

Rock-Paper-Scissors Project Documentation

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Project Overview

The Rock-Paper-Scissors project is a Python-based application that provides an interactive graphical user interface (GUI) for playing the classic game of Rock-Paper-Scissors. Users can choose to play against the computer or against another player.

The project is built using the Tkinter library for the GUI and employs logical game mechanics to determine winners based on user choices. The game also tracks scores for each game mode.

Features

1. Game Modes:
 - Player vs. Computer
 - Player vs. Player
2. User Interface:
 - Interactive buttons for choosing rock, paper, or scissors.
 - Radio buttons for selecting game modes.
 - Separate UI flows for single-player and multiplayer modes.
3. Result Display:
 - Shows both players' choices (or the computer's choice in single-player mode).
 - Displays the winner of each round.
4. Score Tracking:
 - Keeps track of scores for Player vs. Computer mode.
 - Displays final scores upon quitting the game.

Code Breakdown

1. Helper Functions:
 - `get_symbol(choice)`: Converts game choices (rock, paper, scissors) into symbolic representations (e.g., 🪨 for Rock).
 - `determine_winner(player1_choice, player2_choice)`: Determines the winner based on game rules:
 - Rock beats Scissors
 - Scissors beats Paper
 - Paper beats Rock
 - Identifies ties.

2. Single-Player Mode:

- `play_vs_computer(user_choice)`: Handles the logic for Player vs. Computer mode:
 - Randomly generates the computer's choice.
 - Updates scores and displays the result.

3. Multiplayer Mode:

- `start_player1_ui()`: Creates the Player 1 selection interface.
- `start_player2_ui()`: Creates the Player 2 selection interface and determines the winner after both players have made their choices.

4. Game Initialization:

- `start_game()`: Starts the game based on the selected mode.
- `quit_game()`: Displays the final scores and exits the application.

User Interface Design

1. Welcome Screen:

- Title: "Welcome to Rock-Paper-Scissors!"
- Radio buttons to select the game mode.
- Buttons for starting the game and quitting.

2. Game Play:

- Buttons for selecting Rock, Paper, or Scissors.
- Labels for displaying results and scores.

3. Multiplayer Flow:

- Separate windows for Player 1 and Player 2 choices.
- Displays results in a final window after both players make their selections.

Key Variables

- `user_score` and `computer_score`: Tracks scores for the Player vs. Computer mode.
- `player1_choice`: Temporarily stores Player 1's choice in multiplayer mode.
- `game_mode_var`: Stores the selected game mode ("computer" or "player").

Libraries Used

- Tkinter:
 - Core library for GUI creation.
 - Widgets used: Label, Button, Radiobutton, Toplevel, MessageBox.
- random:
 - Used to randomly generate the computer's choice in single-player mode.

How to Run the Application

1. Ensure Python is installed on your system.
2. Copy the code into a Python file (e.g., rock_paper_scissors.py).
3. Run the script using a Python interpreter.

```
'''
```

```
python rock_paper_scissors.py
```

```
'''
```

4. Follow the on-screen instructions to play the game.

Future Enhancements

- Add more customization options (e.g., custom player names).
- Include more game modes (e.g., best of 3).
- Improve UI aesthetics with additional themes.
- Add sound effects for actions and results.

Final Notes

This project serves as an engaging way to explore GUI programming and logical game development using Python. The simplicity of the game makes it an excellent project for beginners while offering opportunities for further enhancements.