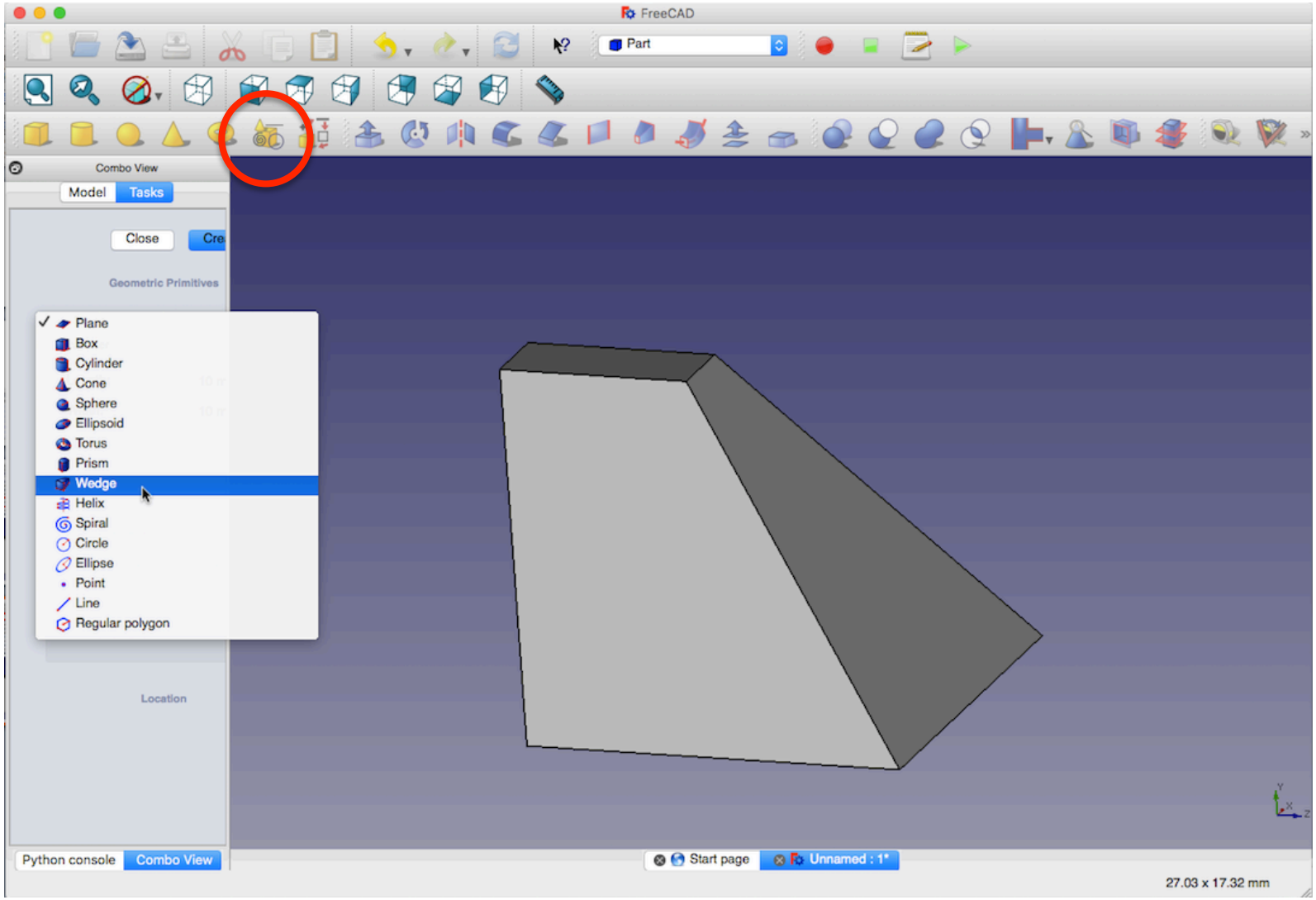
Introduction to solid modelling with FreeCad

Outline

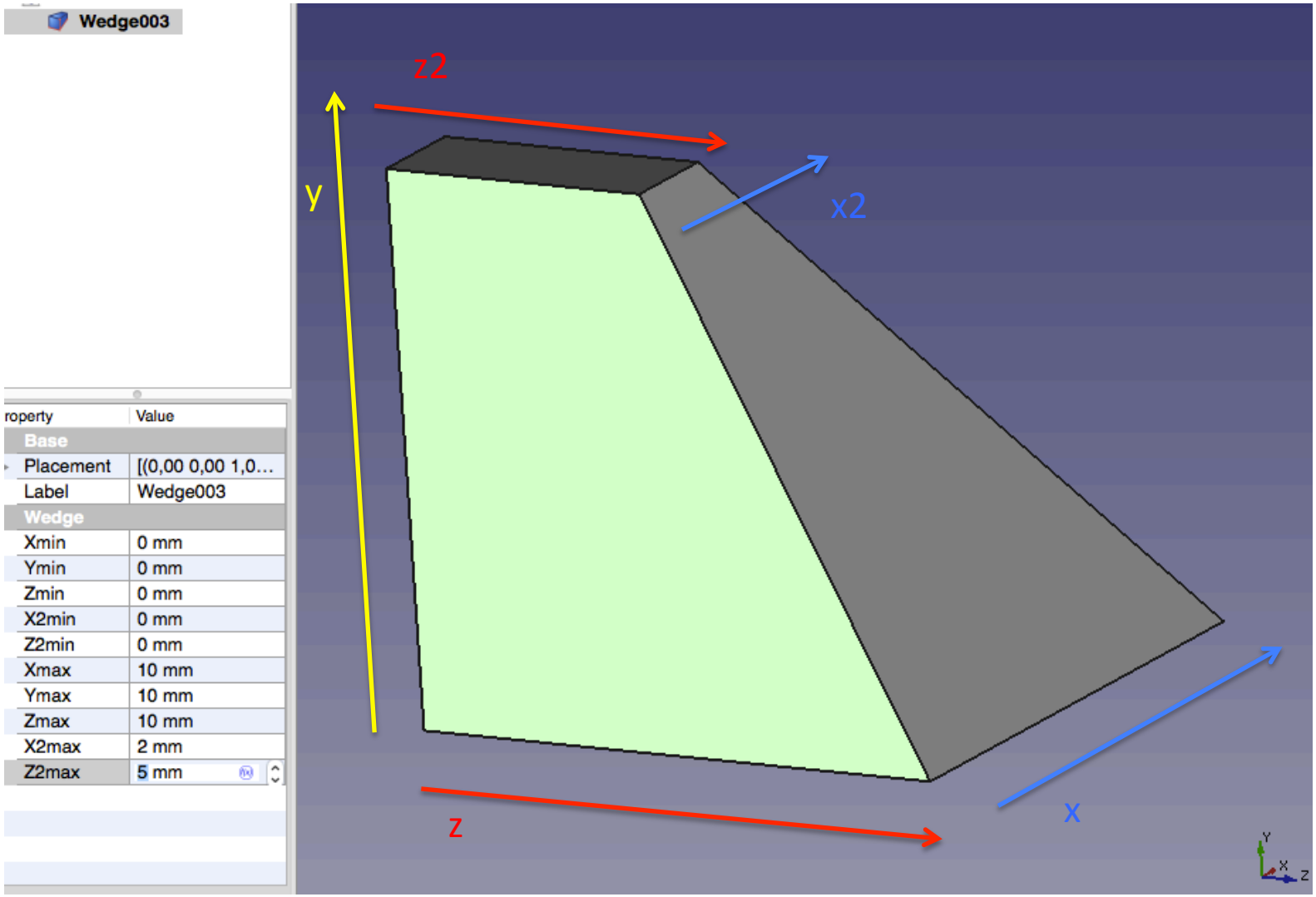
- Workbench
  - Part
- Views
- Primitives and parameters
  - Resizing
  - Positioning
  - Rotating
  - Wedges and cones
- Boolean operations
- Model hierarchy
- Editing objects in the model hierarcy

Example: Wedges

Wedge

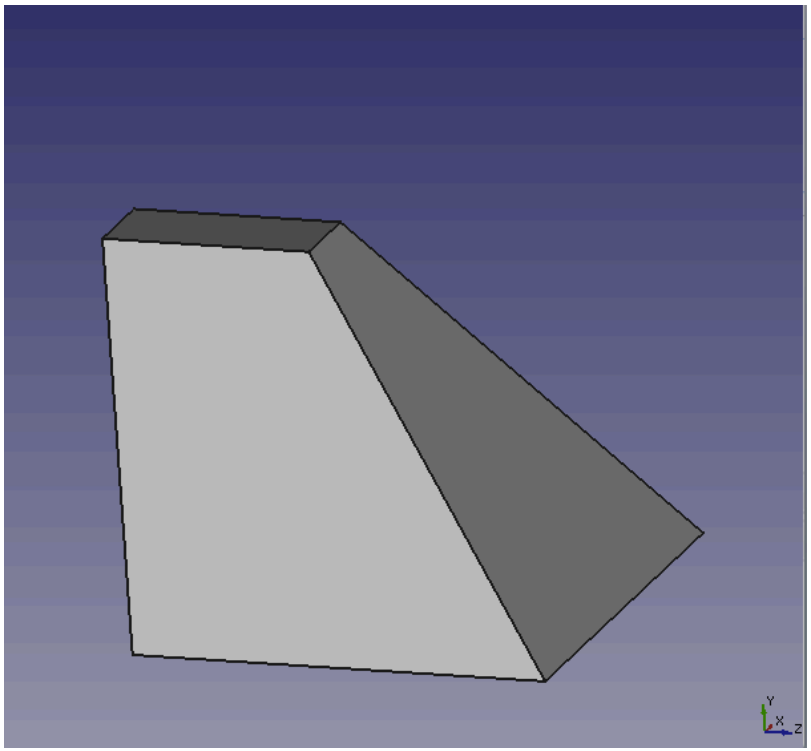

FreeCAD
Part
Combo View
Model
Tasks
Close
Geometric Primitives
Plane
Box
Cylinder
Cone
Sphere
Ellipsoid
Torus
Prism
Wedge
Helix
Spiral
Circle
Ellipse
Point
Line
Regular polygon
Location
Python console
Combo View
Start page
Unnamed : 1*
27.03 x 17.32 mm

Wedge

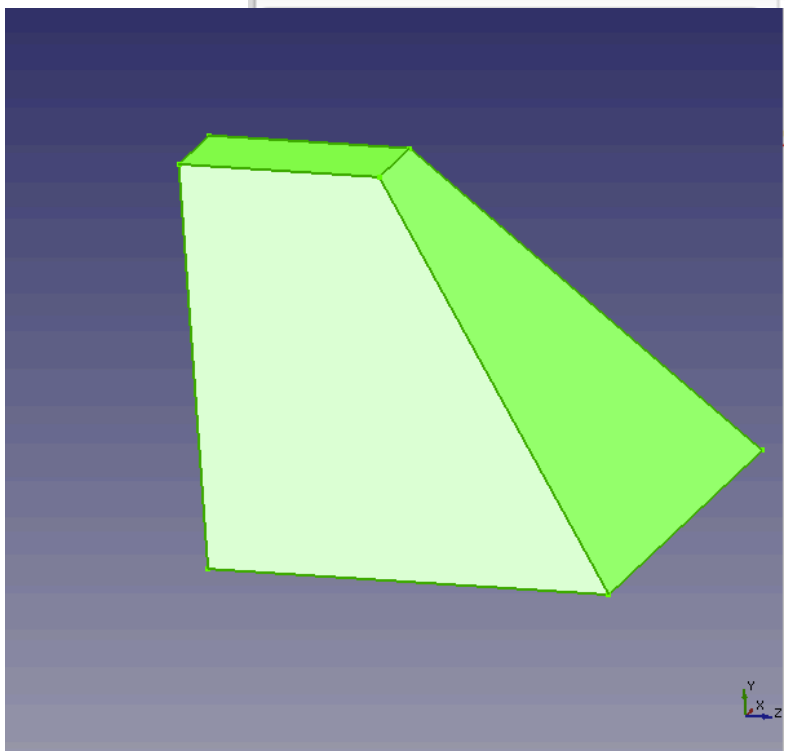

Wedge003
roperty
Value
Base
Placement
[(0,00 0,00 1,0…
Label
Wedge003
Wedge
Xmin
0 mm
Ymin
0 mm
Zmin
0 mm
X2min
0 mm
Z2min
0 mm
Xmax
10 mm
Ymax
10 mm
Zmax
10 mm
X2max
2 mm
Z2max
5 mm
z2
y
x2
z
x

Displacement

Property	Value
Base	
Placement	[(0,00 0,00 1,...
Angle	0 °
Axis	[0,00 1,00 0,...
x	0,00
y	1,00
z	0,00
Position	[0 mm 0 mm...
x	0 mm
y	0 mm
z	0 mm
Label	Wedge003

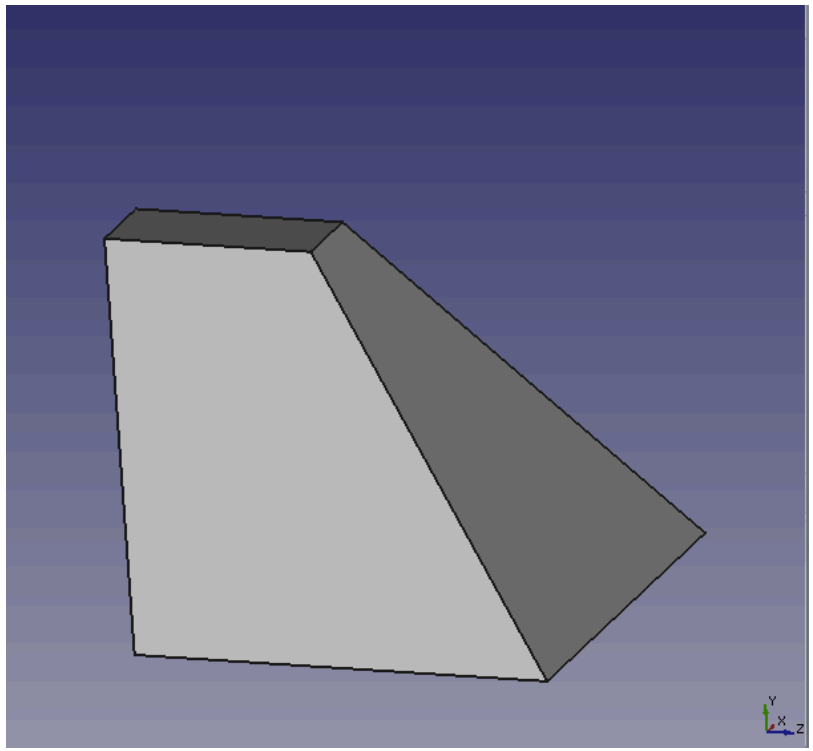


Property	Value
Base	
Placement	[(0,00 0,00 1,...
Angle	0 °
Axis	[0,00 0,00 1,...
x	0,00
y	0,00
z	1,00
Position	[5 mm 0 mm...
x	5 mm
y	0 mm
z	0 mm
Label	Wedge003

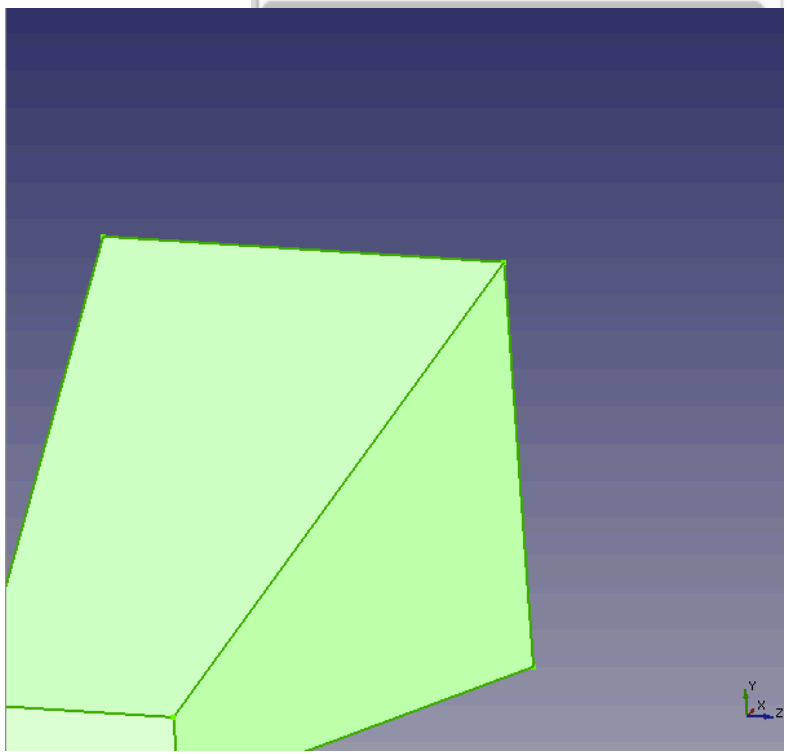


Rotation

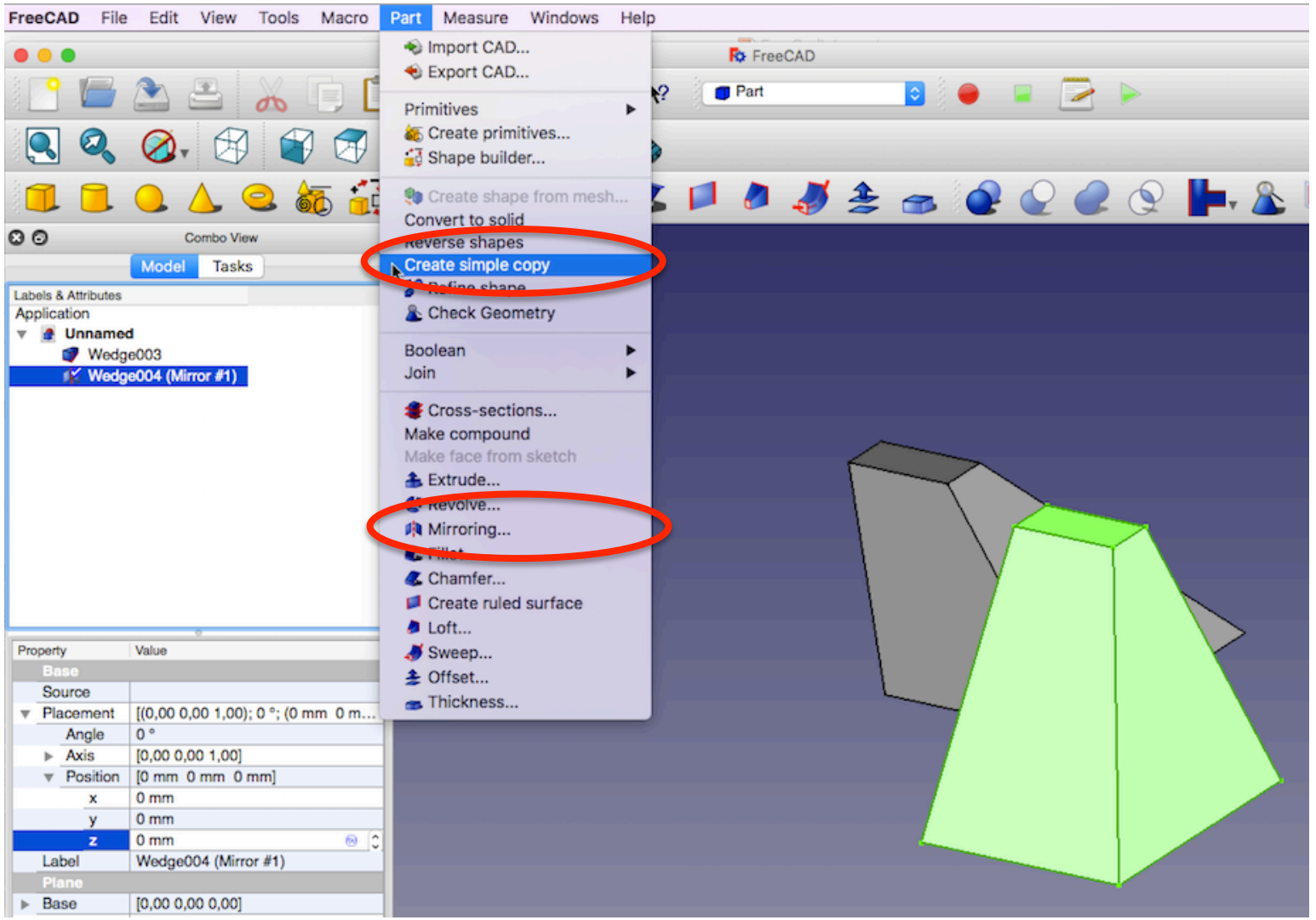
Property	Value
Base	
Placement	[(0,00 0,00 1,...
Angle	0 °
Axis	[0,00 1,00 0,...
x	0,00
y	1,00
z	0,00
Position	[0 mm 0 mm...
x	0 mm
y	0 mm
z	0 mm
Label	Wedge003



Property	Value
Base	
Placement	[(0,00 0,00 1,...
Angle	90 °
Axis	[0,00 0,00 1,...
x	0,00
y	0,00
z	1,00
Position	[0 mm 0 mm...
x	0 mm
y	0 mm
z	0 mm
Label	Wedge003



Duplication and mirroring



The Python console

Startup

Python 2.7.11 (default, Jan 22 2016, 16:30:50) [GCC 4.2.1 Compatible Apple LLVM 6.0 (clang-600.0.57)] on darwinType 'help', 'copyright', 'credits' or 'license' for more information

.>>> import WebGui

>>> from StartPage import StartPage

>>> WebGui.openBrowserHTML(StartPage.handle(),'file://' + App.getResourceDir() + 'Mod/Start/StartPage/','Start page')>>> App.newDocument("Unnamed")

>>> App.setActiveDocument("Unnamed”

)>>> App.ActiveDocument=App.getDocument("Unnamed”

)>>> Gui.ActiveDocument=Gui.getDocument("Unnamed")

Draw axes in python

```
doc=App.ActiveDocument
gui=Gui.ActiveDocument
axis_height=50
axis_radius=0.2
zAxis=doc.addObject("Part::Cylinder","Zaxis")
zAxis.Label = "Zaxis"
zAxis.Height = axis_height
zAxis.Radius = axis_radius
gui.Zaxis.ShapeColor = (0.0,0.0,1.0)
```

Draw axes in python

```
xAxis=doc.addObject("Part::Cylinder","Xaxis")
xAxis.Label = "Xaxis"
xAxis.Placement =
App.Placement(App.Vector(0,0,0),App.Rotation(
App.Vector(0,1,0),90))
xAxis.Height = axis_height
xAxis.Radius = axis_radius
gui.Xaxis.ShapeColor = (1.0,0.0,0.0)
```

Draw axes in python

```
yAxis=doc.addObject("Part::Cylinder","Yaxis")
yAxis.Label = "Yaxis"
yAxis.Placement =
App.Placement(App.Vector(0,0,0),App.Rotation(Ap
p.Vector(-1,0,0),90))
yAxis.Height = axis_height
yAxis.Radius = axis_radius
gui.Yaxis.ShapeColor =(0.0,1.0,0.00)
Gui.SendMsgToActiveView("ViewFit”)
```

Saving

Saving project

Saving object for 3D printing:

- Export to STL

Python console – contextual menu

- Save history as…

Preparing for 3D print

- Cura

https://ultimaker.com/en/products/ultimaker-cura-software