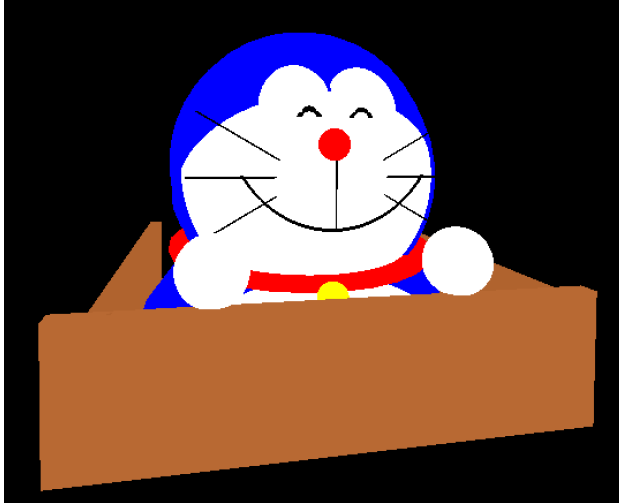
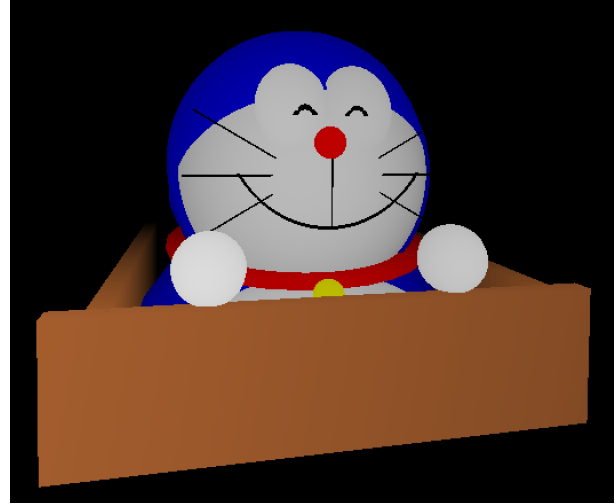


**CS 450 Project #1**  
**“Doraemon Coming Out of Nobita’s Desk”**  
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With Depth Cue off



With Depth Cue on

[Video link](#)

To create this display, I utilized the following geometry:

OSU sphere

Doraemon’s head, eyeballs, paws, nose, and yellow bell on his collar are spheres. Placing these parts involved various transformations, rotations, and scaling—especially for the eyeballs, which are spheres made taller after being stretched on the y-axis, squished on the x-axis, and then rotated -20 degrees along the x-axis. The appearance of Doraemon’s round white muzzle and belly are made possible by white spheres being transformed a bit forward on the z-axis relative to the blue body parts they are in front of.

Cylinder

Referencing the sample code for a circle drawing function, I created a function for drawing cylinders. It involves using a given height and top and bottom radii to draw a GL\_QUAD\_STRIP for the sides of the cylinder and then drawing the top and bottom circles of the cylinder with GL\_TRIANGLE\_FAN. The total number of vertices used per cylinder is 122, composed of those from GL\_QUAD\_STRIP (30 for the bottom vertex of the cylinder and another 30 for the top vertex) and GL\_TRIANGLE\_FAN (31 for both the bottom and top circles, respectively).

Cylinders were used for Doraemon's whiskers, top lip split, collar, body, and head. The whiskers are rescaled black cylinders rotated at different angles, and the top lip split is a thin black cylinder placed in front of Doraemon's face. Doraemon's body is a blue cylinder with a top radius of 0.5 and a bottom radius of 0.8. The collar is a red cylinder with a height of 0.03 and radius of 1. Blue cylinders were used to disguise the unappealing circles where the white sphere for Doraemon's muzzle intersects with the blue sphere for his head. A large but short blue cylinder is behind Doraemon's eyeballs, and another around his face.

### Curved line strip

After determining that  $(x - 1.18)^2 + (y + 0.779)^2 = 2$  from  $x = 0$  to  $2.36$  made a perfect curve for Doraemon's closed eyes, I created a function to draw it using `GL_LINE_STRIP`. A for loop calculates the x and y coordinates of each segment in the curve such that x goes from 0 to 2.36 and y follows the curve equation. There are 100 vertices used for each curve.

I used this curved line strip for Doraemon's closed eyes and mouth. The mouth's scale was adjusted on the x-axis to achieve a curvier appearance than the eyes.

### BoxList

I scaled and assigned colors to the provided `BoxList` function to create wooden planks and translated them around Doraemon for the desk drawer he's coming out of.

