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| University OF THE WITWATERSRAND,  JOHANNESBURG |
| Centipede Game Design |
| ELEN3009 |
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# Introduction

# Requirements

# Constraints

# Criteria for Success

# Design Modelling

## Game Objects and their Construction

## Movement

## Collisions

## Game Graphics

# Structure Overview

## Presentation Layer

### Display Class

This class models the game’s screen by utilizing SFML RenderWindow class. It mimics basic RenderWindow member functions such as display(), clear() and close(). It uses SFML event class to check if the screen is closed by an escape key or window close icon. For construction, Display object requires SFML VideoMode class to be passed onto RenderWindow class’s constructor.

### SplashScreen Class

SplashScreen’s responsibility is to output the game’s name and instructions to the user when the game is initiated. A single member function is used to fulfil this responsibility. Internally, the class consists of helper functions with responsibilities ranging from setting the font for instructions’ string, to drawing the game name and instructions. The class uses SFML RenderWindow and Display class (discussed in section 6.1.1) to draw and display the game’s name and instructions.

### KeyReader Class

The class uses SFML Event and Keyboard classes to read keyboard inputs from the user. It specifically checks for buttons designated for player movement (arrow buttons), player shooting (space bar), game pause (P), and the Escape key, which is used to exit the game screen. KeyReader’s constructor requires SFML RenderWindow class, since the key-checking process occurs while a game screen is open. The class’s member function returns an enum type which signals the key pressed. This hides the SFML classes used for key-checking from KeyReader’s user and enforces layer separation.

### Drawer Class

As the name suggests, Drawer class draws game objects. Its constructor requires a shared pointer to Display object (discussed in 6.1.1). Drawer consists of member functions which are responsible for drawing specific game objects, such as Player and Field of Mushrooms. The member functions uses the objects’ EntityIDs to retrieve their corresponding SFML Sprites, and then uses the objects’ positions to draw on specific locations on the game screen.

## Logic Layer

### Position Class

### Entity Class

### Mover Class

### Laser Class

### Player Class

### Mushroom Class

### Field Class

### Segment Class

### Centipede Class

### Box Class

### CollisionDetection Class

### CollisionReaction Class

## Data Layer

## Mixed Layer

### Enum Class

### GameEngine Class

### Constants Class

# TESTS

# Object Interactions

## Layer interaction

## Movement

## Collisions

# Critical Analysis

## Functionality Analysis

## Design Analysis

# Future Improvements

## Design improvements

## Additional Features

# Conclusions

# References

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