**Project Vision**

**Cpt\_S 587 Design and Architecture**

**Introduction**

This document is intended to explain the vision of the Bullet Hell Shooting Game & its Level Interpreter developed by Team Matrix. The game is called Matrix.

**Developer Names:**

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The basic idea of this game is that the player controls a spaceship that shoots bullets at enemies to advance in the game. Meanwhile, the player must move around and avoid a "large" number of enemies as well as the projectiles they fire. These projectiles will occasionally form specific patterns to increase the difficulty and/or aesthetics of the game. The player will face a "boss" at the end of each phase (or sometimes in the middle), who is more powerful and has more elaborate attacks.

**Environment & Development:**

Language used: C#

IDE: Visual Studio 2019

Development Library: Monogame

Windows Desktop App

**Features**

**Player**

The spaceship that the player can control in this game. Appeared at the beginning at the bottom of the screen. The hitbox, which appears as a white dot in the center of the sprite when “slow speed” mode is activated. The player health is 20 points.

**Regular enemies**

They move and/or attack by firing projectiles. There are 3 waves in total. There are two kinds: smaller grunts in red/blue/green, and the larger enemies that fly from one side to the other. The small grunts have 1 health point, the larger flying enemies have 5 health points.

**The Mid Boss**

Appears for a duration of 40 seconds; there are 2 waves with durations of 20 seconds each. The mid boss has more specific movements, and their attacks are more elaborated and complicated. The mid boss has 10 health points.

**The Final Boss**

The final boss appears for a duration of 80 seconds; there are 4 waves with durations of 20 seconds each. The final boss has significantly larger capabilities compared to the mid boss, and their attacks are more elaborated and complicated. The final boss has 15 health points.

**Collision Detection**

Enemy Projectile Detection – Shoot projectiles at the player and when the player gets hit, the player’s HP gets reduced by 1.

Player Bullet Detection – Occurs when the player shoots bullets at the enemies and reduces the enemy HP by 1.

Boss Bomb Detection – Occurs when the bomb is dropped by either the mid/final boss and if the bomb hits the player, the player’s HP reduced by 2HP.

**Scoring**

The player gets points when killing the enemies with bullets as follows:

Regular smaller grunts: 1 point

Regular larger flying: 5 points

Mid Boss: 10 points

Final Boss: 15 points.

**Supportive System**

Health Booster (Reward 1HP) – the player can either pick up a reward set down when the player kills an enemy or if the health of the player is low, the game engine will automatically drop a health kit.

**Menu**

Start Menu

The user has the option to enter/play the game.

Quit Menu

The user has the option to quit the game.

After the player dies or the game ends, the Menu is shown.

High scores will be shown on the Menu page.

**Aesthetic Makeovers**

Each sprite will have a custom image.

Each phase will have a different background

The large regular enemy will be animated.

Sounds and music for each phase

**Difficulty Level**

The levels are easy, normal, and hard. They can be selected from the Menu.

**Cheating Mode**

GOD Mode: Player has infinite health

Position player in the lower left corner to avoid all enemy bullets

**Game Blueprint:**

* Game lasts for about 3 minutes.
* The features are:
* Menu for start/quit game
* Quit game after player dies and return to Menu
* Replay
* Health status
* Score status
* Normal or Slow motion for player
* Dropping projectiles - regular enemies
* Dropping bombs – mid and final boss
* Show high scores
* Cheating capability
* Phase 1: (40 seconds)
  + Regular Enemy Waves: (Each wave lasts 13 seconds, and drops projectiles)
    - 1st Wave – 10 regular grunts
    - 2nd Wave – 6 smaller grunts, 3 large flying enemies
    - 3rd Wave – 5 smaller grunts, 2 larger flying enemies
* Phase 2: (40 Seconds)
  + Regular Enemies + Mid Boss:
    - 1st Wave – Regular enemies shooting projectiles and the mid boss dropping bombs in a vertical pattern (This wave lasts for 20 seconds, and the boss randomly moves while throwing bombs)
    - 2nd Wave – Solely the mid-boss dropping bombs in a slightly more sophisticated pattern (This wave too lasts for 20 seconds and the boss tires to destroy the spaceship.)
* Phase 3: (40 seconds)
  + Regular Enemies + Final Boss:
    - 1st Wave – Regular enemies shooting projectiles and the final boss dropping bombs in a circular pattern (This wave lasts for 20 seconds, and the boss randomly moves while throwing bombs)
    - 2nd Wave – Solely the final-boss dropping bombs in a slightly more sophisticated pattern (This wave too lasts for 20 seconds and the boss tires to destroy the spaceship.)
* Phase 4: (40 Seconds)
  + Final Boss:
    - 1st Wave – Final boss by itself, Projectiles/Bombs being shot at in a circular pattern. (20 seconds)
    - 2nd Wave – Final boss by itself, Projectiles/Bombs being shot at in a more sophisticated circular pattern. (20 seconds)

**Game Over**

Player dies during the game or wins the game by having lasted to the end for all phases. A message will be displayed showing “Game Over”, and then the main menu appears after 5 seconds.