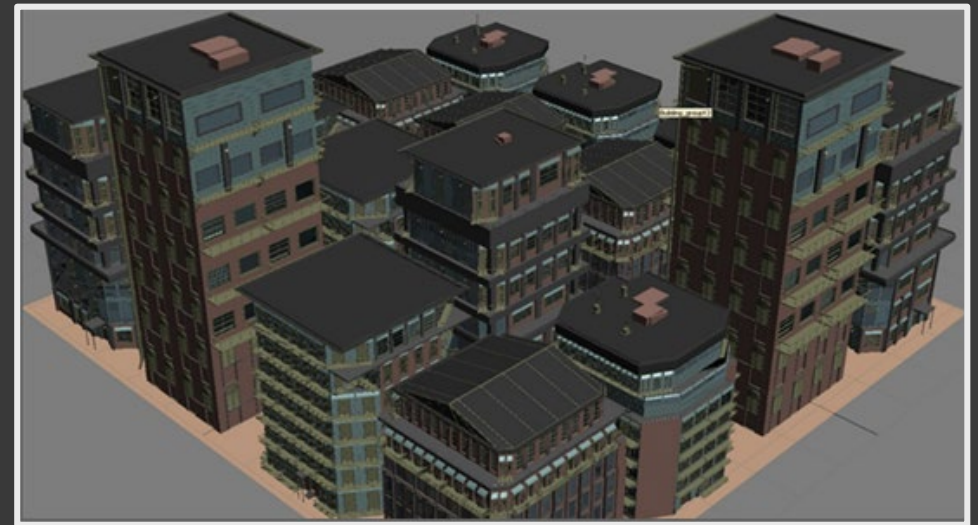
Procedural Building Generator

Midterm Update – Sandy Demian



Overview

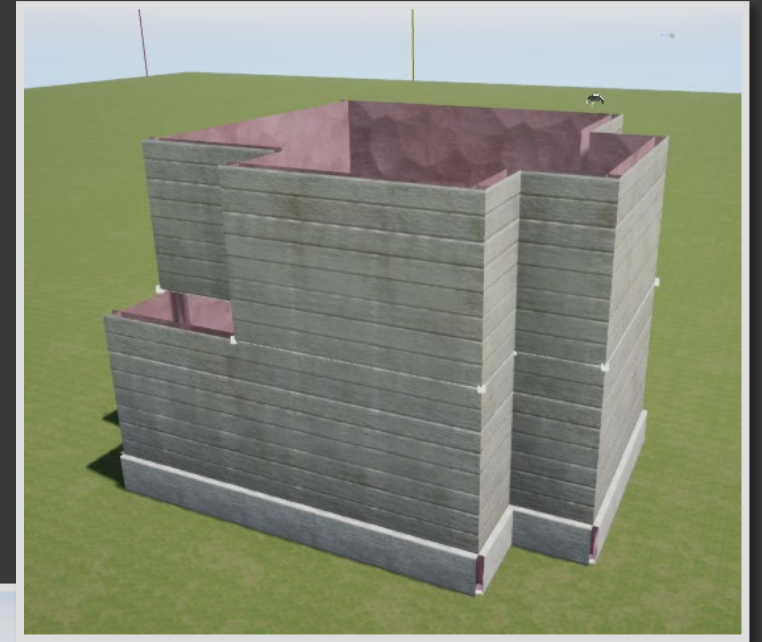
- Procedural Building Generator
 - Residential houses
 - City buildings
- Buildings can be generated automatically or by using controls
- Modular pieces can be replaced for more variations
- Works with Modular meshes from asset packs
- Engine: Unreal



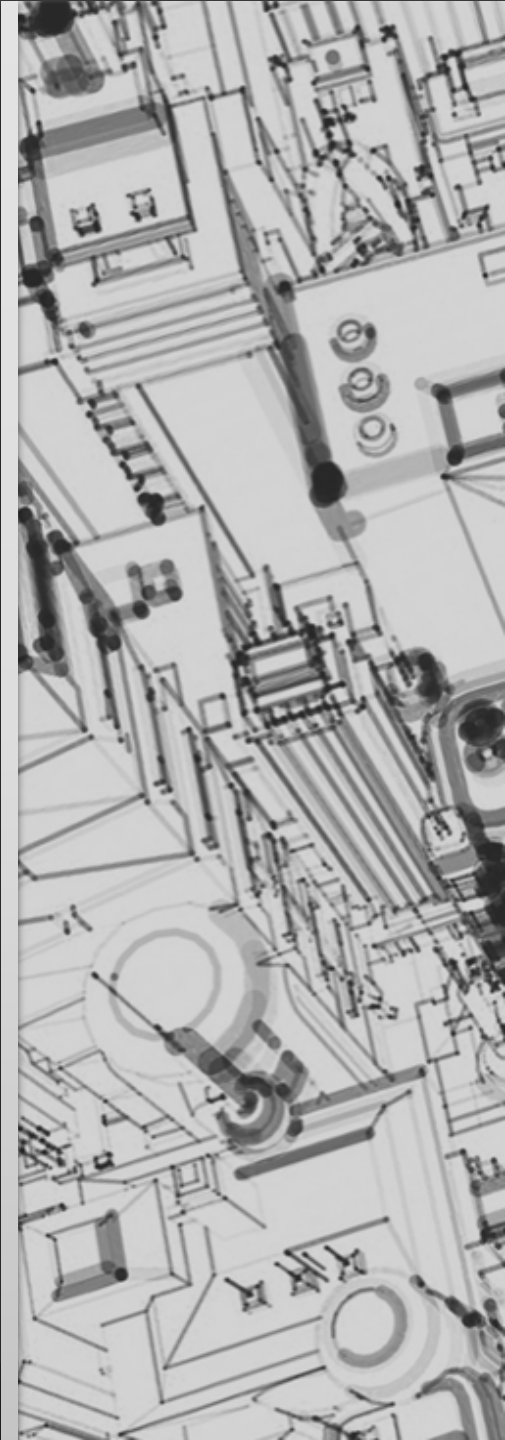
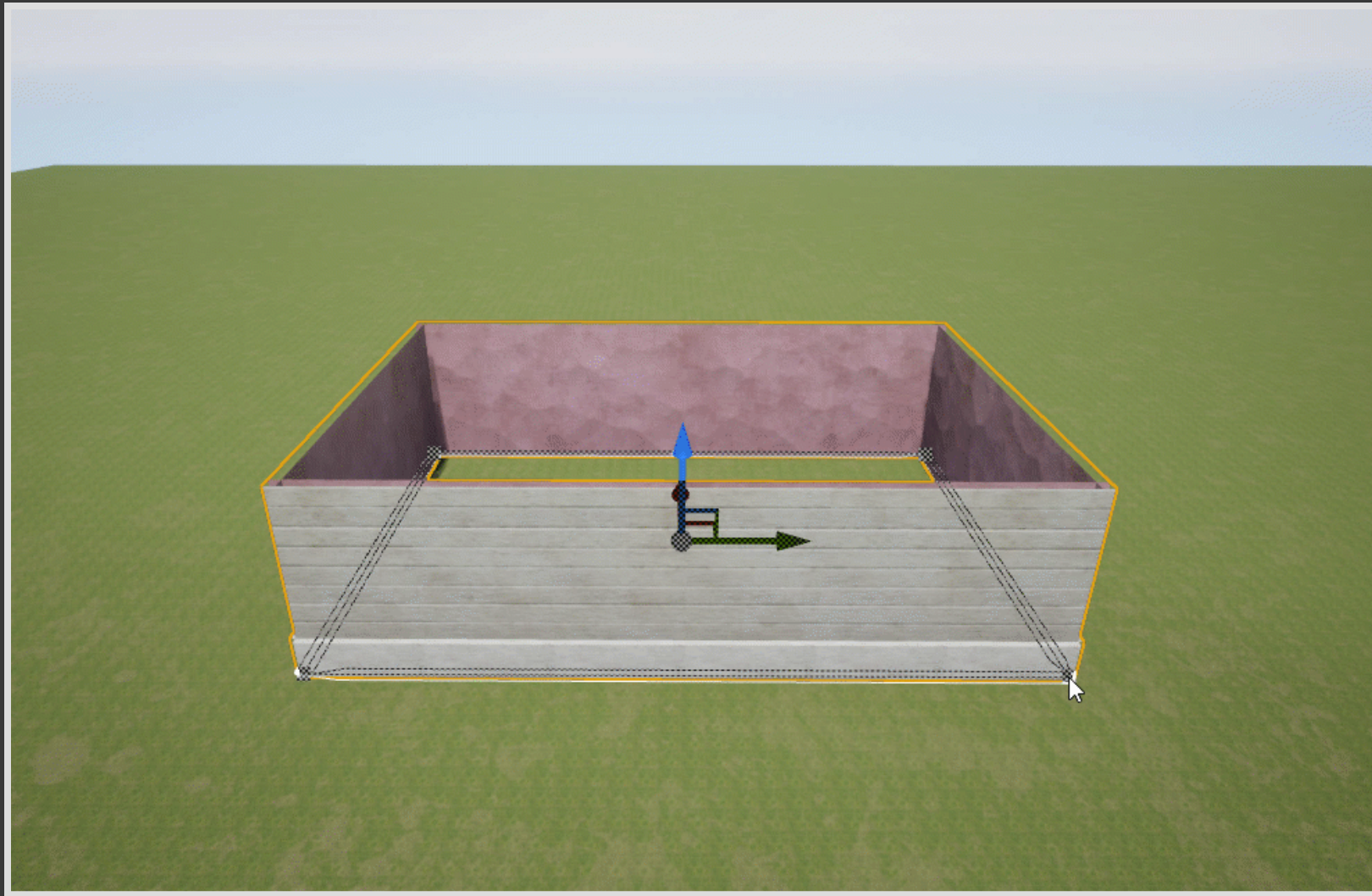
Progress

- Generate floorplans procedurally or using splines for multiple levels
- Choose the wall mesh for the different levels and the segment length

- Struggles:
 - Meshes have different pivot points
 - Corner Meshes
 - Gaps in corners
 - Z-fighting

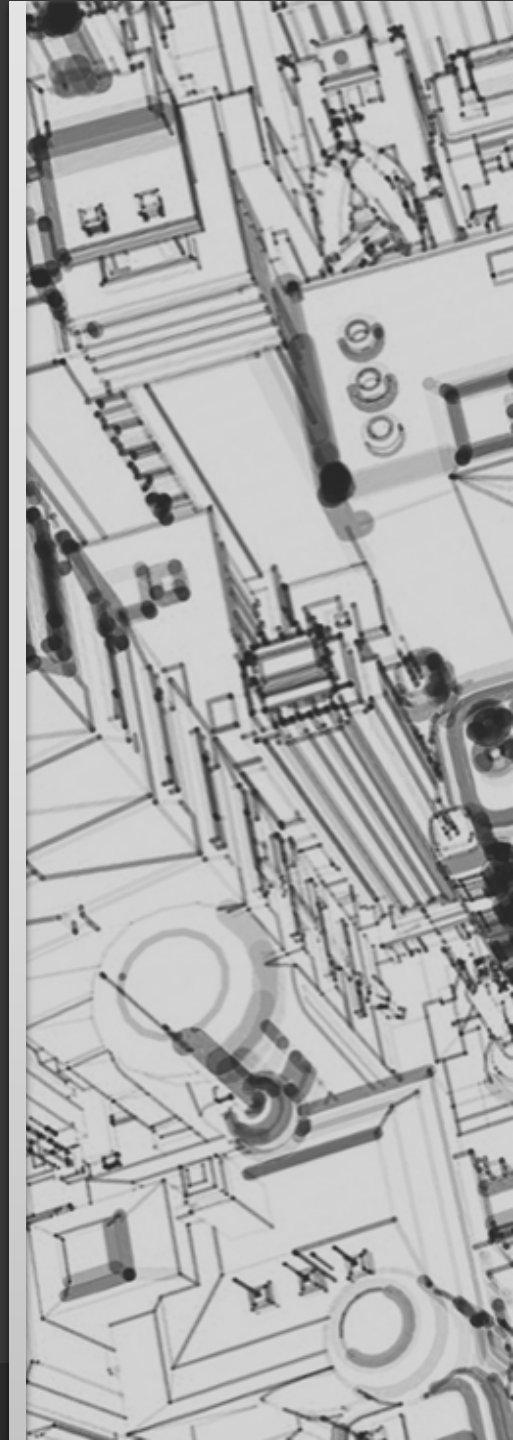
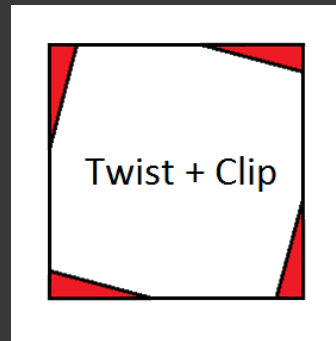
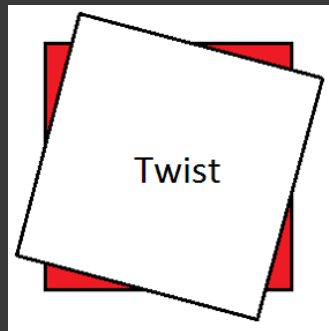
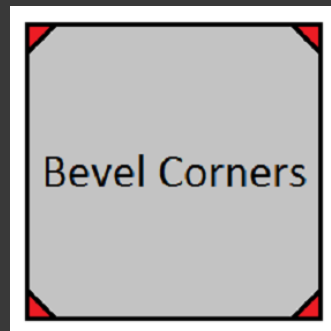
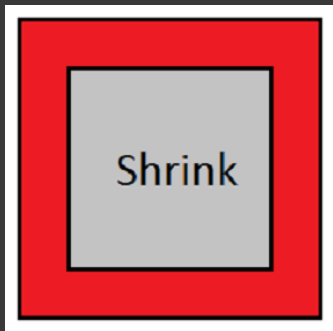
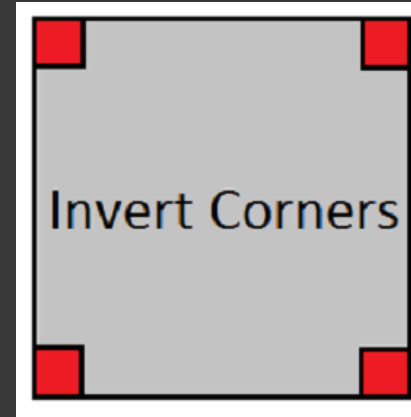


Manual Floorplan Generation

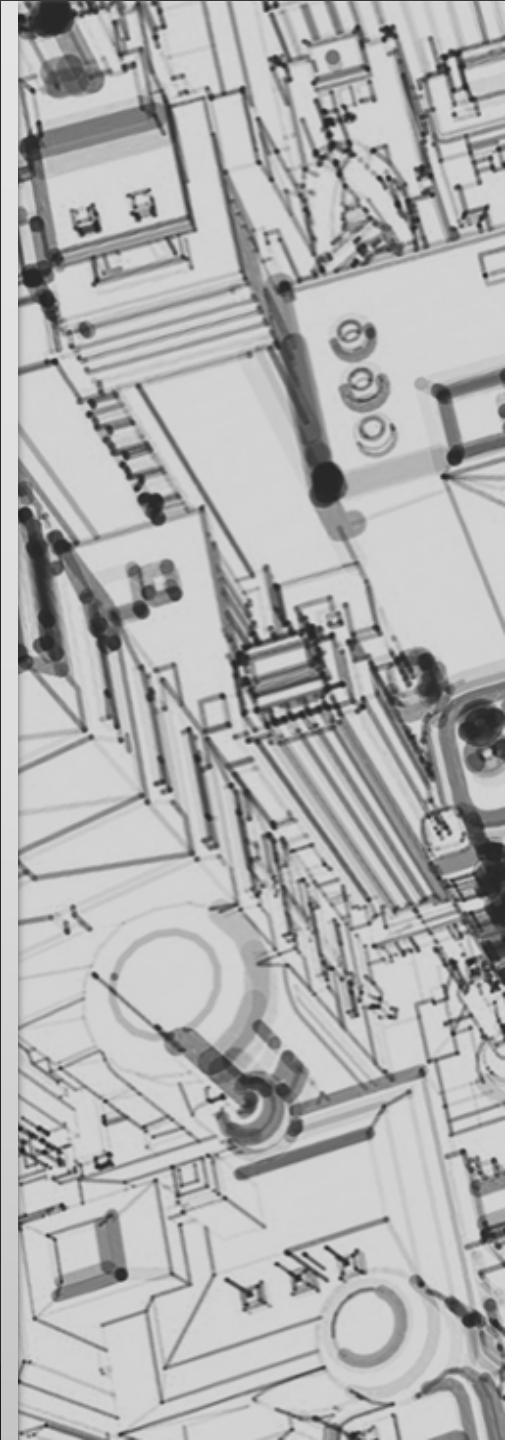
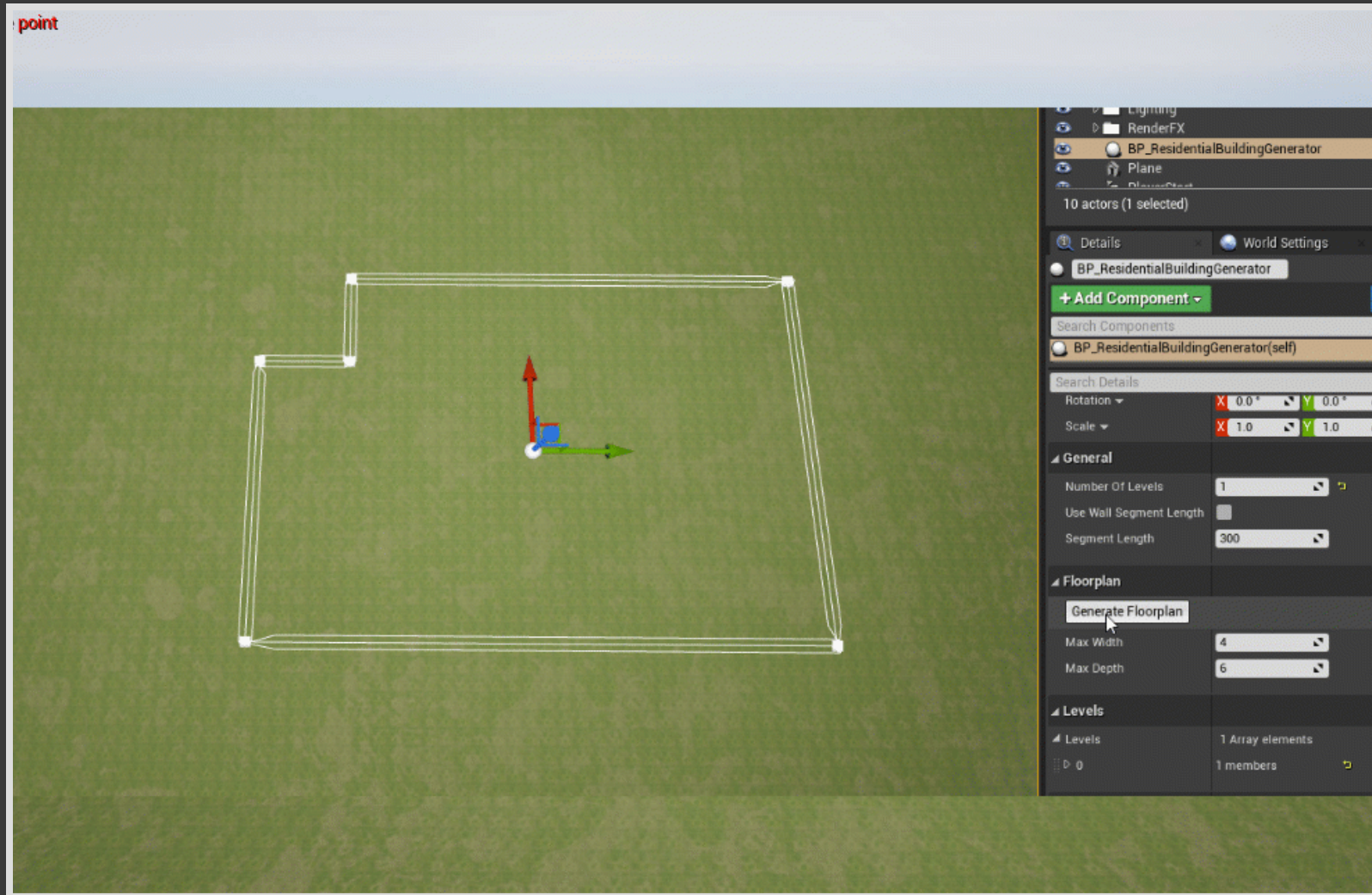


Procedural Floorplan Generation

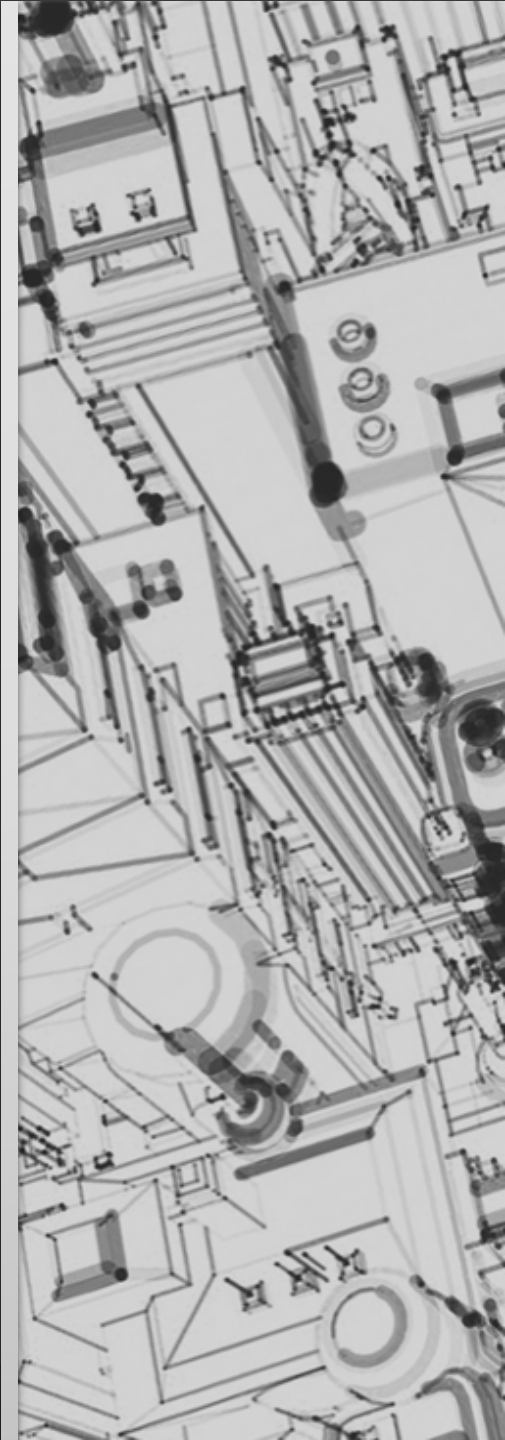
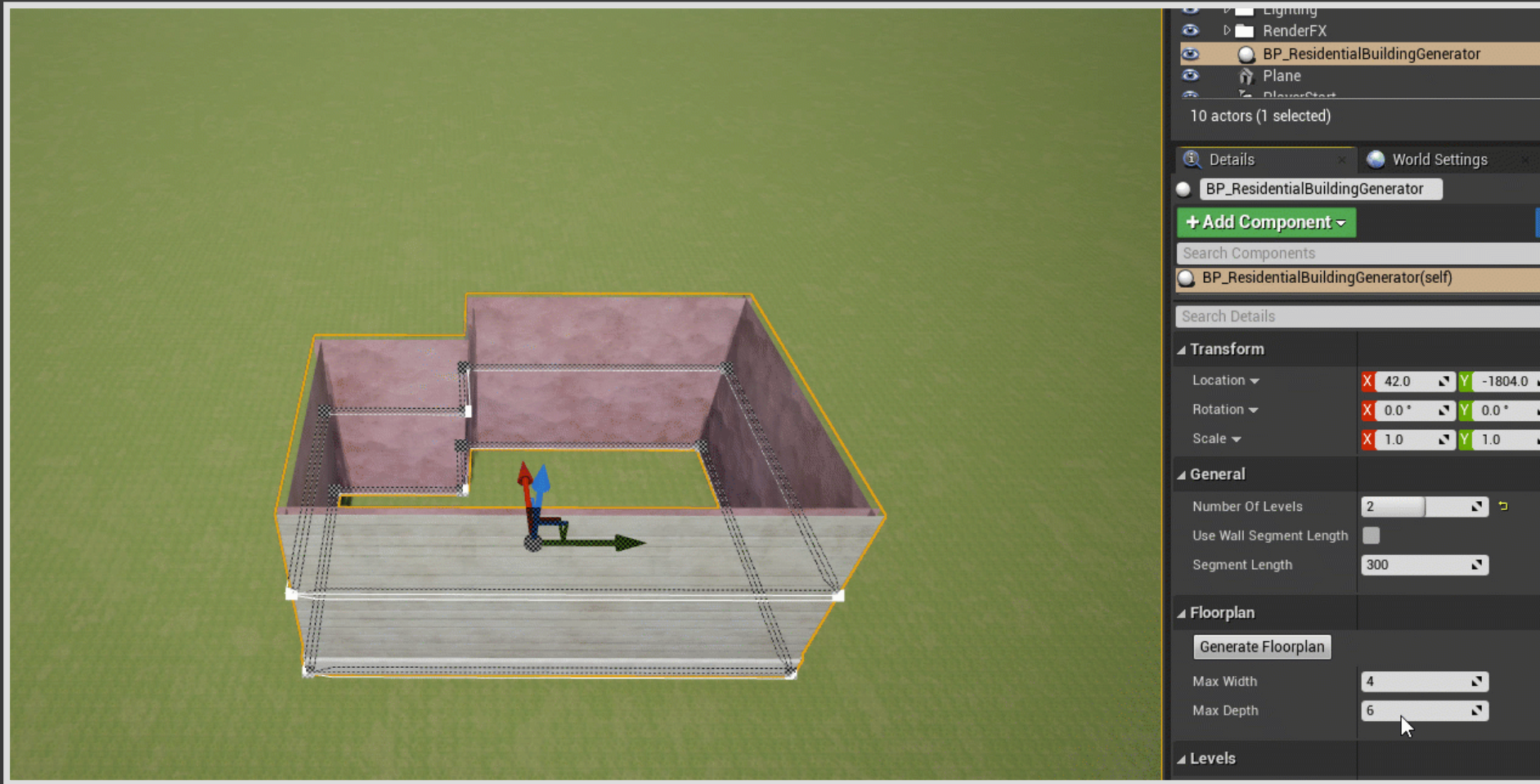
- Inverting Corners to take out pieces of the square
- The pieces have a random width and depth based on the length of the walls and an upper bound



Procedural Floorplan Generation [1st Floor]

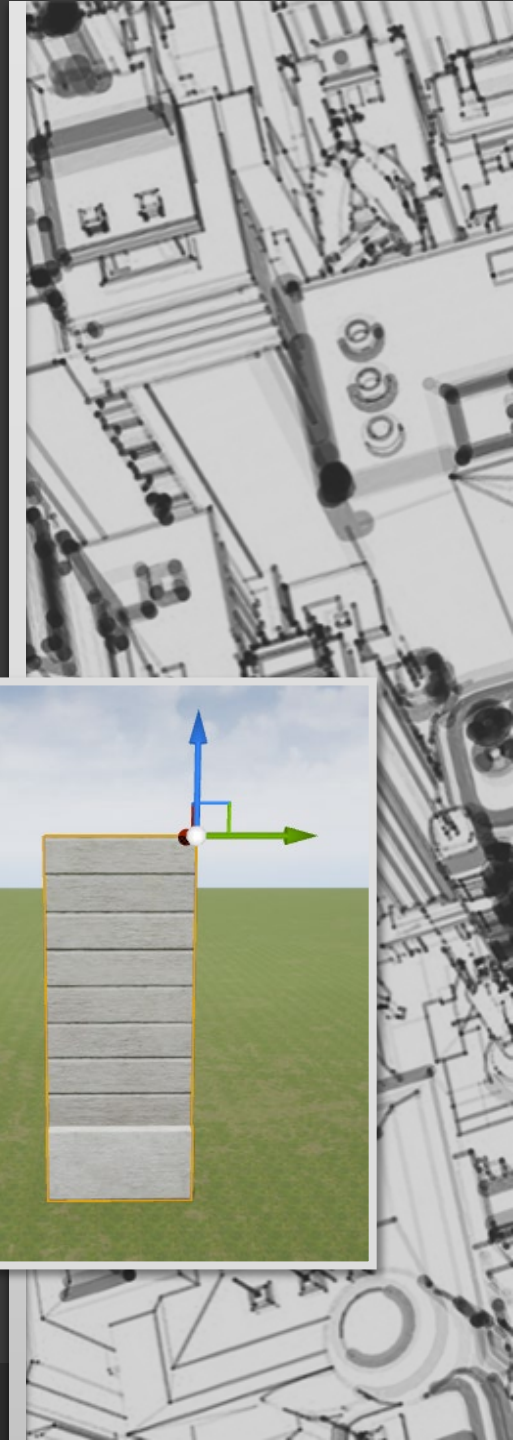
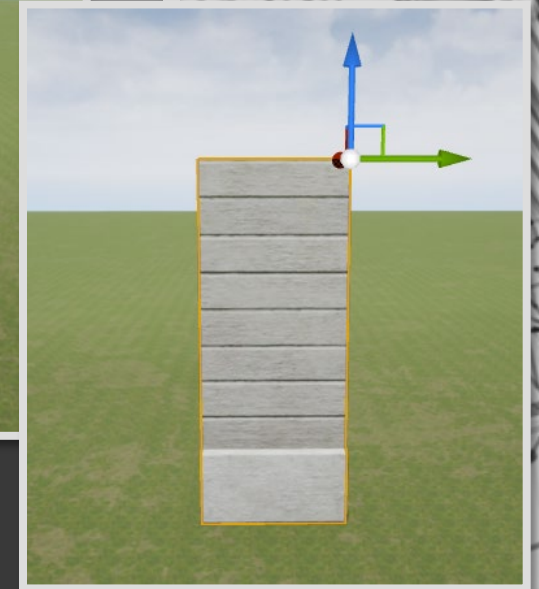
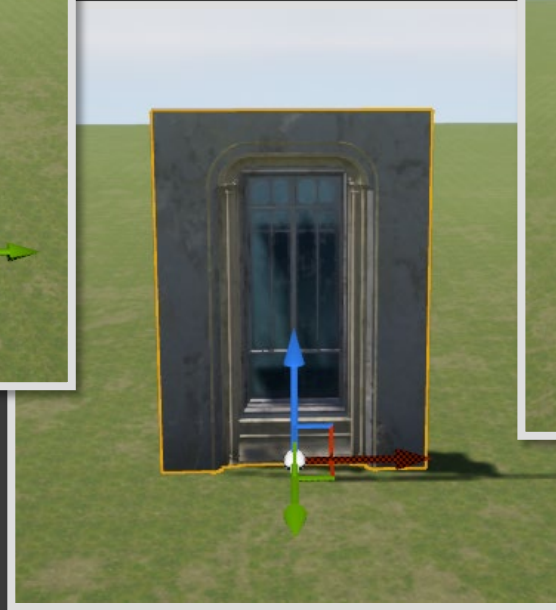
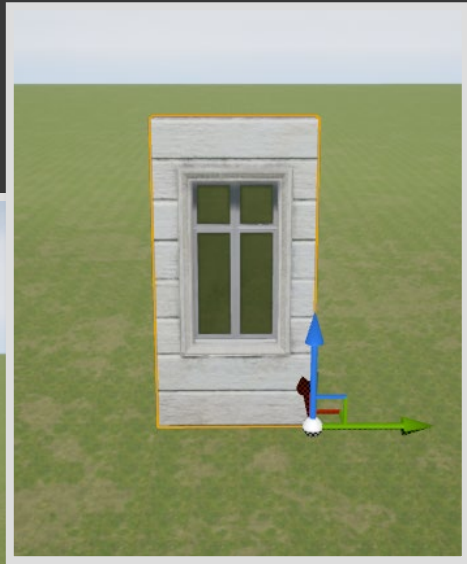
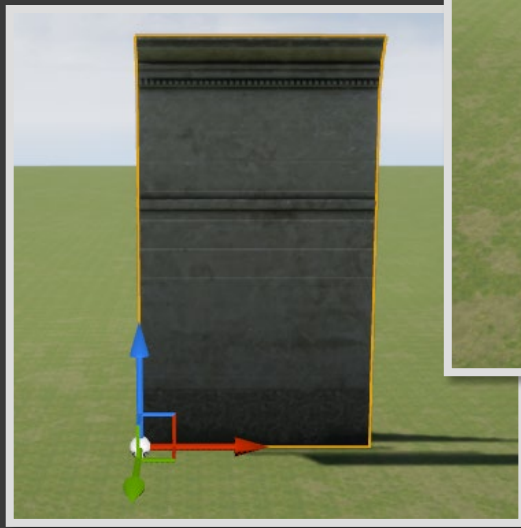


Procedural Floorplan Generation [2nd floor]

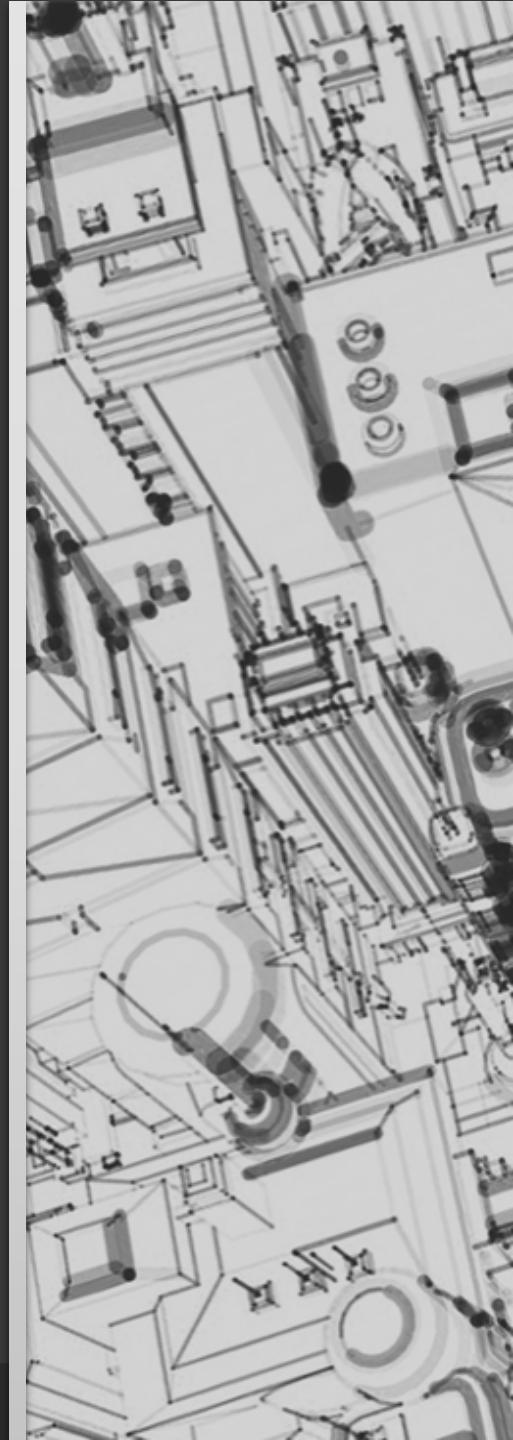


Mesh Struggles

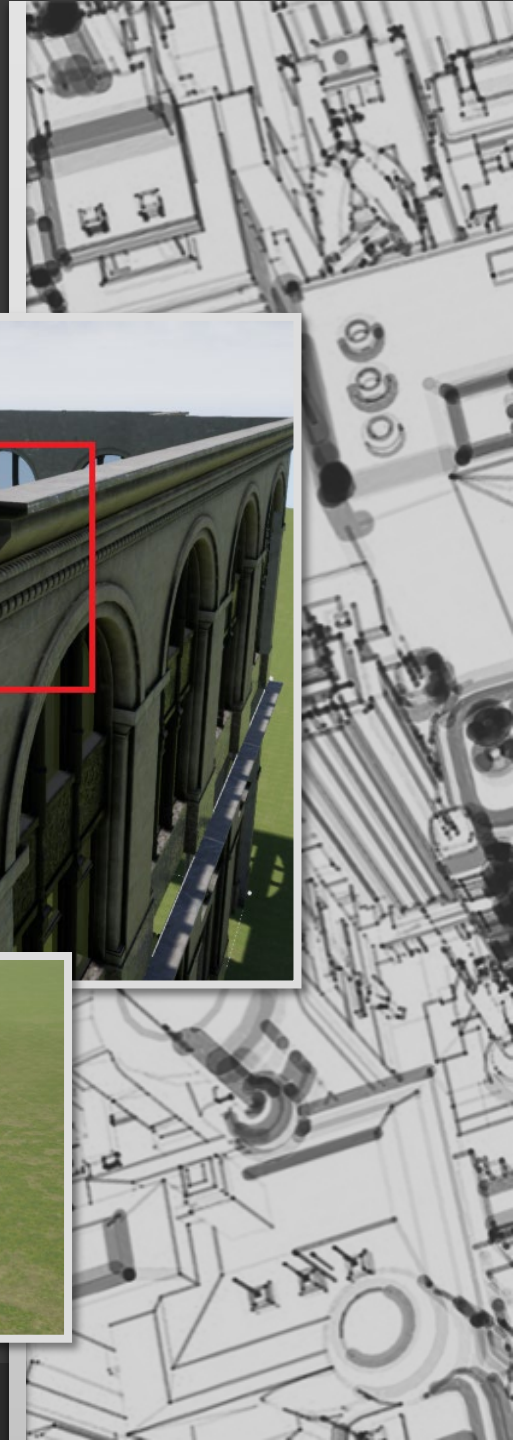
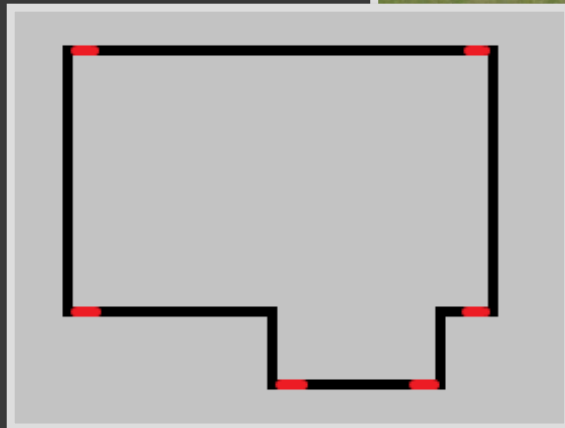
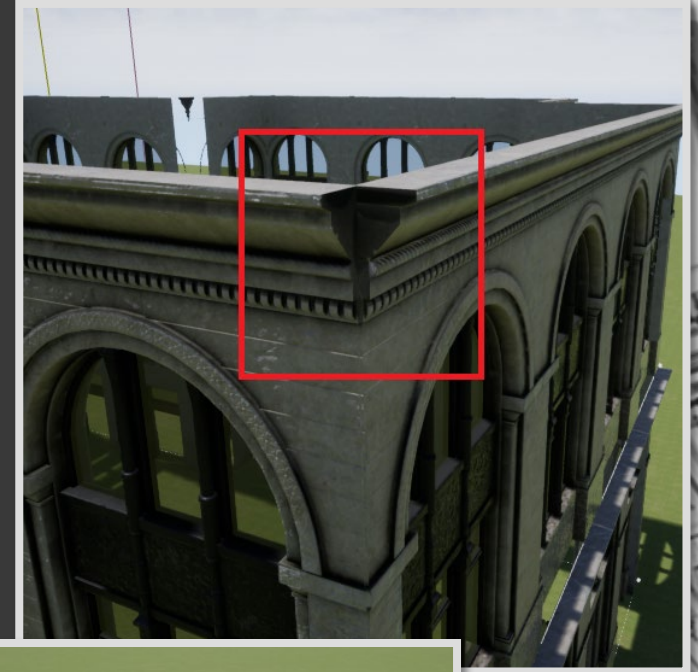
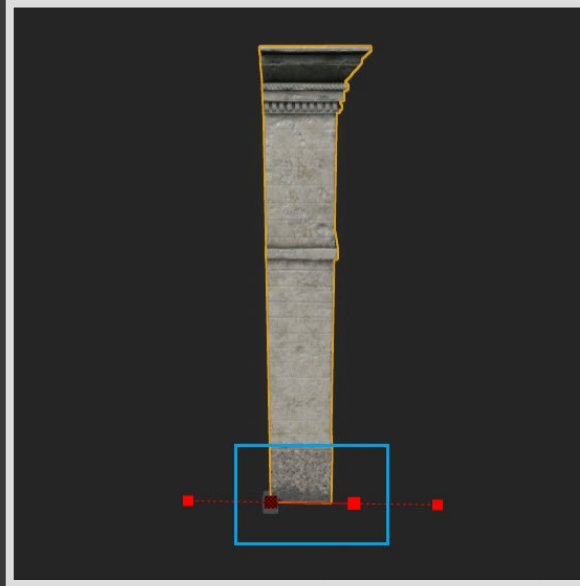
- Meshes have different pivot points



Mesh Solution

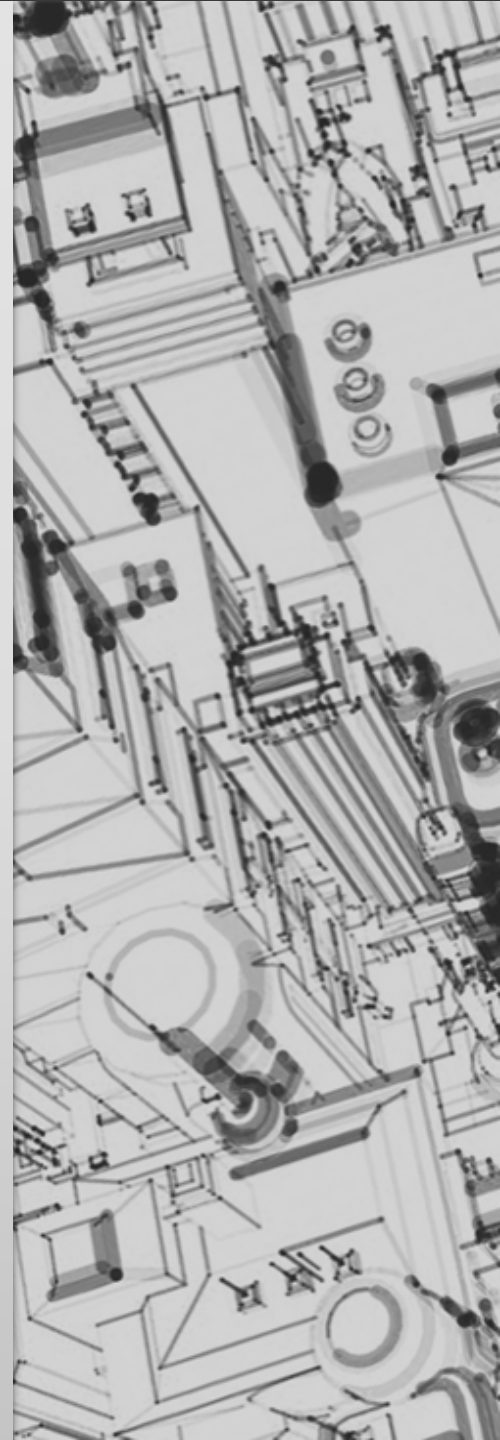
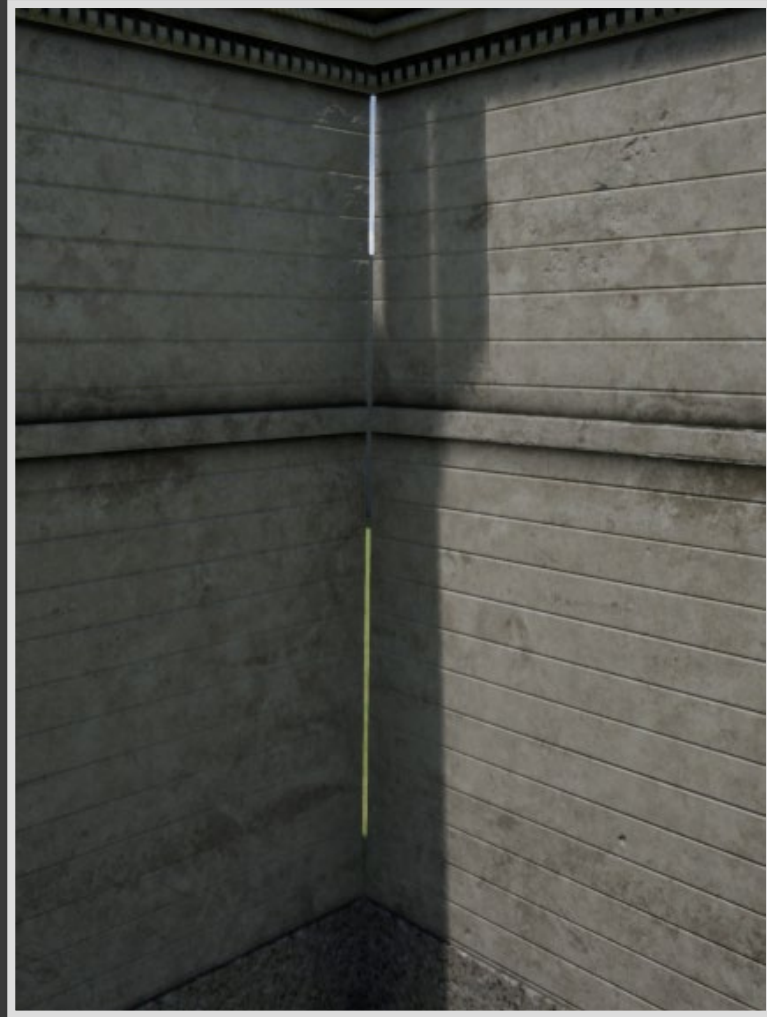
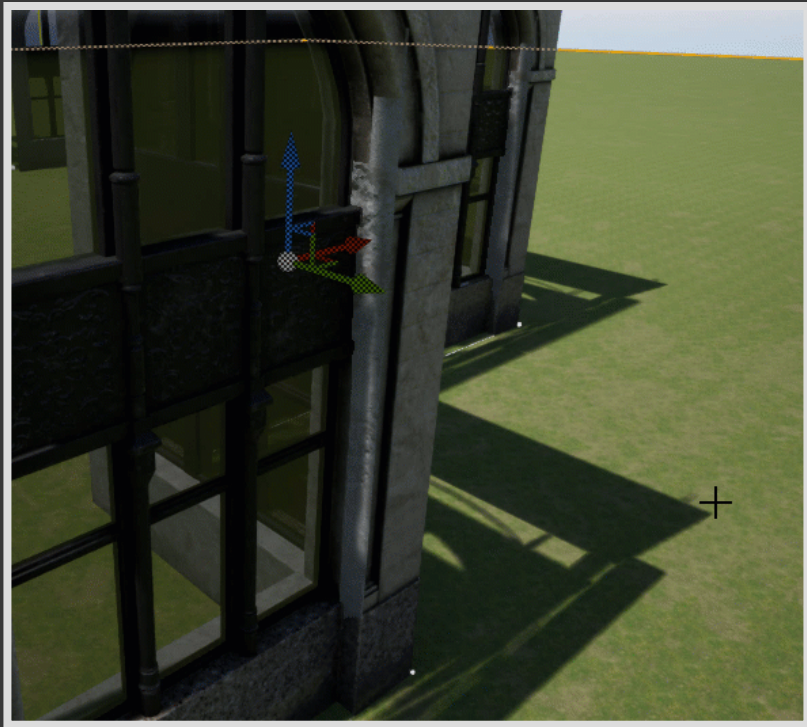


Corner Meshes

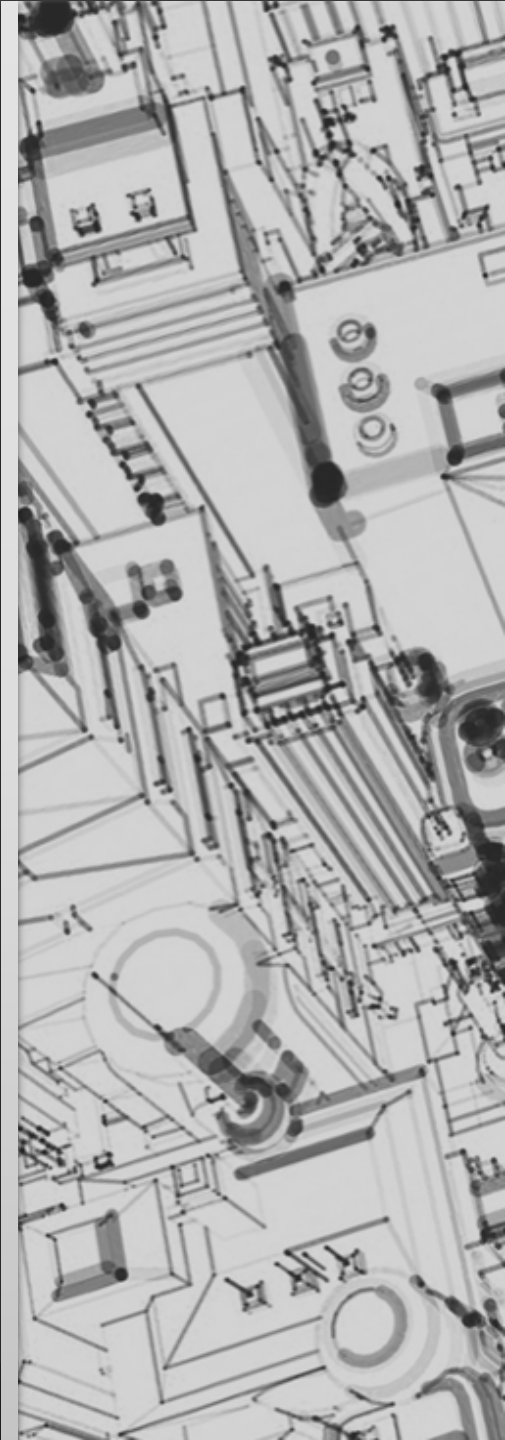


Other Struggles

- Z-fighting
- Gaps in corners



Demo



Schedule vs Progress

Original Schedule

Week 1
<ul style="list-style-type: none">▪ Collect modular meshes▪ Set up development diary▪ Start on generating footprints
Week 2
<ul style="list-style-type: none">▪ Finish building footprints▪ Generate walls▪ Extend to multiple levels
Week 3
<ul style="list-style-type: none">▪ Add controls for base size, stories▪ Start on placing windows and doors

Progress

Week 1
<ul style="list-style-type: none">▪ Collect modular meshes▪ Set up development diary▪ Set up the spline tool
Week 2
<ul style="list-style-type: none">▪ Find solution for different mesh pivot points▪ Implement a solution [ModularPiece class]▪ Generate walls
Week 3
<ul style="list-style-type: none">▪ Add controls<ul style="list-style-type: none">– Spline points segment size snapping– Dynamic segment size– Corners [removed later]



Schedule vs Progress

Original Schedule

Week 4

- Generate windows and doors
- Add windows/doors controls

Week 5

- Generate roof [Mansard, Hipped, Gable]
- Add roof controls
- Prepare for update presentation

Progress

Week 4

- Manually generating floorplans
- Multiple Levels

Week 5

- Procedurally generating floorplans
- Prepare for update presentation



Updated Schedule

Week 6

- Polish procedural floorplan generation
- Create a way of grouping meshes with the same style together
- Place windows/doors

Week 7

- Place windows/doors
- Generate roofs

Week 8

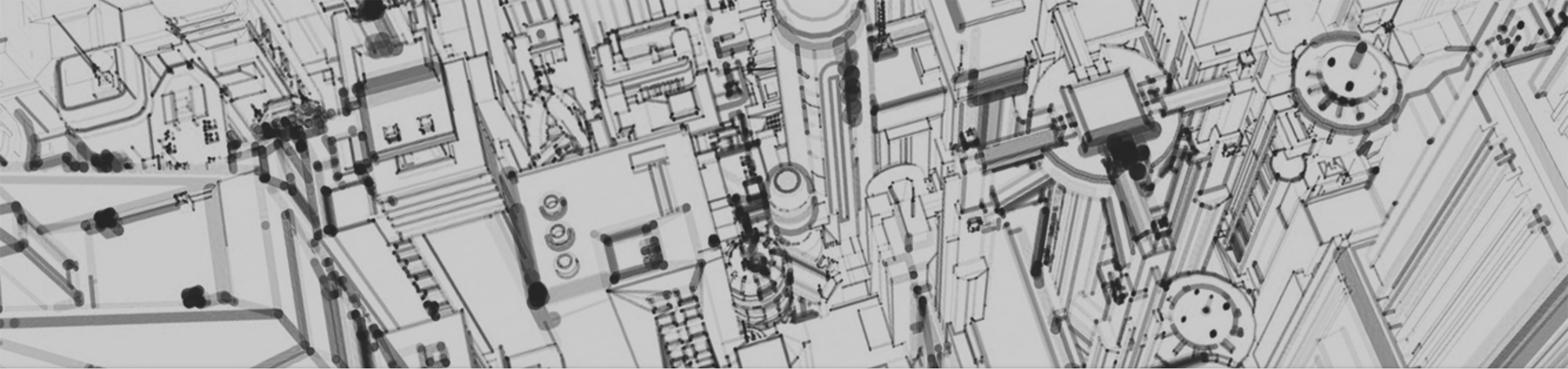
- Generate roofs
- Generate decorations [shutters, light fixtures, trims, fireplace chimney]

Week 9

- More decorations
- Save generated buildings
- Create two modes for generating high rise buildings and houses

Week 10

- Polish
- Prepare for the final presentation



Questions/feedback

