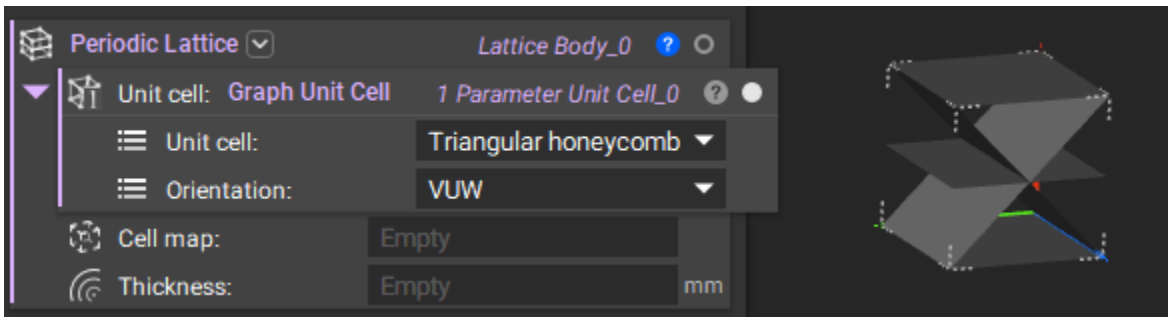
Follow Along: Creating Ribs

In this lesson, we will walkthrough different ways to creating ribbing using our Periodic Lattice block. If you are unfamiliar with lattices, we recommend reviewing our Intro to Latticing Course which covers these topics in greater detail.

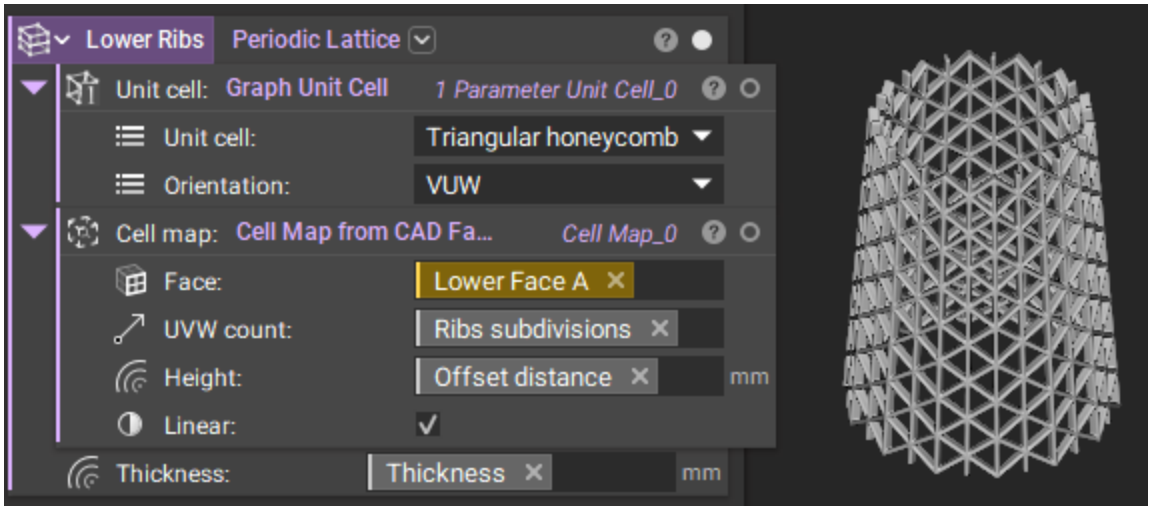
Please download the nTop file below to follow along with the tutorial.

The starter file already has our geometry section completed as well as the inputs we will use for our ribbing.

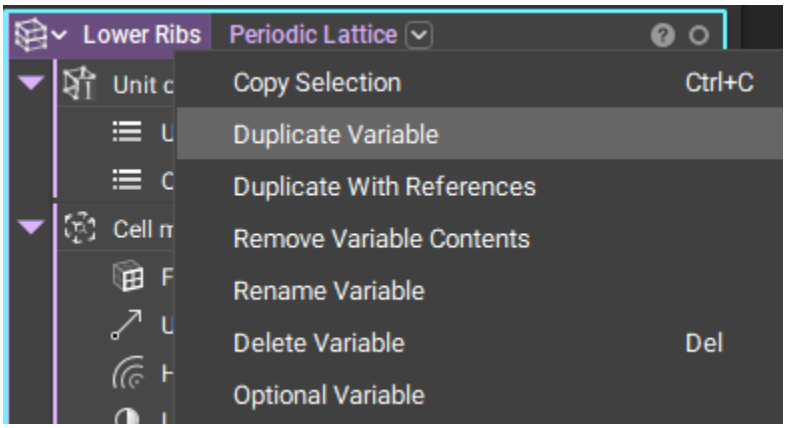
Step 1: First, add the **Periodic Lattice** block into the CAD Face Method section of the notebook. Double click on the unit cell input to add a **Graph Unit Cell** block. We will use the triangular honeycomb option as the unit cell.

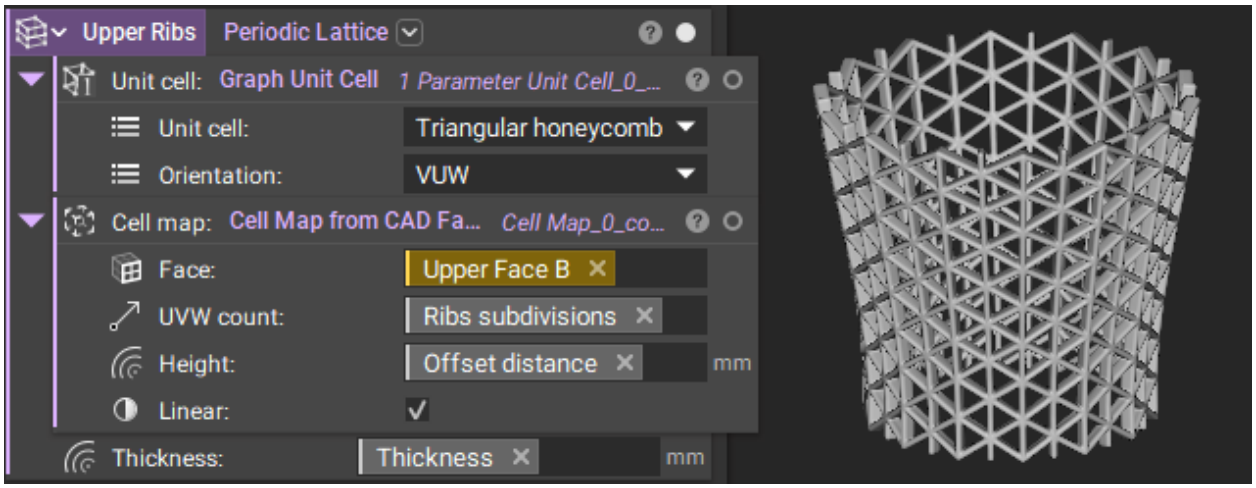


Step 2: Double click on the cell map option and choose the **Cell Map from CAD Face** block. For the face, choose the “Lower Face A” variable in the geometry tab. For the UVW count, drag and drop the “Rib subdivisions” (a variable in the input section). For height, drag and drop the “Offset distance” variable from the top of the notebook. For thickness, drag and drop the “Thickness” variable into that input. The linear option should be checked. Right click on the **Periodic Lattice** block and make this a variable. Label this “Lower Ribs”.

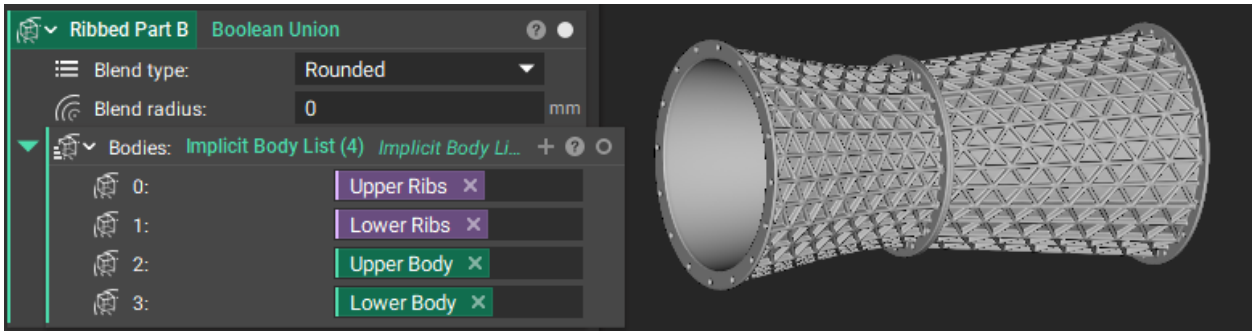


Step 3: To create the upper ribs, right click on the “Lower Ribs” and choose the Duplicate Variable option. Delete the “Lower Face A” variable in the Face input and replace it with the “Upper Face A” variable. Double click on the name of that variable and relabel this as “Upper Ribs”.

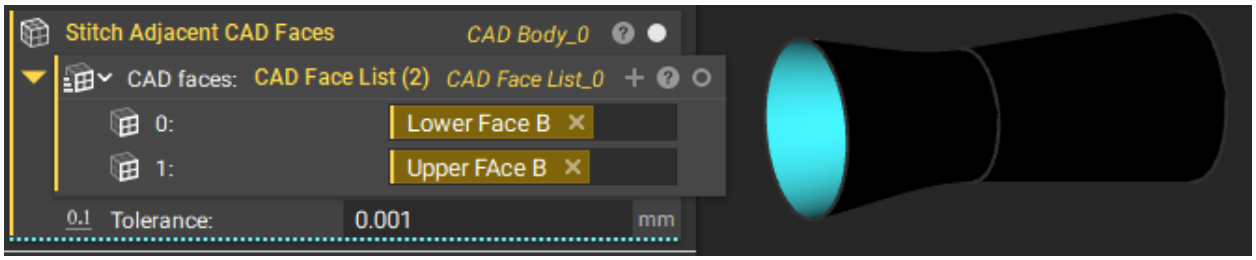




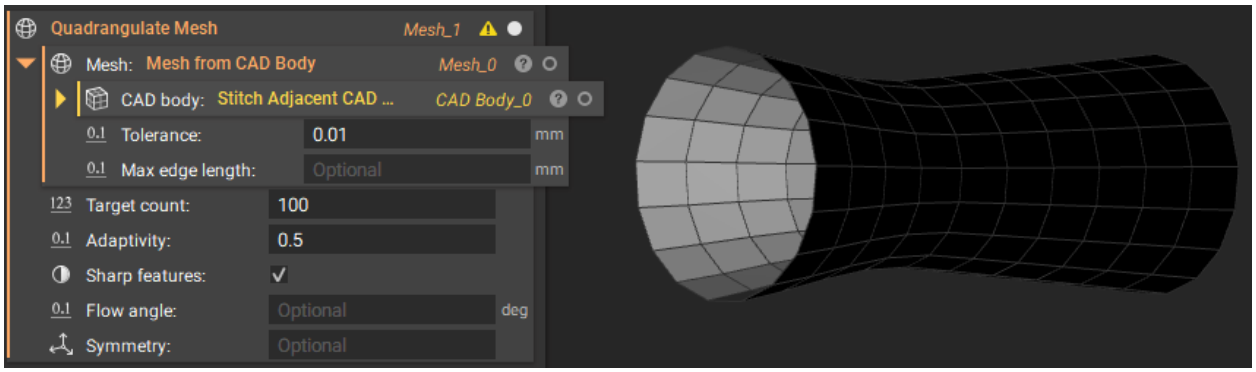
Step 4: Use the **Boolean Union** block to combine the “Lower Ribs”, “Upper Ribs”, “Lower Body” and “Upper Body”. Right click and make this a variable labeled “Ribbed Part”.



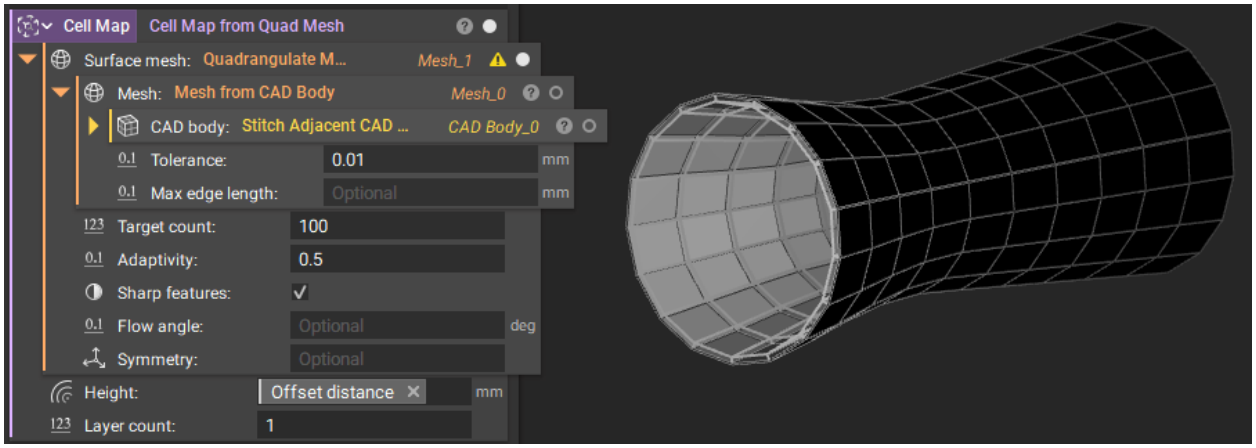
Step 5: If you are working with multiple CAD faces or a mesh, we will use the **Cell Map from Quad Mesh** block to create ribbing on the inner faces (Lower and Upper Face B). First, add a **CAD Face List** block in the Mesh Method Section to stitch the”Lower Face B” variable and the “Upper Face B” faces. Then, place this block in the **Stitch Adjacent CAD Faces** block.



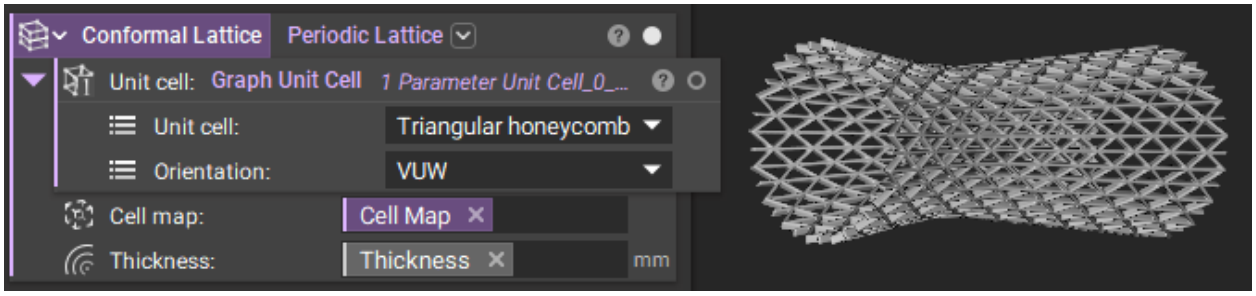
Step 6: Convert the stitched CAD faces to a mesh using the **Mesh from CAD Body** block. Place the mesh in a **Quadrangulate Mesh** block with a target count of 100. The cells will be placed where we have those quads in the quad mesh.



Step 7: Add a **Cell Map from Quad Mesh** block to your notebook and place the **Quadrangulate Mesh** block into the **Surface Mesh** input. For the height, place in the “Offset distance” block and use a Layer Count of 1. Right click on this block and make this a variable labeled “Cell Map.”



Step 8: Add a **Periodic Lattice** block to your notebook. Use the **Graph Unit Cell** block with a Triangular Honeycomb as the unit cell. For the Cell Map input, use the “Cell Map” variable made above and the “Thickness” variable for the thickness input. Right click and make this a variable labeled “Conformal Lattice”.



Step 9: Use the **Boolean Union** block to combine the Conformal Lattice, the Lower Body and the Upper Body. Right click and make this a variable labeled “Ribbed Part A”.