Ashley Xu
ajx3171
CS 351
Project C

<u>Project C: Frogs in a Pond</u>

<u>User Guide</u>

Upon loading my Project C program, one will see a rotating sphere at the center coordinates, and three different 3D assemblies across the landscape. To move around the landscape, the user can use the W/A/S/D keys to move the camera, and the arrow keys to aim the camera. This gives the user the freedom to explore the different assemblies, the landscape, and to investigate the assemblies as close or as far as they wish.

The user may also interact with the light source. Using the button below the canvas, the user can turn on or off the lamp. There are also sliders on the webpage, which can be used to change the position of the light source using the X, Y, and Z positions, or to change the values for the light's ambient, diffuse, or specular values. The user may observe their changes in real time in the canvas above.

As well as the light source, the user can change the modes of shading or lighting–choosing between 'Gouraud' or 'Phong' for shading, and 'Phong' or 'Blinn-Phong' for lighting. Finally, the user can press the 'M' key to change the material for the rotating sphere in the center of the landscape.

<u>Results</u>

When the program is first loaded, the user is presented with the default shading and lighting combination of Phong shading and Blinn-Phong lighting. Below the canvas is a list of instructions for the user to interact with the program, as well as sliders and buttons to control the light source.
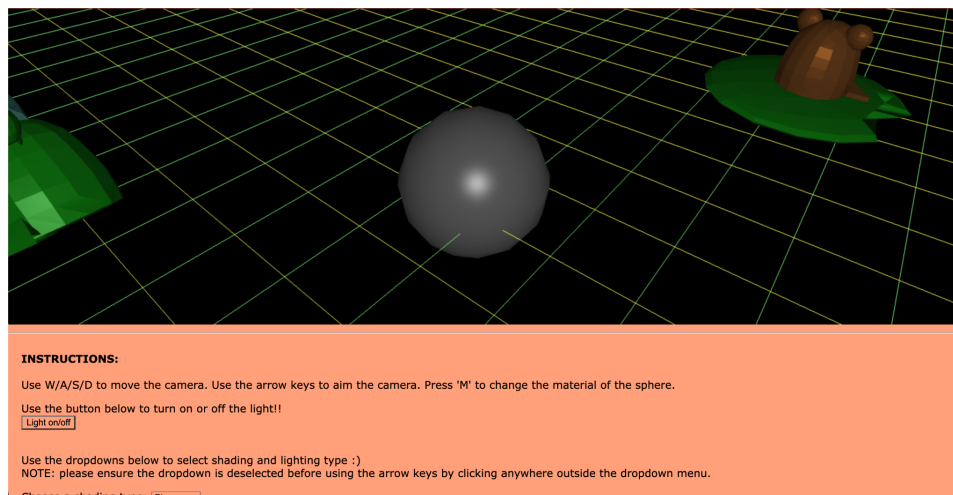

Figure 1: Screen view upon loading the program. Instructions are listed below the canvas.

After loading the program, the user may interact with the program in many different ways, including changing the position of the light and moving the camera with the W/A/S/D keys or the arrow keys.
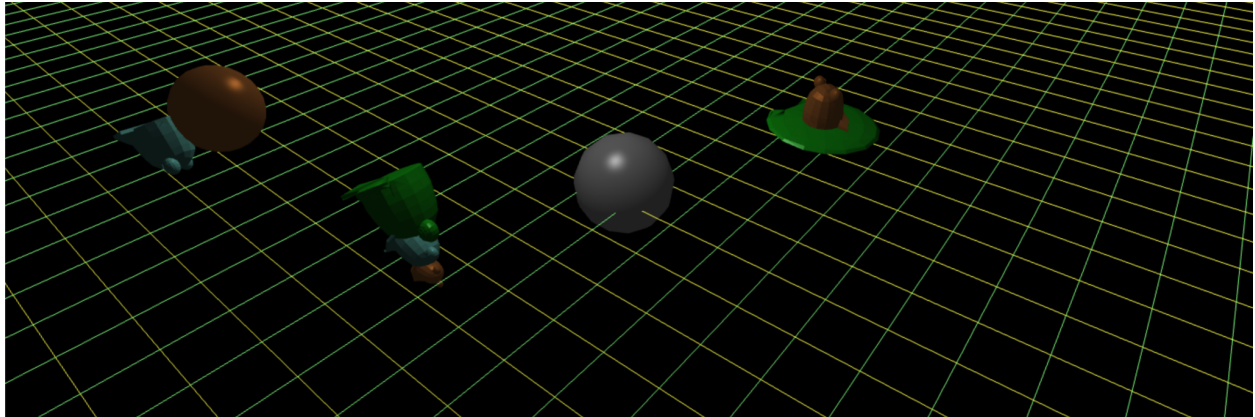

Figure 2: The scene after moving the camera backwards and moving the position of the light source using the sliders.

Figure 3: Moving the sliders to change the light position.

The user may also decide to change the shading and lighting options. They can also use the 'M' key to change the material of the rotating sphere.
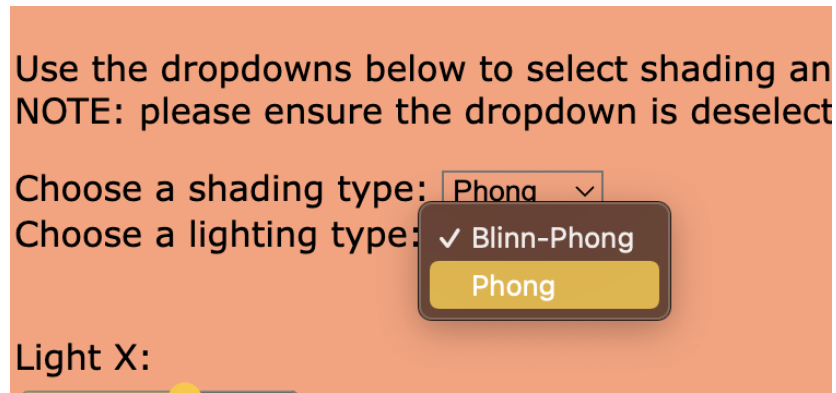
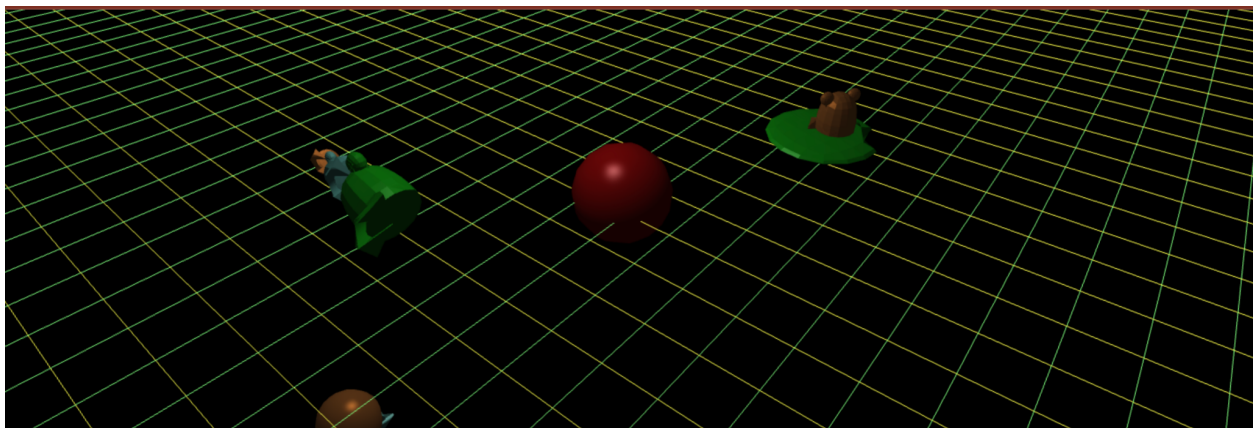*Figure 4: Switching the lighting method to Phong lighting.*

Figure 5: The result of changing the lighting to Phong and changing the material of the sphere by pressing 'M'.

Finally, below is the scene graph of the program for reference. There are four major groups under the root node which include each of the assemblies as shown on screen. The assemblies are then created with further children nodes and transforms.

HTML Canvas

Viewport

CVV

projection

camera

view

World

t0   t1   t3   t6   Sphere frog group

Sphere group

lily pad frog group

frog group

Sphere obj

t2

t4   t7
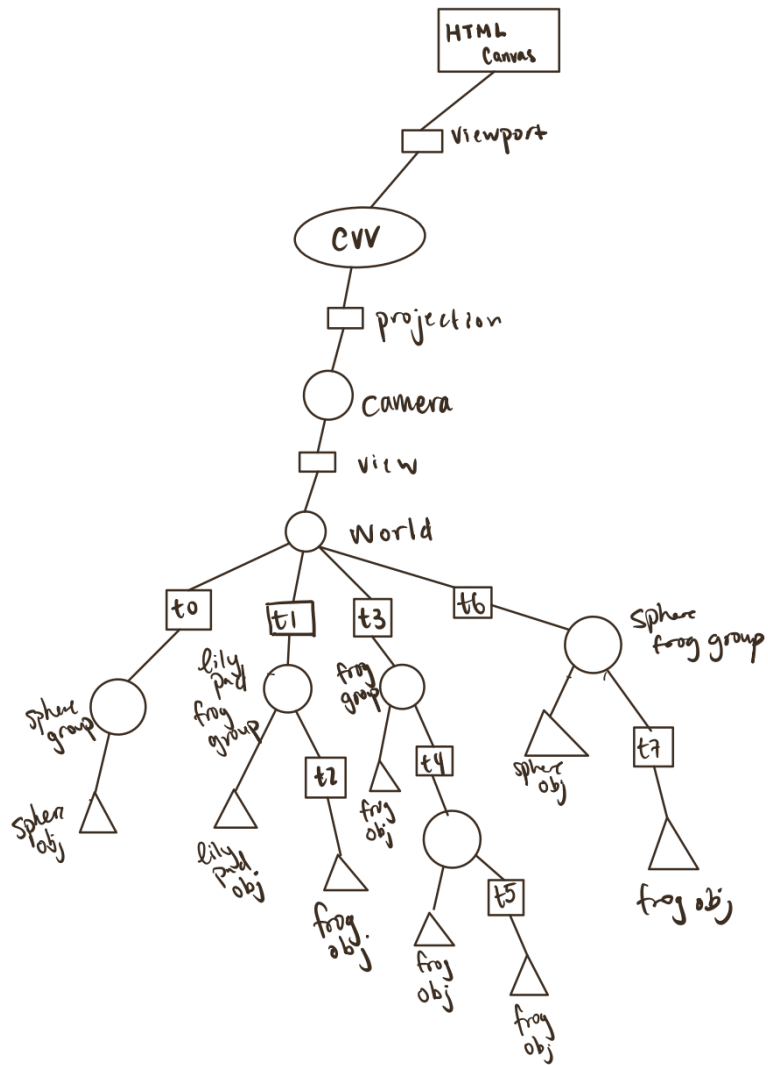
Sphere obj

Sphere obj

lily pad obj

frog obj

t5

frog obj

frog obj

frog obj

frog obj

Figure 6: Scene graph of Project C.