Arcade Game

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ABSTRACT

Our arcade game project focuses on creating an interactive and engaging experience where the player controls a balloon, navigates obstacles, shoots bullets, and deploys barriers for protection. Developed using Pygame in Python, the game enhances traditional mechanics with improved controls and dynamic challenges. Through an iterative development process, we have refined gameplay elements, visuals, and user interactions. By addressing limitations of classic arcade games, this project contributes to both academic learning and practical game development skills.

1-INTRODUCTION

The Balloon FPS Game is a 2D arcade-style shooting game developed using the Python Pygame library. The main objective of the game is to control a balloon, navigate it around the screen, and shoot falling obstacles before they collide with the balloon.

To enhance engagement, the game includes additional features like login and registration, barrier activation, level progression, and background music. Players can shoot obstacles, avoid collisions, and increase their score and level as the game progresses. The game ends when an obstacle hits the balloon.

This project demonstrates how core game mechanics like player control, enemy spawning, collision detection, and score tracking can be built using Pygame, making it an ideal mini-project for beginners in game development.

2-LITERATURE SURVEY

1. Pygame Library for Game Development

Pygame is a powerful, open-source library in Python designed for developing 2D games. It provides functionalities for handling graphics, sound, images, input events, and collision detection. It is built on top of the SDL (Simple DirectMedia Layer) library.

Application in Your Project:

Your game uses Pygame to create the game window, draw objects (balloon, bullets, obstacles), detect collisions, and manage game states and events.

2. Game Loop Architecture

A game loop is the core of any game. It constantly updates the game state, processes user inputs, and renders graphics. The loop ensures that the game runs continuously at a specific frame rate.

Application in Your Project:

The while not game_over: loop is used to update balloon movement, obstacle positions, bullet trajectories, and to handle player inputs in real time.

3. Event Handling in Games

Theory:

Event handling allows the game to respond to player actions such as key presses, mouse clicks, or system events (like quitting the game). This is essential for interactive gameplay.

Application in Your Project:

Your game uses pygame.KEYDOWN, pygame.KEYUP, and pygame.MOUSEBUTTONDOWN to handle login/registration input, shooting (S key), placing barriers (Z key), and pausing (P key).

4. User Authentication System

A basic user authentication system allows users to register and log in before starting the game. This is often simulated using dictionaries or implemented using databases in larger applications.

Application in Your Project:

You implemented a simple login and registration system using a Python dictionary (user_db) to store and verify user credentials.

5. Leveling and Score System

Games often have scoring systems and levels to reward player progress and increase difficulty. Leveling adds variety and keeps the player challenged.

Application in Your Project:

The score increases as bullets hit obstacles. Every 10 points, the level increases, making the obstacles and bullets move faster, thus raising the difficulty.

3-PROPOSED METHODOLOGY

1**. Interactive Gameplay:**

Player controls a balloon that moves in four directions.

Players can shoot bullets to destroy obstacles.

Barriers can be placed temporarily for defense.

2. **Login and Registration System:**

New users can register with a username and password.

Returning users can log in and resume playing.

All user data is stored temporarily in a dictionary (user_db).

3. **Obstacle and Bullet System:**

Randomly generated red obstacles fall from the top.

The player can shoot obstacles using the S key.

On collision, bullets destroy obstacles and increase score.

4. **Barrier Mechanism:**

Players can press Z to activate a temporary horizontal barrier.

The barrier blocks obstacles from hitting the balloon.

5. Audio Integration:

Background music plays continuously during gameplay.

A “Game Over” sound effect plays upon losing.

6. Scoring and Leveling:

Score increases as obstacles are destroyed.

Difficulty increases with score — obstacles and bullets speed up with each level.

4-IMPLEMENTATION

Technologies Used: HTML5, CSS3, JavaScript (optionally React.js)

Features:

Register and login to save your progress.

Move the balloon using arrow keys.

Press S to shoot bullets at obstacles.

Avoid or shoot falling obstacles.

Press Z to create a protective barrier.

Score points and level up as game gets harder.

Pause and resume the game with P key.

Background music and sound effects included.

Game over screen shows final score and options.

Process:

1. First, the player registers or logs in to the game.

2. Use arrow keys to move the balloon up, down, left, or right.

3. Press S to shoot bullets and Z to create barriers for protection.

4. Red obstacles come down from the top of the screen.

5. Shoot or avoid the obstacles to survive and score points.

6. As the score increases, the game gets faster and harder.

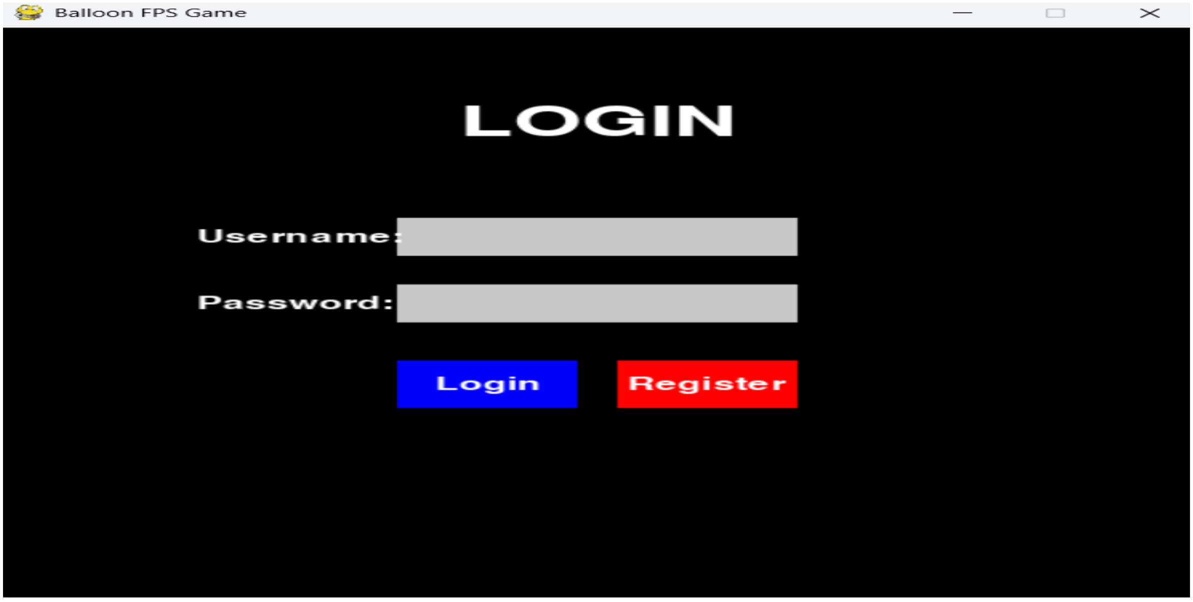
7. Press P to pause and unpause the game.

8. If the balloon hits an obstacle, the game is over.

9. After the game ends, the final score is shown.

10. The player can choose to restart the game or quit.

5-RESULT

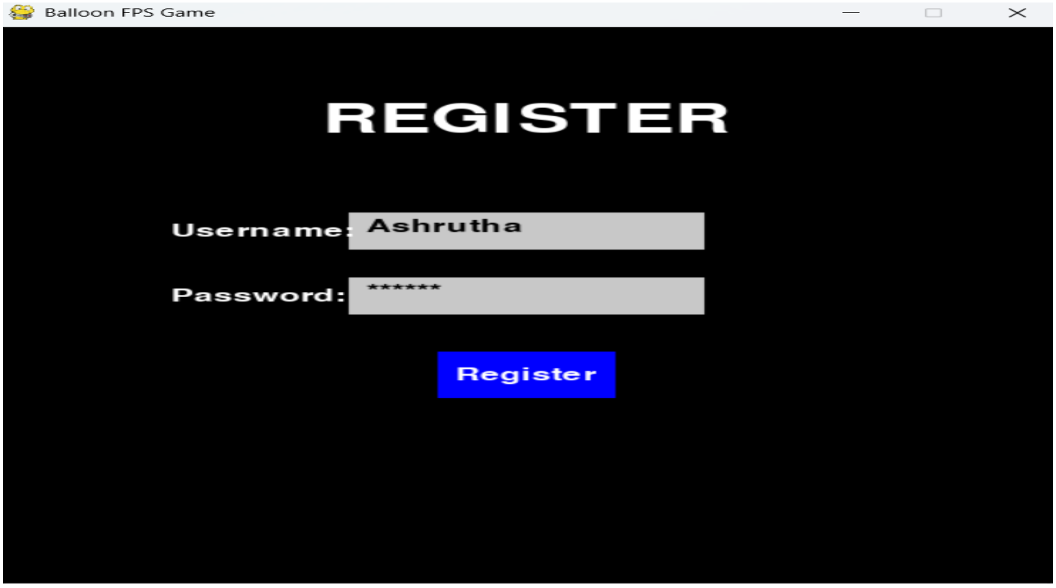


Balloon FPS Game

LOGIN

Username:

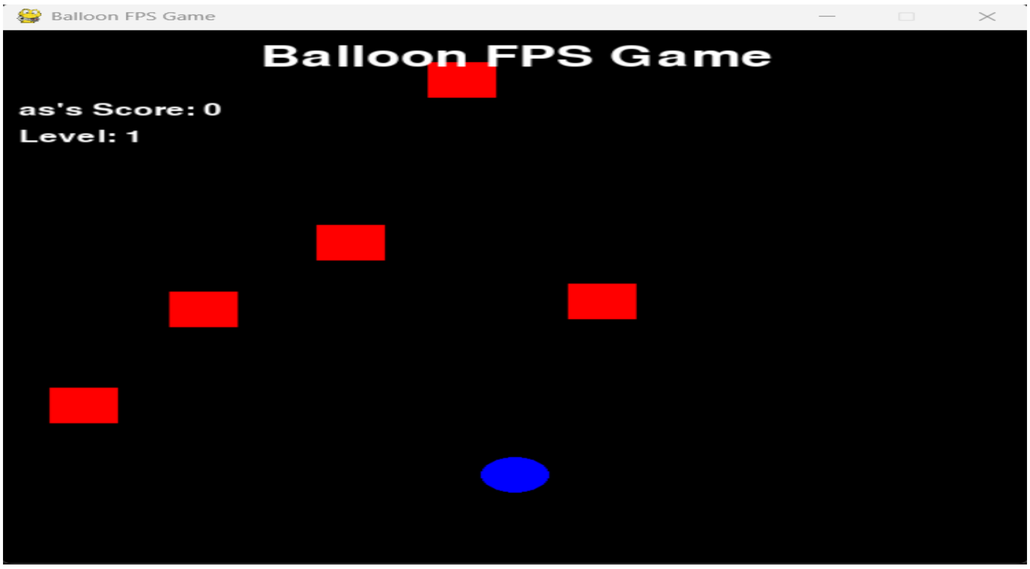
Password:



REGISTER

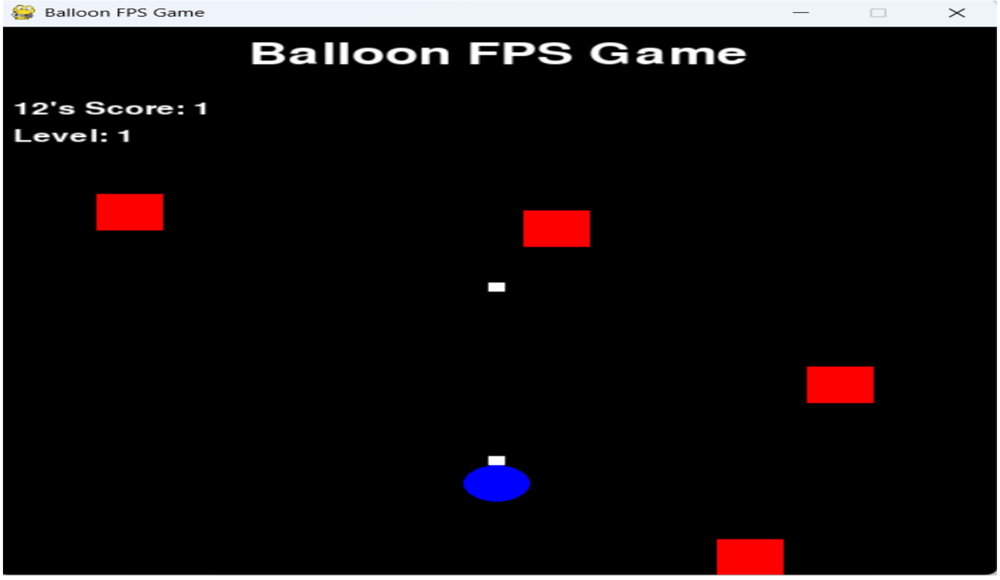
Username: Ashrutha

Password: *******



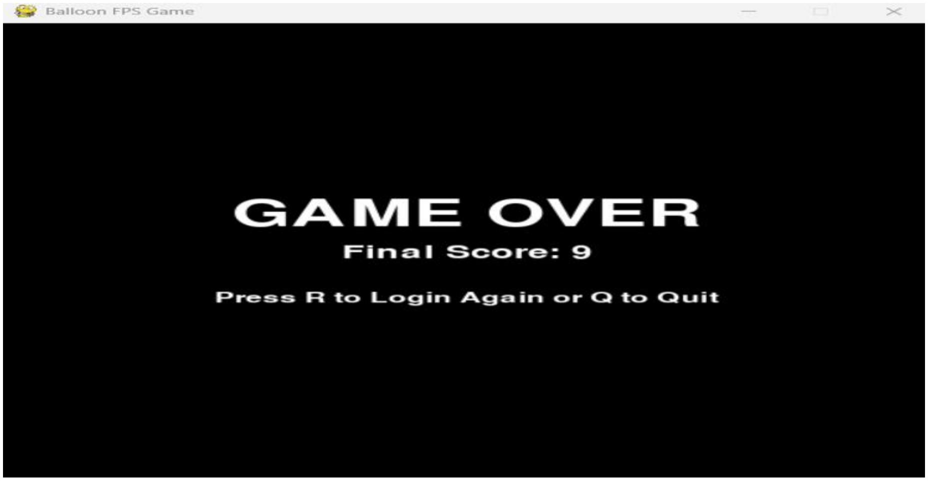
Balloon FPS Game

as's Score: 0
Level: 1



Balloon FPS Game

12's Score: 1
Level: 1



GAME OVER

Final Score: 9

Press R to Login Again or Q to Quit

6-CONCLUSION

This Balloon FPS Game project helped us learn how to build an interactive and fun game using Python and Pygame. It includes features like user login/registration, shooting, barriers, scoring, and background music. Through this project, we understood the basics of game development, how to manage user input, graphics, sound, and game logic. Overall, it was an exciting way to apply programming skills in a creative and enjoyable way.

7-REFERENCES

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