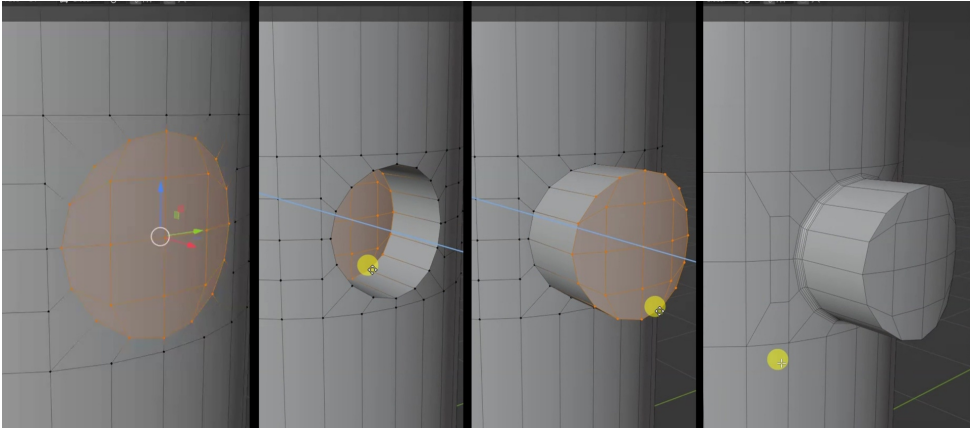


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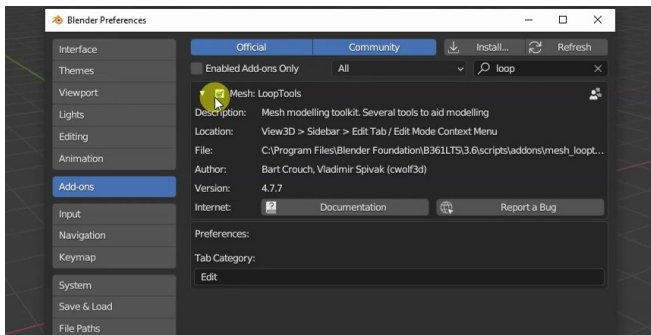
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Hello everyone!

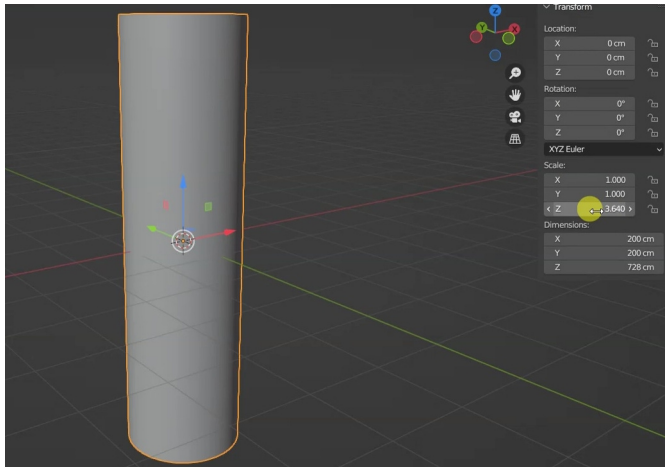
This is a basic videotutorial on how to use **the Circle operator** from the **LoopTools** Add-On, particularly to correctly create circles on curved surfaces, making it easy to perform extrusions both outward and inward on objects.

The tutorial was created using Blender 3.6, but the LoopTools Add-On comes with Blender from several versions of the software; however, by default, the Add-On is disabled, so first we need to find and activate it in the **Add-Ons** tab of the Preferences window.

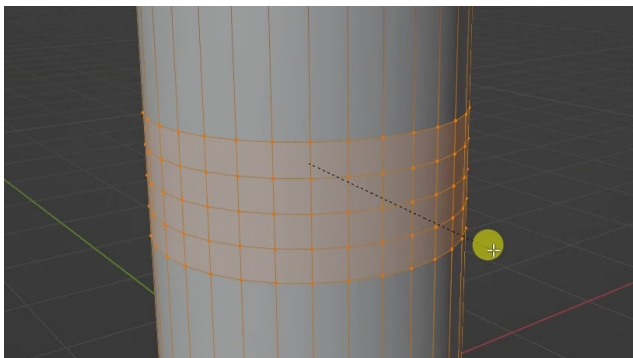


After activation, the operators provided by LoopTools will be available by **right-clicking on a mesh object in Edit Mode** to open the contextual menu.

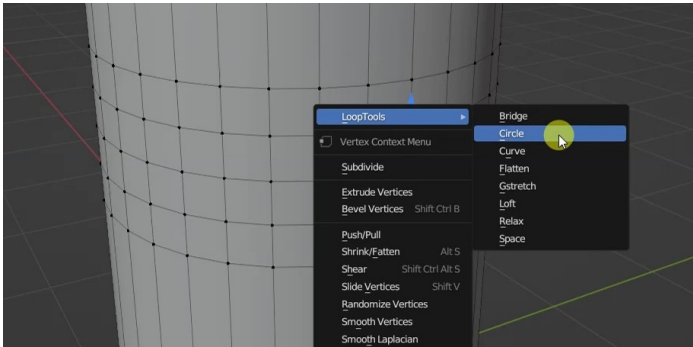
Among the various operators, there is Circle. To show you an example, I'm using a cylinder that I'm intentionally **scaling** along its Z axis in Object Mode. I'm doing this operation because shortly I will show you a small issue and its solution.



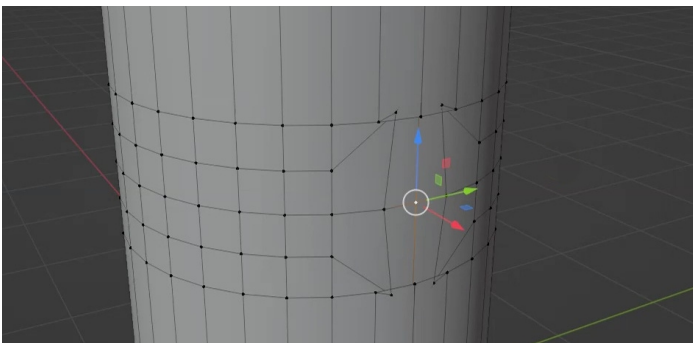
I'm inserting cross cuts with **Ring Cut** to have some vertices to round off. It's important here that the faces are as square as possible to achieve a good result later on. You can proceed, for example, with just one Ring Cut, to be placed where you want to make the hole or the extrusion, and then perform the **Beveling** of that cut to obtain the other necessary cuts.



The Circle operator also works **on a single vertex**: indeed, it's possible to select a vertex, right-click, and choose **Circle** to see the surrounding vertices rounded off.



After performing this operation, however, we notice at least a couple of problems.

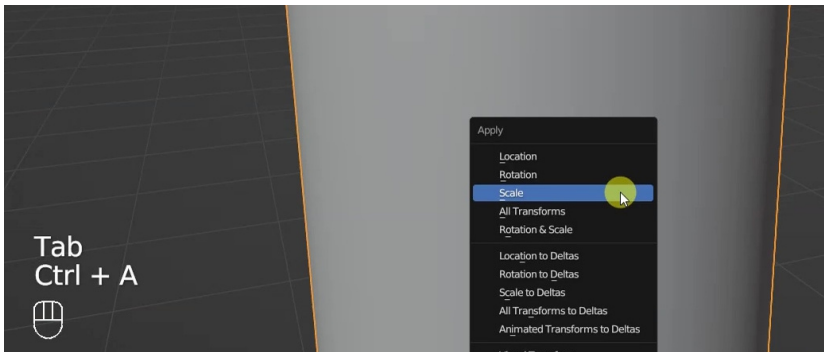


The first problem, quite evident, is that we haven't obtained a circle, but an **oval**, even though the faces that made up the geometry were quite square.

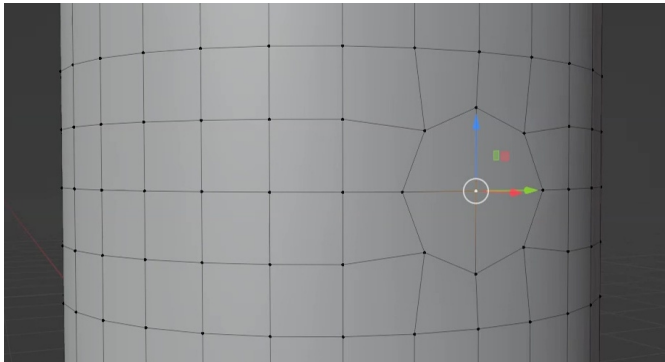
This problem is due to the fact that **I resized the cylinder in Object mode** without subsequently applying the **Scale** transformations, so the Circle operator will create a **non-uniform rounding**.

To solve this problem, all we need to do is **apply the Scale transformations** to the object before using LoopTools Circle.

So, I undo the performed operations, switch to **Object** mode, apply the **Scale** transformations with **CTRL A** and **Apply Scale**...

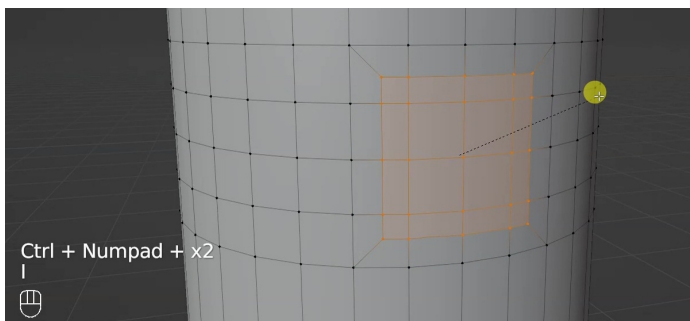


... then return to Edit Mode and use **LoopTools Circle** again, this time achieving the desired result.

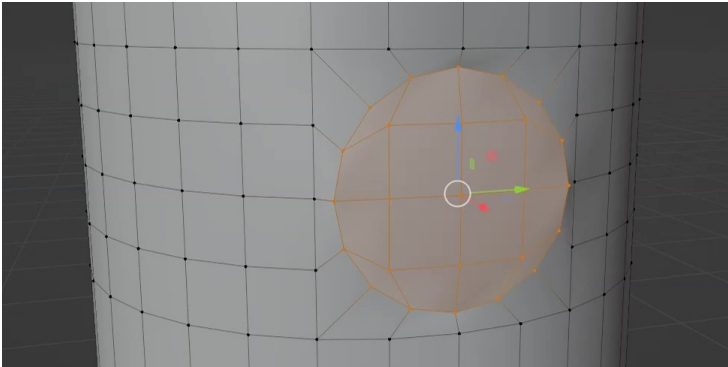


The second problem is that rounded vertices introduce deformations that could get problematic later on, so it would be better to round a more limited set of vertices.

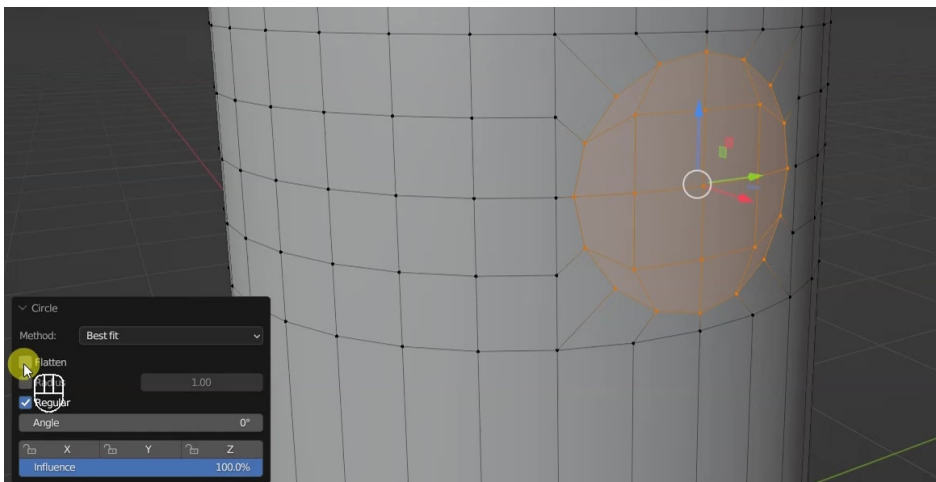
To solve this problem, once again, we undo the effect of LoopTools Circle, then **select the faces within which** we want to create the circle and **press I**, which is the shortcut for the **Inset** operator, in order to get a new set of faces within the selection.



Now, we can **use LoopTools Circle again**, this time on the newly obtained selection, to achieve a good rounding... but another problem arises: the newly obtained faces are flat, meaning they do not follow the curvature of the cylinder.

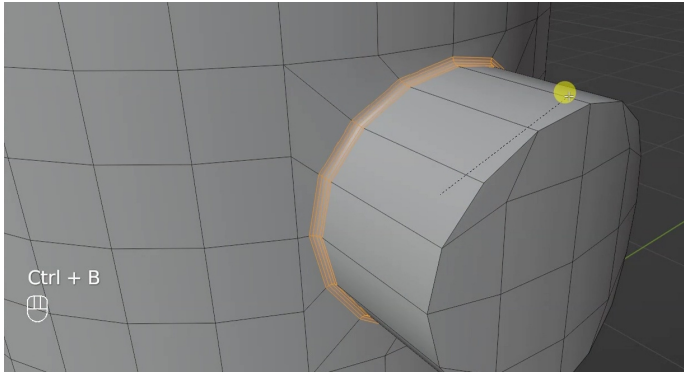


The solution to this problem is immediate... I mean that this operation needs to be performed **immediately** after using Circle: it's necessary to open the operator's menu and **deselect the Flatten checkbox**.

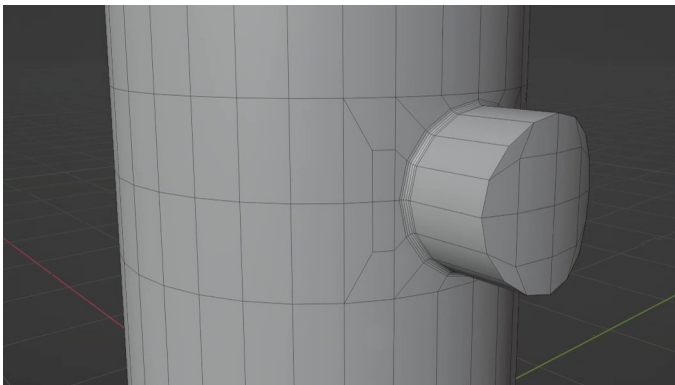


LoopTools Circle is an operator, so the tab will be available immediately after applying the operator but **will disappear after performing another operation**, so **Flatten** needs to be deselected immediately.

Now, the geometry obtained can be extruded inward or outward from the object; moreover, it's possible to use Bevel on the rounded edge ring to create a smoother transition at the base of the extrusion.



Before closing this tutorial, a small observation: in an object like this one, **all those cross cuts** outside the area subjected to Inset are **unnecessary** and can be removed using some **retopology** techniques.



As you may have guessed, this operator works well for circles on simple surfaces: for holes or extrusions on more complex surfaces, it's better to resort to **Shrinkwrap**, but that's another topic... Let me know in the comments if you want me to make a tutorial on that tool, too.

For this tutorial, that's all! I hope it has been helpful to you!  
See you soon!