ROCK PAPER SCISSOR GAME

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Abstract

The Rock, Paper, Scissors game is a simple yet classic hand game played between two players. In this Python project, we will implement a text-based version where a user competes against the compute.This project implements the classic **Rock, Paper, Scissors** game using Python. The game allows a user to play against the computer, which makes its choice randomly. The program takes the user's input, compares it with the computer's selection, and determines the winner based on predefined rules. The project demonstrates key programming concepts such as conditional statements, loops,functions, and randomization. It also incorporates user interaction through input handling and output display.The primary objective of this project is to develop an interactive Python application that enhances programming skills by using variables, functions, loops, conditional statements, and randomization. The program takes user input, validates it, generates a random computer choice, compares both selections, and displays the result (win, lose, or draw).

Keywords: Rock paper scissor, Python,Tkinter, Random, GUI(Graphical User Interface)

1.Introduction

The Rock, Paper, Scissors game is a popular hand game played by individuals of all ages across the world. It is a simple game that involves two players choosing one of three possible moves—Rock, Paper, or Scissors—simultaneously. The winner is determined based on the following rules:

Rock crushes Scissors → Rock wins

Scissors cut Paper → Scissors win

Paper covers Rock → Paper wins

If **both players choose the same move, the game results in a draw.**In this mini-project, the game is implemented using Python, where a user competes against a computer opponent. The computer generates a random choice, and the game logic determines the winner. This project serves as an excellent introduction to fundamental programming concepts such as user input handling, conditional statements, and randomness using Python's built-in random module.If both players choose the same option, the game ends in a tie. Due to its straightforward nature, Rock, Paper, Scissors is often used in various scenarios, including simple entertainment, random decision-making pattern prediction.

2.Literature Review

The Rock, Paper, Scissors (RPS) game has been extensively studied in various fields, including computer science, artificial intelligence (AI), probability theory, and gametheory. While the game is simple, its underlying principles of randomness, strategy, and decision-making make it an interesting subject for academic and computational research. In programming, Rock, Paper, Scissors serves as an introductory project for learning logic structures, user interaction, and randomness**.** Many researchers have also explored advanced implementations of the game**.**

3. Methodology

The proposed system incorporates the following components:

Objective: To implement a Graphical User Interface (GUI)-based Rock-Paper-Scissors game where:

- The user selects a choice.
- The computer randomly selects a choice.
- The game displays the result and allows a reset.

Components:

- Tkinter as tk for GUI elements.
- Random to let the computer choose randomly.

Game Logic:

- user_select(choice)
- computer_play()
- check_winner()
- enable_buttons() & disable_buttons()
- reset_game()

4. System Architecture & Design

The system architecture consists of various modules including tkinter, Random.The UML diagrams supporting the system design are:

- **Use Case Diagram**: Illustrates the interactions between the system and its users.

5. Implementation

The development process will follow these steps:

Develop Core Game Logic – Implement the basic Rock, Paper, Scissors functionality**.**

Integrate GUI – Design and integrate a graphical interface for better user interaction**.**

Enable Player Mode – Develop socket-based communication for real-time online gameplay.

TWINKER: It looks like you meant Tkinter, which is the standard Python library for creating Graphical User Interfaces (GUIs).

RANDOM:The random module is used in a Rock-Paper-Scissors Python project toallow the computer to make a random choice.

6. Results & Testing:

- **Functional Testing:** ensures that the game correctly handles user input, generates a valid computer choice, evaluates outcomes accurately (win/lose/draw), and properly resets the interface.
- **Edge Case Testing:**Rapidly click different choice buttons before they are disabled to ensure only the first input is processed and the game logic doesn't break.

- **User Interface Testing:** Verify that all UI elements (buttons, labels, result text) are correctly placed, styled, responsive to clicks, and update dynamically based on user actions.
- **Performance Testing:**Measure the application's responsiveness and CPU/memory usage during rapid repeated interactions, ensuring smooth gameplay without lag or crashes

7. Future Scope

A popular variant of the classic game is **Rock, Paper, Scissors, Lizard, Spock**. You can extend your game to include more options. This would involve updating the game logic to account for the additional choices and determining the new winning conditions.

Example rules:

- Rock crushes Scissors.
- Scissors cuts Paper.
- Paper covers Rock.
- Rock crushes Lizard.
- Lizard poisons Spock.

8. Conclusion

The Rock, Paper, Scissors game developed in Python provides a fun, simple, and interactive experience for users. It serves as an excellent beginner project for anyone learning programming, as it involves fundamental concepts like conditional statements, loops, and random number generation. However, the future scope of the game is vast, with numerous opportunities for enhancement and expansion.

9. Reference

Here are some common references and resources you can use for developing and expanding the Rock, Paper, Scissors game in Python:

1. Python Official Documentation

- For learning and understanding Python's built-in modules like random, tkinter, and basic programming concepts.
- Website: https://docs.python.org/

2.Tkinter Documentation

- For building graphical user interfaces (GUIs) in Python.

Website: https://docs.python.org/3/library/tkinter.html