THE AMERICAN UNIVERSITY IN CAIRO
100 YEARS | SCHOOL OF SCIENCES AND ENGINEERING

CSCE1101 Fall 2022 Project

Grand Theft Auto (GTA)

1. Overview

It is required to implement a graph based GTA game that takes places in a maze. Inside this maze, there are four bullets in each corner. The player (Franklin) aims to get each bullet and eliminate his enemies, but the enemies are chasing Franklin to make this mission harder.

The goal of the game is for Franklin to be alone in the maze. Once he's alone, a gate should appear for him where he can walk to and win.

The enemies, however, will make it difficult for Franklin to collect the bullets. They will chase Franklin and if he comes into contact with them, he will lose a life. When Franklin loses all his lives, the game is over, and the player loses.

There are 2 power pellets inside the maze and if Franklin eats any of these power pellets, then Franklin becomes powerful and unaffected by enemies, so even if enemies catches Franklin in that power mode, Franklin isn't affected.

2. Game Specifications

- Reading the board from a text file to the window.
- Classes of all the objects needed i.e. You should be able to create objects of the player character (Franklin), the enemy characters (should be 2), the bullets, and the pellets.
- The player (Franklin) starts with three lives.
- Franklin starts in his home which is always located in the middle of the maze with openings from 4 sides.
- enemies starts at the middle bottom of the maze.
- Four bullets are located in the four corners of the maze.
- When the game starts the player controls Franklin's movement with the four keyboard arrows. Keep in mind that Franklin should stop when he hits a wall.
- enemies should be able to take a life from Franklin if he intersected with him.
- In any random places of your choosing inside the maze, are the two power pellets.

- Franklin moves to collect each bullet from the corner to his home avoiding enemies. With each bullet the enemy that's closer to franklin gets damaged with "half a life". After receiving 2 bullets, an enemy should disappear.
- When Franklin catches a bullet, his texture changes, i.e. Franklin looks like he's actually carrying a weapon, and he returns to his original shape after one second.

- The power mode that occurs when Franklin gets the power pellets lasts for a short-defined time of your choosing, there should be an indicator on the screen with that time.
- If Franklin gets caught by enemies, a life is lost and Franklin and his enemies return to their initial positions, Also, the bullets should re-appear in each corner. When the 3 lives are lost, the player has lost the game.

- The game ends if Franklin wins (kills his enemies and reaches the exit gate) or Franklin loses the three lives.
- There should be texts on the window representing the lives left and the mode of the Franklin (normal/powerful).
- A win/lose output at the end of the game is required. You can choose how to design it and how it looks.

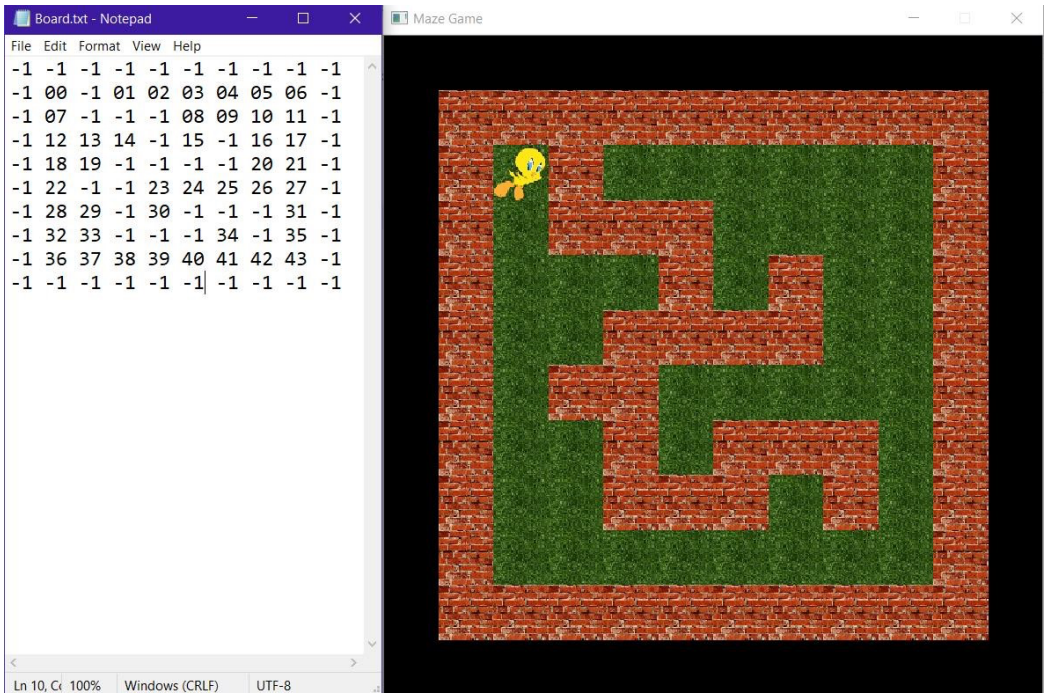
3. Maze Mapping

To create the maze, it should be represented in a text file. When the game starts, it should parse the corresponding text file to the map.

Design your own format that would satisfy the requirements described in this document.

1. Franklin's home.
2. The four bullets.
3. Maze streets and buildings.
4. Pathways for Franklin and the enemies to move through, that would contain the two power pellets as well.

Here is an example for how you can use text to generate a simple maze (that will be turned into a graph later). Here, -1 represents bricks and numbers are given to the points (rectangles) that are considered the pathways (as seen in the lab).



4. Suggested Workflow

1. Create the text file representing the board.
2. Read the text file inside the code and draw the board graphics.
3. Draw the character of the player, i.e., Franklin, and control its movement.
4. Handle the power pellets mode (Franklin being powerful).
5. Handle Franklin carrying a weapon -- when he collides with a bullet, Franklin's image that is used changes. After a second, the weapon should disappear.
6. Draw enemies and control his movement (his movement is based on random directions *for now*).
7. Handle enemies' collision with Franklin (each collision results in a life lost, when the three lives are lost a lose output would appear).

Note: You can use whichever graphics you want. You can use these websites to search for 2d art:

OpenGameArt.org
Kenney • Free game assets
4122 free SVG and PNG icons for your games or apps | Game-icons.net
Reiner's Tilesets (reinerstilesets.de)
Or any other website you like. You can also design your own artifacts.

5. Guidelines

- Groups consist of (2-3 students)
- It is vital that each team member works on some parts of milestone 1 and some parts of milestone 2. Each student should have a clear contribution to the completion of each milestone.
- Start working on the report as you build your project. Each function/class should be explained in the report. Your design choices and user interface should be also clearly discussed with screenshots provided. Furthermore, a section where the contribution of each team member should be added.
- Plagiarism will not be tolerated.
- Your code should be modular and object oriented.
- Please make your code readable.
- Choose short and descriptive variable and function names.
- You can seek the help of TAs if you need more clarification, but please make sure to read the document first.

Best of luck