2D Drawing

Due date: March 17th, 2021, Wednesday, 11:59pm

The goal of this assignment is to implement a simple shooting game with OpenGL functions. The game is based on "Phoenix 2" (2016) by "Firi Games". You control the spaceship and destroy the enemy's spaceship. In this game, enemy fires bullets at the player, and the player must avoid the bullet by moving up, down, left and right. The goal of this game is to get rid of the last boss. You can watch a footage of the original video game in link.
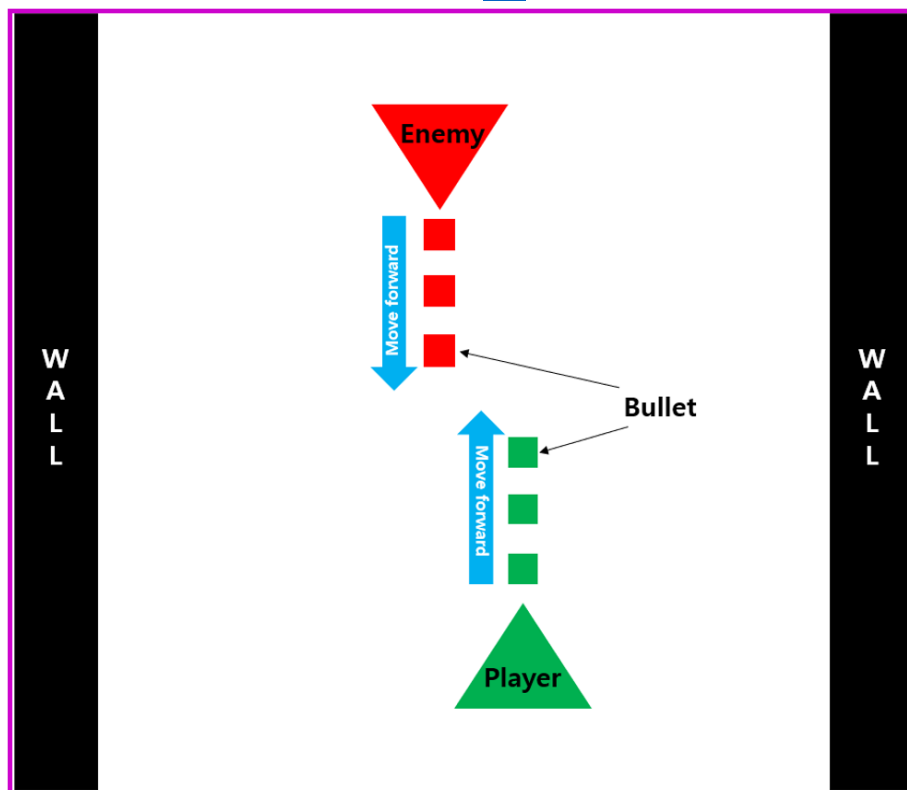

Figure 1. Game prototype

Requirements

*All objects in the game may be represented by simple shapes, such as square and triangles, as shown in the above game prototype.

- The player
  - The player starts at a certain distance from the enemy.
  - You can manipulate the player up, down, left and right by pressing the arrow keys.
  - The total health of the player is three, and the color of player changes according to the remaining health. (Color is free).
  - Fire a bullet by pressing the space bar.

- The enemy
  - A total of 5 enemies appears, and each enemy has a different color. (Color is free).
  - The enemy is created at the top of the screen and moves randomly left and right. (The movement pattern is free)
  - The enemy fires bullets at regular intervals.
- System
  - The bullets move forward at a constant speed.
  - When colliding with an opponent's bullet, health decreases and the bullet is removed.
  - The exact timing of the collision is up to you. (It could be a time when the character's center meets the bullet, or the character and the bullet overlap at least one pixel.)
  - When an enemy is destroyed, it is removed from the screen and the next enemy is created after a certain period of time.
  - Player and enemies cannot go out of the window.
  - The game ends when one of the two conditions is met.
    - Win: When the player destroys five enemy.
    - Lose: When the player runs out of health.
  - The camera is fixed.
- Cheat codes
  - For better debugging, two cheat codes should be implemented.
    - All-pass
      - You can toggle the "all-pass" mode by pressing "c" (Default: off).
      - When the "all-pass" mode is on,
        - Even if the player encounters a bullet, health remains the same.
        - Enemies are destroyed even if they are hit once by a player's bullet.
    - All-fail
      - You can toggle the "all-fail" mode by pressing "f" (Default: off).
      - When the "all-fail" mode is on,
        - If the player gets hit once, the game is lost immediately.
        - The player does not fire bullets.
- If you implement additional functions unspecified in this document, you can get extra points, up to 10% of the full score.
  - This should be stated in the report.