

Assignment 2

Zaxxon Game

COP701: Software Systems Laboratory

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I. Objects:

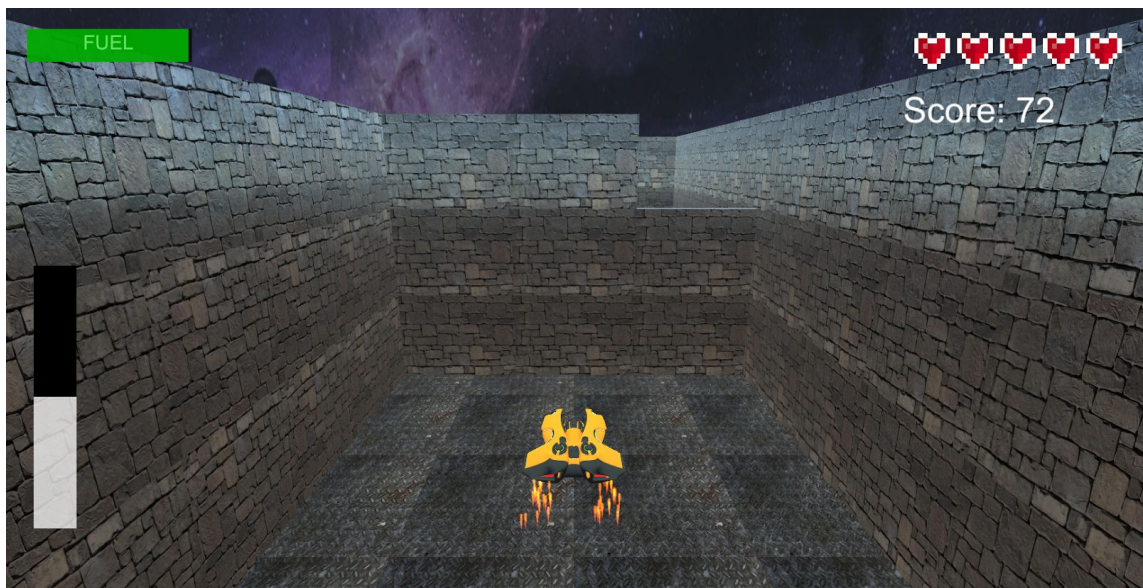
The game has several objects, some of which are listed below with their graphics

- A. Walls
- B. Tanks
- C. Turrets
- D. Enemy Planes
- E. Homing Missiles

II. Layouts

The game has two layouts.

- A. Walls: The plane is surrounded with walls on its four sides. These walls have openings through which the plane can cross it. There are other obstacles in between two walls.



- B. Space: The plane is moving forward in an empty space and tackling obstacles like enemy planes.



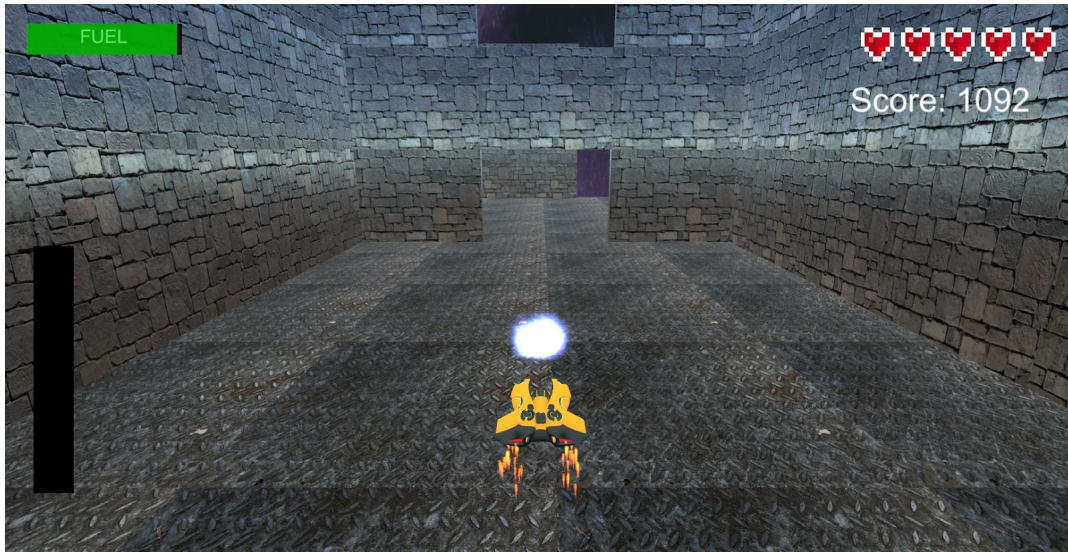
III. Levels

A. **One**

This level is set in the wall layout. It only has tanks as obstacles. Shooting these tanks provides the player with more fuel.



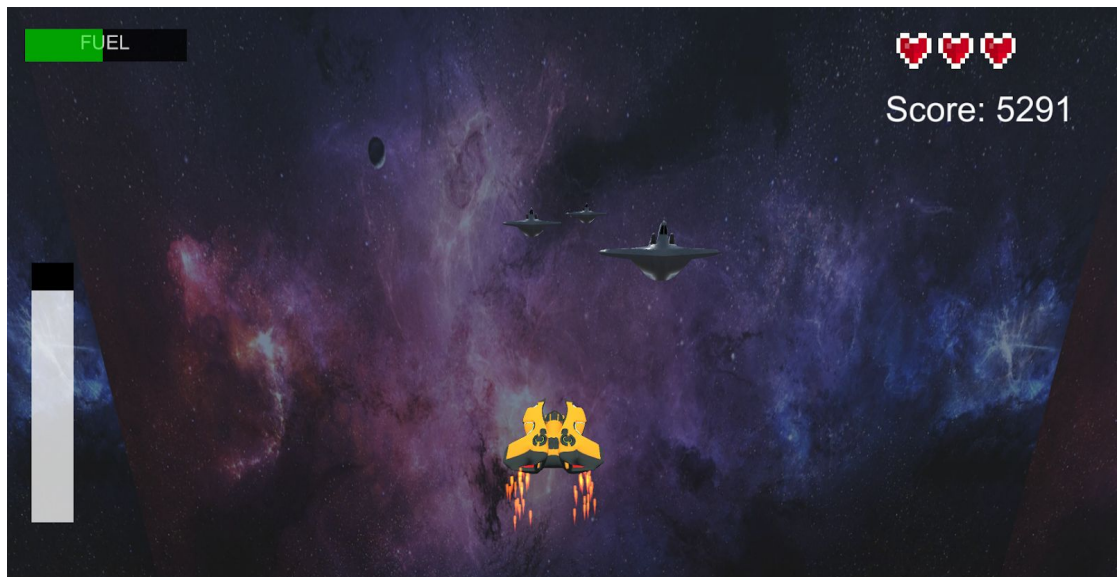
Level 1 in wall layout, with fuel tanks



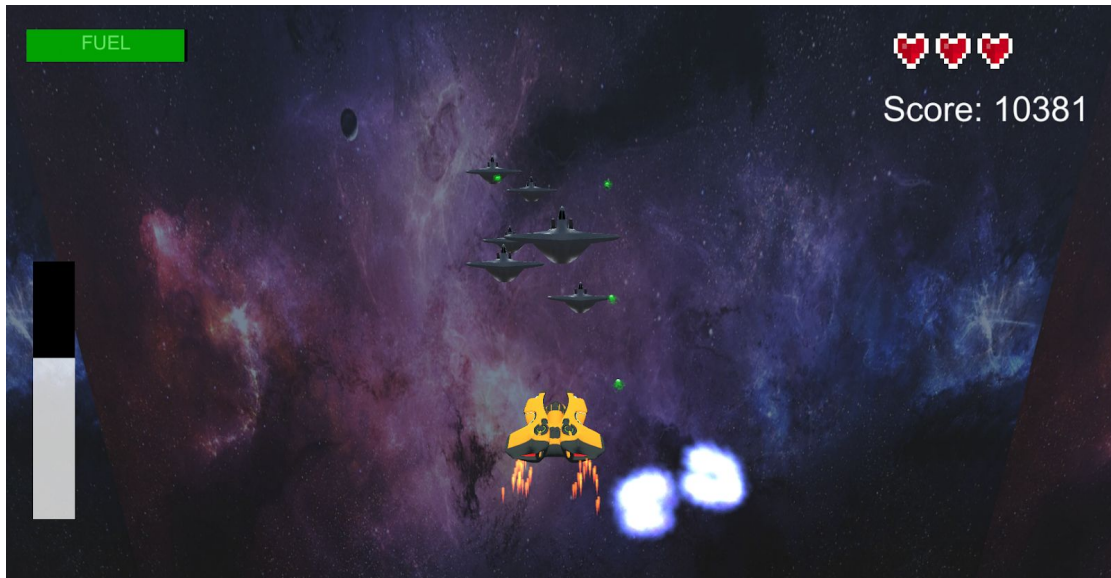
After shooting the tank, the score increases and the fuel also increases

B. Two

This level is set in the space layout, with multiple enemy planes coming at the player from the front. The goal of the player is to shoot as many planes as it can to increase its score. If the player is hit by any enemy player then it loses one life.



Enemy Planes in Level 2



Score increases after shooting the enemy planes

C. Three

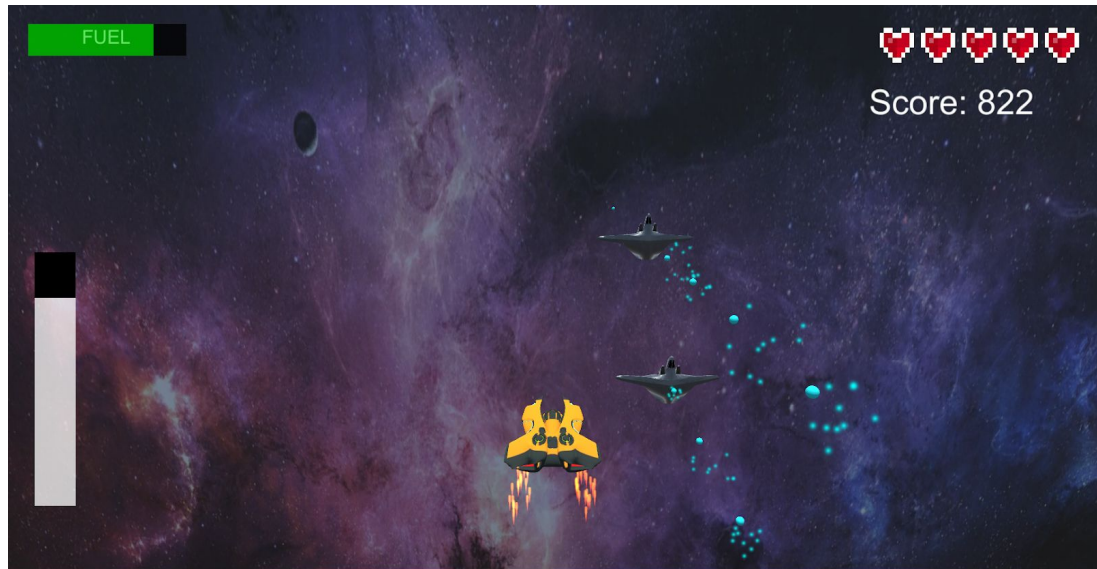
This level is set in the wall layout. In addition to tanks as before, it has turrets as obstacles, which are fixed at one place in between two walls and fire bullets while spinning. The player must dodge these bullets else it loses one life. The player can shoot the turrets as well to get a higher score.



Turrets in level 3

D. Four

This level is set in the space layout. The only difference from the second level is that now the enemy planes also shoot in a straight direction instead of just moving forward.



Enemy Planes shooting at the player in level 4

E. Five

This level is set in the wall layout. The extra feature added in this section is that of a homing missile which originates from the ground and continuously moves towards the player unless shot or is left behind. The player can also score by shooting the missile



Homing missiles in Level 5

IV. Keyboard Controls

- A. Up-Down
- B. Left-Right
- C. Shoot: Space or mouse click

V. Indicators

- A. Fuel: The fuel left with player is shown by a bar in which the length of the green segment corresponds to the amount of fuel left
- B. Height: The gray vertical bar on the left side of the screen indicates the height at which the player is flying. This is essential in case of the space layout where we do not have an idea of height as there is no object to compare our height with.
- C. Life: Five heart containers on the top-right indicate the current health of the player. Once health drops to zero the game restarts
- D. Score: Points are awarded for distance covered as well as objects destroyed. Current score is displayed in the top right

VI. BONUS

- A. Turrets :
 - 1. Sentry movement (patrolling)
 - 2. Shooting at random orientation
- B. Homing Missiles
 - 1. First-order intercepts to calculate the movement
 - 2. Silos to launch them
- C. Enemy Planes shooting
 - 1. A continuous barrage of bullets from enemy planes in level 4
 - 2. Handled collisions and physics of explosions
- D. Pseudo-random container selection
 - 1. Choice of 3 fuel tankers
 - 2. Selected randomly (even position)
- E. Self-created explosion
 - 1. Use the particle system with shader and material
 - 2. Different colors for players and NPC explosions