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**CS-330**

**October 20, 2024**

**7-1 Final project**

**Reflection**

1. **Justify development choices for your 3D scene**. Think about why you chose your selected objects. Also, consider how you were able to program for the required functionality.

In creating my 3D scene, I wanted to build an interesting and visually appealing environment using a variety of objects. Each object plays a unique role in the overall design. My choices were based on looks and the challenges of working with different materials and shapes.

**House:** I chose to include a house as a main feature because it is complex. The house has several parts: a roof, three windows, and a door. These elements let me explore detailed shapes and textures. This house is special to me; my daughter made it at school, showing her creativity. By modeling this house, I wanted to capture those details and lay a strong foundation for my project.

**Vase with Flowers:** The vase adds another challenge because it is made of glass and has two shapes: a cylindrical neck on top of a box-like base. The flowers add extra difficulty because I need to think carefully about their shape and color to make them look lifelike. This choice brings color and energy to the scene.

**Candle:** I added a candle to provide both function and visual interest. Like the vase, the candle has two different shapes, which lets me try different rendering techniques.

**Green Ball:** Lastly, I included a green ball to add a playful touch and contrast with the more complex objects.

I considered adding more textures to my four objects, but I decided against it to keep the file size small.

1. **Explain how a user can navigate your 3D scene**. Explain how you set up the virtual camera for your 3D scene using different input devices.

In my 3D scene, users can explore an engaging environment using keyboard and mouse controls. The camera moves as it does in real life, helping users see details and how different items interact. Users navigate with the W, A, S, and D keys to move forward, left, backward, and right. This makes it easy to get around. The Q and E keys allow users to move up and down, enabling them to view objects from different heights, like looking inside a vase or gazing up at a roof.

I created simple functions for camera movement. These functions make it easy to adjust and enhance camera controls later. One function checks which keys are pressed and updates the camera position.

1. **Explain the custom functions in your program that you are using to make your code more modular and organized**. Ask yourself, what does the function you developed do and how is it reusable?

In my 3D scene, I created functions for rendering different shapes. This approach makes the code clearer and easier to maintain.

I used separate functions for each object, like `RenderHouse()`, `RenderVase()`, `RenderCandle()`, and `RenderBall()`. Each function contains all the details needed for that object for example:

RenderHouse(): This function manages the house's size, position, and color. If I need to change anything about the house, I can update `RenderHouse()`.