Exercise 3: Procedural Modeling-Building Readme File
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Houdini Version: 17.0.352

Important statistics:

Average render time: 32mins/frame
Resolution: 1280x720
Samples: 4
Noise value: 0.01
Min rays: 6
Max rays: 16
Diffuse (include time, resolution, samples, noise value, min/max rays – additional settings)
Number of lights in scene: Three (two sun lights and one environment light)
Complexity of geometry (approximate):

Points	27,200
Primitives	17,936
Vertices	86,168
Polygons	17,396
Packed Geos	540

Brief user's manual:
Width: The width slider controls not only the width of the building but also the number of the stores in the basement being alined on the width.
Depth: The depth slider controls not only the depth of the building but also the number of the stores in the basement being alined on the depth.
Floor: The floor slider controls the number of floor stacking in between the basement and the roof.
windowColumn: This slider controls the number of columns of the windows, as the number increases, the height of each windows decreases as to fit within floor.
windowRow: This slider controls the number of rows of the windows, as the number increases, the width of each windows decreases as to fit within the floor.
**windowGapH**: This slider controls the gap between each column.
**windownGapV**: This slider controls the gap between each row.
Chance_of_airconboxs: This slider controls the percentage of aircon boxes exist the building, each boxes will be placed randomly. (Noted: this slider does not support keyframe.)
Chance_of_supports: This slider controls the percentage of the support frames exist the building, each frame will be placed randomly. (Noted: this slider does not support keyframe.)

**Description of what you have done beyond the requirements:**
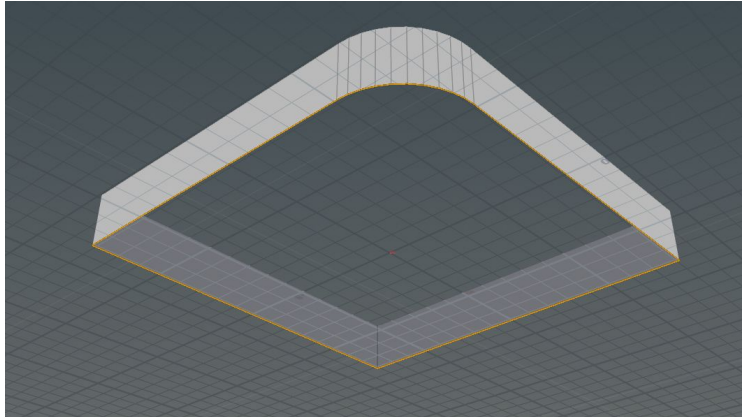
Curve - Due to the non-regular shape of the building I've chosen, I first beveled one of the edges on the box. Then I grouped this curve and deleted the edge that left only the points. I then used the sort tool to re-arranged the order of the points. The resample node is being used to evenly distribute the points. This curve played the HUGE role in later use, such as copying the windows, support frames and ac boxes along the curve. It's being used to create the shelter too, by extruding polygon from curve.
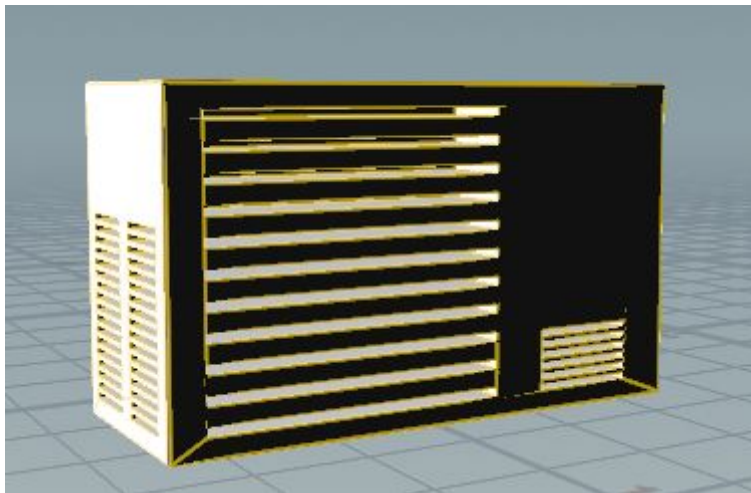

boolean: This is being used frequently on window frames, AC boxes and the roof.
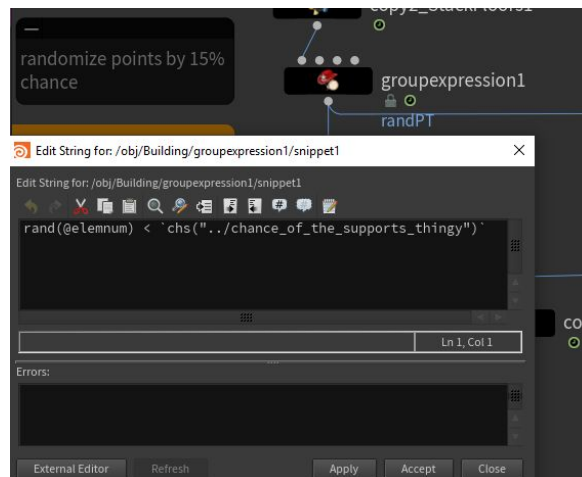
Groupexpression: This is being used on randomizing the number and position of AC boxes and support frames on the curve. The number is being control by the sliders (**Chance_of_airconboxs/supports**).
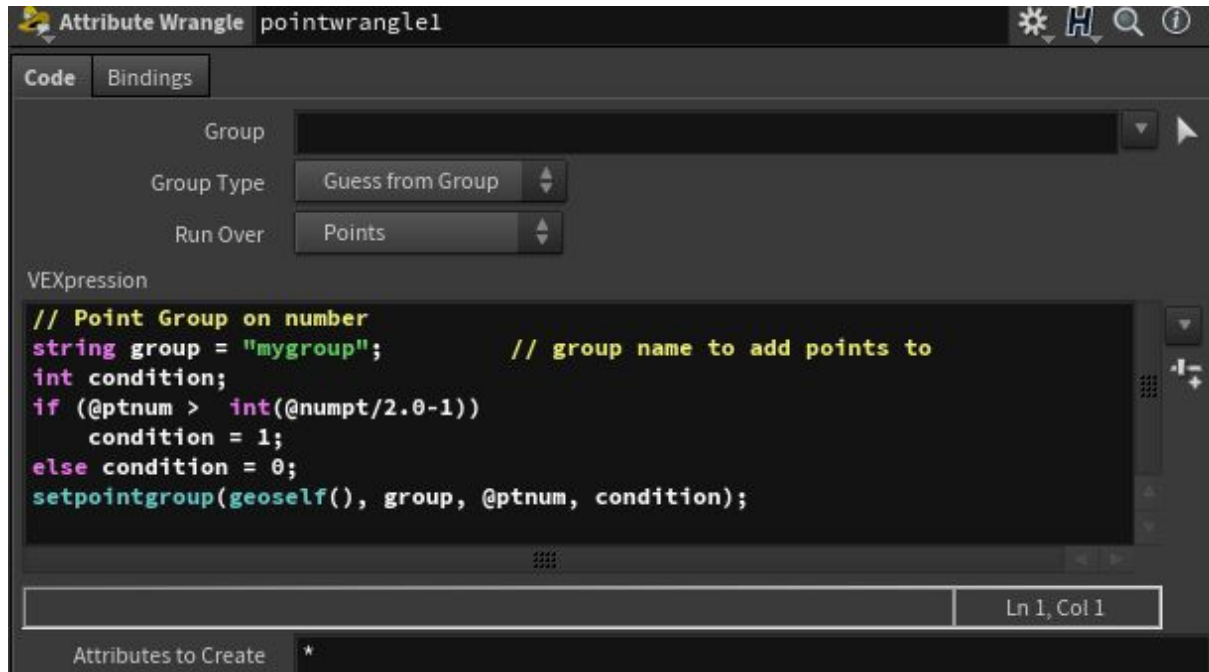
This expression is being used to group only half of the points(outer half) of the shelter, it would not be affected by the change of number of points afterward. I then moved the points lower to create the shelter like geometry. I used pointjitter to randomize the direction of the points on y-axis to create the wavy look of shelter.
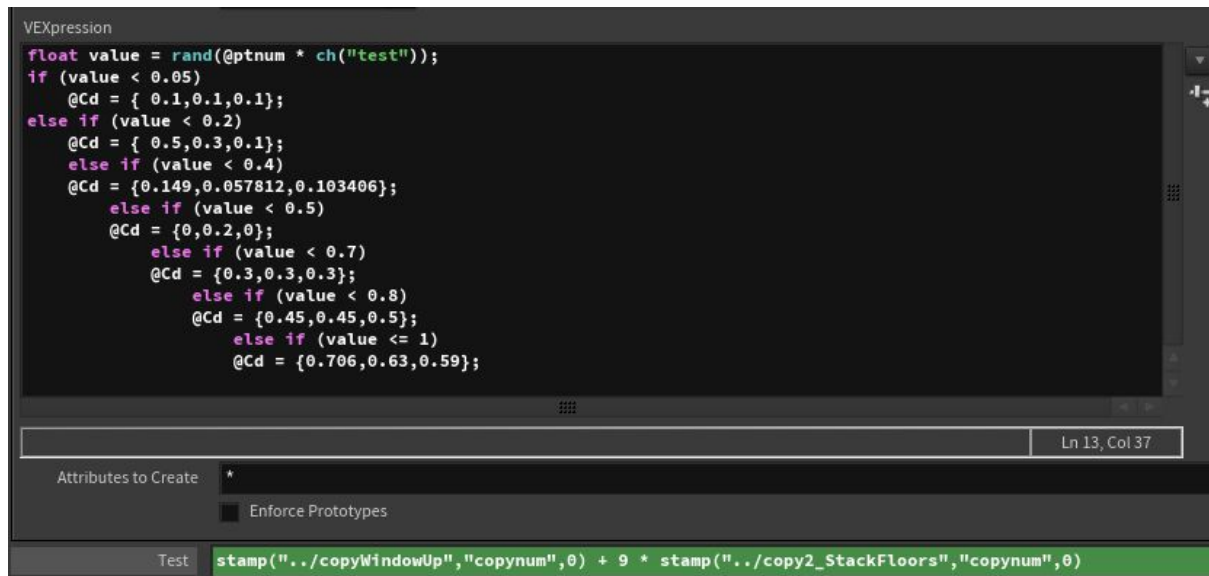
This expression is being used to randomize the color of the windows.
stamp("../copyWindowUp","copynum",0) is to first randomize the color of the windows on the same floor, it's added to 9 * stamp("../copy2_StackFloors","copynum",0) to prevent the first floor windows having the same color since the copynum($CY) for the first floor is 0 which would turn every result into 0 with multiplication. 9 was being multiply to increase the randomization. There are several colors are being assign to different result as shown.