User Interface Software Projects

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INF 134 Winter 2013

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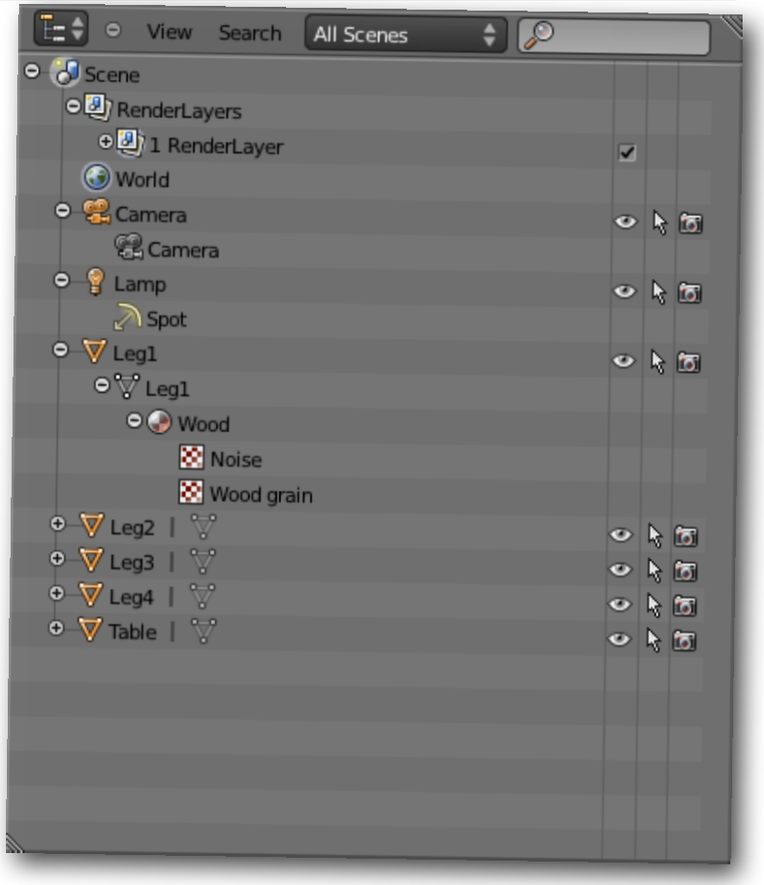
Intro to Blender

http://wiki.blender.org/index.php/Doc:2.6/Manual

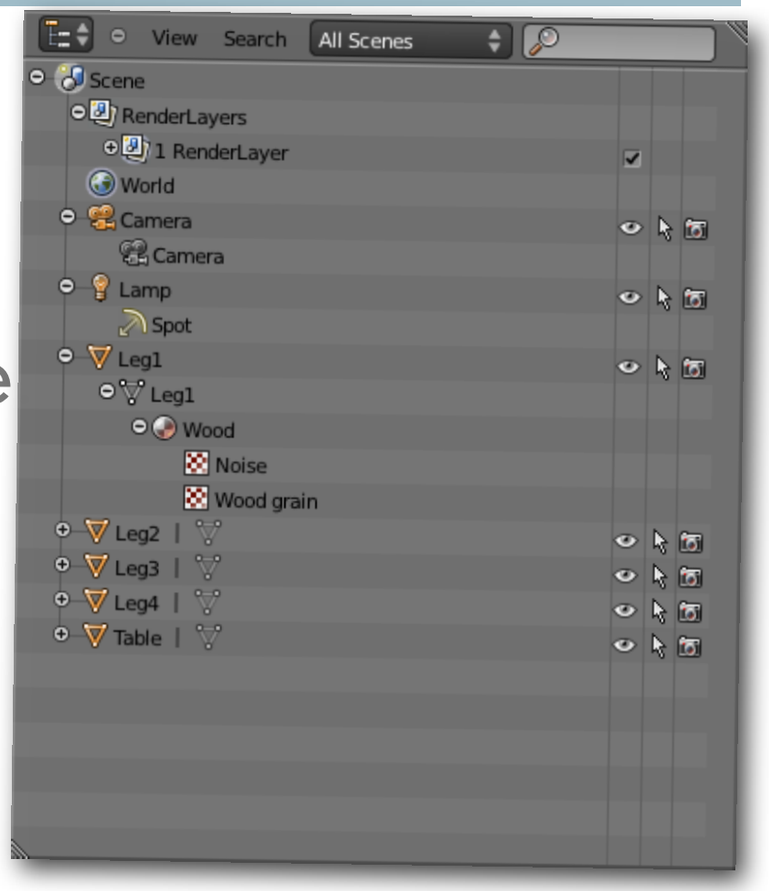
MicroLesson #4
Modifiers

The Outliner Window

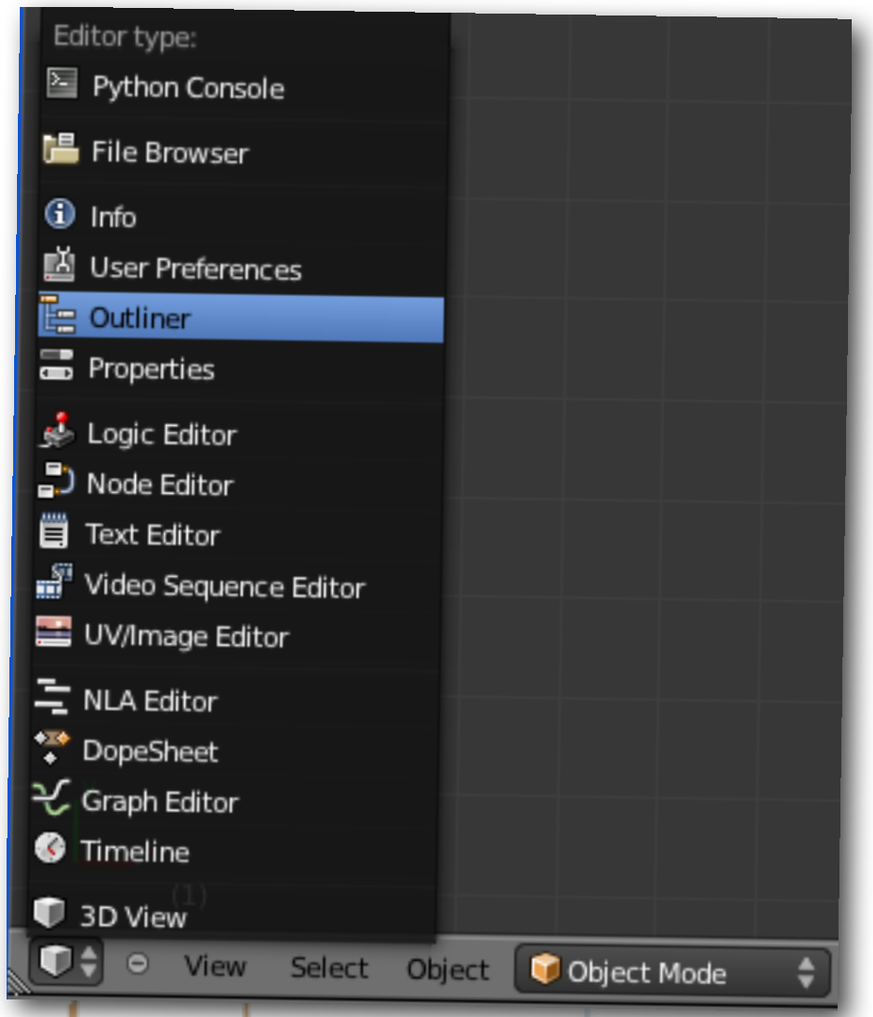


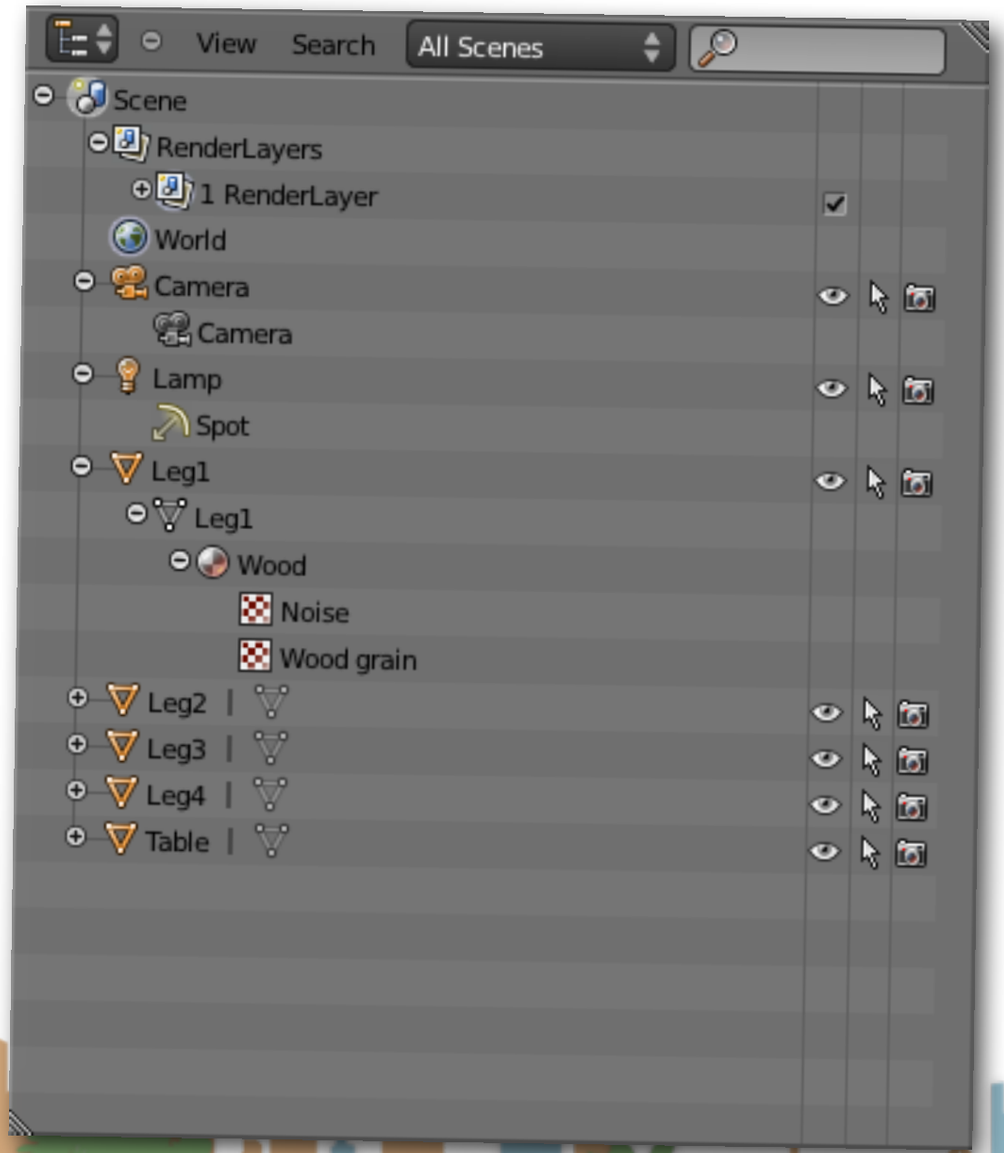
The Outliner Window

- A list that organizes things related to each other.
  - View the data in the scene.
  - Select and deselect objects in the scene
  - Hide or show an object in the scene.
  - Enable or disable selection (to make an object “unselectable” in the 3D Views).
  - Enable or disable the rendering of an object.
  - Delete objects from the scene.
  - Examine hierarchical objects



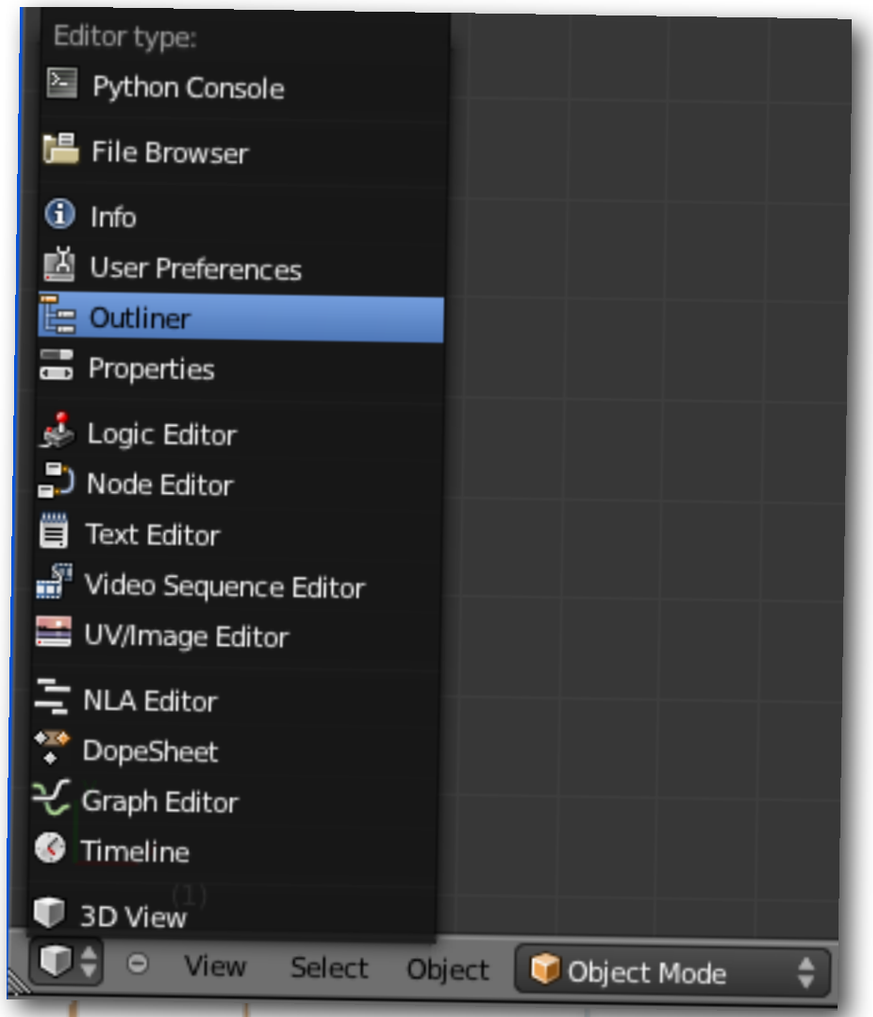
The Outliner Window

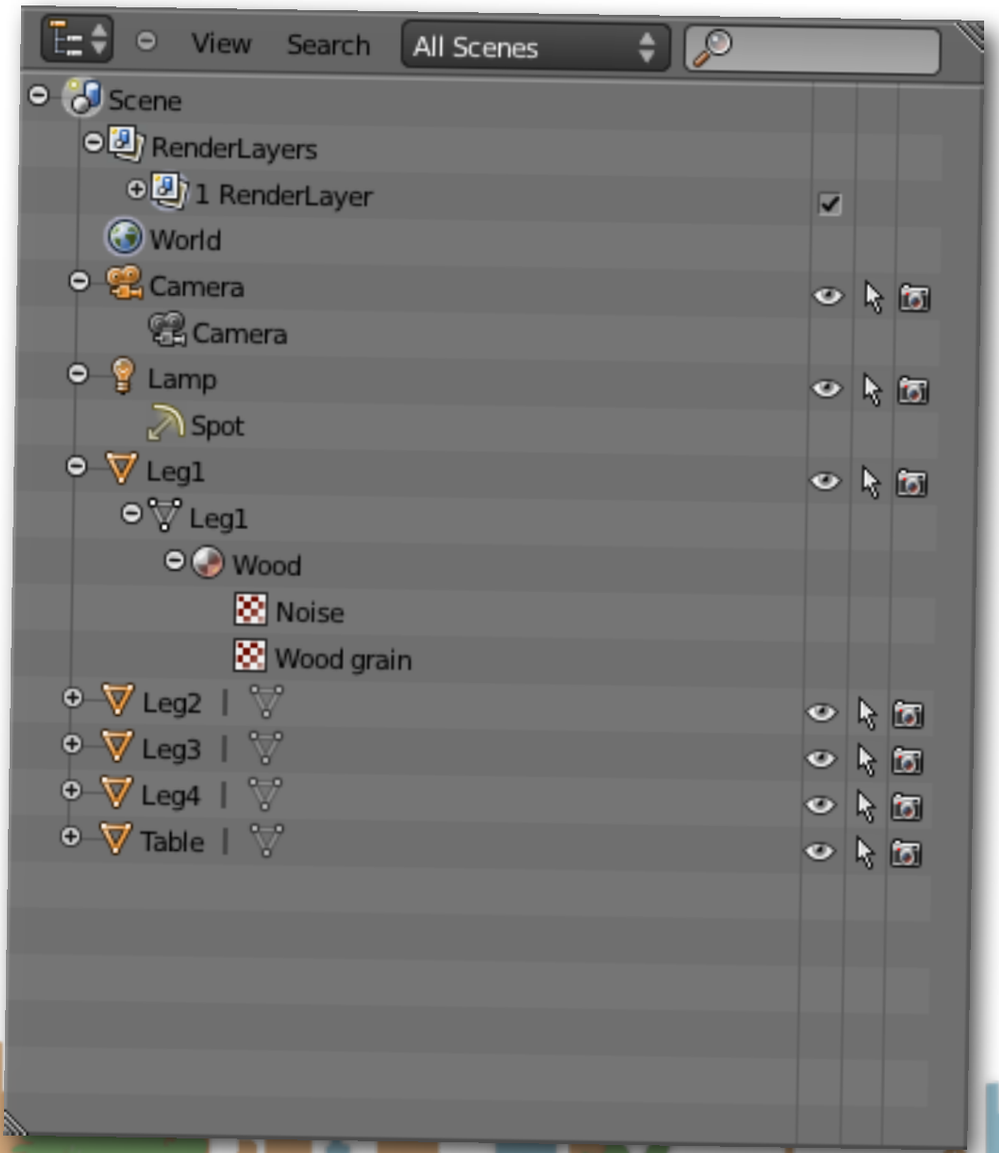




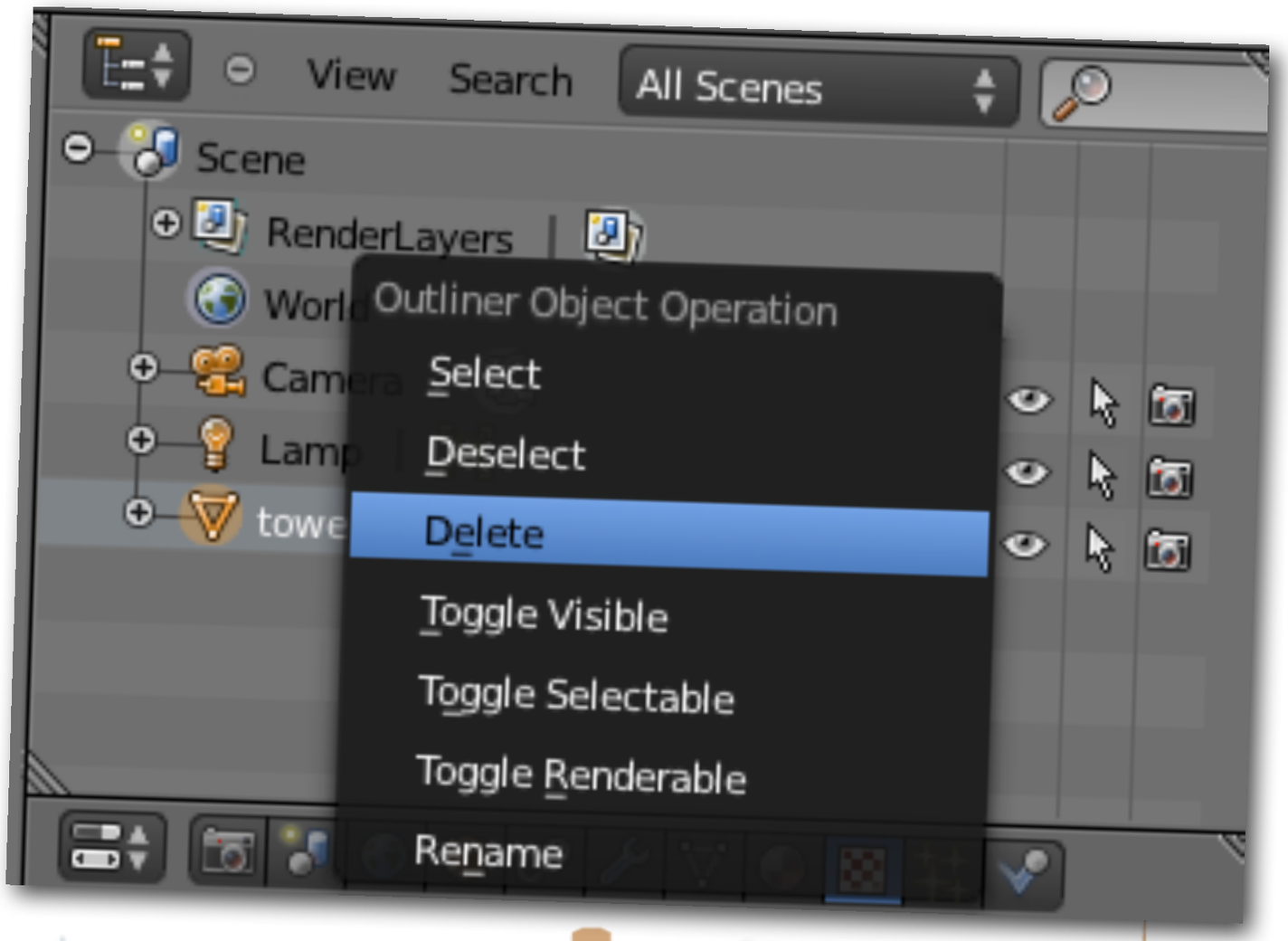
The Outliner Window

- In case you want to put the outliner somewhere else in your layout





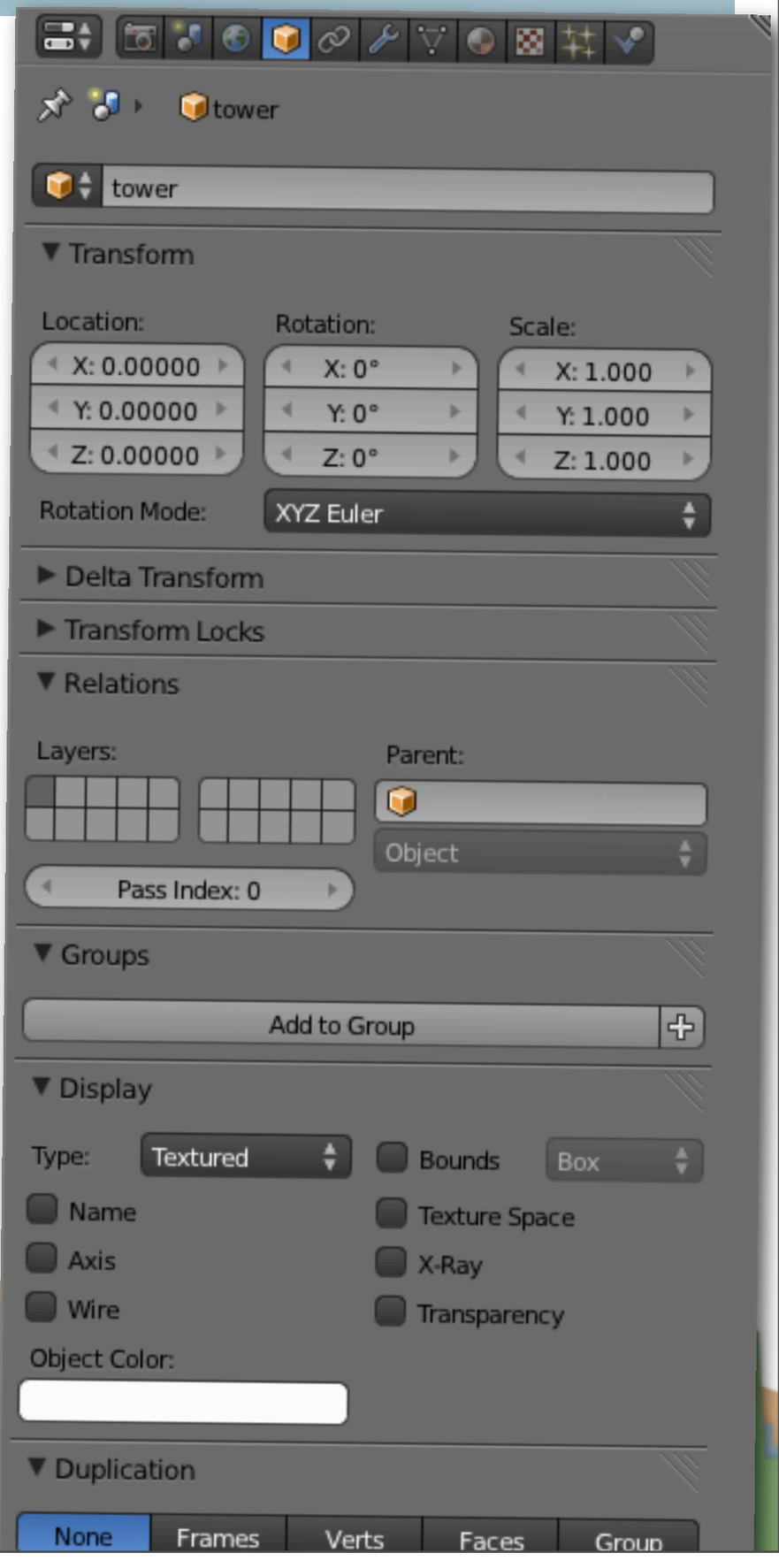
The Outliner Window



The Outliner Window

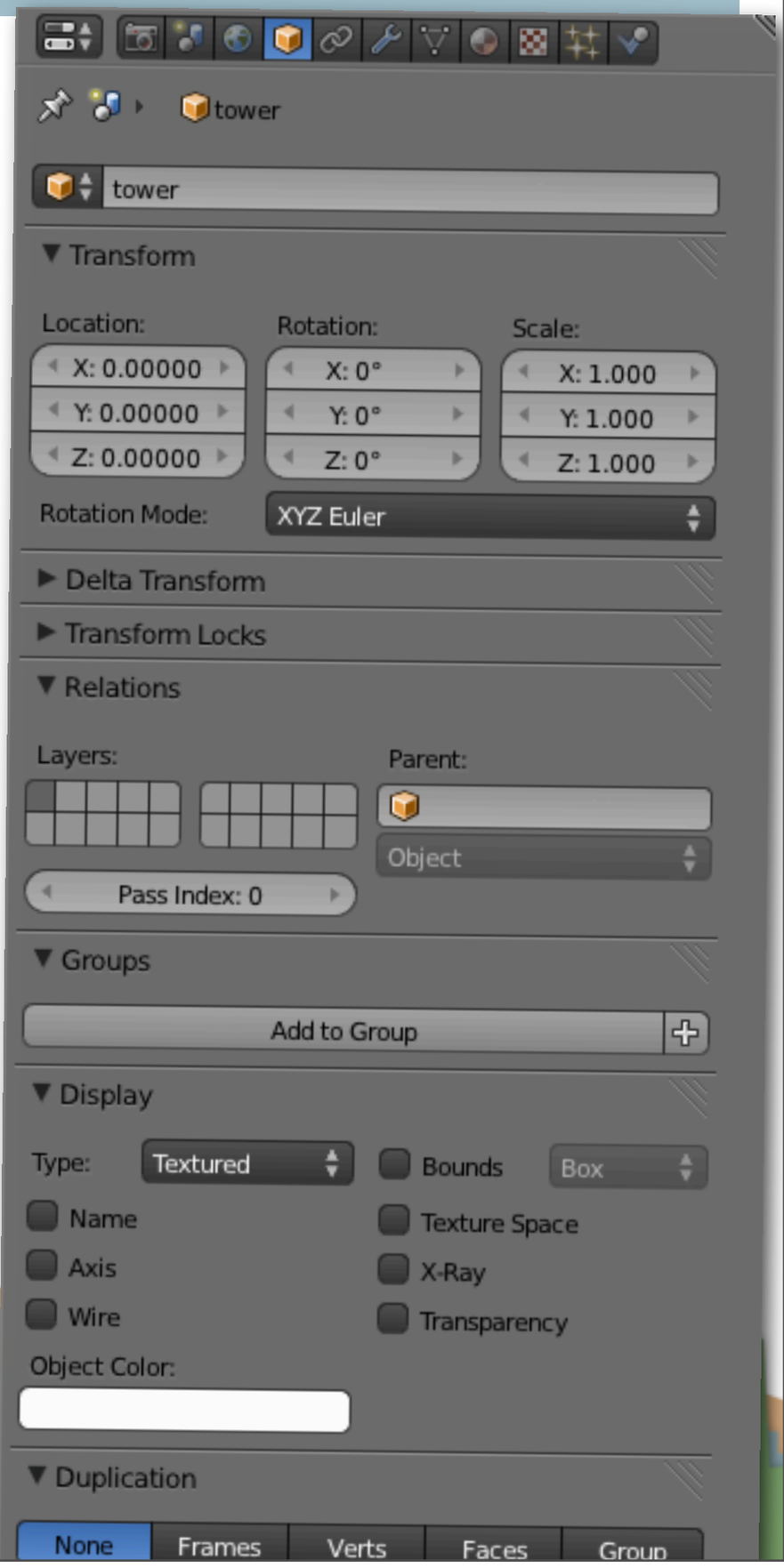
- The context menu on the outliner window
  - Selecting here selects an object in all other windows as well

The Properties Window

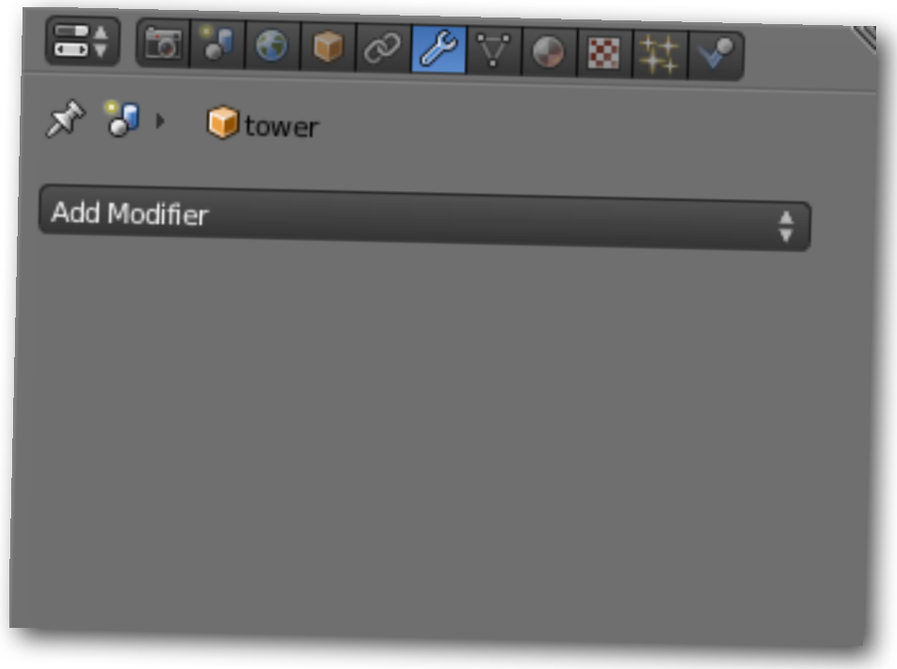


The Properties Window

- The properties window allows access to properties of many aspects of the model
  - Material properties for rendering
  - Lighting properties for rendering
  - Modifiers for altering models
  - Object constraints for animation
  - World properties
  - Render properties
- Different properties are enabled depending on what is selected

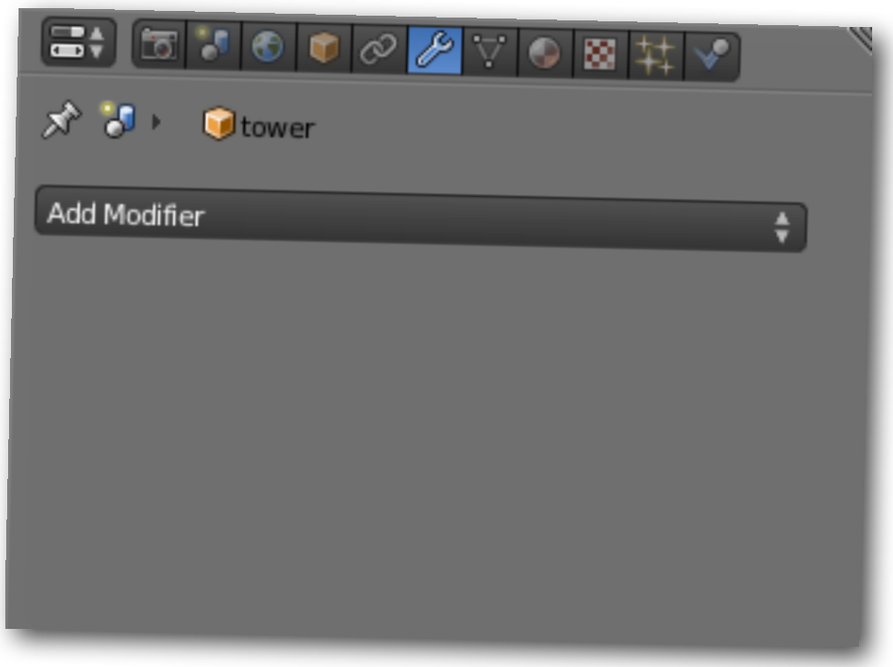


Modifiers

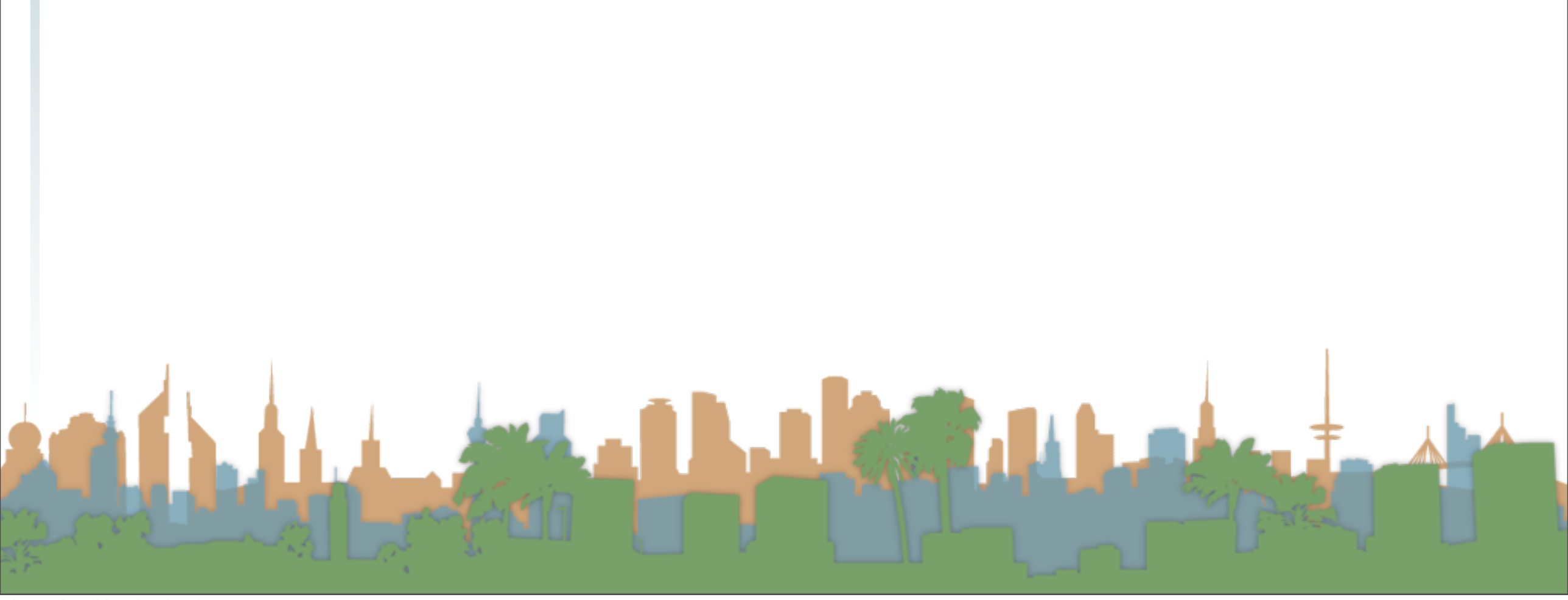


Modifiers

- Modifiers (wrench icon)
  - Allow procedural modifications to model primitives
  - Support constructive solid geometry
  - Support spinning and screw extrusion of models
- Modifiers operate in a stack
  - Multiple modifiers affect each other according to the order they are calculated
  - They aren't permanent (or fast) until made permanent ("apply")



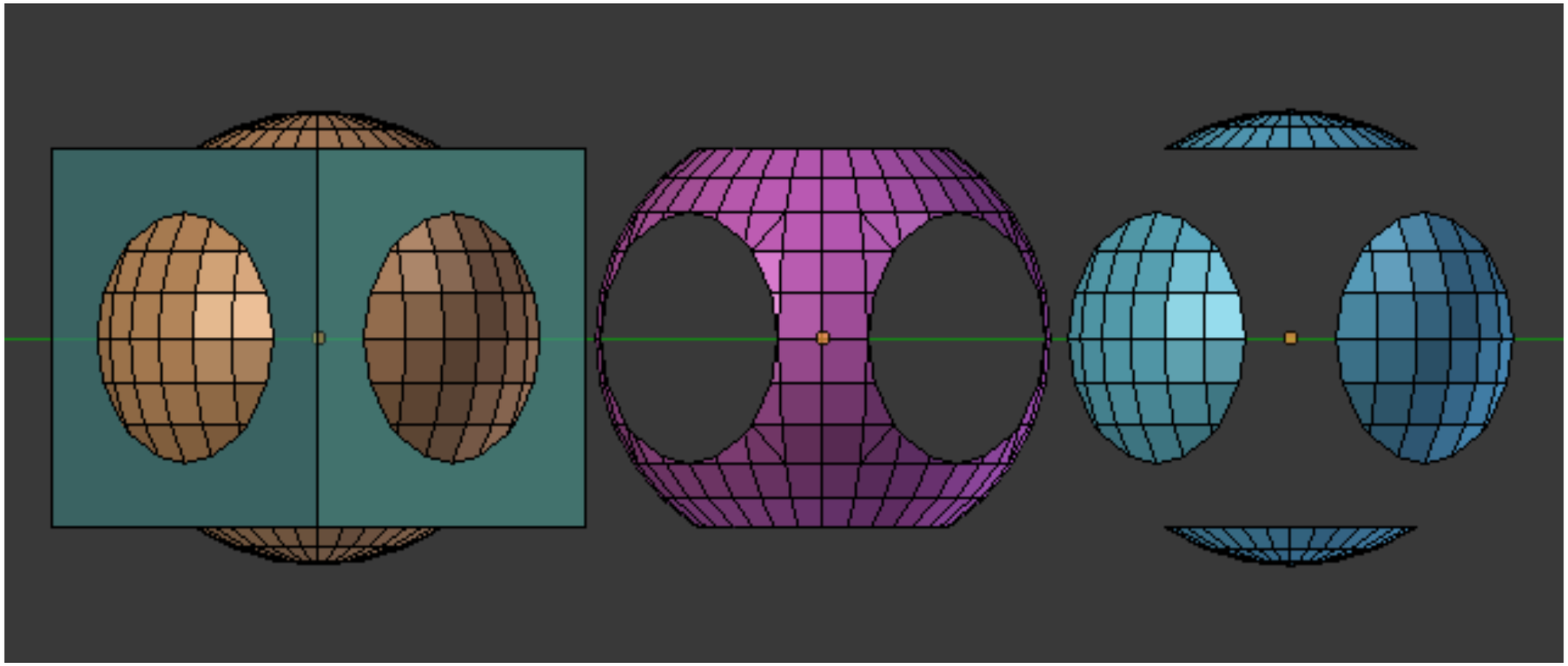
Constructive Solid Geometry



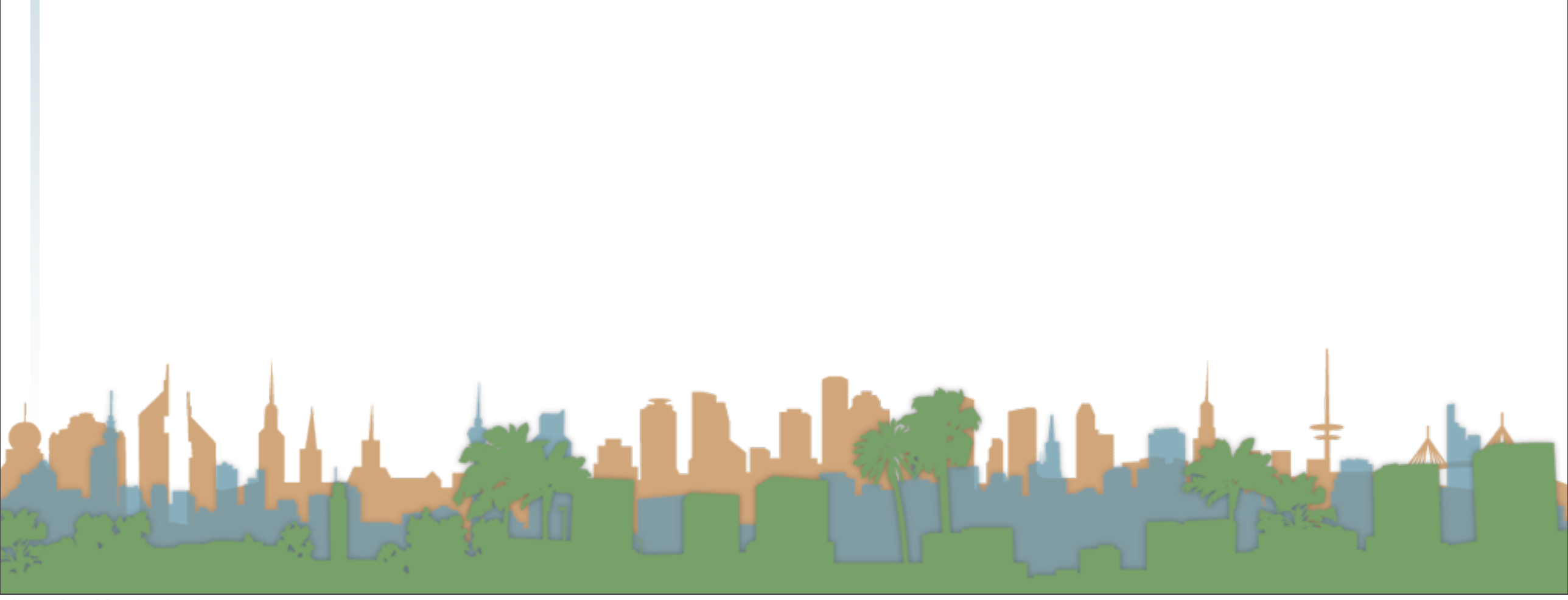
Constructive Solid Geometry

- This is applying concepts from Boolean Algebra to models
  - Union: combining models
    - "OR"
  - Difference: subtracting one model from another
    - "NOT"
  - Intersection: creating a model from two overlapping models
    - "AND"
- Mathematically difficult to construct the resulting model
  - Doesn't always have a clean solution.

Constructive Solid Geometry



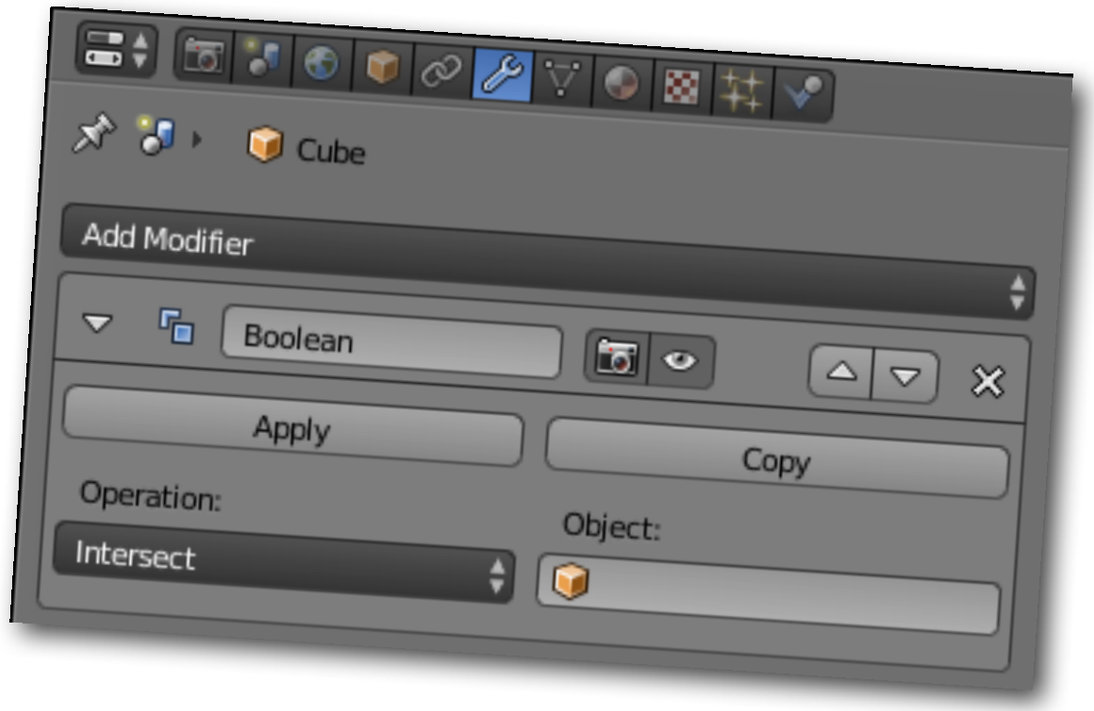
Constructive Solid Geometry - Boolean Modifier



Constructive Solid Geometry - Boolean Modifier

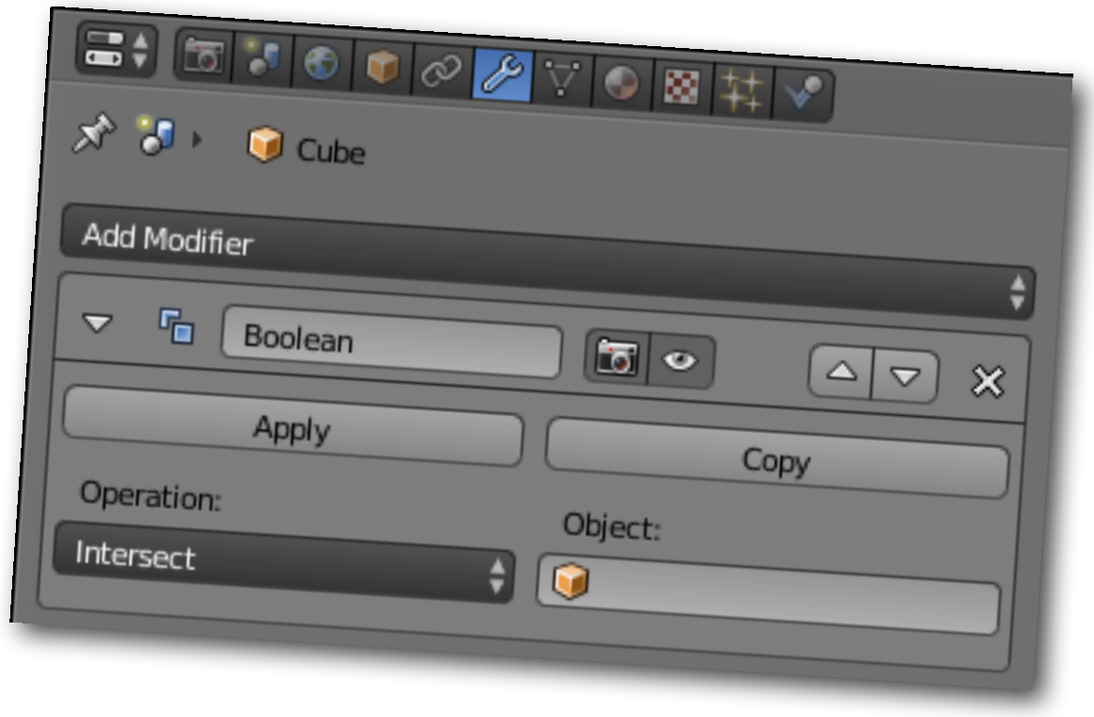
- The Boolean Modifier applies only for Mesh operations.
- It performs one of the three Boolean Operations for the faces of open or closed volumes.
- This modifier will only work properly for the intersection of faces of the two meshes that will result in another closed loop of edges (filled with faces), creating a new resulting face topology.
- The Boolean modifier is non destructive for the target.
- You have to move or hide the target to see the changes!

Constructive Solid Geometry - Boolean Modifier



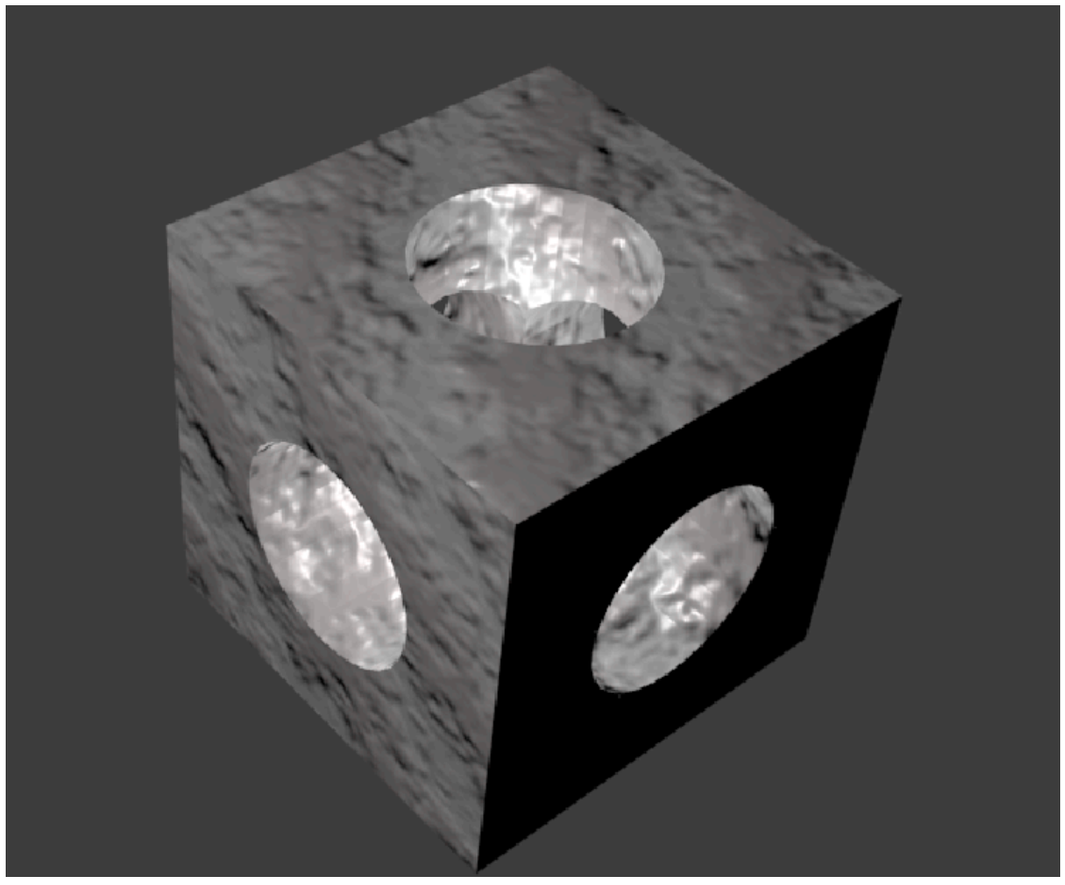
Constructive Solid Geometry - Boolean Modifier

- Usage
  - Select the base object
  - Switch to the modifier panel
  - Add a Boolean modifier
  - Choose your function
  - Choose the target object
  - Hide the target object in the properties window
  - If you like the result, “apply” the modifier



Micro-Lesson #4

- Using constructive solid geometry
- Create a cube that has a hole drilled through it in each of the 3 dimensions

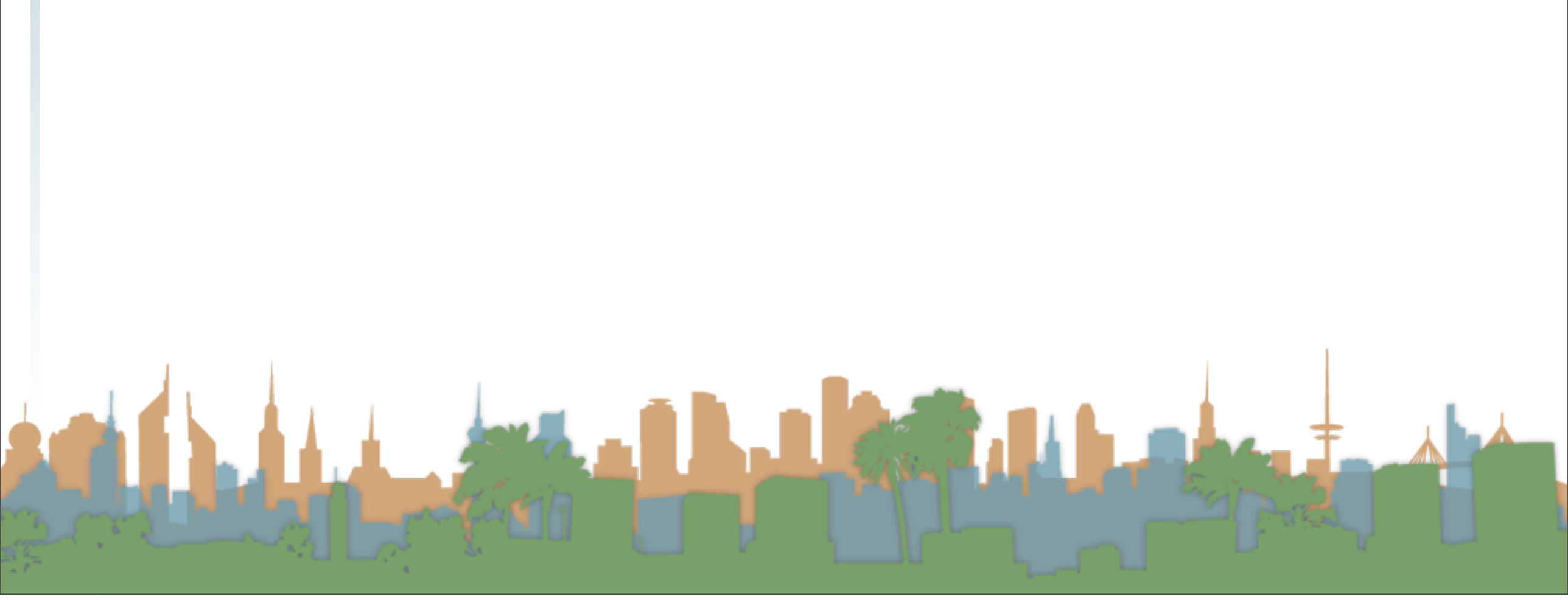


MicroLesson #5
Spin Extrusions

Spin Modifier

Spin Modifier

- Use the Spin tool to create the sort of objects that you would produce on a lathe
- This creates a circular extrusion of your selected elements
- The object center is important for this modifier
- A variant called a “Screw Extrusion” extends the spin into another dimension
-

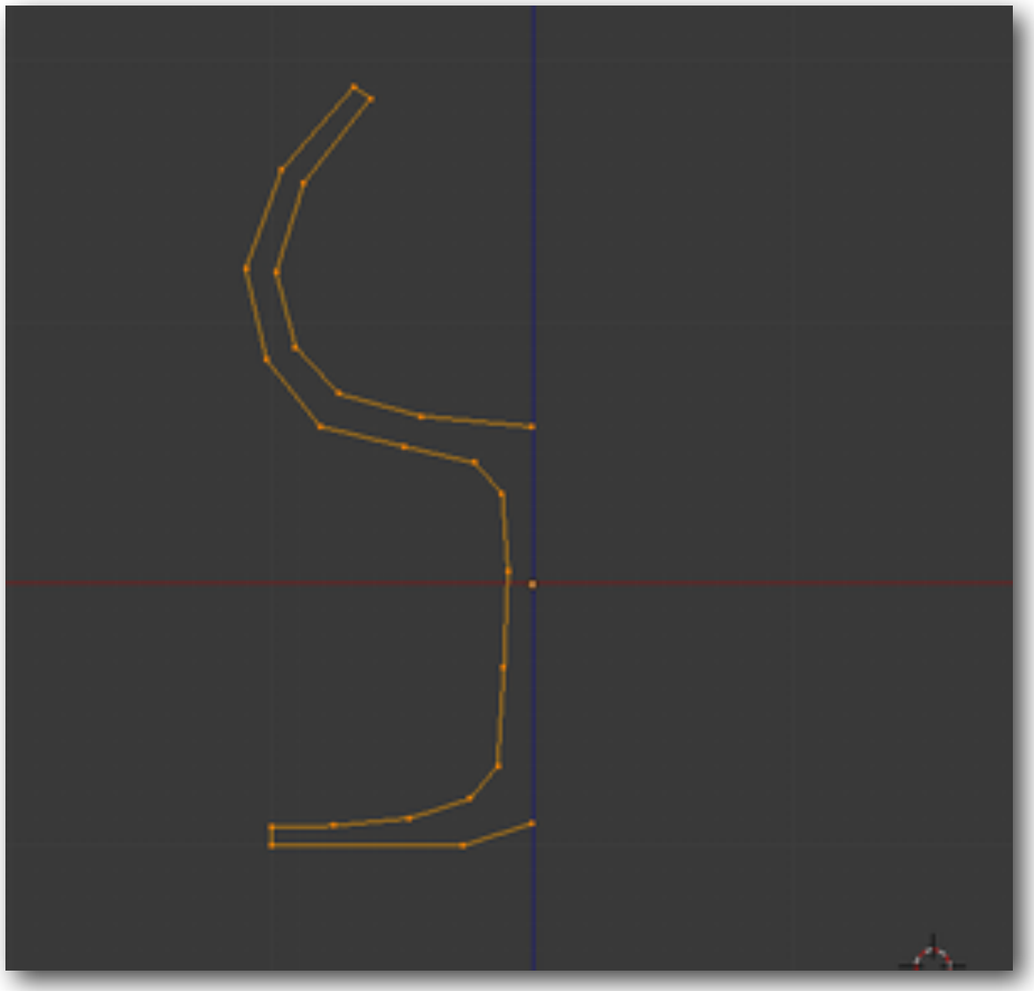


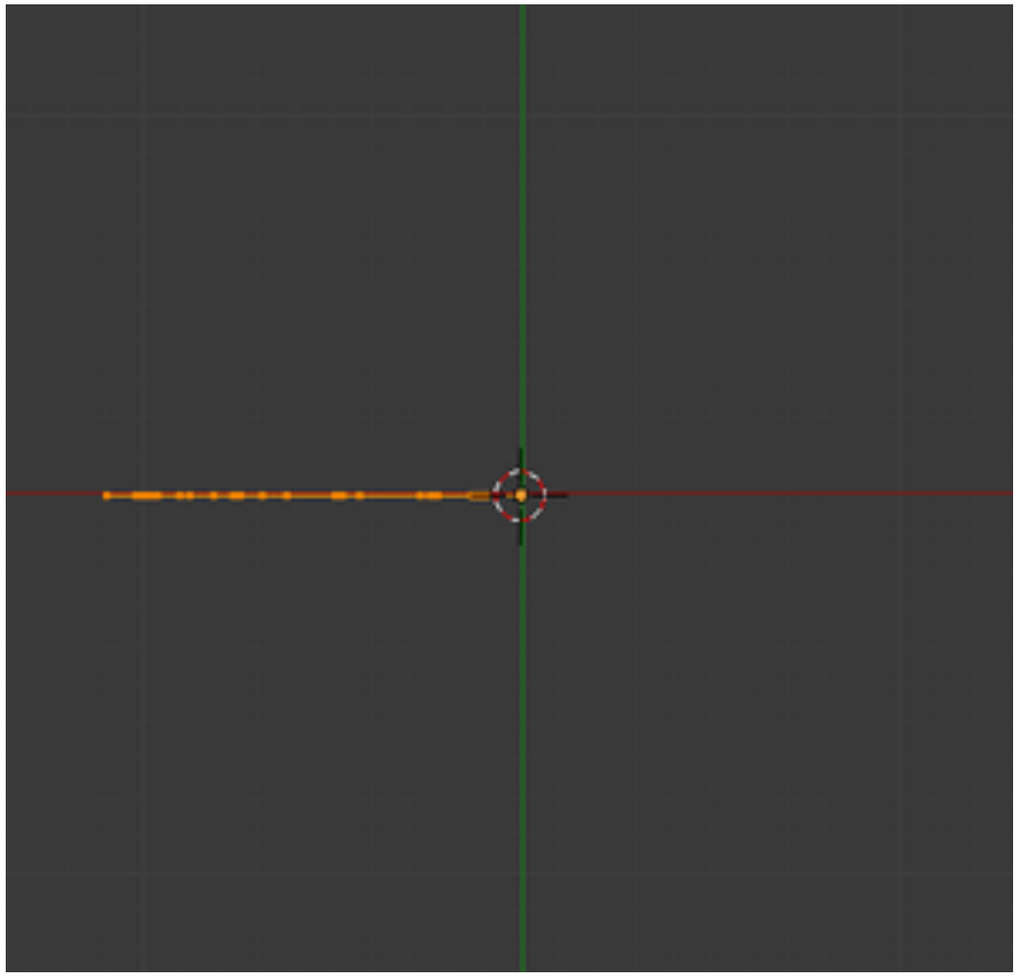
Spin Modifier Settings

Spin Modifier Settings

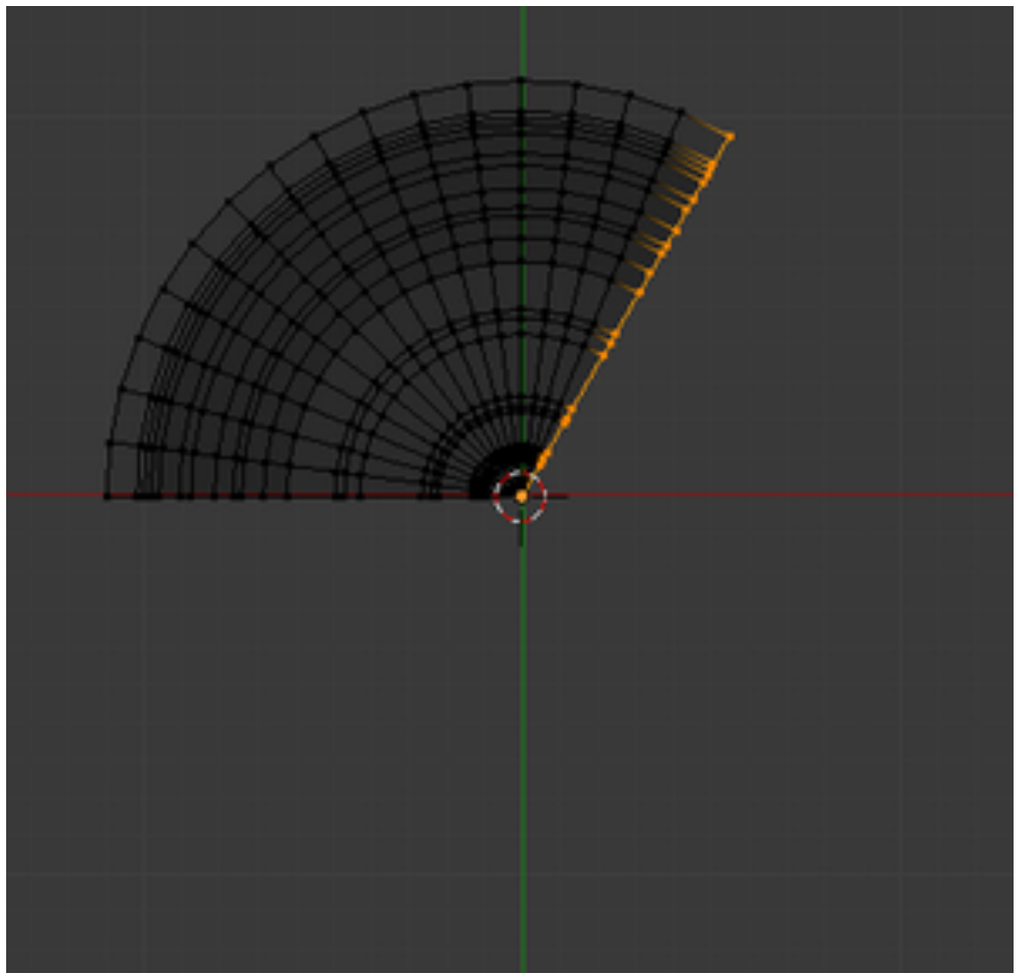
- Steps: Specifies how many copies will be extruded along the “sweep”
- Dupli: When enabled, will keep the original selected elements, as separated islands in the mesh (i.e. unlinked to the result of the spin extrusion).
- Angle: specifies the angle “swept” by this tool, in degrees (e.g. set it to 180 ° for half a turn).
- Center: Specifies the center of the spin. By default it uses the cursor position.
- Axis: Specify the spin axis as a vector. By default it uses the view axis.

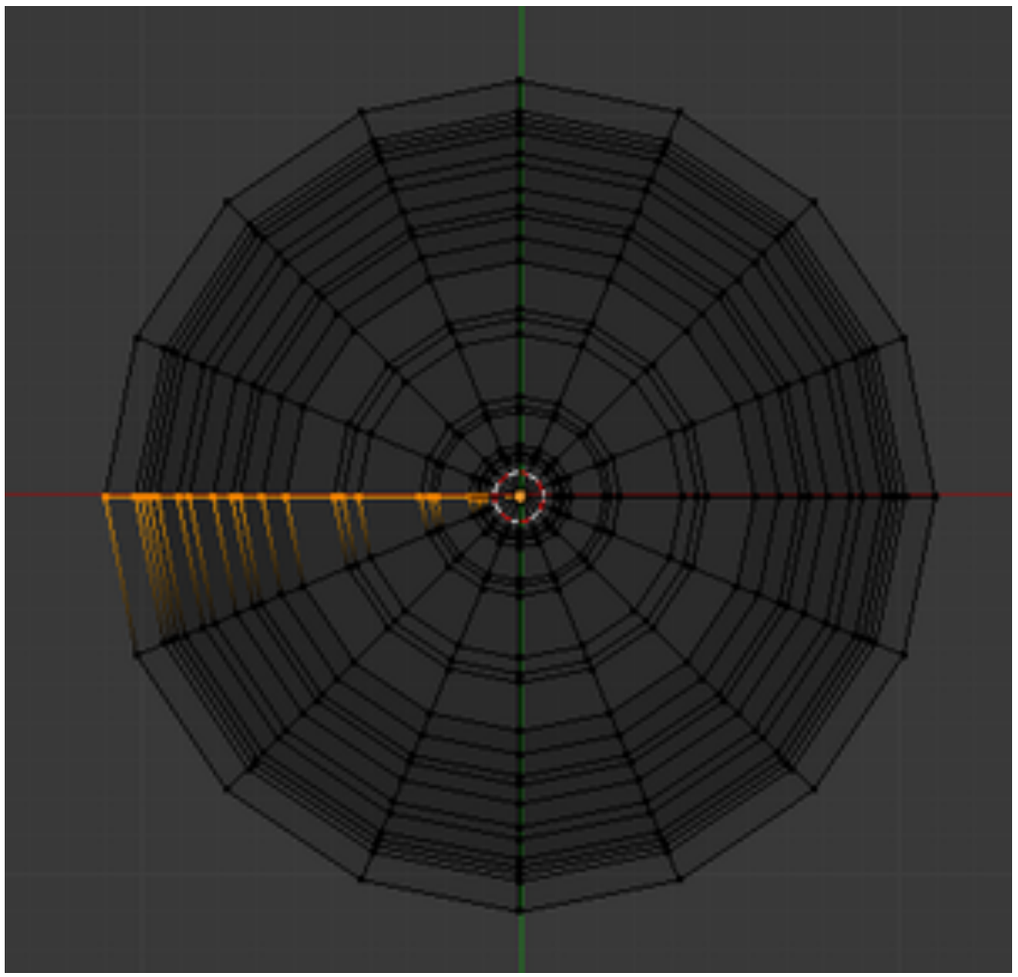
Spin Modifier Settings





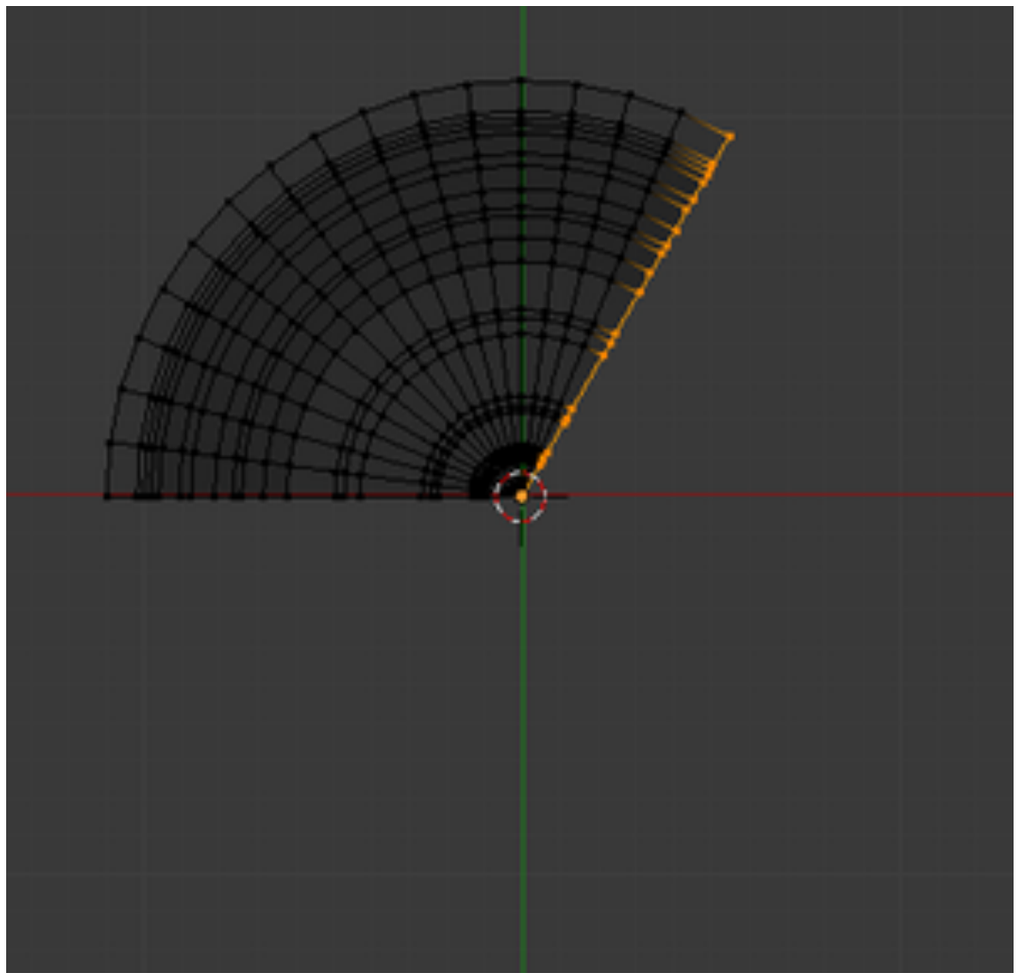
Spin Modifier Settings

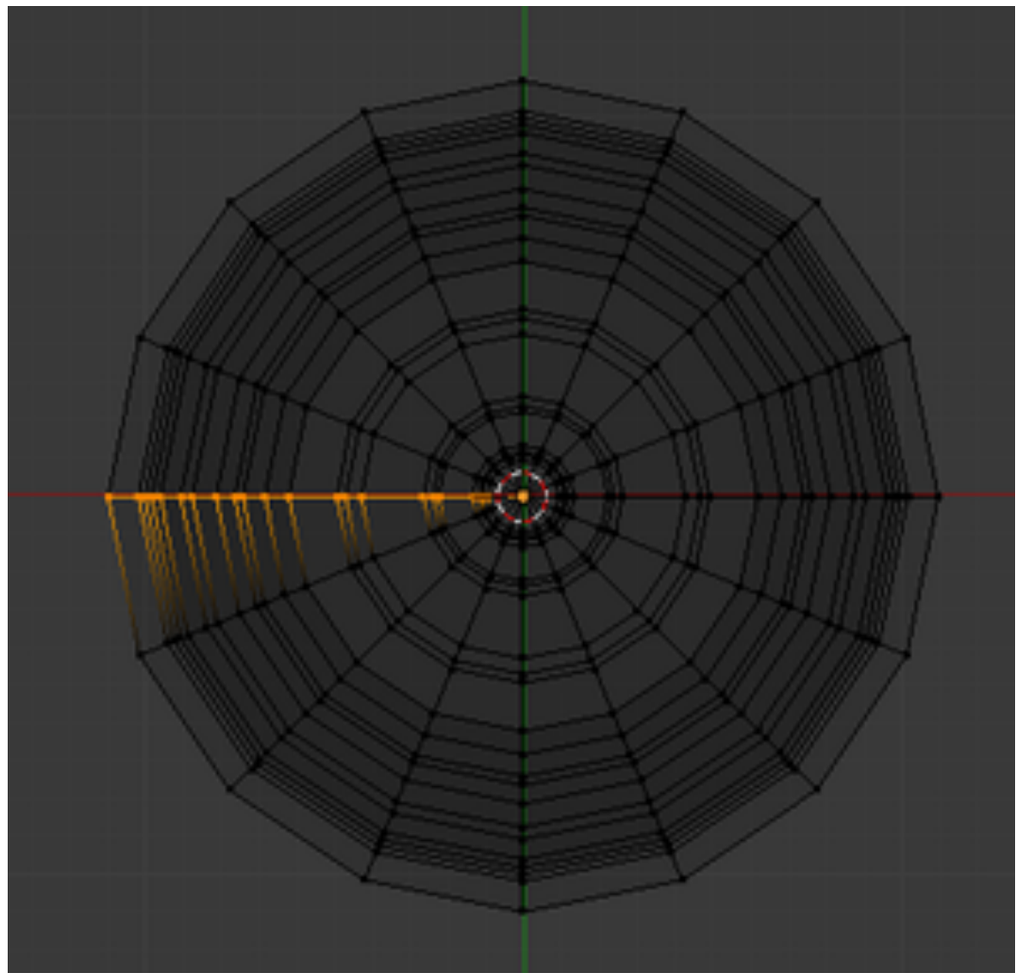




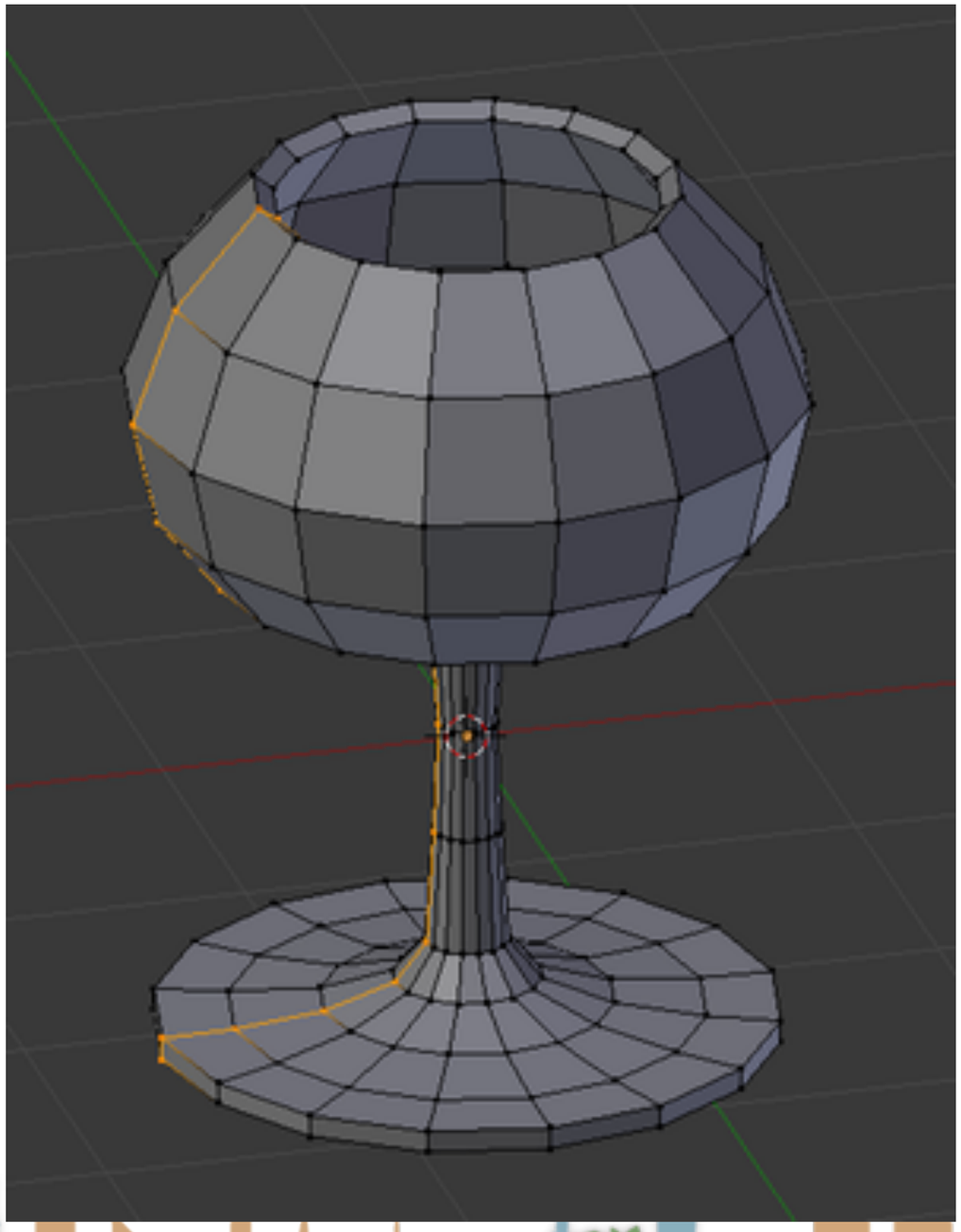
Spin Modifier Settings

- Angle



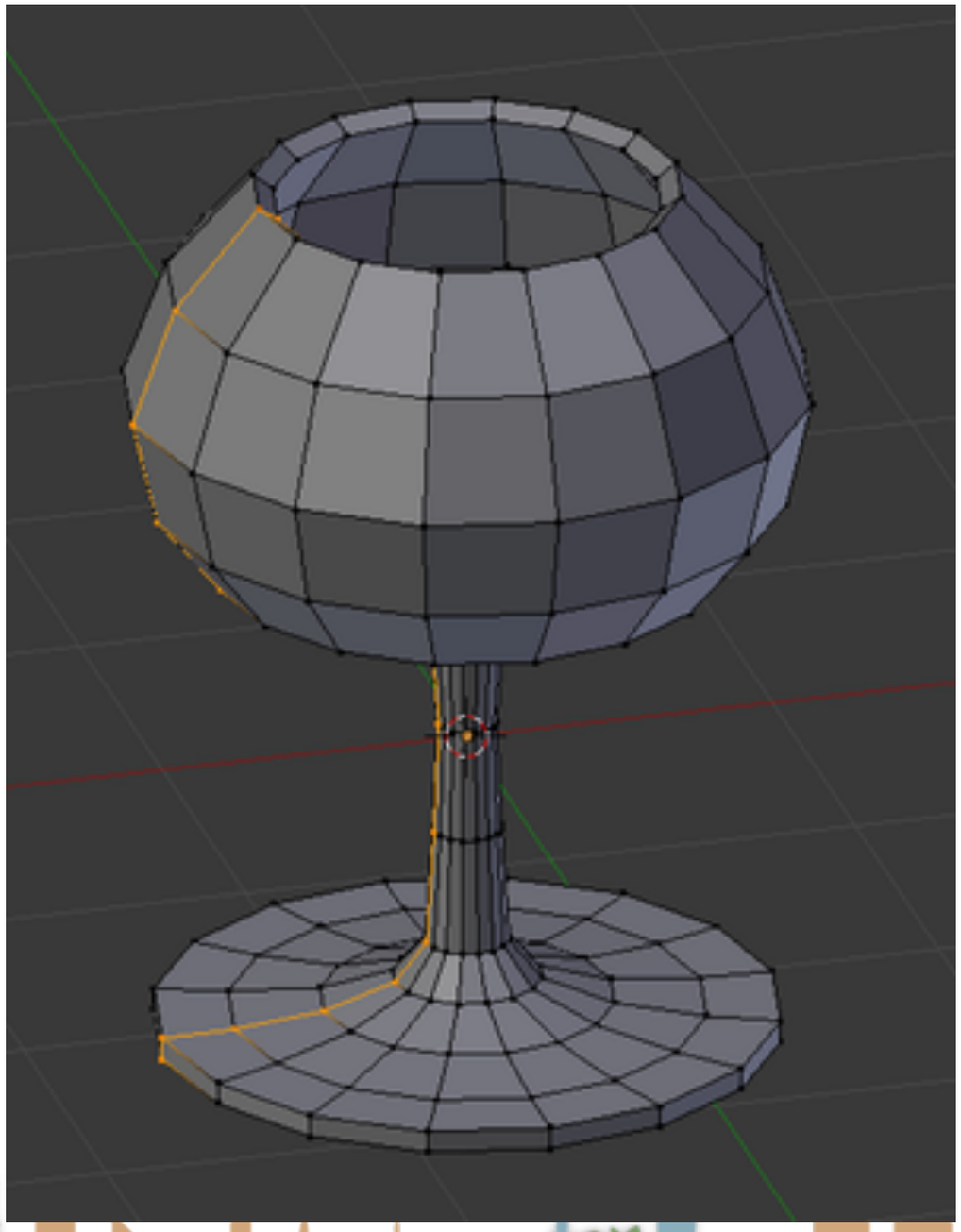


Spin Modifier Settings

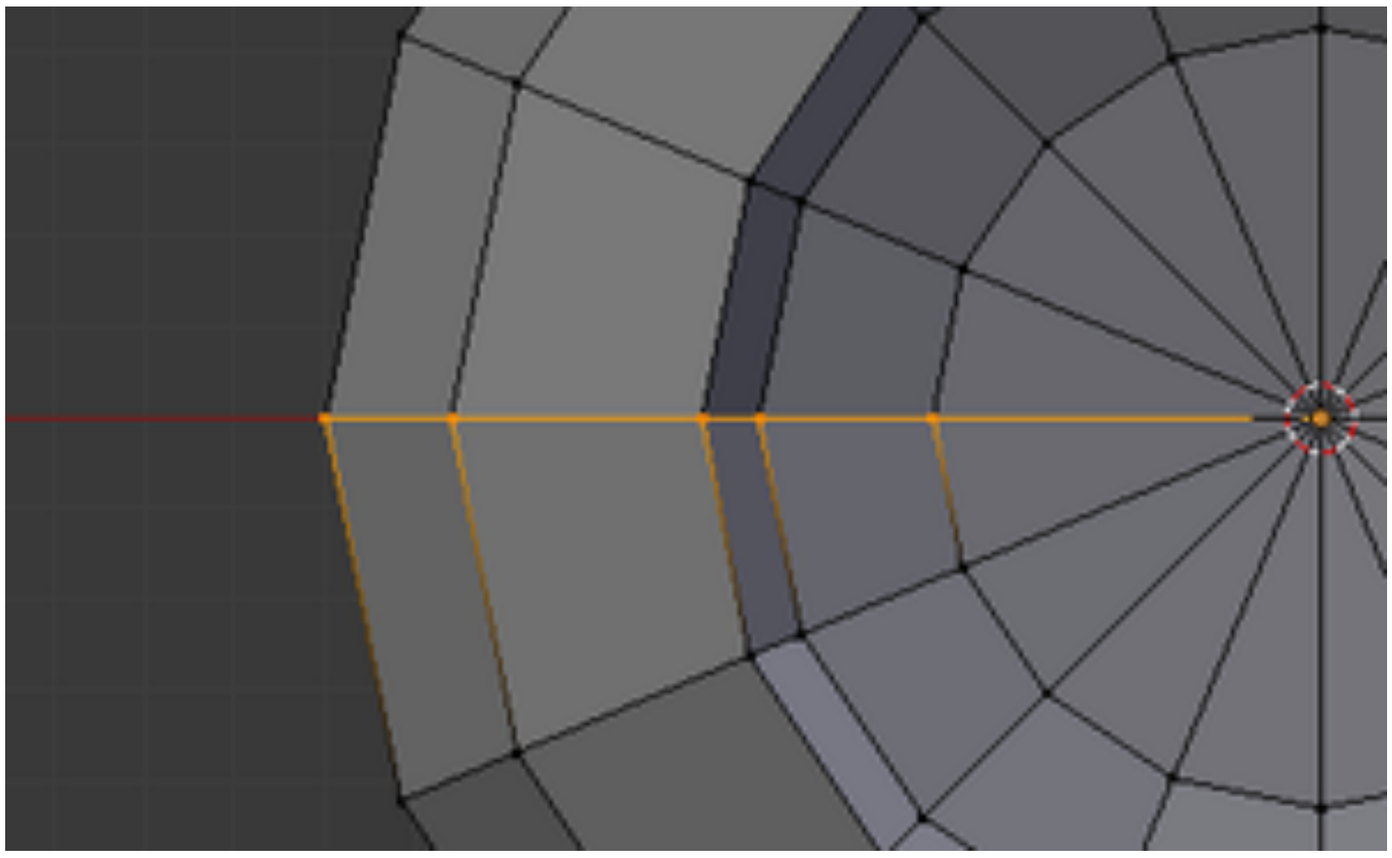


Spin Modifier Settings

- Dupli (enabled on right)

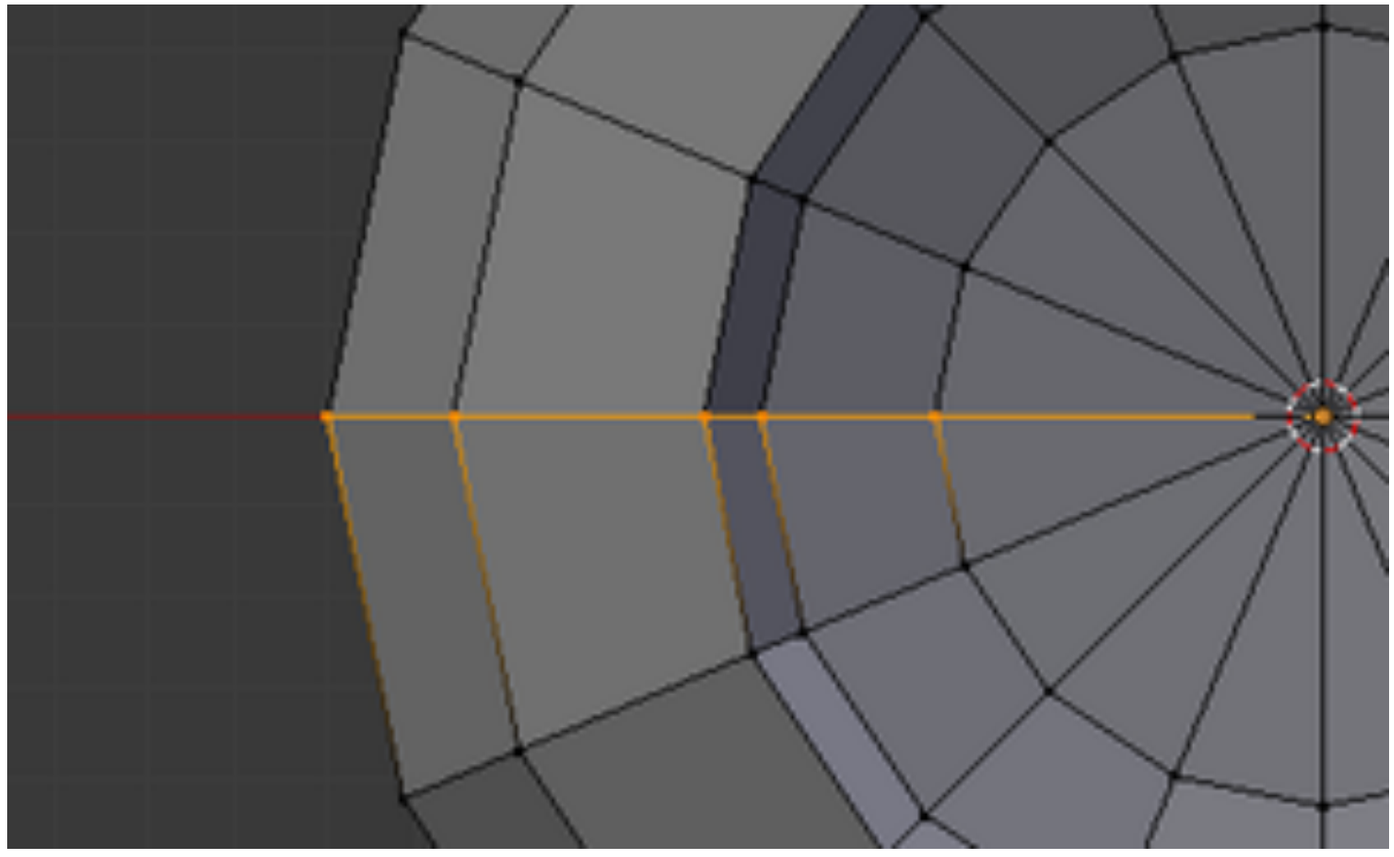


Spin Modifier Settings

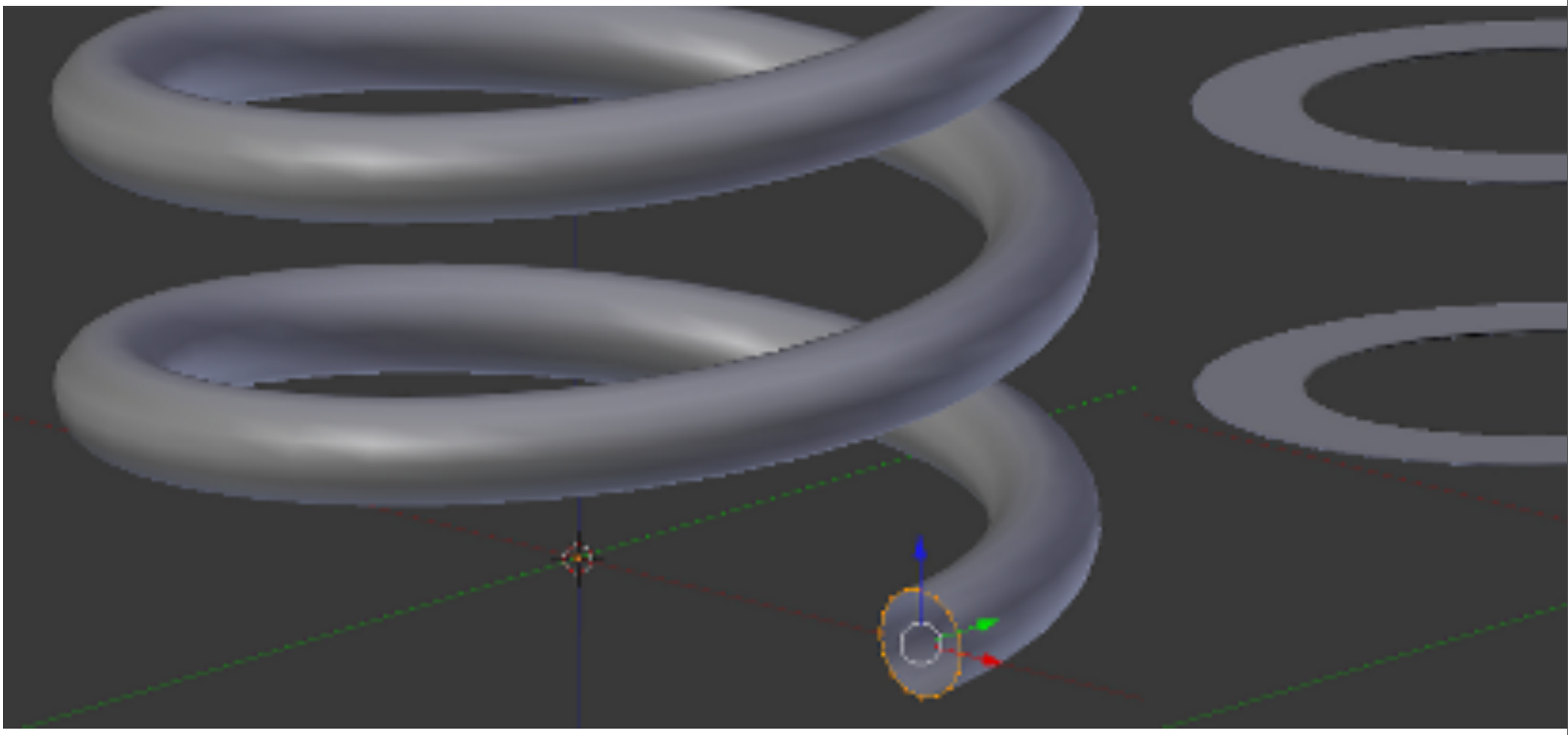


Spin Modifier Settings

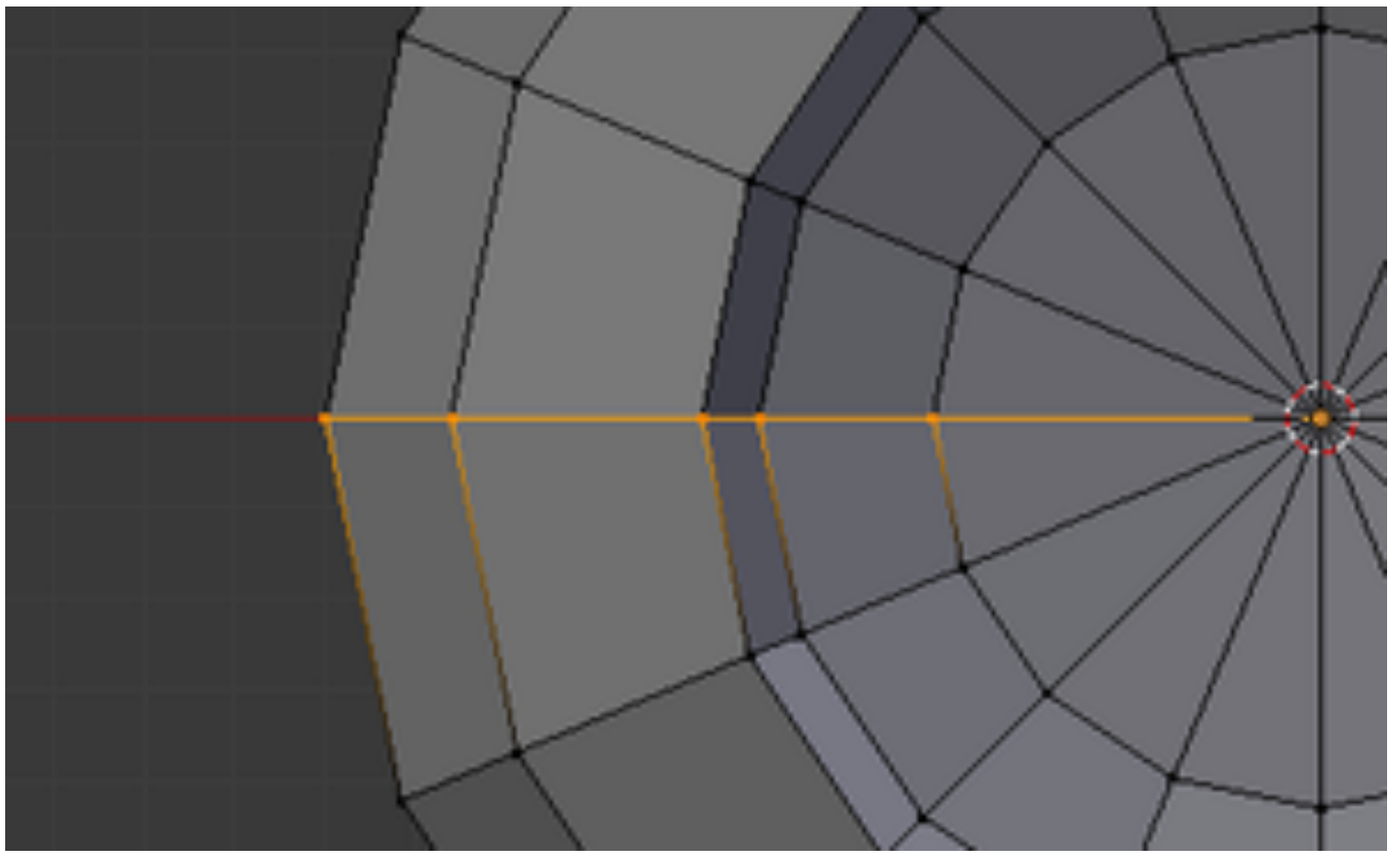
- Merge Duplicates
  - The spin operation leaves duplicate vertices along the profile.
  - Perform a “Remove Doubles” operation to join the spin



Screw Modifier

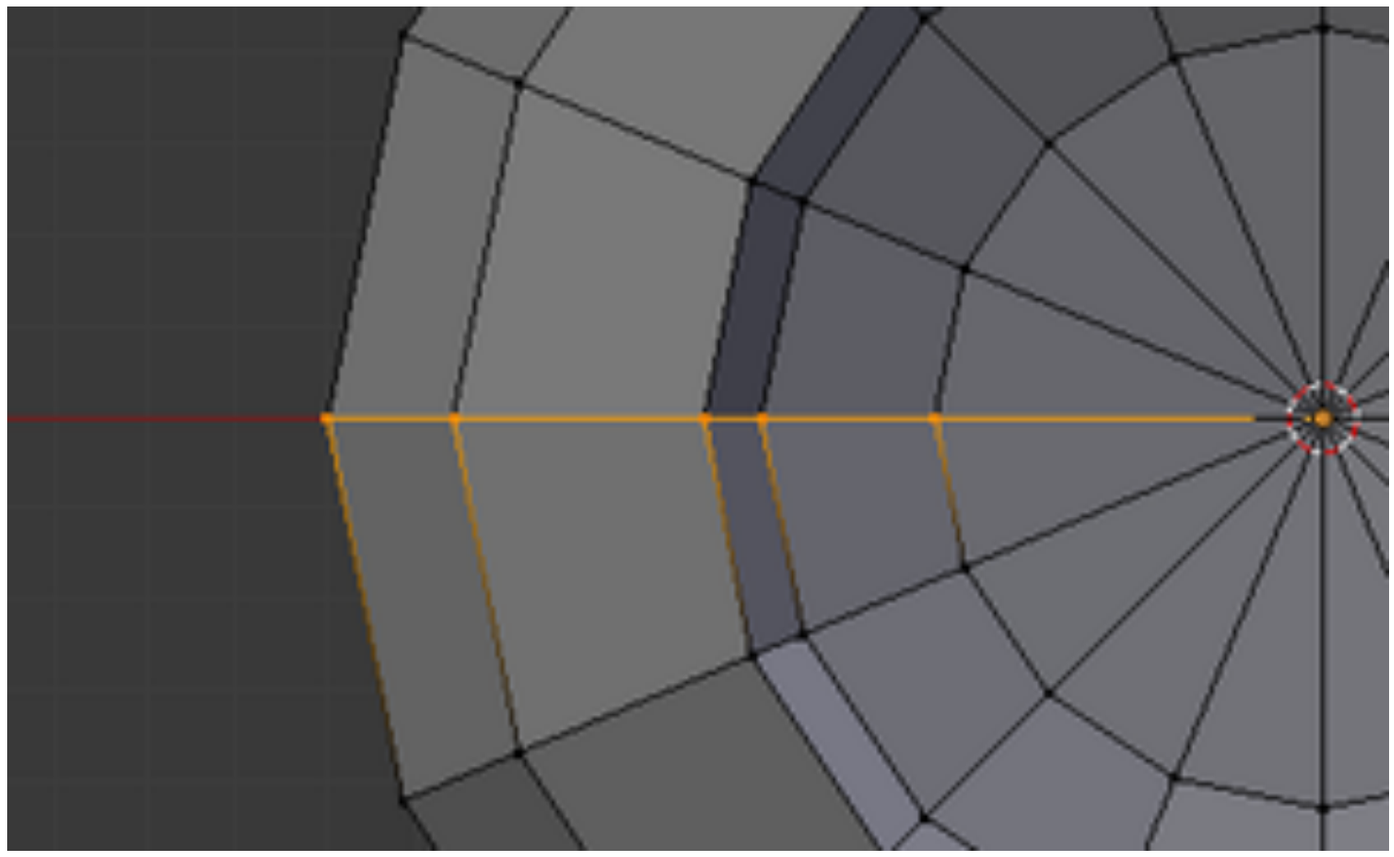


Spin Modifier Settings

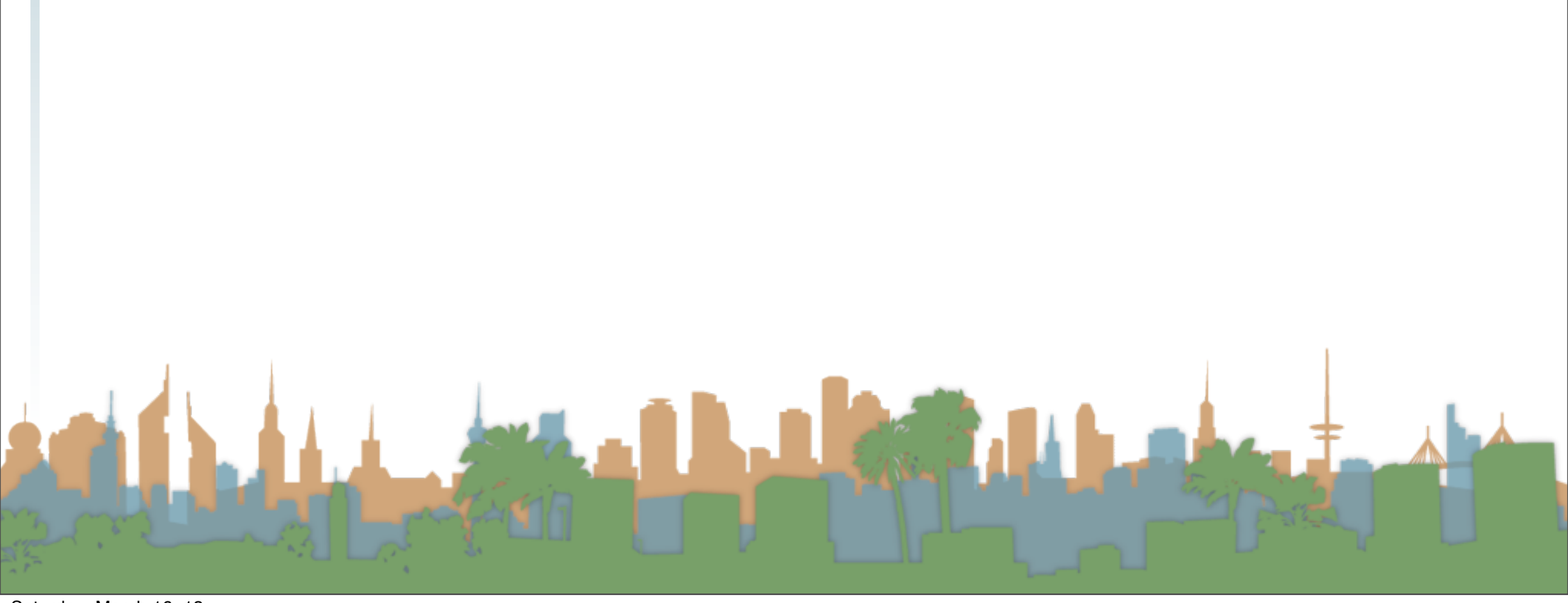


Spin Modifier Settings

- Recalculate Normals
  - All that remains now is to repair thenormals by selecting all vertices and pressing Ctrl-N and selecting "Recalc Normals Outside" in the pop-up "menu".



Screw Modifier Settings

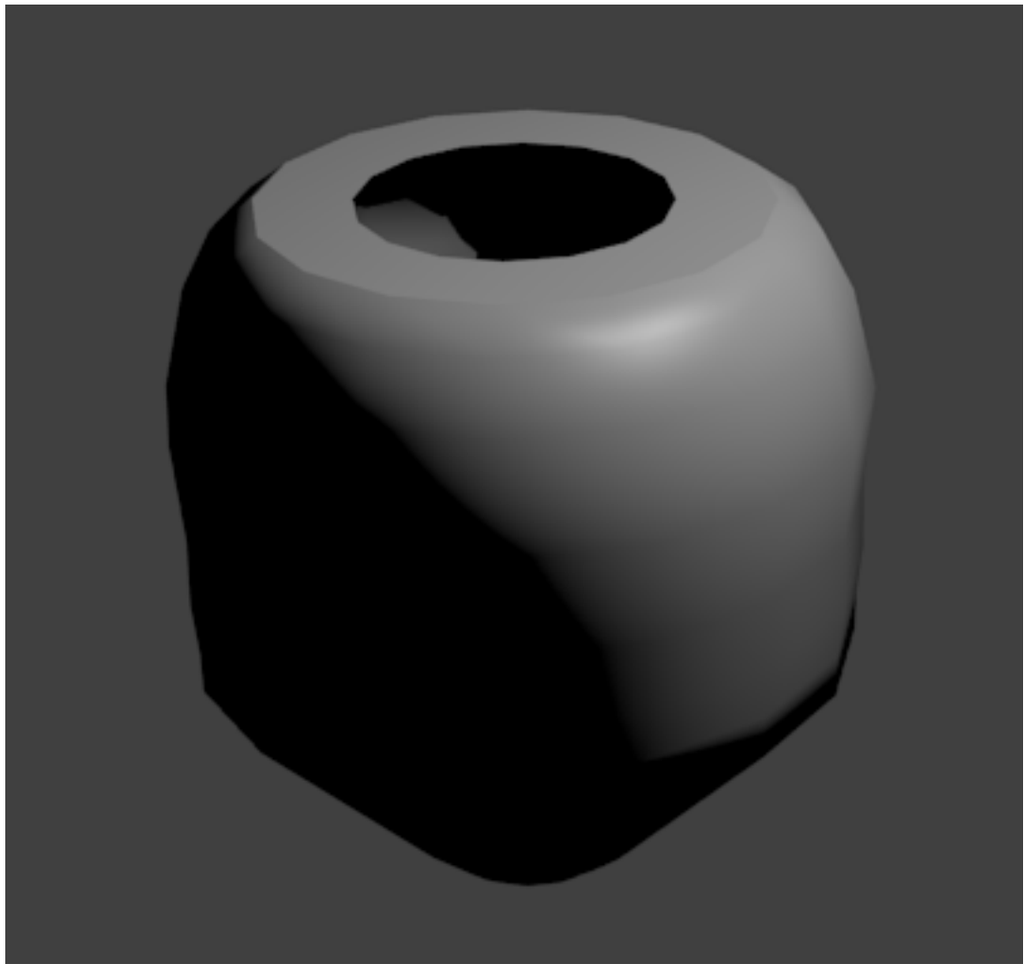


Screw Modifier Settings

- Axis: The axis along which the helix will be built.
- Screw: The height of one helix iteration.
- AxisOb: The name of an object to define the axis direction.
- Object Screw: Use the Axis Object to define the value of Screw.
- Angle: Degrees for a single helix revolution.
- Steps: Number of steps used for a single revolution
- Calc Order: Order of edges is calculated to avoid problems with normals. Only needed for meshes, not curves.
- Flip: Flip normals direction.
- Iterations: Number of revolutions.

Micro-Lesson #5

- Make a Bowl
- Use spin/screw extrusion



Assignment 7

Course Wrap-up and Eval