Pacman with map creator

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Introduction

This report pertains to the semester project for BI-PYT. The theme of this project revolves around creating a Pacman game with a map creator. The objective is to develop a playable game reminiscent of the original Pacman, incorporating some simplifications and new features. The game has several simplifications compared to the original pacman game:

- Ghosts do not have chasing algorithms, they move randomly (details will follow)
- Teleports are not present
- Big balls are not animated

New features include:

- Ghosts spawn simultaneously with Pacman and, after being eaten, return to their starting position
- The game now includes four different levels
- Game sounds have been adjusted to be softer
- Players can create their own levels with any (non-empty) name and a wide range of wall colors

The game also offers options, allowing players to choose a difficulty level or adjust volume settings. A menu enables the selection of user-created maps for play or deletion. Almost all buttons in the game are animated, and sprites are manually drawn.

How it Works

Creating a Map

When a player creates a new map, he actually work with a matrix, filling its cells with specific numbers corresponding to objects like walls and ghosts. The entire screen is a matrix, but after saving a map, the tools and icons from the matrix sides are deleted.

Playing the Game

When a player starts a game, active objects like ghosts and Pacman are removed from the map. Ghost cells are replaced with "thombs," and corresponding matrix positions are saved and transformed into starting coordinates for created objects (ghosts and pacman).

Ghosts' Behavior

As mentioned earlier, ghosts lack chasing algorithms. They move only forward, choosing from all available options randomly when a new path opens. Ghosts choose to turn around only when reaching a dead end.

Pacman

Pacman is animated with several frames, switching with each step for smoother motion. Pacman belongs to the same class as ghosts but it doesn't use some functions.

Option changes and created maps are saved upon returning to the main menu. However, company progress is saved only upon exiting the game by clicking EXIT. The "pickle" library is used for file operations, saving all settings, player maps, and company maps to the file "current_status.pkl," which is loaded every time the game starts.

Game Modes and Rules

The game has two modes: company mode and user map mode, with the same rules.

When a ghost contacts the player, the player dies, losing one life. Each round starts anew from the default position. The game ends when the player runs out of lives.
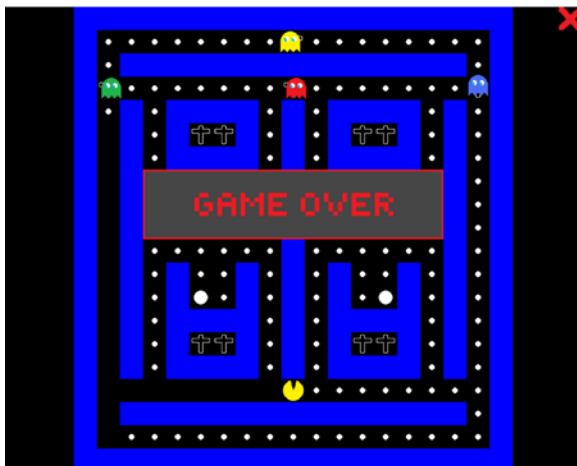

Eating balls or sleeping ghosts increases the player's score. The small balls give 20 points, big balls and sleeping ghosts give 200 points. Eating a big ball makes ghosts move slower, allowing the player to eat them. Independently on original color, the sleeping ghosts are blue. Winning occurs when the player eats all the balls on the map.

Player can also create his own unique levels using the map creator.
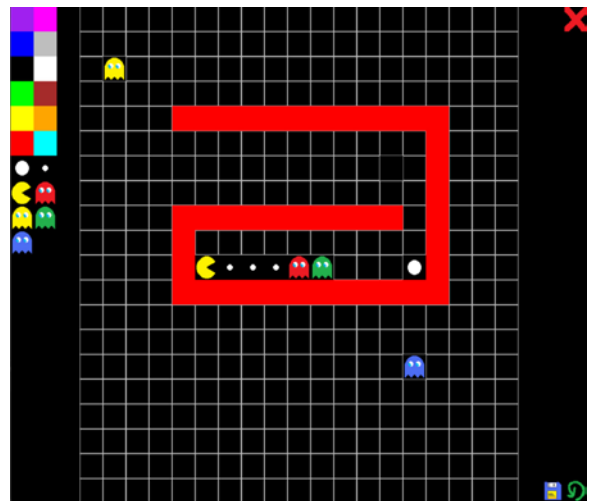
After creating and saving a new map, player can select, play, or delete it.

Development Opportunities

Several improvements can be applyed:

- Adding chasing algorithms for ghosts would significantly enhance the gaming experience
- Introducing more animations and game mechanics, such as animations for ghosts and big balls, would make the game more engaging
- Enhancing the end of the company game with a simple animation after completing the final level would add excitement to the winning experience
- Implementing a table of winners to save the best scores at the end of the game

References

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