

## **Report on Mini project of Image Synthesis**

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The script that I've sent creates a simple 3D scene featuring a car moving around a stationary house. The scene includes additional elements such as sun (mentioned as clouds in code), lighting, and a camera that the user can control. The program is written in Python and utilizes the OpenGL library for graphics rendering.

Here are components of the program:

- Car Class:

The Car class represents a moving car in the scene. It is defined by its position, speed, and radius of movement on a circular path. The car's movement is controlled by the move method, and its appearance is defined by the draw method using OpenGL commands.

- StationaryCar Class:

The StationaryCar class is a subclass of Car representing a stationary car (Inheritance and Polymorphism principles of OOP - Object Oriented Programming). It overrides the speed parameter, making it not move.

- Camera Class:

The Camera class represents the viewpoint in the scene. It allows the user to control the camera's position, orientation, and distance from the scene.

- Light Classes:

The Light class is a base class for light sources, providing methods to set up lighting properties. PositionedLight and RotatingLight are subclasses representing fixed and rotating light sources, respectively.

Here are functions that was used in program:

Various functions are defined for setting up material properties for the car and house, and drawing the house and car. The display function combines these elements to render the entire scene.

- User Interaction:

The program allows user interaction through keyboard inputs. Arrow keys (up, down, left, right) control the camera's rotation and movement.

- Main Loop:

The main loop is established using GLUT, handling display updates, idle state operations, and keyboard inputs.

And scene elements:

- House:

The house is represented as a cube with front and side windows, a roof, and a chimney.

- Cars:

There is a moving car and a stationary car, both with distinct appearances.

- Lighting:

Two light sources are present: a positioned main light and a rotating secondary light.

User Interaction - Camera Control:

Arrow keys allow users to rotate and move the camera, providing a different perspective of the scene.

Animation - Car Movement:

The moving car follows a circular path, creating the appearance of drifting.

Animation - Light Rotation:

The secondary light source rotates, simulating changes in lighting conditions.