AVIATOR'S QUEST - Flight Simulator Game

Objective

Fly an airplane through rings, avoid obstacles, shoot enemies, and survive as long as possible while collecting power-ups in an endless 3D world.

Flight Controls

- **W - Pitch up (climb)**
- **S - Pitch down (dive)**
- **A - Roll left (bank left)**
- **D - Roll right (bank right)**
- **Arrow Keys - Alternative precise flight control**
- **Q - Strafe directly left**
- **E - Strafe directly right**
- **SPACEBAR - Fire bullets at enemies**
- **C - Change camera view (cycles through 3 modes)**
- **P - Pause/Resume game**
- **X - Toggle cheat mode (invincibility + auto-fire)**
- **R - Restart game**

Mouse Controls:

- **Left Click - Fire bullet**
- **Right Click - Change camera view**

Camera Modes (3 Views)

1. **Third-Person (Chase Cam)** - Classic view from behind and above the plane
2. **First-Person (Cockpit)** - Pilot's eye view from inside the cockpit
3. **Side View** - Lateral angle for better spatial awareness

Press C or Right Click to cycle through views.

Game Objects

Rings (Gold/Yellow):

- **Fly through them to score 100 points (base)**
- **They respawn infinitely ahead of you**
- **Collecting consecutive rings builds combo multiplier (2x, 3x, 4x, etc.)**
- **Combo system: You have 3 seconds after each ring to collect the next one**

Obstacles (3 Types):

1. **Clouds (White) - Pass through harmlessly (non-collidable, visual only)**
2. **Rocks (Brown) - Crash into them = lose 1 life**
3. **Balloons (Red with string) - Crash into them = lose 1 life**
- **During Boost Mode: You can smash through rocks/balloons for +50 points bonus**

Enemies (Red Aircraft):

- **Chase and follow you using AI**
- **Shoot them for +100 points**
- **Collide 5 times = lose 1 life**
- **Collision counter resets after each life lost**
- **During Boost Mode: Ram enemies for +150 points**
- **Enemies respawn closer for better visibility (300-800 units ahead)**

Power-ups (Cyan Spinning Cubes):

- **Collect for +200 points + BOOST MODE activation**
- **Boost duration: 7 seconds**
- **Boost benefits:**
  - **5x speed increase**
  - **Invincibility against obstacles and enemies**
  - **Ability to smash through obstacles for bonus points**
  - **Ability to ram enemies for bonus points**
  - **Aircraft turns ORANGE during boost**

HUD Information

The game displays the following information on screen:

- **Score - Total points earned**
- **Lives - Remaining lives (starts with 3)**
- **Stage/Level - Increases every 500 points**
- **Speed - Current velocity**

- **Enemy Hits Counter - Shows hits taken (0-5) before losing a life**
- **Enemies Destroyed - Total enemy kills**
- **Boost Timer - Shows remaining boost time when active**
- **Camera Mode - Current view name**
- **Combo Multiplier - Shows current combo (2x, 3x, 4x, etc.)**
- **Combo Timer - Time remaining to maintain combo chain**

Special Features

Start Screen:

- **Displays game title and instructions**
- **Shows all controls and objectives**
- **Press SPACEBAR to start**

Pause Menu (Press P):

- **Pauses all game action**
- **Displays current stats (score, lives, stage)**
- **Press P to resume or R to restart**

Combo System:

- **Collecting rings in sequence (moving forward) builds combo multiplier**
- **Each consecutive ring increases multiplier: 1x → 2x → 3x → 4x...**

- **Points are multiplied by combo level**
- **3-second timer to collect next ring**
- **Timer resets if you collect rings out of order or time expires**
- **Combo resets on crash**

Boost Mode Features:

- **Aircraft color changes to ORANGE when boosted**
- **Invincibility active - no damage from obstacles or enemies**
- **5x speed increase for rapid navigation**
- **Smash obstacles for bonus points**
- **Ram enemies for bonus points**
- **Visual "POWER MODE!" indicator on HUD**

Progressive Difficulty:

- **Speed increases as you level up (+0.5 per stage)**
- **More enemies spawn at higher stages**
- **Enemy AI becomes more aggressive**
- **Stage progression: every 500 points**

Endless World:

- **Infinite procedural generation**
- **Objects behind you get recycled and respawn ahead**
- **Seamless gameplay with no boundaries**
- **Continuous challenge**

Cheat Mode (Press X):

- **INVINCIBILITY MODE - no damage from anything**
- **Auto-firing bullets - rapid fire at enemies**

- Magenta "INVINCIBILITY MODE!" indicator on HUD
- Toggle on/off anytime

3D Environment

- Ground terrain - Green grass with grid lines
- Sky gradient - Blue gradient from horizon to zenith
- Mountain scenery - Distant brown mountains on horizon
- Dynamic objects - Rings, obstacles, enemies, power-ups
- Particle effects - Explosions when destroying enemies

Scoring System

Action	Points
Ring collected	+100 points (×combo multiplier)
Enemy shot	+100 points
Enemy rammed (boost)	+150 points
Obstacle smashed (boost)	+50 points

Power-up collected	**+200 points**

Combo Multiplier Examples:

- **Ring with 2x combo = 200 points**
- **Ring with 5x combo = 500 points**

Game Over Conditions

You lose when all 3 lives are depleted.

Lives are lost by:

1. **Crashing into rocks**
2. **Crashing into balloons**
3. **Taking 5 enemy collisions (counter resets after each life lost)**

Note: Clouds do NOT cause damage - they're visual only.

Additional Features

Start Screen with full instructions
Pause Menu with stats display
Combo System for consecutive ring collections
Visual Boost Mode - aircraft turns orange
Explosion Effects when destroying enemies
Animated Power-ups - rotating and pulsing

Propeller Animation on aircraft
Enemy AI - chase and evasion patterns
Infinite World Generation - seamless recycling
Multiple Camera Angles - 3 different perspectives
Progressive Difficulty scaling
Enemy Kill Counter tracking
Collision Feedback - visual explosions

Tips for High Scores

1. Maintain combos - Collect rings in order without missing
2. Use boost strategically - Save for dense obstacle sections
3. Shoot enemies early - Don't let them surround you
4. Master camera views - Switch views for better awareness
5. Strafe (Q/E) for quick dodges without banking
6. Watch the collision counter - Avoid 5th hit at all costs
7. Collect all power-ups - They're worth 200 points + boost

Technical Details

- **Engine: OpenGL with PyOpenGL**
- **Graphics: 3D polygonal rendering**
- **Physics: Custom flight dynamics**
- **Frame Rate: 60 FPS target**