**Escape The Grid: 3D Adventure Game:**

Escape the Grid is an advanced **3D OpenGL game** developed with **PyOpenGL**.

The project demonstrates extensive use of **3D transformations** (translation, rotation, scaling), **perspective projection**, and **camera manipulation** while providing a much richer and more interactive gameplay experience.

The player begins at the center of a dynamic 3D arena made of checkerboard tiles, some of which **rise, fall, or turn into traps**. The goal is to **survive waves of enemies**, collect **diamonds and power-ups**, and eventually **escape the arena** by defeating a boss enemy or gathering enough resources.

**Gameplay Features:**

**1. Player**

* Represented with cubes, spheres, and cylinders.
* Can move, rotate, jump, and strafe using a combination of **W/S/A/D** keys and **Arrow keys**.
* Equipped with a gun that fires cube-shaped bullets.
* Gains temporary boosts through collectibles (speed boost, shield, and multi-shot).

**2. Enemies**

* **Chasers:** Classic red-sphere enemies that pursue the player.
* **Shooters:** Stationary enemies that fire projectiles at the player.
* **Boss:** A giant pulsating enemy that spawns after every 20 points, requiring multiple hits to defeat.

**3. Arena**

* Dynamic checkerboard floor with **moving platforms** and **lava trap tiles**.
* Surrounded by four boundary walls.
* Collectible **diamonds** appear randomly; gathering those increases score.

**4. Camera & Controls**

* **Arrow Keys:**

1. UP/DOWN → zoom in/out.
2. LEFT/RIGHT → orbit camera around the arena.
3. SHIFT + UP/DOWN → jump/hop control.
4. SHIFT + LEFT/RIGHT → strafe player sideways.

* **Right Mouse Button:** Toggle between First-Person, Third-Person, and Tactical Top-Down View.
* **Left Mouse Button:** Fire bullets.

**5. Environmental Effects**

* **Day/Night cycle**: background color changes dynamically.
* **Fog mode (F key):** simulates reduced visibility.

**6. Game Flow**

* **Life System:** Player loses health if touched by enemies or steps on lava.
* **Energy Bar:** Consumed for power-ups, recharges over time.
* **Game Over:** If life reaches zero.
* **Victory:** Collect 30 diamonds or defeat the boss enemy.