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CS 330

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3D Design Decisions

I decided to go for a scene that blends simplicity with a touch of complexity. The textured tree and the brown rectangle offered a good mix—allowing me to showcase basic shapes while delving into the intricacies of a 3D object. The use of shaders for both elements gave me the flexibility to play with their appearance, and throwing in a light source in the fragment shader added that extra visual flair. I wanted something straightforward yet visually interesting for a foundational dive into 3D graphics programming.

I set it up so users could navigate the 3D scene with the classic WASD keys—forward, backward, left, and right movements are all covered. Adding Q and E for upward and downward movements made it more intuitive. The mouse, in turn, controls the camera's orientation, letting users explore the scene from different angles. It's a familiar and user-friendly navigation scheme commonly seen in first-person experiences.

I crafted a couple of custom functions to handle mouse input. The `mouse\_callback` function takes care of the mouse movements, updating the camera's yaw and pitch angles as the mouse moves. It's a neat little piece of code that can be easily reused in other 3D scenes where mouse-controlled camera movements are needed.

Then there's the `scroll\_callback` function, which adjusts the camera's speed based on the mouse scroll wheel input. It's a handy addition, giving users control over their movement speed. I can see myself repurposing this in future projects that demand a similar functionality.

Finally, the `loadTexture` function. It encapsulates the whole texture-loading process, making the code cleaner and more readable. This one's a gem for anyone wanting to load textures for different objects or scenes without diving into the nitty-gritty details each time.

All in all, my code has a modular and organized structure thanks to these custom functions. The choice of objects and the user navigation scheme make the scene interactive and visually engaging, exactly what I was aiming for.