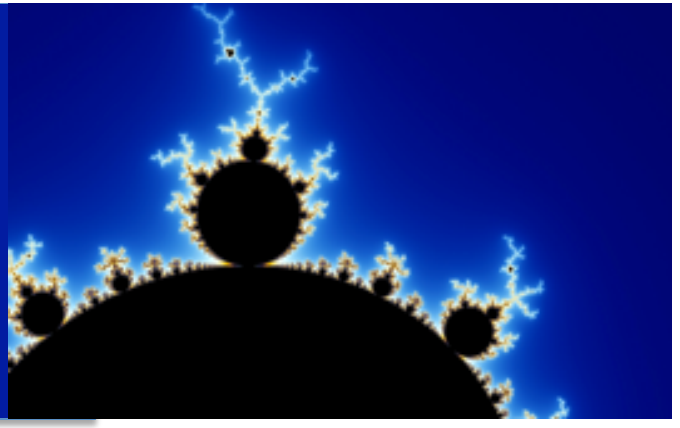
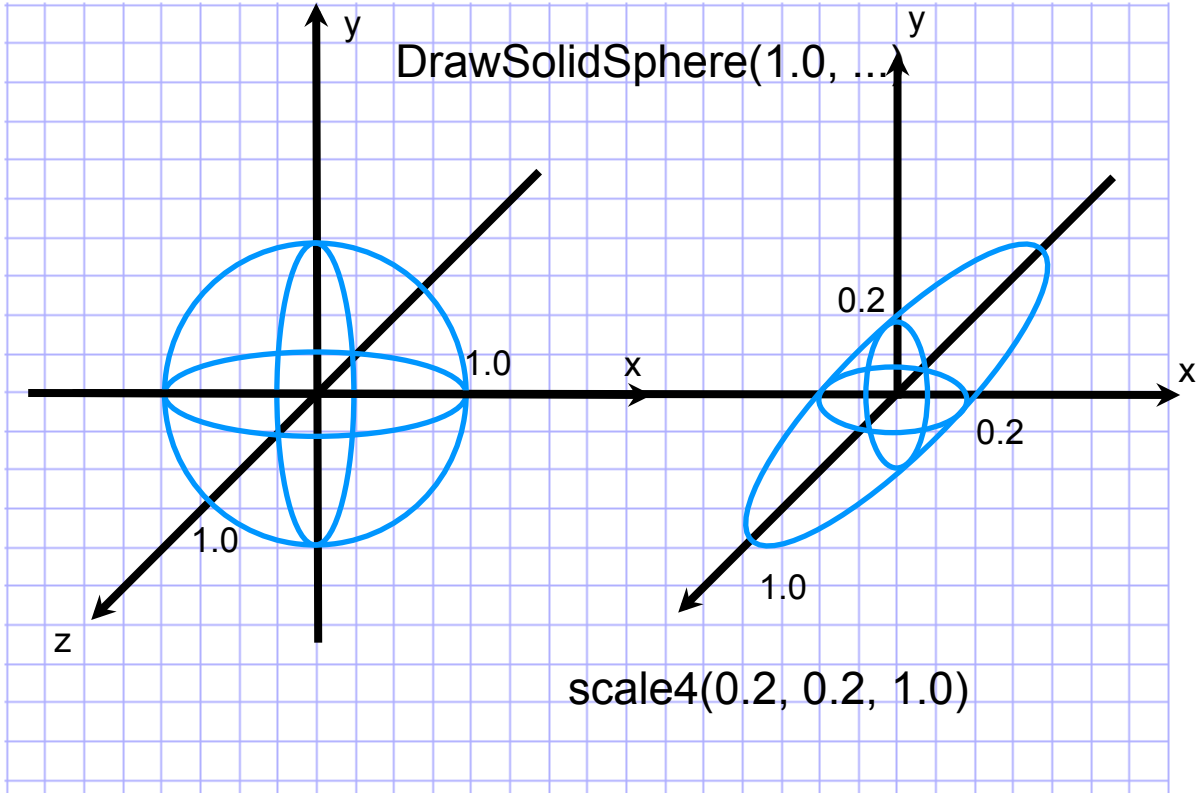
Computer Graphics

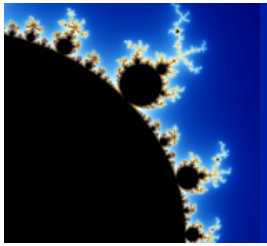


Build 3D objects Using 3D Primitives

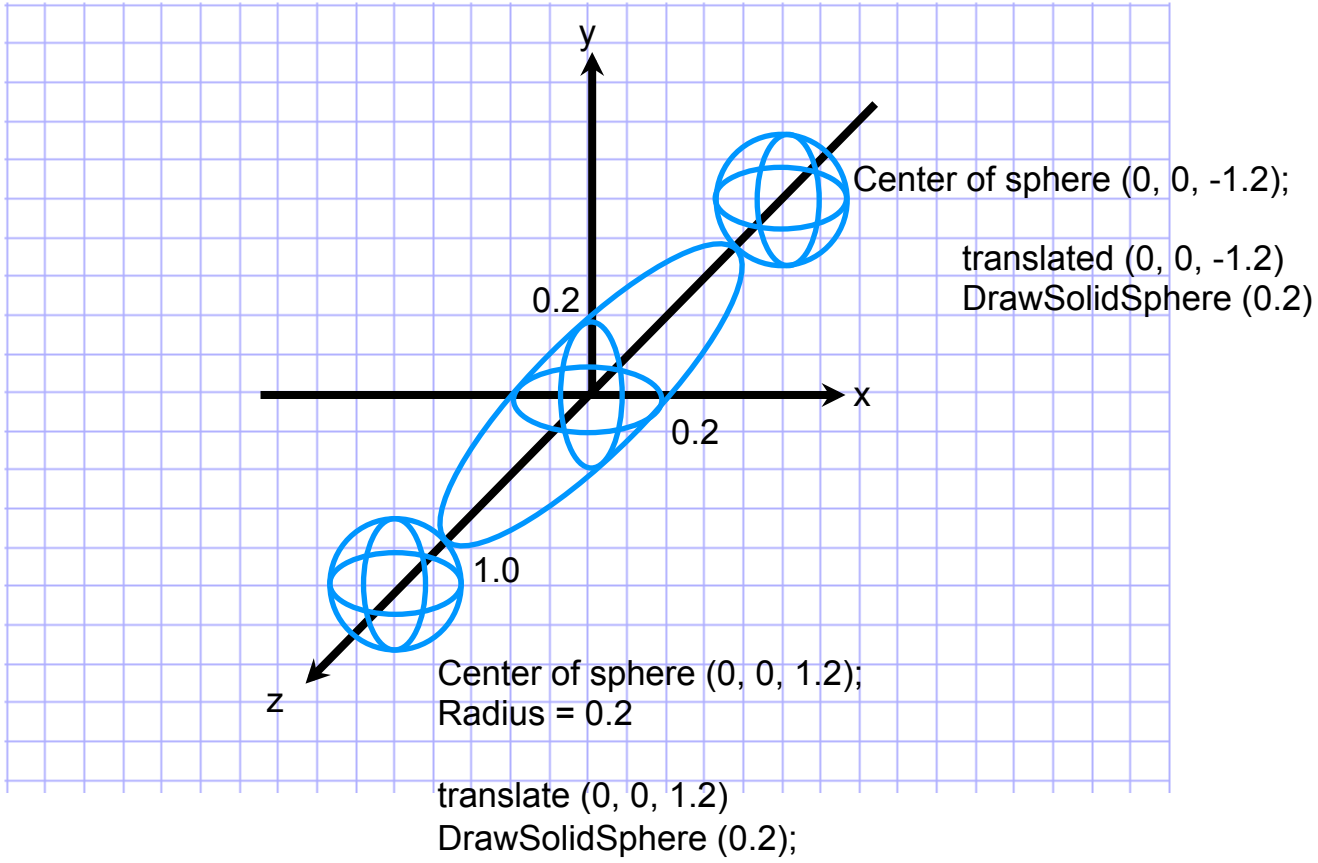
Jack Construction



Solid sphere centered at origin



Jack Construction



Jack Construction

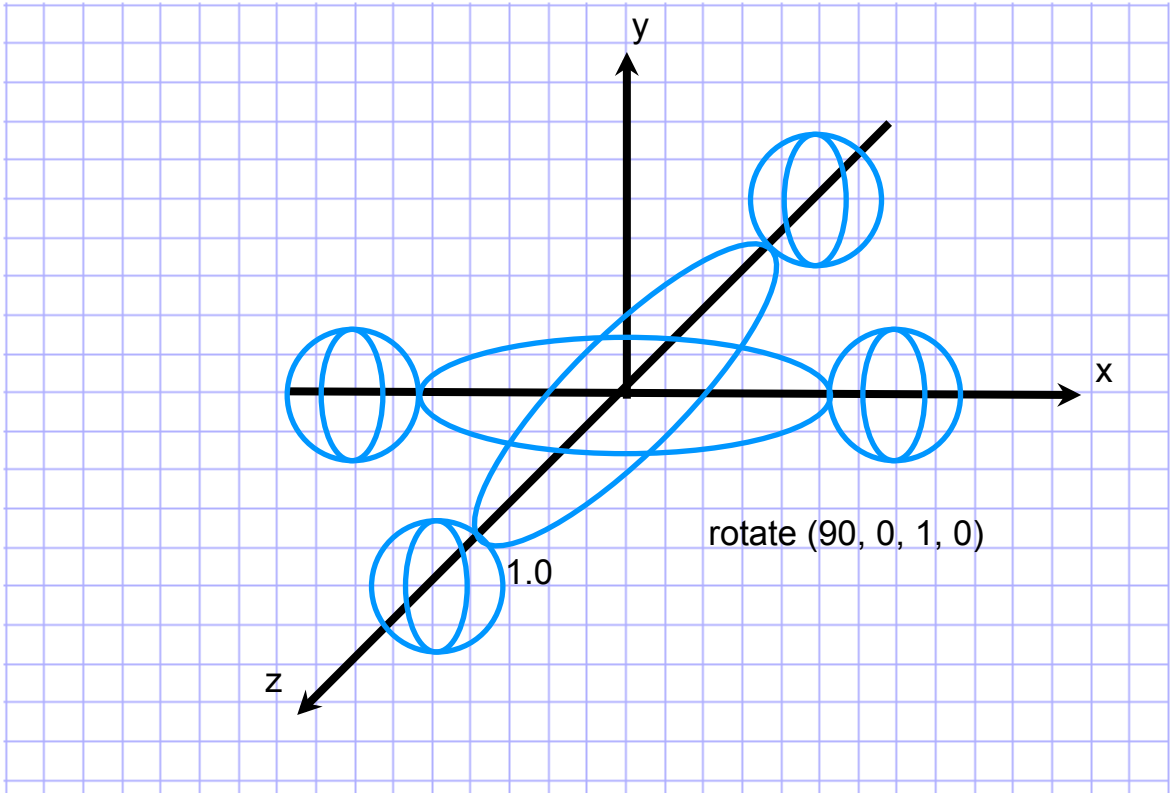
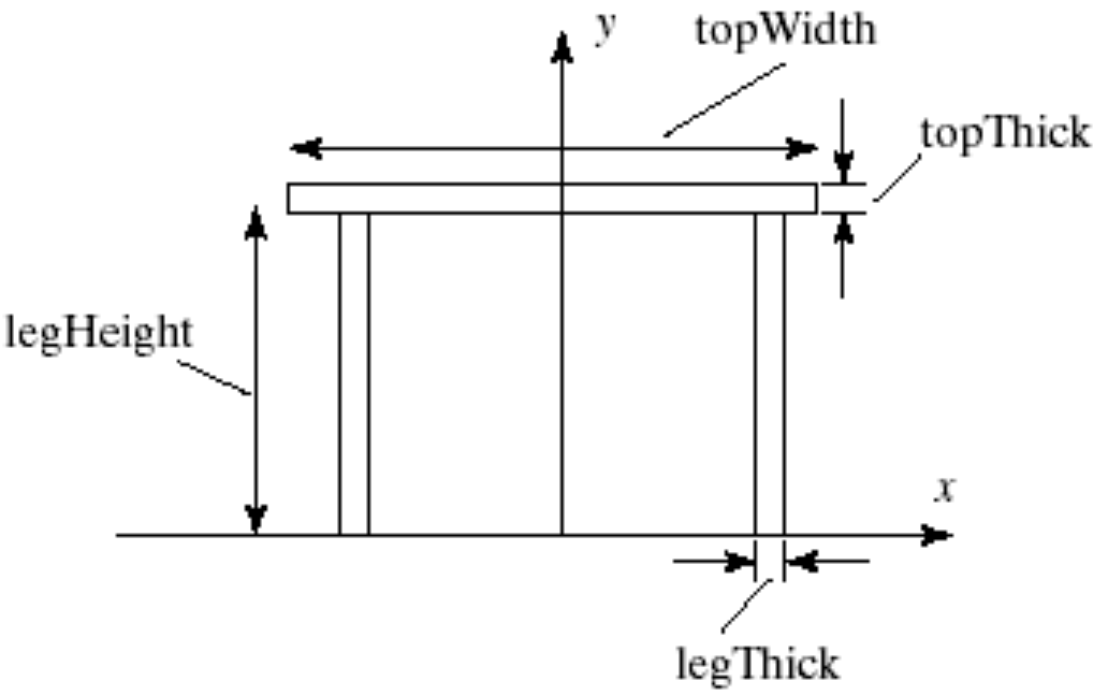


Table Construction



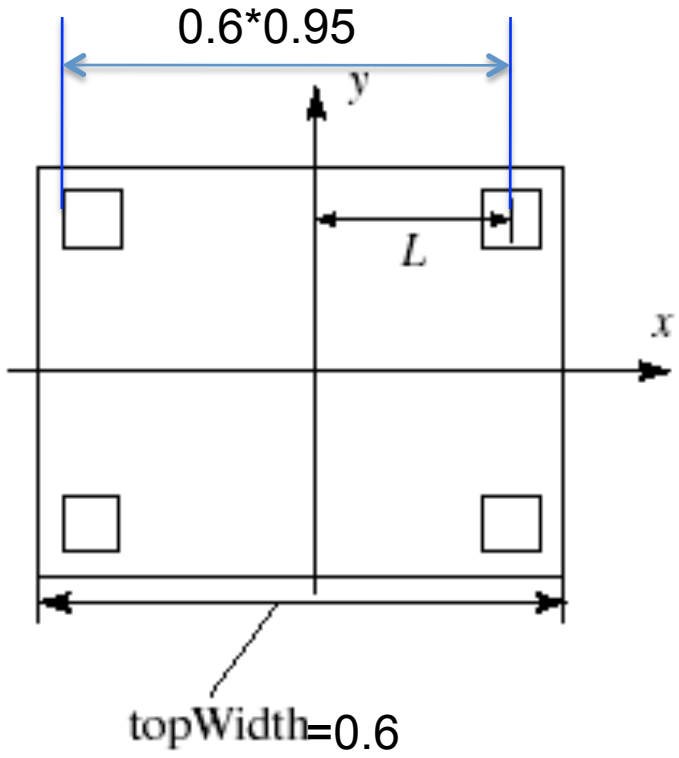
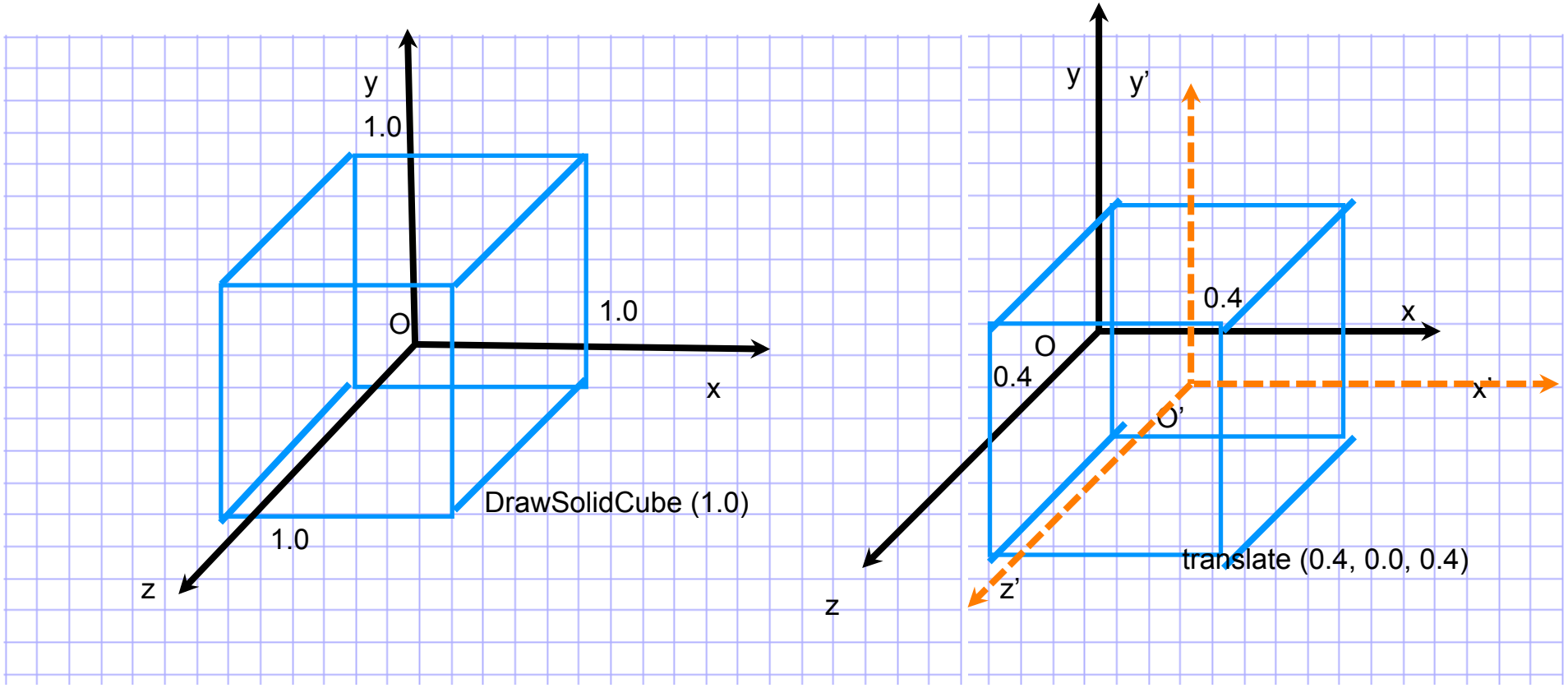


Table Top



Coordinate system translated to the new origin O'

Draw Table Top

Table Top

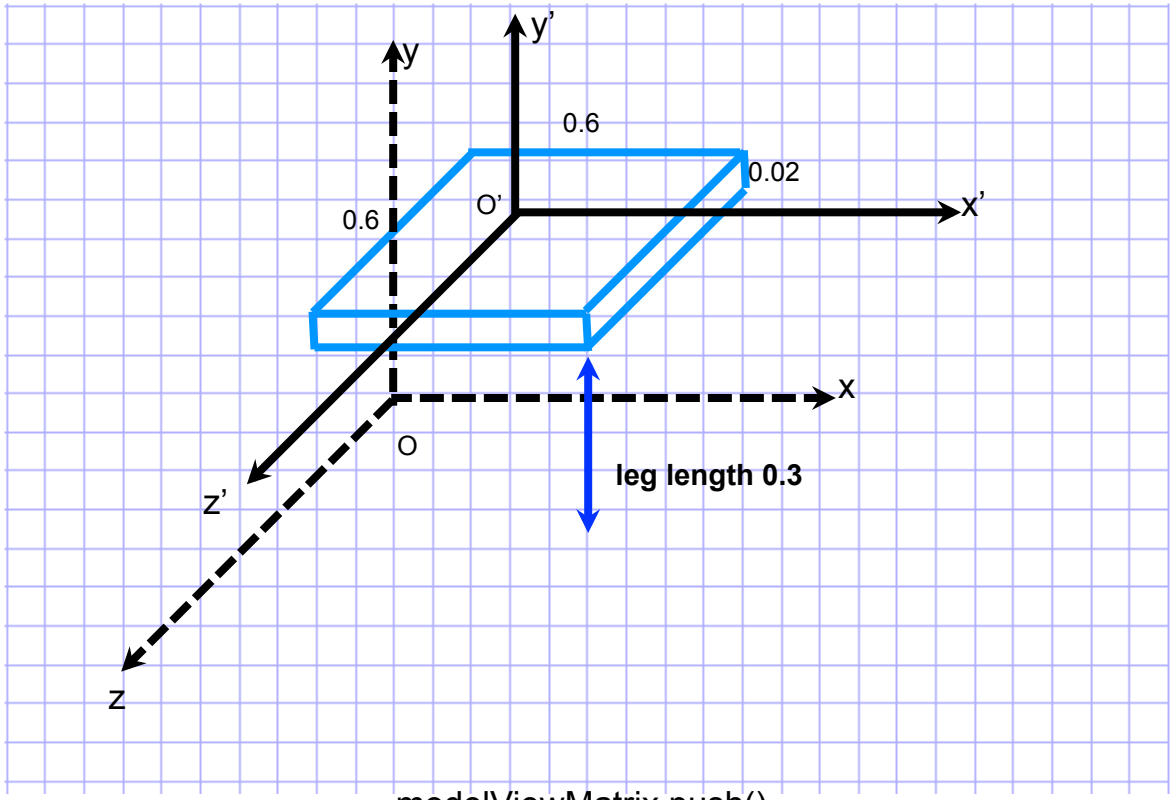


Table Width = 0.6
Table Thickness = 0.02

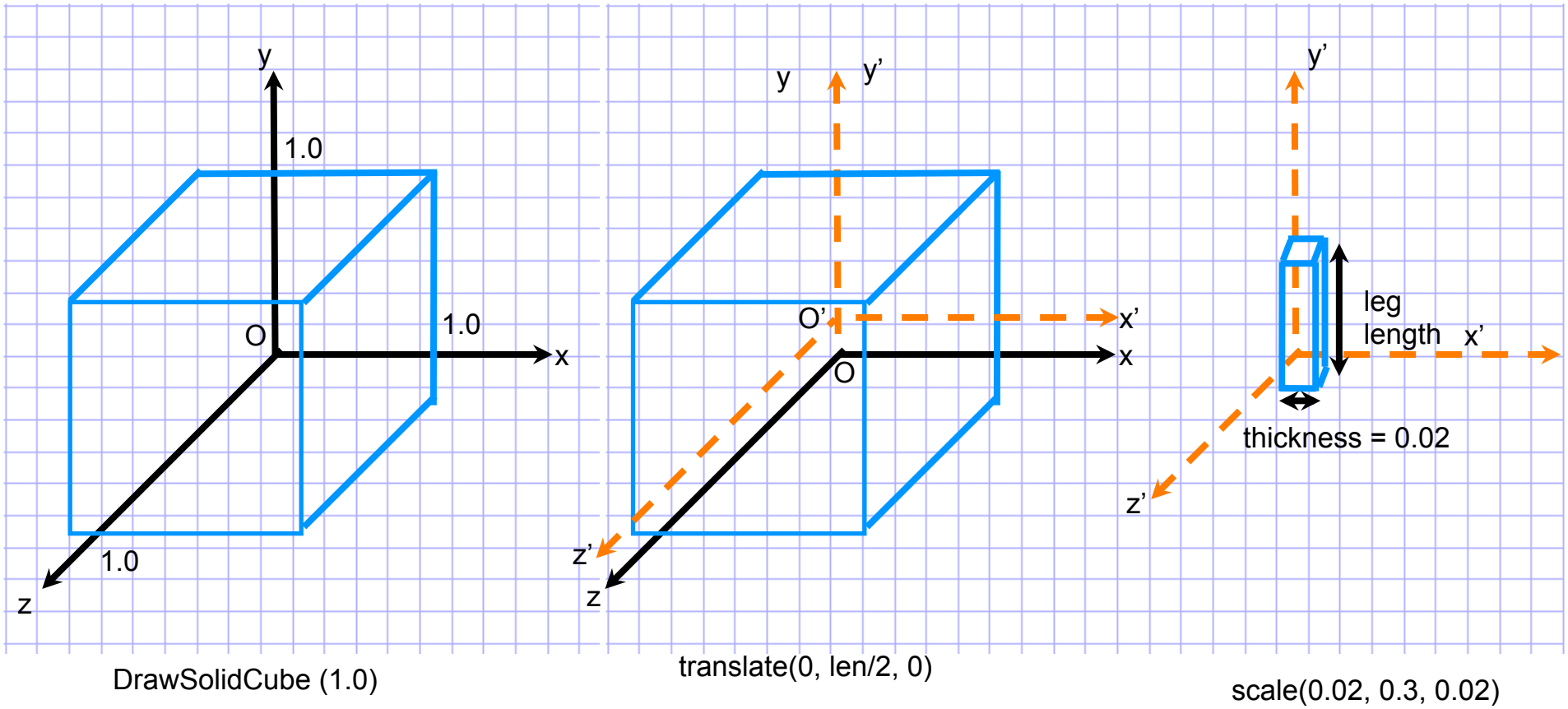
Table Top

```
modelViewMatrix.push()

translate (0, 0.3, 0)  // O' raised 0.3 from 0 along y
scale(0.6, 0.02, 0.6)  // O' (0.4, 0.3, 0.4)
DrawSolidCube (1.0)

modelviewMatrix.pop()
```

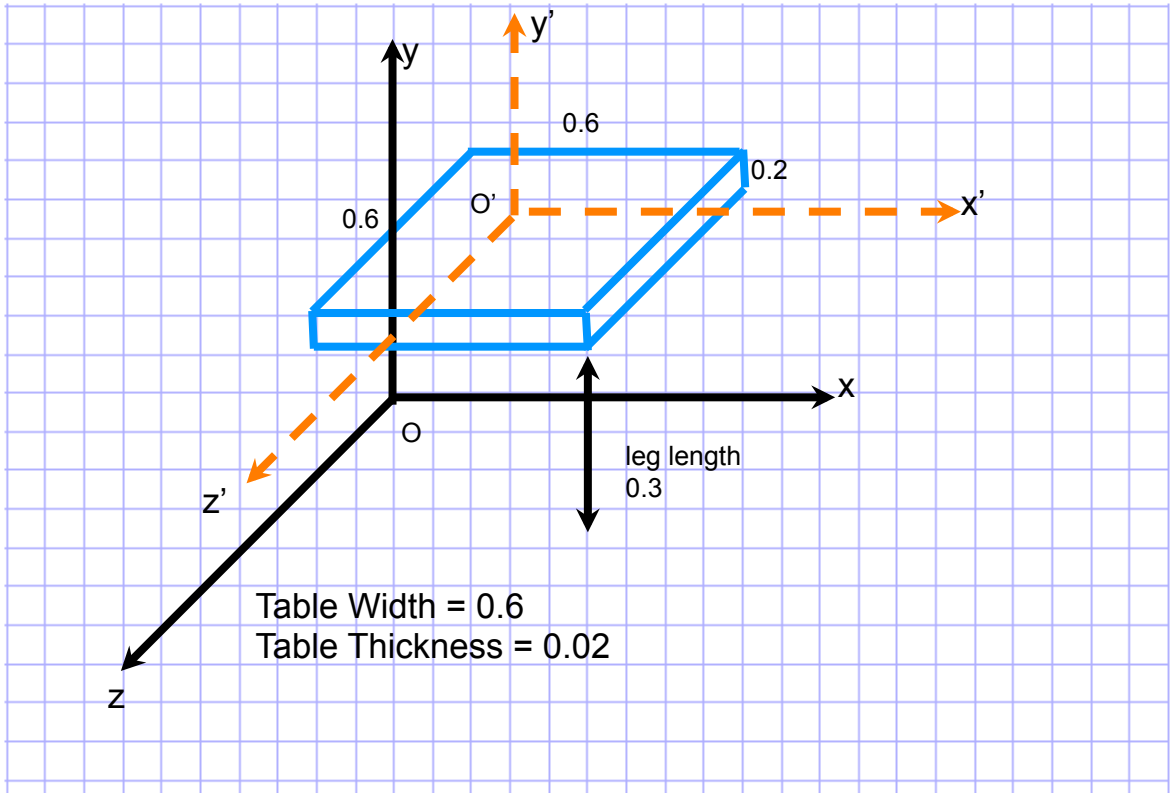
Table Leg



Leg Thickness = 0.02
Leg Length = 0.3

Draw Table Leg

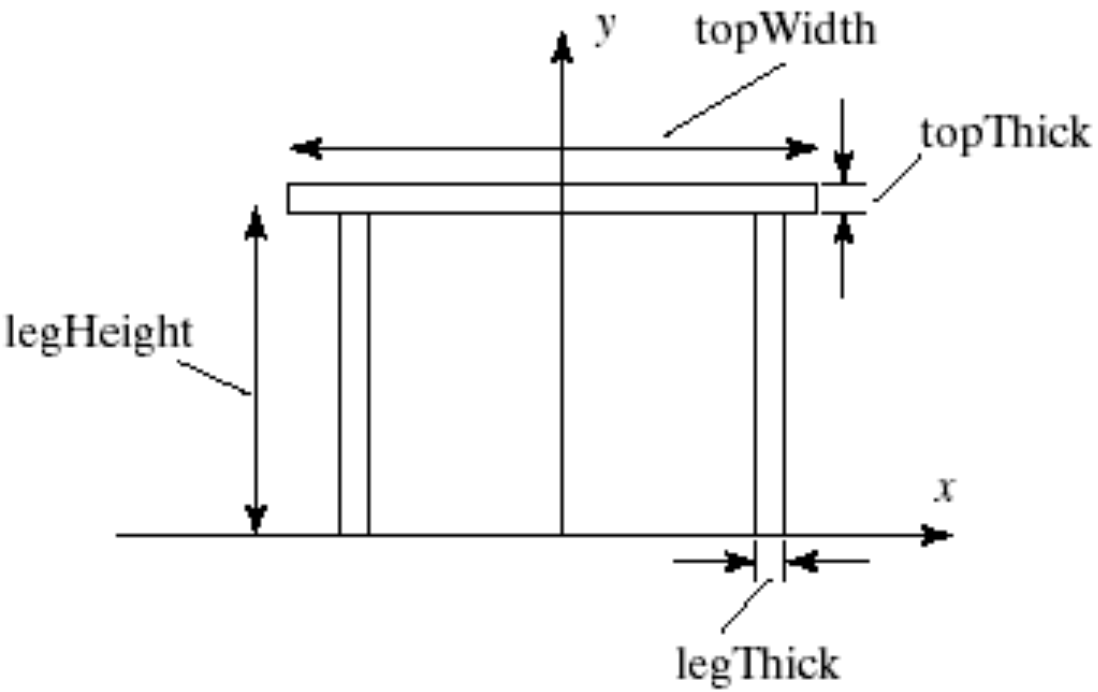
Place Table Leg

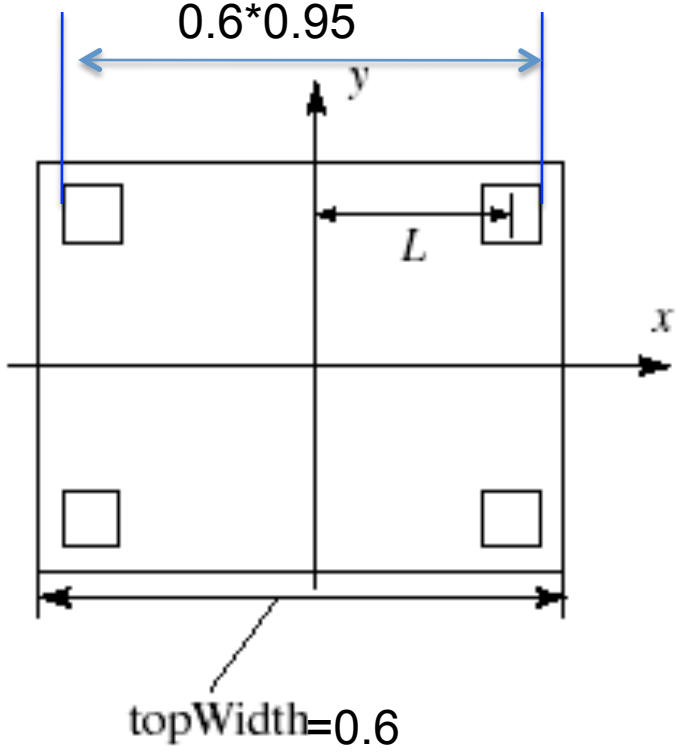



```
modelViewMatrix.push()
translate(0, 0.3, 0)
scale(0.6, 0.02, 0.6)
DrawSolidCube (1.0)
modelViewMatrix.pop()
```

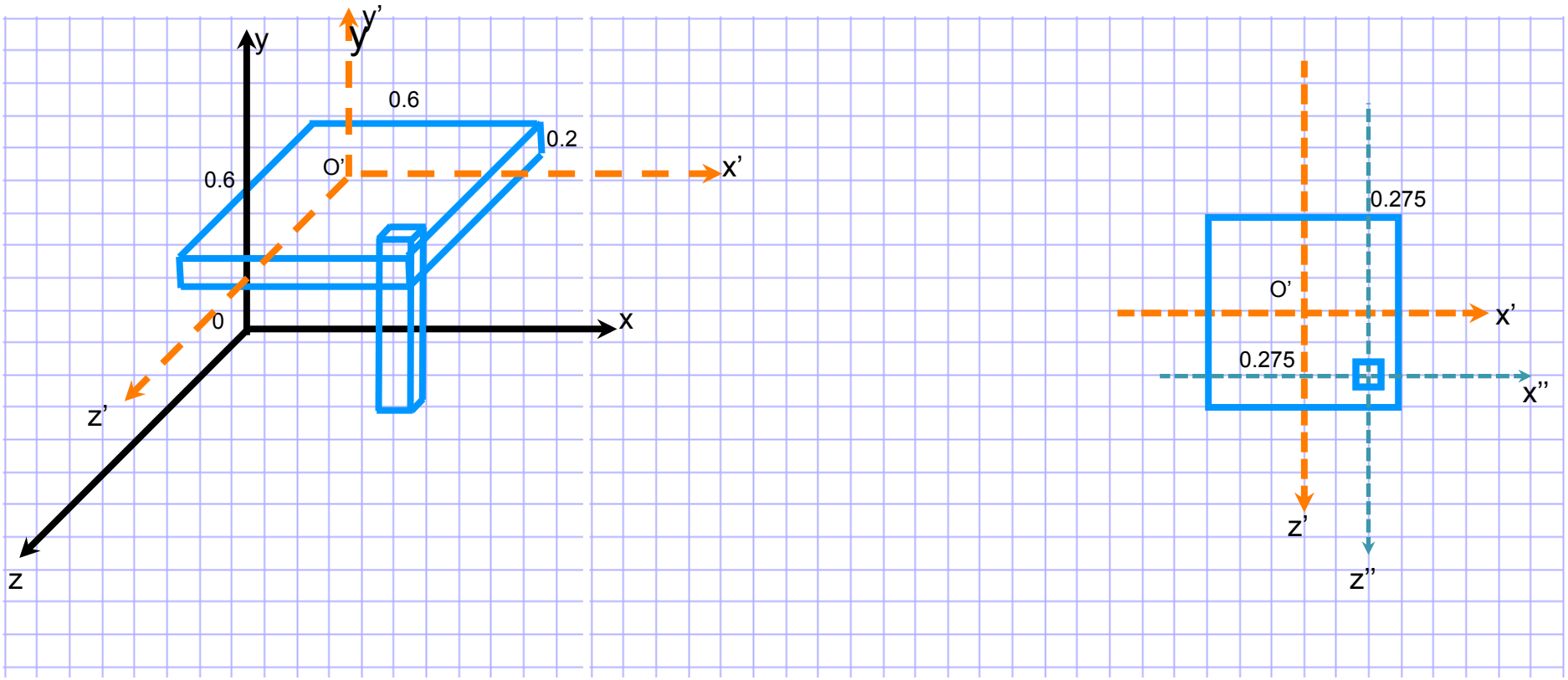
Assemble The Table (draw table)

Assemble Table





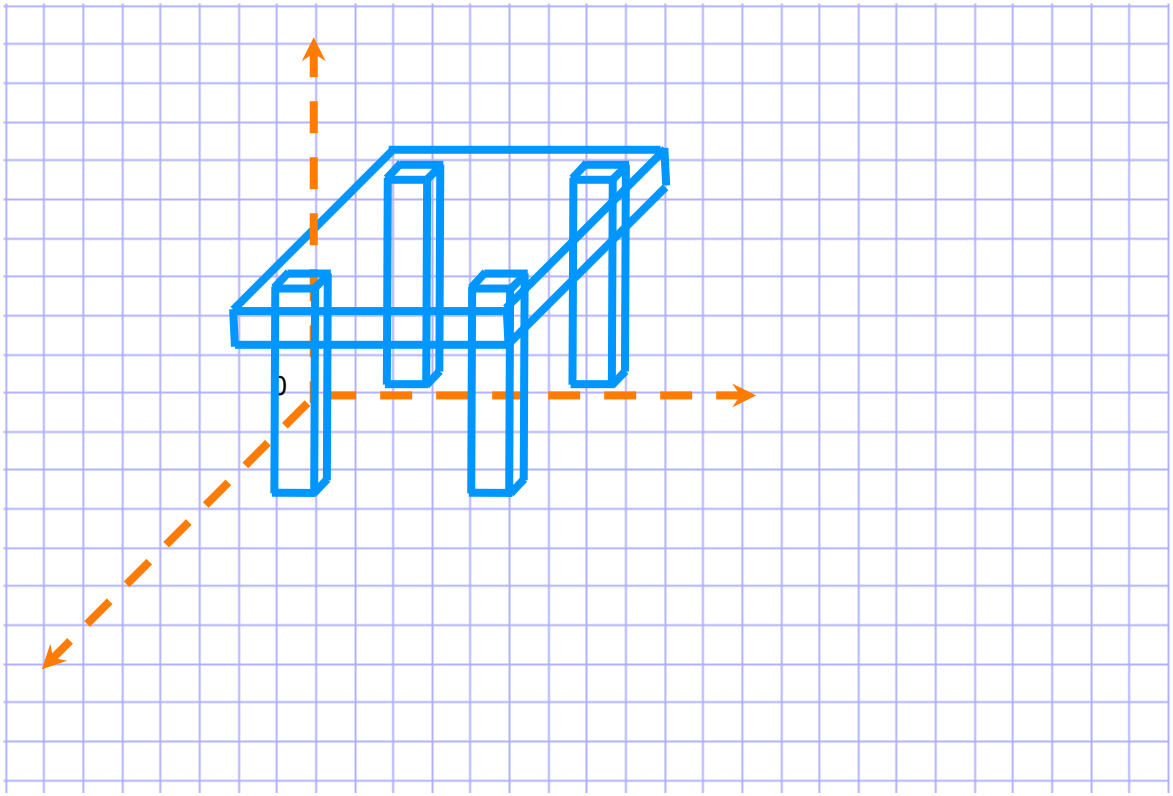
Assemble Table



modelViewMatrix.push()
dist = 0.6 * 0.95 / 2 - 0.02 / 2.0 = 0.275
translate(0.275, 0, 0.275)
DrawTableLeg(0.02, 0.3)

modelViewMatrix.push()
translate(0, len/2, 0)
scale(0.02, len, 0.02)
DrawSolidCube(1.0)
modelViewMatrix.pop()

Assemble Table



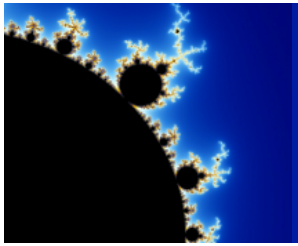
Assembled Table

dist = 0.275

translate(0, 0, -2*dist)
DrawTableLeg(0.02, 0.3)

translate(-2*dist, 0, 2*dist)
DrawTableLeg(0.02, 0.3)

translate(0, 0, -2*dist)
DrawTableLeg(0.02, 0.3)



Example Code

- The code to draw each object is imbedded in a modelViewMatrix.push(), modelViewMatrix.pop() pair.
- To draw the *x*-axis, the *z*-axis is rotated 90^{o} about the *y*-axis to form a rotated system, and the axis is redrawn in its new orientation.
- This axis is drawn without immersing it in a pair modelViewMatrix.push(), modelViewMatrix.pop() , so the rotation to produce the *y*-axis takes place in the already rotated coordinate system.