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CS-330

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**Project 1 Reflection**

**Object Selection:**

1. **Monitors**: Chosen to mimic my workspace setup, creating a realistic environment. Each monitor was designed with its own screen saver texture to enhance realism.
2. **Keyboard and Mouse**: These are essential components of and workspace, providing users with familiar references. The keyboard was modeled using box meshes for simplicity and efficiency, while the mouse design incorporated a cylindrical mouse wheel to enhance visual appeal.
3. **Desk**: The desk is the main stage for this scene and gives a realistic size comparison of the other objects.
4. **Walls, Floor, and Ceiling**: These elements create the boundaries of the scene and help in defining the space, adding context and depth to the environment.
5. **Wall Paint Material**: Adding a specific material for the walls, such as wall paint, helps in diversifying textures and enhances the visual richness of the scene.

**Programming for Required Functionality:**

* **Lighting**: Directional lighting was implemented to simulate the light coming from the monitors and window which mimics the scene at night. This was achieved using directional light sources positioned at the monitors and behind the window, as well as additional light sources to ensure the scene has full light coverage.
* **Textures**: Custom textures were applied to different objects to enhance realism. For instance, textures for the monitor screens, floor, ceiling, and walls were chosen carefully.
* **Transformations**: Objects were positioned, scaled, and rotated to create a realistic and organized scene.

**User Navigation:**

* **Keyboard Controls**: Users can navigate the scene using keyboard inputs (W, A, S, D for movement, Q and E for vertical movement, and O and P to switch perspectives).
* **Mouse Controls**: Mouse movements are used to control the camera's view direction, allowing users to look around the scene.
* **Mouse Scroll Wheel**: The mouse scroll wheel can be used to increase and decrease the movement speed of the camera.
* **Smooth Transition**: The camera's position and orientation are updated smoothly based on user input, providing an immersive experience.

**Custom Functions for Modularity and Organization:**

‘DefineObjectMaterial’:

 **Purpose**: This function initializes the material properties for various objects in the scene.

 **Usage**: It is called during the scene setup to define the ambient, diffuse, and specular properties of materials.

*‘LoadSceneTextures’:*

* **Purpose**: This function loads textures from image files and binds them to texture slots.
* **Usage**: It is called during the scene setup to load all necessary textures.

*‘ProcessMouseScrollWheel’:*

 **Purpose**: This function processes the mouse scroll wheel input to increase and decrease camera movement speed in the 3D scene.

 **Usage**: It is called in the input handling routine to adjust the camera's movement speed.

*Lighting with 7 Light Sources in the Fragment Shader:*

 **Purpose**: Update the fragment shader to handle up to 7 different light sources, including different types such as directional, point, and spotlight.

 **Usage**: Update the shader code to include additional light sources and types.

References:

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Rodriguez, J. (n.d.). OpenGL API Documentation. Docs.GL. <https://docs.gl/>

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