**Design Decisions - 3D Scene Project**

**Introduction**

This paper lists the most important design choices I made while working on my 3D scene project. The main things to focus on are choosing objects, handling transformations, designing modular code, and moving the camera around. Every choice is a compromise between what is technically necessary and what is creative.

**Object Selection and Scene Composition**

I picked a table with a mug on top as the main scenario. These things were chosen because they are simple shapes and can show many types of meshes. For instance:

* The **mug body** was modeled with a cylinder mesh to showcase scaling and texturing.
* The **mug handle** used a torus mesh to demonstrate more complex shapes.
* The **tabletop and legs** were constructed using box and cylinder meshes, combining simple primitives into a composite object.

This composition let me work on realism by putting numerous meshes in the right size and location in relation to each other.

**Transformation and Modularity**

To avoid writing the same code over and over, I built a function called SetTransformations that could scale, rotate, and move any object. This modular method made it easy to change objects without having to write transforms over and over. It also made it easier to maintain, since updates could be made in one location and used everywhere.

I also included the SetShaderTexture and SetTextureUVScale routines to make sure that object textures are always the same. This design choice made the code easier to read and reuse, which cut down on mistakes and duplication.

**Textures and Materials**

Textures were applied to objects to improve realism:

* A **wooden texture** was chosen for the table to create a natural appearance.
* A **ceramic texture** was used for the mug body.
* A **metallic texture** was applied to the mug handle.

Scaling the UV coordinates made it possible for the textures to tile correctly without stretching, which made the scene seem better.

**Camera Navigation**

I designed the camera system so that people could move around the 3D environment in a way that was interactive. The user can walk around the scene using the keyboard and rotate it using the mouse. They can also zoom in and out and see things from different angles. This design choice makes the scenario easier to use and more interactive, which is what people anticipate from 3D navigation in the real world.

**Lighting and Shading**

Basic lighting was used to add depth and authenticity to the picture. I made sure that items cast the right shadows and looked three-dimensional by trying out different light sources and material reflections.

**Conclusion**

The choices made in this project about how to design things include both creative choices (such what objects to use, how to texture them, and how to arrange them) and technical techniques (like how to set up the camera and how to make things modular). They all illustrate that I can make a 3D world that makes sense and is fun to play in while keeping my code tidy and reusable.