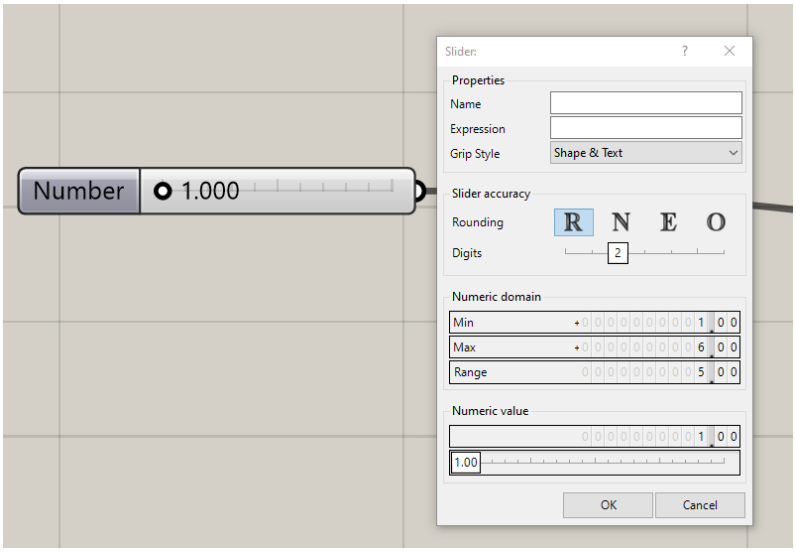
Preparing your Grasshopper Script for AI Training

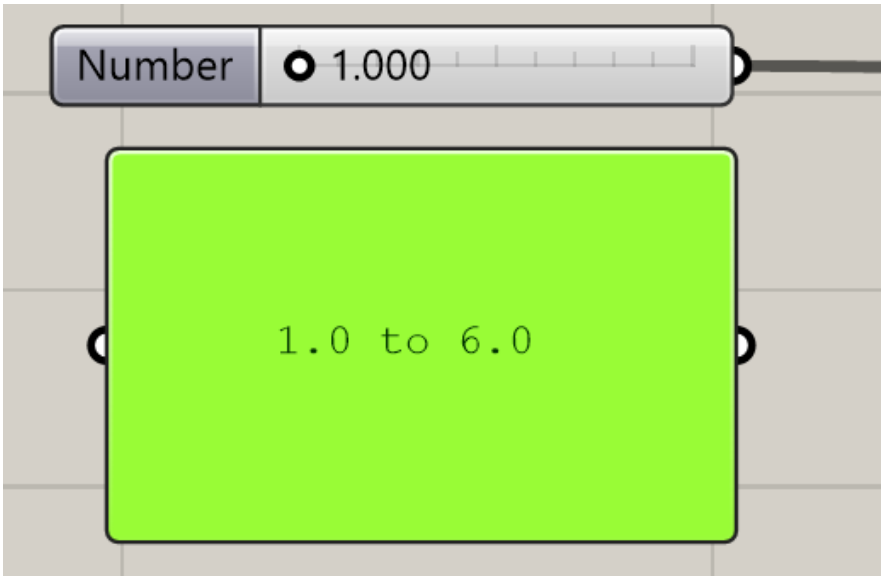
We need to export a lot of variations (around 3000) from our Grasshopper script so we can use these exported geometries to train a custom AI in the next class. Since exporting so many b< hand is not practical we need to automate the process. 3 Steps are needed to do so:

1. Replace all your input sliders with a single Master Slider

- Write down the Minimum and Maximum Value for each of your input sliders (in the picture example the slider goes from 1.0 to 6.0)

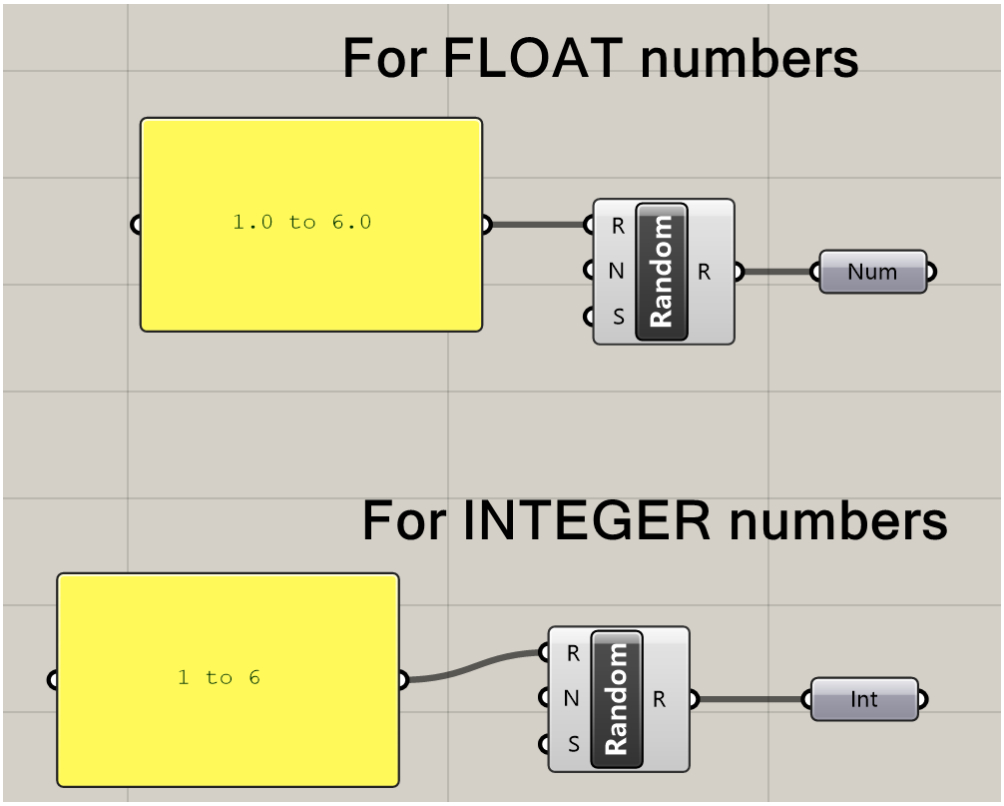


- Take a *panel* and make a domain out of the slider values by typing in the panel "*minimum value to maximum value*" (in picture example it is *1.0 to 6.0*)

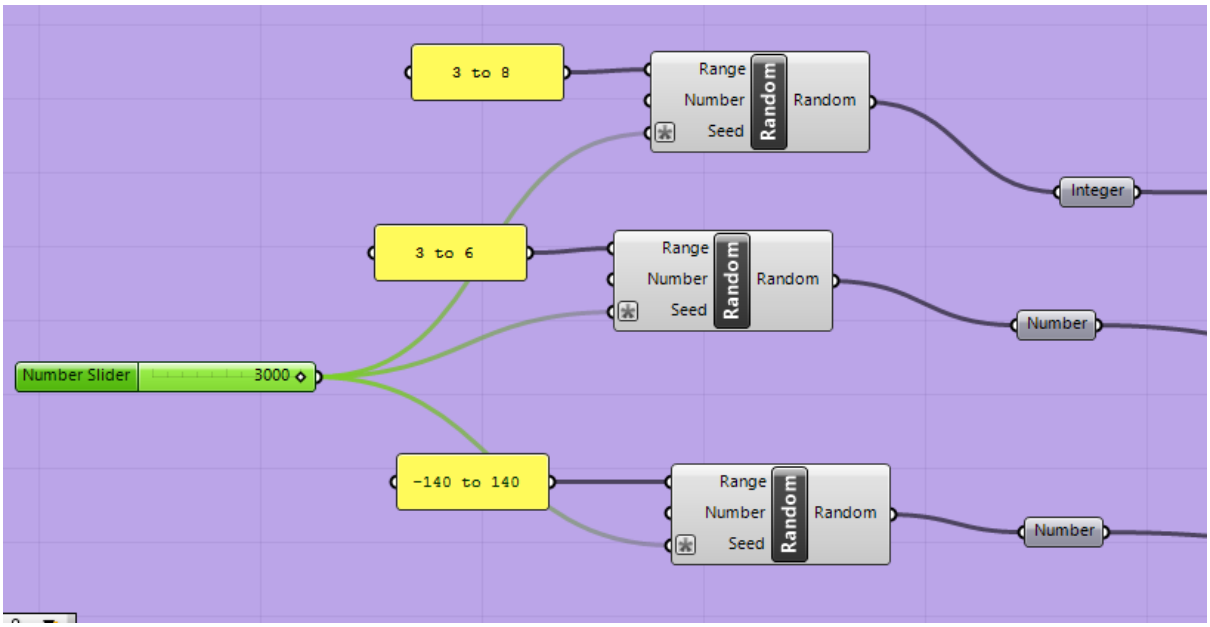


- Delete the slider. Take a *Random* component and connect the panel to the first input *(R/Range)*. If the numbers in the panel are float numbers (like 1.2) connect the *Random* output to a *Num* component. If the numbers in the panel are integer numbers (like 2) then connect the *Random* output to an *Int* component. Connect the output from the

Num/Int component to all the components the original slider was connected to.



- Repeat this procedure for all the number sliders in your script. Afterward make a new number slider: *right click -> edit*. Set *the rounding to N (integer)* and leave the minimum number at 0 and set the maximum number to 3000. You get a slider between 0 and 3000. Connect this slider to all the *S/Seed inputs* of all the *Random* components. If you move this single slider every time your Grasshopper script should generate a new random variation. Make sure this works reliably. If sometimes the script breaks you might need to adjust the numerical ranges in the panels.



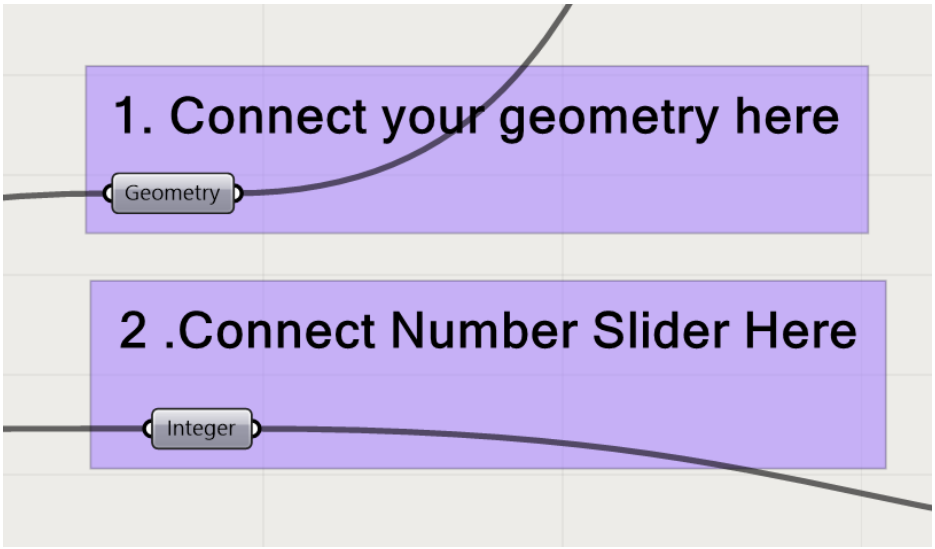
2. Setup the export of the Output Geometry

We now need to export all the 3000 random variations of your grasshopper script in a special data format which we can use for AI training! To do so download the GH_Export_Script from the TeachCenter and open it in Grasshopper and copy everything into your own Grasshopper file.

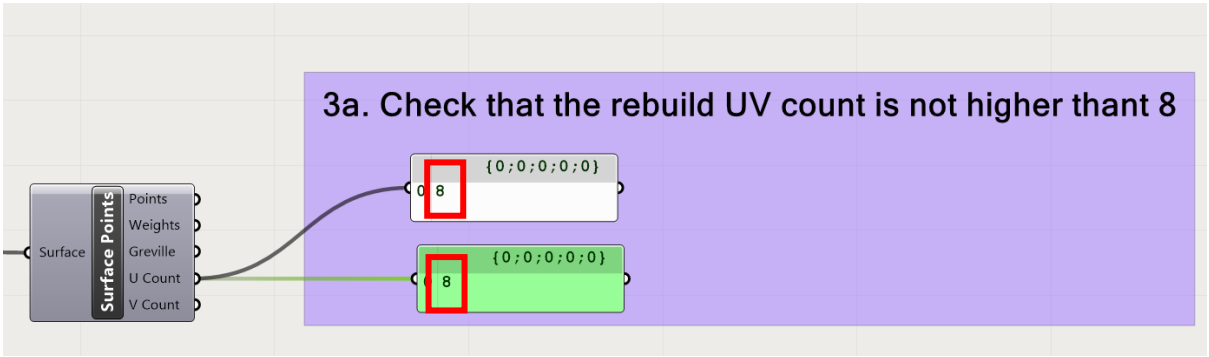
IMPORTANT: This grasshopper script only works with **Rhino 8** (so if you do not have Rhino 8 on your computer you need to work in the computer lab)

After copying the export script into your Grasshopper file follow these six steps:

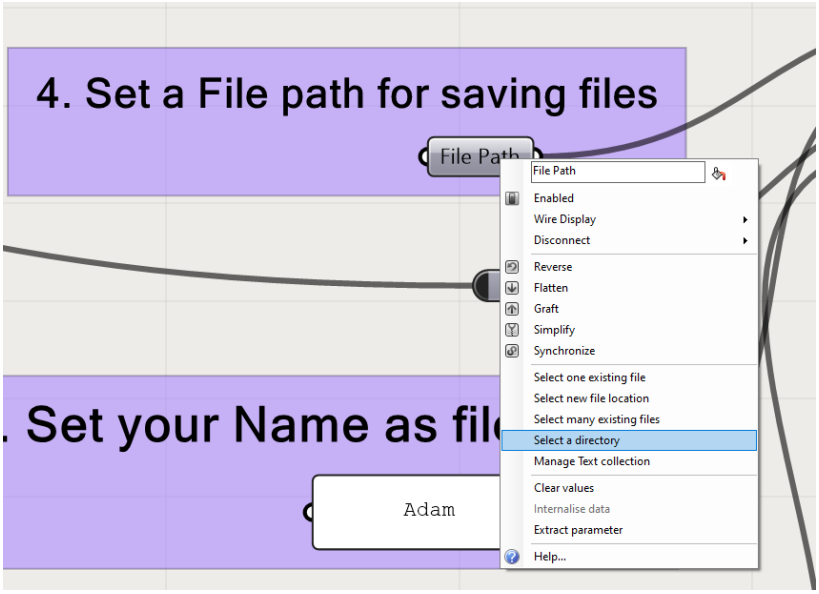
1. Connect your geometry output to the *Geometry* component of the export script
2. Connect your single slider to the *Integer* component of the export script



3. The export script rebuilds your geometry (similar to using the *Rebuild* command from Rhino) It is important that each rebuild surface or poly-surface does NOT exceed an **UV count** of higher than 8. Go to the 3a. component of your script and make sure that both uv counts are not higher than 8 (move your slider around to make sure that the number does not go over 8 with different variations) – if this works you can move to point 4. If at some point the uv count is higher than 8 go to 3b. there decrease the number in the panels until the final uv count is not higher than 8.



4. Create a new folder on your computer where all the data will be saved. Name it *Your_Name_Export*. Right click on the File Path component in Grasshopper -> *Select directory*. Navigate to the new folder you just created and select it. Press *select folder*



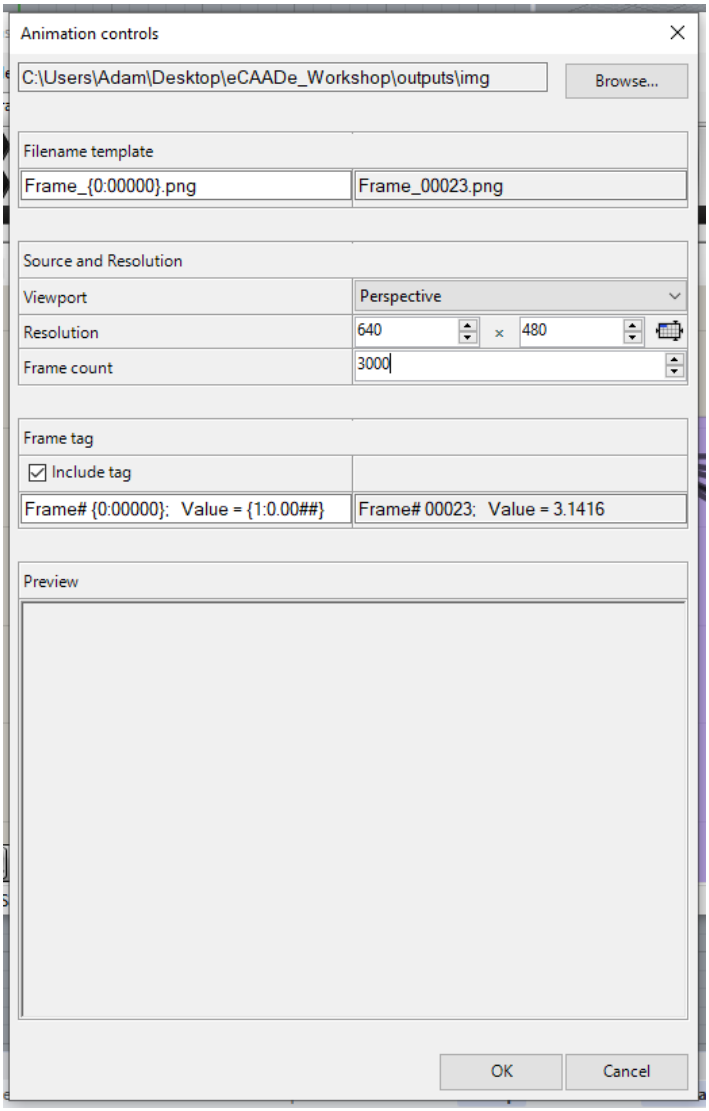
5. Type your name into the panel. This will be the file name of your output files
6. Click on the Boolean toggle (on the word *false*) until it turns to *true*

If everything is set up correctly in your newly created folder there should be a new file which is named: *yourName_someNumber.npy* Move your number slider around to make a new geometry. Check the export folder. There should now be more new files. If this works you can now move on to automatically exporting all 3000 geometries.

3. Export All geometries

We will export all 3000 geometries with Grasshoppers Animate functionality, which automatically moves the slider for us while taking screenshots of each geometry.

- Create a new folder where the screenshots will be saved (you can delete this folder right after the export of the files)
- Right-click on your number slider ->*Animate*
- On the top click *Browse* and select the folder where the screenshot will be saved
- In the *frame count* type in 3000
- Click *OK*
- The slider will now move automatically and the export folder with the .npy files will fill up. Wait until the process is complete. Afterwards check your export folder to make sure you have around 3000 .npy files (if there are a few 100 less than 3000 this is also fine)
- Delete the folder with the screenshots. Keep the folder with the .npy files


Animation controls
C:\Users\Adam\Desktop\eCAADe_Workshop\outputs\img
Browse...
Filename template
Frame_{0:00000}.png
Frame_00023.png
Source and Resolution
Viewport
Perspective
Resolution
640
x
480
Frame count
3000
Frame tag
Include tag
Frame# {0:00000}; Value = {1:0.00##}
Frame# 00023; Value = 3.1416
Preview
OK
Cancel