SLAM SPHERES

Introduction

The provided code implements a simple Pong game(Slam Spheres) using the SDL (Simple DirectMedia Layer) library in C. The game involves two paddles and a ball, with players controlling one paddle each to hit the ball and score points by making the ball pass the opponent's paddle. The game features a main menu, gameplay, and an end screen.

Code Structure:

1. Initialization:The code initializes SDL, SDL_image, and SDL_mixer libraries, creates a window and renderer, and sets up necessary surfaces and textures.

2. Structures: The code defines structures for the ball and paddles to manage their positions and dimensions.

3. Global Variables: Global variables are declared for the game elements, such as the ball, paddles, score, window, renderer, and audio files.

4. Functions: Several functions handle different aspects of the game:

- **init_background_music():** Initializes background music for different screens.
- **init_game():** Initializes the starting position and sizes of game elements.
- **check_score():** Checks if any player has reached the score limit to declare a winner.
- **check_collision():** Checks collision between the ball and paddles.
- **move_ball():** Moves the ball and handles collisions with walls and paddles.
- **move_paddle_ai():** Implements AI for player vs. computer mode to control one of the paddles.
- **move_paddle():** Moves the player-controlled paddle based on keyboard input.
- **draw_game_over():** Draws the game over screen with appropriate messages.
- **draw_menu():** Draws the main menu screen.
- **draw_background():** Draws the game background.
- **draw_net():** Draws the net in the middle of the game screen.
- **draw_ball() and draw_paddle():** Draw the ball and paddles on the screen.
- **draw_player_0_score() and draw_player_1_score():** Draw the scores of players on the screen.

5. Main Function: The main function controls the flow of the game:

- It initializes necessary components, including the window, audio, and game elements.
- It contains the main game loop, which handles user input, updates game state, draws game elements, plays audio, and manages the timing of frames.

Features:

- Main Menu: Allows players to choose between single-player and multiplayer modes.
- Gameplay: Supports both single-player and multiplayer modes, with AI-controlled paddle for single-player mode.
- Scoring: Tracks and displays scores for both players.
- End Screen: Displays a game over screen when a player wins, allowing them to restart the game.

Audio Support:

- The game includes background music for the title screen, gameplay, and end screen.
- It also features a bounce sound effect when the ball hits a paddle.

Improvements:

1. Code Refactoring: Some functions, especially those related to drawing, could be refactored for better code organization and readability.
2. Error Handling: Implement more robust error handling, especially for file loading and resource allocation.
3. Optimization: Optimize collision detection algorithms and game logic for better performance.
4. Enhanced AI: Improve AI behavior for single-player mode to provide a more challenging experience.
5. Graphics: Enhance visual elements such as paddles, ball, and background for better aesthetics.

Conclusion:

The provided code successfully implements a basic Pong game using SDL library in C, offering simple yet engaging gameplay with support for single-player and multiplayer modes, scoring, audio, and a user-friendly interface. With further enhancements and refinements, it has the potential to become a polished and enjoyable gaming experience.