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Small Assignment 4:

For this assignment, we were given the opportunity to design a model that could hold some value as a regular household object using what we have learned thus far.

I came into this project with a very different mindset. In the past, I was used to just throwing down different input values into the code that generated the model until something stuck. I felt personal development but did not have the same feeling of authorship that I do with other art forms. Taking that into account and using my classmates’ wonderful projects as inspirations, I wanted to try to be more creative when initially starting. My idea was to make a shelf that I can display a plant, figurines and/or my previous prints on top. With our previous experience with the Vessels project, this was the perfect way to build upon previous projects. I credit much of this code to the examples we have gone over within class. Although I used a large amount of recycled code, I feel more authority and creative development as a computational fabricator within this project.

Step-by-step guide:

First open Rhino and Grasshopper. Within Grasshopper, create a new GhPython Script. There will be multiple integer input values and each value could utilize a number slider to individualize the stand. The first input values will control the number of side/facets the stand has. Height will control how tall the stand is, and the radius top/mid/bottom integers control size of the bottom, middle and top section of the stand below the flat shelf. Lastly, the top width and top facets will control the width size and the number of sides/facets of the top shelf. The Python script utilizes three main functions. polyPoints, which creates a set of points based on the input from the sliders. topPolyPoints, which has the same functionality of the polyPoints, but creates a shelf-like polygon, instead of a smaller stand-like one. The polygon function is the last and these first checks if the program is creating the stand of the top shelf and then creates points and lines through each point to create a solid object for each polygon. These are used to create Polyline curves within Rhino to generate some great models. You will be able to view the Python script within the Zip file or with the image below.

Next, the creation of a solid base and the merging of the shelf, stand, and that base must occur. By using the Offset Curve, List Item, Boundary Surfaces and Extrude Grasshopper object, a solid base for your stand will be created. The thickness of the surface will be available for the user to decide by right-clicking on the Extrude input *D* and selecting “Set One Vector”. After that is selected, the user can go into Rhino and select a vector to a size of their liking. Both the base of the stand and the top shelf of the stand are created the same way, giving the user the freedom to choose the thickness of each part of the model and the overall shape of the stand. Using Loft and Cap allows for the PolyLines created from the stand list will become one solid object with a capping around the stand. Since there is an issue on the output type, the user must remember to flatten the stand list whenever passing it through the List Item block and the Loft Block from the Offset Curve block. After the stand has been lofted and capped, a Solid Difference block must be used to properly make the two stand lists into a singular list with no overlaps or duplicated. The flattened list must be subtracted by the un-flattened list. Lastly, the user can now use the Merge object in Grasshopper to merge the base, stand, and top shelf of the model and the Solid Union object to make the models into one consistent piece of unionized objects. This will allow the user to make a cool looking shelf that they can display anything on.

After the object is created in Rhino, the user can choose to find which model they want to print. When slicing the model, the user should turn the model upside down, so they start with the top shelf printing and then the stand. This allows for the removal of having any supports for the print and avoids the struggle of hoping the stand does not fall over.

I appreciate how creative this project allowed me to be and by having a more open mind approach to this project let me expand my knowledge and ideas. I was able to come up with the idea for my final project with this assignment. There were two plans I had for this project, the first was this stand and the other required more time is what I am going to do for our final project for the class. Overall, I had a great time with this project, I now have a cool shelf that I can display anything on, and an idea of how I can do something great for my final project. I am looking forward to that and seeing my classmates amazing projects and creativity!