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COMP3609 Project Report

Introduction

Zombie Survivor is a survival-based action game that incorporates multiple game development principles, including animated gameplay, targeted enemy movement, collision detection, and level progression with increasing difficulty.

Game Overview

Game Title: Zombie Survivor

Genre: Survival/Action

Platform: PC (Java-based implementation using Java 2D API)

Objective: The player must survive against endless waves of zombies while collecting health packs and avoiding zombie attacks. If a zombie reaches the player, the player is damaged. The game has 3 levels that the player must survive to win, each level has more creepy zombies than the last.

Game Entities

Player

- A controllable character that moves around the map to avoid zombies and collect items.
- Can navigate in all four directions (up, down, left, right).
- Can shoot using the Space key.
- Health decreases upon zombie contact, if health reaches 0 then Game Over.

Zombies (Enemy)

- Zombies spawn continuously and chase the player.
- Number of zombies increase with each level.
- If a zombie reaches the player, it attacks the player and causes damage which decreases his life.
- There are 3 types of zombies that attack differently and causes varying level of damages:
 1. Zombie1 causes 1 Damage and Awards 10 points when shot.
 2. Zombie2 causes 5 Damage and Awards 20 points when shot.

3. Zombie3 causes 10 Damage and Awards 30 points when shot.

Items

- **Health Packs:** Restores some player health.
- **Powerup:** Increases score by 10 points.
- Items are automatically collected upon collision.



Environment



Player spawns in the middle of the screen.

Zombies all around the screen except where the cemetery is.

Movement is limited to the walkway of the image.

Image Management

Title	Use	Source
Player (folder)	Contains the strip images used for the player animations in all states.	https://craftpix.net/freebies/free-soldier-sprite-sheets-pixel-art/?num=1&count=129&sq=man%20with%20gun&pos=3
Zombie	Used for the initial Zombie class and animations.	https://craftpix.net/freebies/free-zombie-sprite-sheet-pack-pixel-

		art/?num=1&count=51&sq=zombie&pos=4
Zombie2	Used for the second level zombies.	https://craftpix.net/freebies/free-zombie-sprite-sheet-pack-pixel-art/?num=1&count=51&sq=zombie&pos=4
Zombie3	Used for the third level zombies.	https://craftpix.net/freebies/free-zombie-sprite-sheet-pack-pixel-art/?num=1&count=51&sq=zombie&pos=4
Deadforest	Background Image	https://craftpix.net/freebies/free-vampires-locations-battle-background-pack/
Health	Used for the health pack	https://www.freepik.com/free-vector/emergency-survival-kit-flat-design_3097884.htm#fromView=image_search_similar&page=1&position=30&uuid=22deb050-a1d1-4975-9a32-bcb0c61fa7fb&query=health+pack
Powerup	Used for the powerup/bonus points	https://www.vecteezy.com/png/59254123-yellow-lightning-bolt-icon-3d-render

Sound Management

Title	Use	Source
Countdown	Used to start each level, gives the player time to recoup	https://www.youtube.com/watch?v=cSi4U4q-EFs
BackgroundMusic	Use throughout the gameplay; from start to finish	https://www.youtube.com/watch?v=l63T1ayKw6E&list=PLHCnq-Bdt6lezbs0erW-dxzZUtouU2X7e&index=2
Playerhurt	Used when a player is attacked by a zombie.	https://freesound.org/people/Flying_Deer_Fx/sounds/369003/
Winmusic youwin	Both were used when the player completed all three levels successfully	https://www.youtube.com/watch?v=e3q7a8cLdOY
Zombieintro	Used whenever a zombie spawned	https://freesound.org/people/137SOUNDS/sounds/246486/
Click	Used whenever any of the panel buttons were clicked.	https://freesound.org/people/Christopherderp/sounds/333043/

Gunshot	Used when a bullet is fired from the gun.	https://freesound.org/people/CJDeets/sounds/476740/
Zombieshot	Used when the bullet hit a zombie, before they die.	https://freesound.org/people/MilkyMilkshke/sounds/211536/
gameover	Used when the game ended because the player died/lost all health.	https://www.youtube.com/watch?v=s5B188EFivE
Healthpack	Used whenever a health pack or powerup is collected.	https://www.youtube.com/watch?v=DdCjg1IX-Bc

Game Play

In Zombie Survivor, the player must navigate a hostile environment overrun by relentless zombies, using agility and strategy to survive. Armed with a ranged weapon, the player moves in all four directions, collecting health packs and powerups while shooting zombies to gain points. Zombies continuously spawn and pursue the player, increasing in numbers as the levels progress.

If a zombie reaches the player, he loses health. After all health is lost, Game Over.

As the levels progresses, new types of zombies are introduced that cause varying levels of damage but offer higher rewards for being shot, i.e. more points.

Game Mechanics

Controls

- **Arrow Keys** – Move player in all four directions.
- **Space Key** – Shoot bullets to defeat zombies.

Scoring System

- **Zombie Kills:** Each defeated zombie increases the score.
- Different types of Zombies earn different points.

Level Design

To progress from one level to the next, you must kill all the zombies that have spawned.

Level 1:

- Fewer zombies.
- Least Damage.

- Least Points.

Level 2:

- Increased number of zombies.
- Faster zombies.
- Damage increased.
- Higher Points offered.

Level 3:

- Constantly increasing difficulty.
- More zombies than ever.
- Max Damage.
- Max Points

Features & Implementation

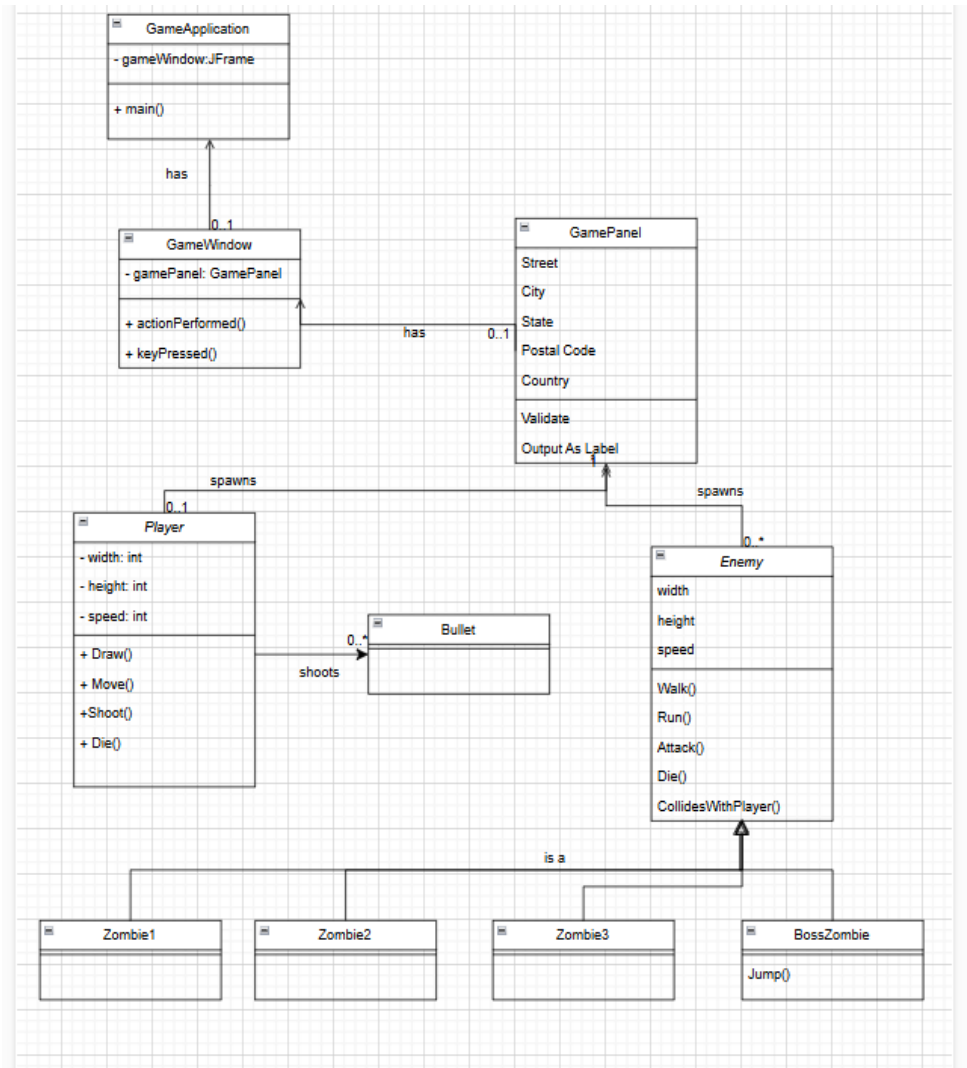
- **Animated Gameplay:** Smooth animations for player movement, zombies, and shooting effects.
- **Collision Detection:** The game will detect when zombies touch the player, bullets hit zombies, and the player collects items.
- **Difficulty Scaling:** Each level becomes progressively harder by increasing zombie numbers and varying levels of damage.
- **Health Depletion Mechanic:** If a zombie touches the player, the player's health decreases
- **Item Collection on Collision:** No key press required to pick up powerups or health packs.
- **Game Restart:** Once the game ends (win or lose), the user can restart by simply hitting "Start Game".
- **Background Scrolling:** The background scrolled horizontally allowing the player more room for escape while limiting their movement to the confines of the cemetery.
- **Tint Effects:** Player turns red when health is low. When the Game is over, the entire panel undergoes a grayscale.

Technologies & Tools

- **Programming Language:** Java
- **Graphics:** Java 2D API

- **Game Loop:** Continuously updates game state using Single Thread.
- **Event Handling:** Keyboard input for player actions

Class Diagram



Simplified class diagram showing only key classes and methods.

Video Link

<https://youtu.be/1MEc2JdqrPQ?si=ISBaXQICRifvXyx7>

