The Shining

Technical Design Document

This technical design document describes the technical details and requirements for The Shining, a top down adventure puzzle game where the player escapes a spooky hotel.

Contents

Section 1 – Game Overview

1.1 Game Summary

The Shining is a top-down adventure puzzle game where the player tries to escape a hotel. Players must avoid enemies like the axe wielding psycho and get out of the hotel, moving from the top floor to the lobby. There will be enemies, items and power ups throughout the hotel for the player to fight, collect, use and navigate.

1.2 Platform

The game will be developed for Windows/Mac/Linux and will be able to be controlled with a keyboard or game controller.

Section 2 – Development Overview

2.1 Development Environment

*The game will be made using the **ASGE Game Framework** and C++.*

2.2.1 Development Hardware

The game will be developed on Windows computers.

- *CLion requires a minimum of Windows 7, 2GB of RAM and 2.5GB of disk space (plus 1GB for caches).*
- *GitKraken requires a minimum of Windows 7, 4GB of RAM and 5GB of disk space.*

2.2.2 Development Software

*We will be using **CLion** to develop C++ code. Version control will be handled by **Git** with the repository hosted by **GitHub**. We will also be using **GitKraken** to provide a graphical interface for Git.*

We will be using Trello for project management and to track our progress, our Trello board can be found here: **https://trello.com/b/nsPLdJVR/llp-game-2**

2.2.3 External Code

We will be using the ASGE Framework for C++ written by James Huxtable to provide basic game functionality such as the game loop, sprite rendering and input events.

Section 3 – Game Mechanics

3.1 Main Technical Requirements

3.1.1 Randomly Generated Floors

One main technical requirement of this game will be the randomly generated floors. Rooms will be randomly selected from a set of sprites to make up the floor. This will involve lining up doors, so they lead somewhere and stopping the floor from reaching out too far. The algorithm we have for this is:

- *Generate starting room, with all 4 doors.*
- *Create a queue of rooms to generate based on open doors*
- *For each room in the queue*
    - *Check surrounding rooms for doors*
    - *Select the required doors*
    - *Randomly generate a room with the correct doors*
    - *Add new rooms to generate to queue*
- *Generate mini map*

3.1.2 Collision

Collision will be another big requirement of this game. We will be using simple bounding boxes to determine collision between enemies, projectiles, rooms and items.

The collisions we will need to detect will be:

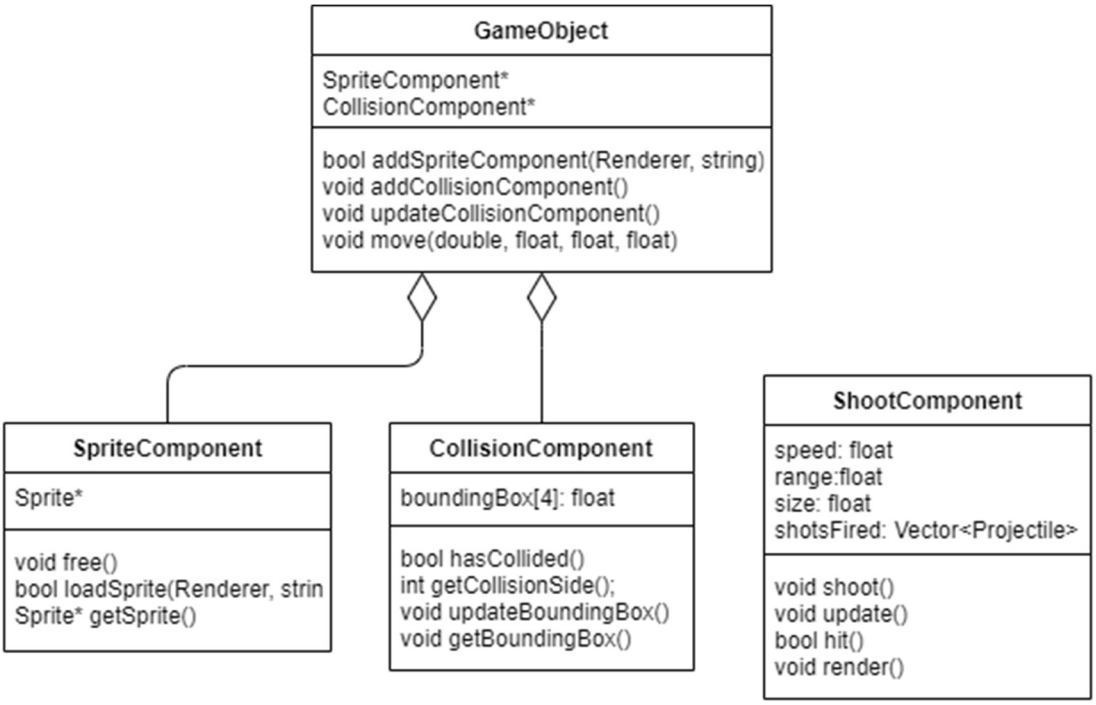
- *Player and Room*
- *Player and Items*
- *Player and Enemy Projectile*
- *Enemy and Player Projectile*
- *Enemy and Room*
- *Enemy and Items*

3.1.3 Psycho Axe Man

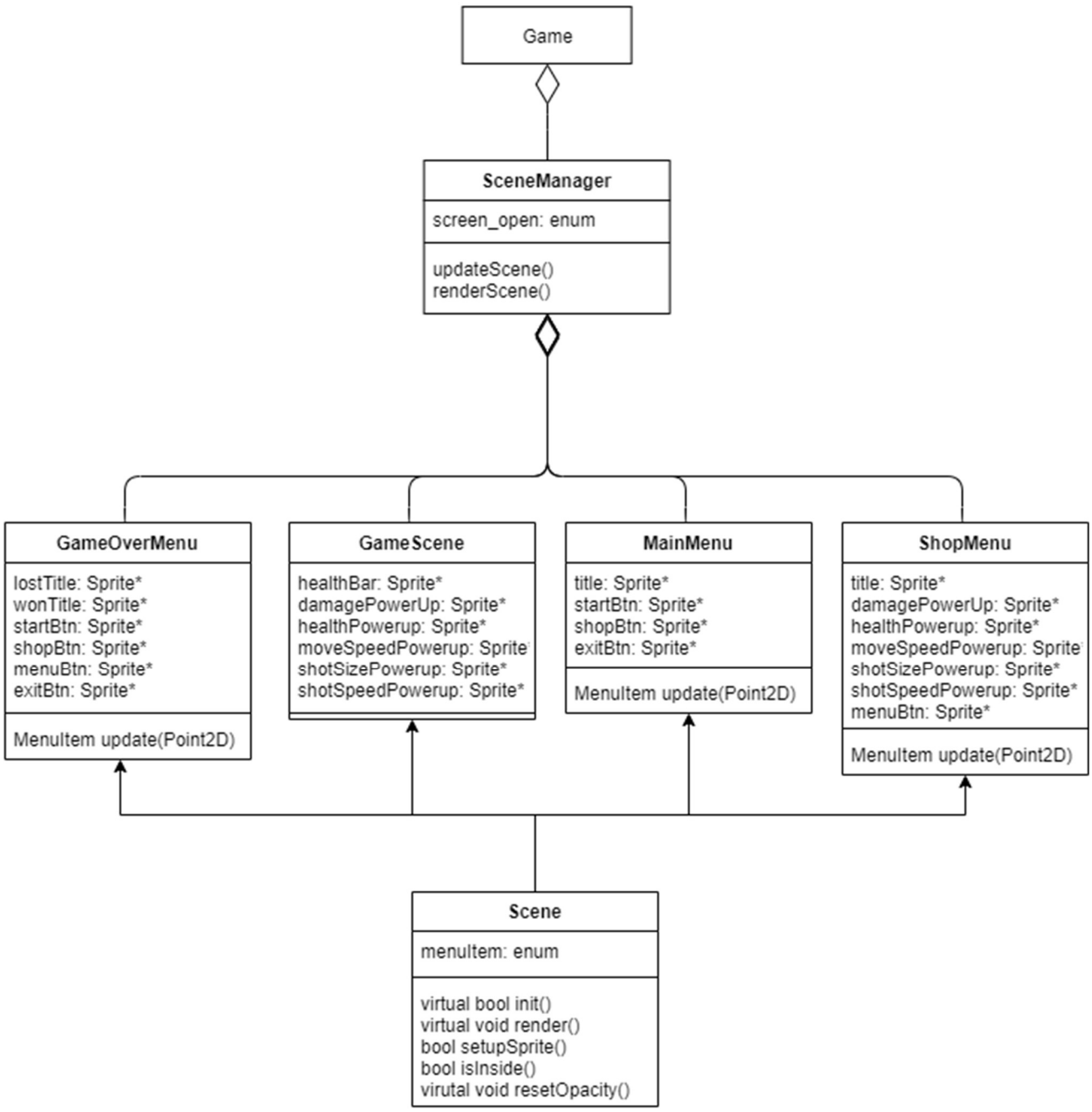
Another technical requirement of the game is the Psycho Axe man. He will need to randomly appear and attack the player and then retreat when his health is too low. To do this we will need to have a timer, but also check other game values, like the number of enemies to make sure the player is not overwhelmed with enemies on the first level.

3.2 Architecture

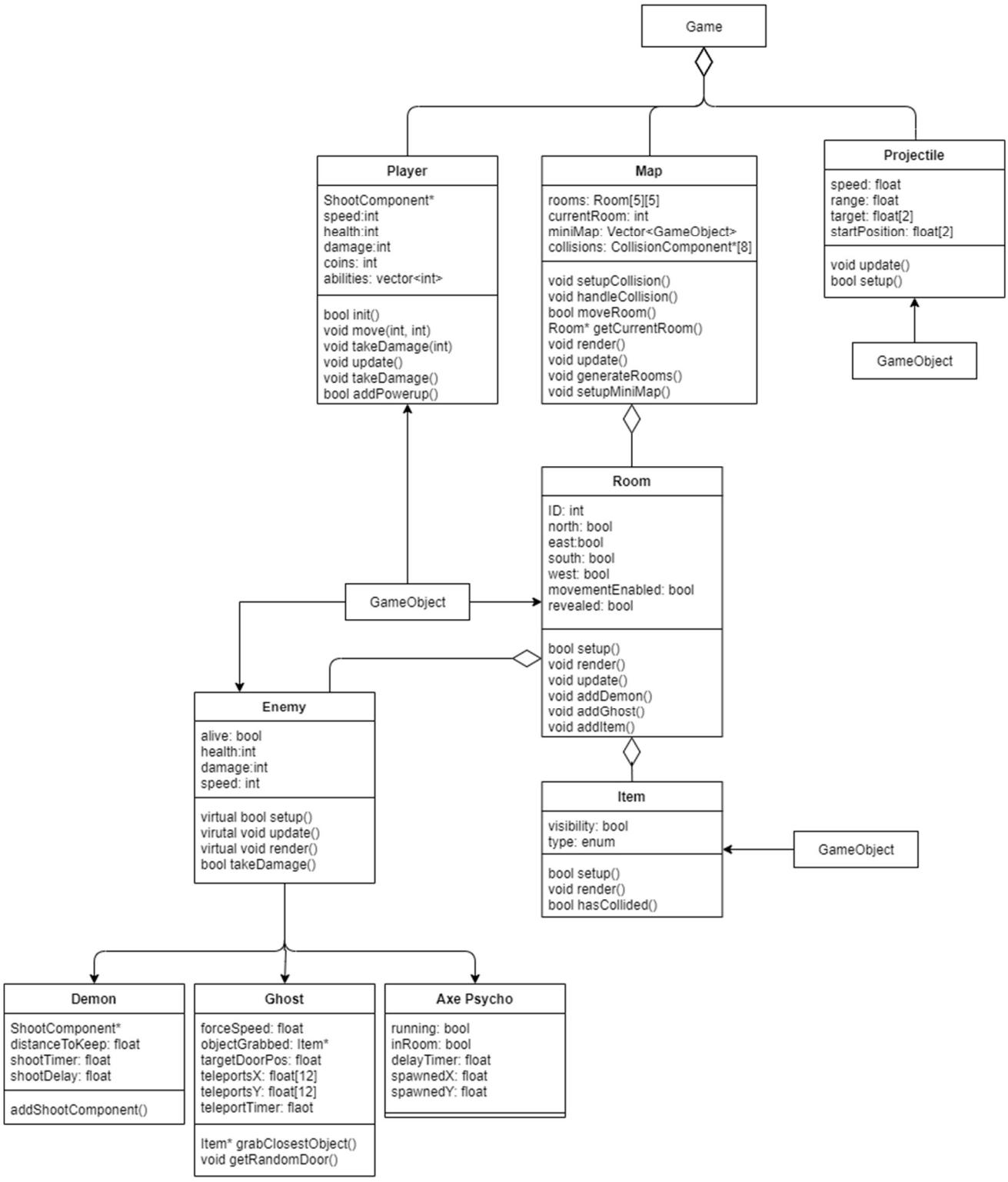
3.2.1 Game Object



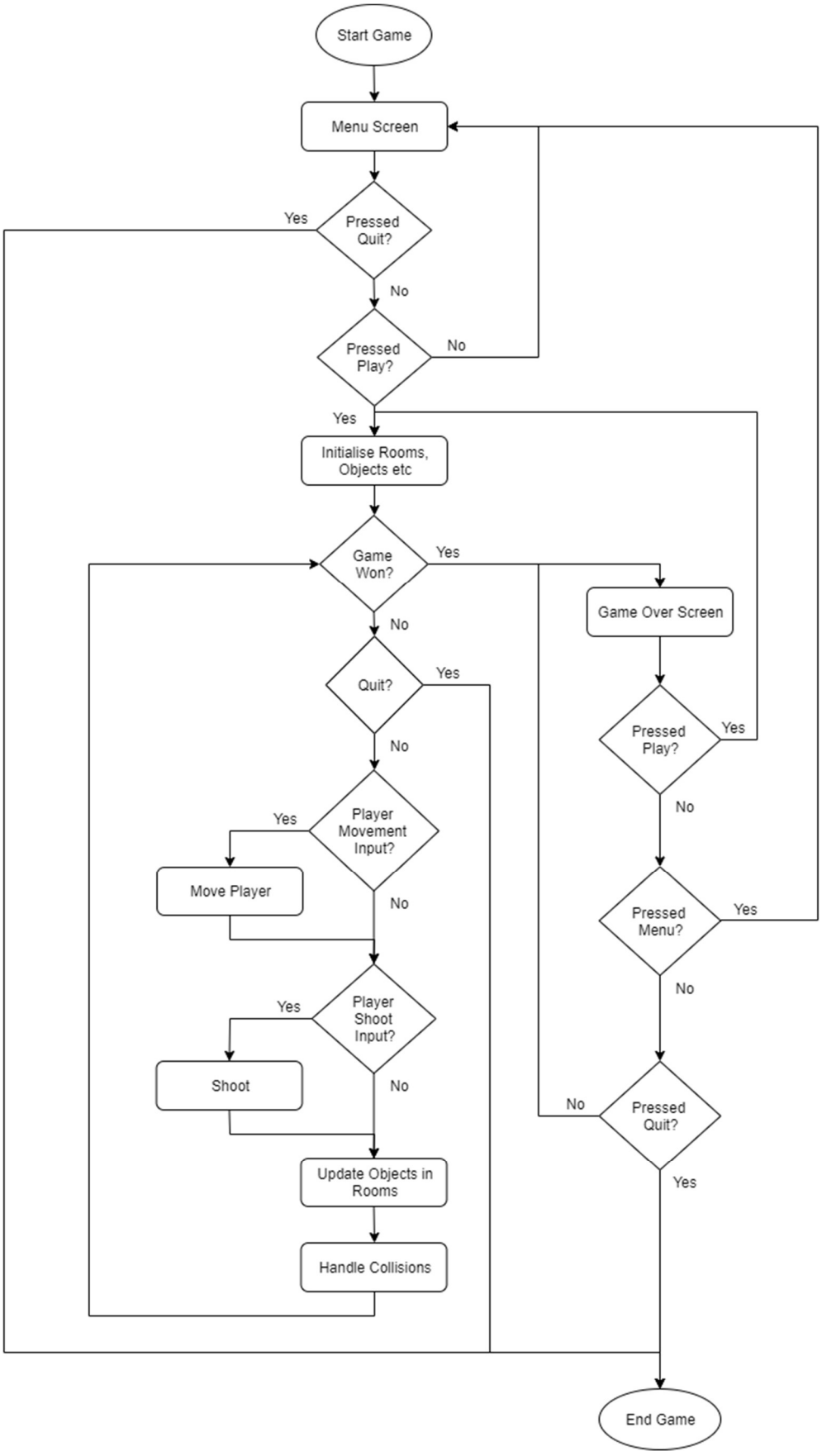
3.2.2 Scene Manager



3.2.3 Main UML


Game
Player
ShootComponent*
speed:int
health:int
damage:int
coins: int
abilities: vector<int>
bool init()
void move(int, int)
void takeDamage(int)
void update()
void takeDamage()
bool addPowerup()
Map
rooms: Room[5][5]
currentRoom: int
miniMap: Vector<GameObject>
collisions: CollisionComponent*[8]
void setupCollision()
void handleCollision()
bool moveRoom()
Room* getCurrentRoom()
void render()
void update()
void generateRooms()
void setupMiniMap()
Projectile
speed: float
range: float
target: float[2]
startPosition: float[2]
void update()
bool setup()
GameObject
Room
ID: int
north: bool
east:bool
south: bool
west: bool
movementEnabled: bool
revealed: bool
bool setup()
void render()
void update()
void addDemon()
void addGhost()
void addItem()
GameObject
Enemy
alive: bool
health:int
damage:int
speed: int
virtual bool setup()
virutal void update()
virtual void render()
bool takeDamage()
Item
visibility: bool
type: enum
bool setup()
void render()
bool hasCollided()
GameObject
Demon
ShootComponent*
distanceToKeep: float
shootTimer: float
shootDelay: float
addShootComponent()
Ghost
forceSpeed: float
objectGrabbed: Item*
targetDoorPos: float
teleportsX: float[12]
teleportsY: float[12]
teleportTimer: flaot
Item* grabClosestObject()
void getRandomDoor()
Axe Psycho
running: bool
inRoom: bool
delayTimer: float
spawnedX: float
spawnedY: float

3.3 Game Flow


Start Game
Menu Screen
Pressed Quit?
Yes
No
Pressed Play?
No
Yes
Initialise Rooms, Objects etc
Game Won?
Yes
No
Quit?
Yes
No
Player Movement Input?
Yes
Move Player
No
Player Shoot Input?
Yes
Shoot
No
Update Objects in Rooms
Handle Collisions
Game Over Screen
Pressed Play?
Yes
No
Pressed Menu?
Yes
No
Pressed Quit?
No
Yes
End Game

3.4 Game Objects and Logic

Room

All rooms will have the same shape, with different colours and themes, meaning they will all have the same simple collider. Rooms will be randomly generated on each floor, from a set of stored sprites. Items will be randomly generated into each room for the player and the enemies to interact with.

Item

Items will either be crates in the rooms, which the player cannot interact with, or collectibles to help the player advance through the floors of the hotel, such as coins or hearts.

Projectile

A projectile will constantly move in it's given direction for a certain distance, or until it hits an object. After a set distance has been travelled, or if the projectile hits an object, the projectile will be destroyed and the object it hits will be updated.

Enemies

Enemies will be spawned at random times throughout the game. The number of enemies spawned will be determined by the floor the player is on, increasing difficulty as the game continues.

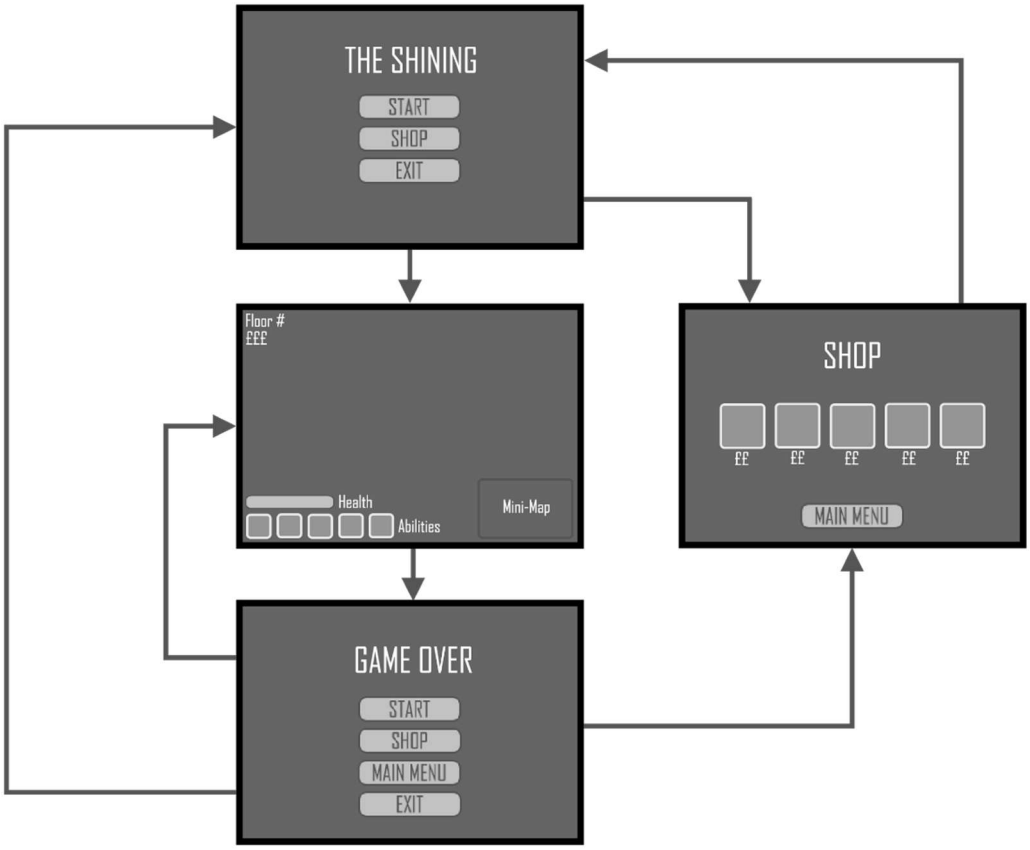
Scene Manager

The scene manager will render the game scenes and will update UI items as needed.

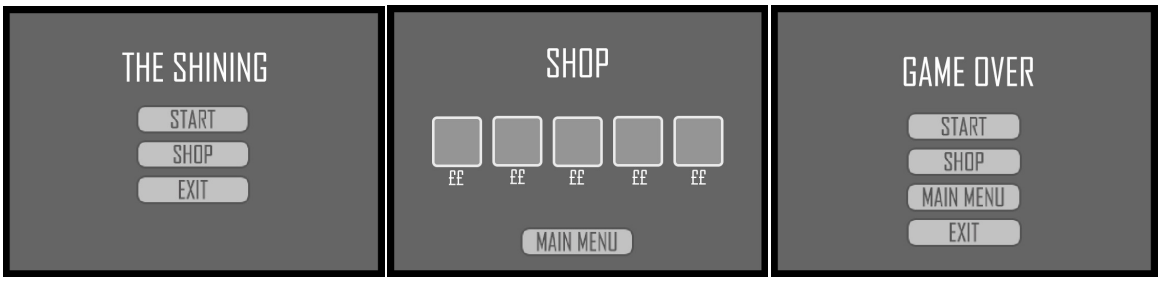
Section 4 – UI and Controls

The game will have a resolution of 1056px wide by 672px tall as this is the size of a single room sprite and a suitable size for PC monitors.

4.1 Screen Flow



4.2 Game Shell



The non-gameplay screens of the game are the Main Menu, Shop and the Game Over/Won screens. Users will select the option they want by moving the left analog stick around the screen and then pressing the A button to confirm their choice. If using a keyboard, the mouse and left click button will be used.

Main Menu

The main menu displays the game title and 3 options:

- ***Play:*** *Starts the game*
- ***Shop:*** *Goes to the shop*
- ***Quit:*** *Exits the program*

Shop Menu

The shop menu will display the possible power ups and abilities the player can buy:

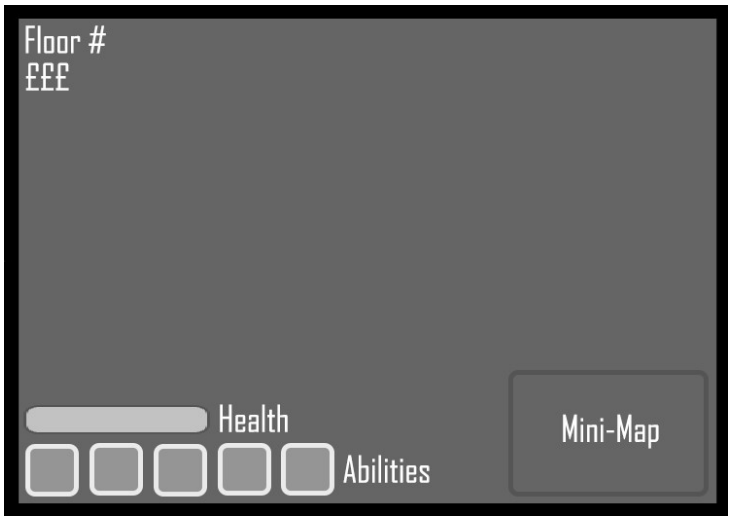
- ***Abilities:*** *The player can select these using the analog stick and can choose to buy one with the A button, if they have the right amount of money.*
- ***Main Menu:*** *Takes the player back to the main menu screen.*

Game Over

The game over menu will have the following options:

- ***Play Again:*** *Will reset the game, allowing the player to play again*
- ***Shop:*** *Goes to the shop*
- ***Menu:*** *Goes to the main menu*
- ***Quit:*** *Exits the program*

4.3 Play Screen



Main Game Screen

The main game screen will show the current room the player is in. The UI will include floor number, coins, health, current abilities and the mini map.

4.4 Controls

The game will use ASGE's built in controller support to control the player. The game will be compatible with both controller and keyboard.

4.4.1 Controller

Left Analogue Stick: *Move Player*
Right Analogue Stick: *Aim Direction*
Right Bumper: *Shoot*
A (Xbox) / X (PS): *Select*

4.4.2 Keyboard

Arrow Keys: *Move Player and Aim Direction*
Spacebar: *Shoot*
Left Mouse Button: *Select*
Escape: *Close Game*