Report On

Simple Game AI for Rock-Paper-Scissors

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Introduction

Rock-Paper-Scissors is a simple hand game that is often used as a decision-making tool or a recreational game. This report presents a Python-based implementation of a Rock-Paper-Scissors game with a simple AI opponent. The AI randomly selects its moves, making it unpredictable. This report covers the methodology used, the full implementation of the code, and sample outputs.

Methodology

The implementation of the Rock-Paper-Scissors AI follows these steps:

1. **Random AI Selection:** The computer randomly picks one of three choices: rock, paper, or scissors.
2. **User Input Handling:** The program takes user input and ensures it is valid.
3. **Game Rules Application:** The winner is decided based on predefined rules:
    - Rock beats Scissors
    - Scissors beats Paper
    - Paper beats Rock
    - If both choices are the same, it results in a tie.
4. **Loop for Multiple Rounds:** The game runs continuously until the user decides to quit.
5. **User-Friendly Output:** The computer's choice and the result of each round are displayed.

Code Typed

```
import random  # Import the random module for AI's move selection


# Function to get a random choice for the computer
def get_computer_choice():
    return random.choice(["rock", "paper", "scissors"])


# Function to determine the winner based on player and computer choices
def determine_winner(player, computer):
    if player == computer:
        return "It's a tie!"  # Both chose the same, so it's a tie
    elif (player == "rock" and computer == "scissors") or \
         (player == "scissors" and computer == "paper") or \
         (player == "paper" and computer == "rock"):
        return "You win!"  # Player wins if they choose the winning move
    else:
        return "Computer wins!"  # Computer wins in all other cases


# Main function to play the game
def play_game():
    print("Welcome to Rock-Paper-Scissors!")

    while True:  # Loop to keep playing until the user quits
        # Get the player's choice
        player_choice = input("Enter rock, paper, or scissors (or 'quit' to stop): ").lower()
```

```
        if player_choice == "quit":  # Check if the player wants to exit
            print("Thanks for playing!")
            break  # Exit the loop and end the game

        if player_choice not in ["rock", "paper", "scissors"]:
            print("Invalid choice, try again.")  # Ensure valid input
            continue  # Restart the loop to get a valid choice

        # Get the computer's choice
        computer_choice = get_computer_choice()
        print(f"Computer chose: {computer_choice}")  # Show the computer's move

        # Determine and display the winner
        print(determine_winner(player_choice, computer_choice))

# Start the game
play_game()
```

Screenshot of Output

```
Welcome to Rock-Paper-Scissors!
Enter rock, paper, or scissors (or 'quit' to stop): rock
Computer chose: rock
It's a tie!
Enter rock, paper, or scissors (or 'quit' to stop): paper
Computer chose: paper
It's a tie!
Enter rock, paper, or scissors (or 'quit' to stop): scissors
Computer chose: rock
Computer wins!
Enter rock, paper, or scissors (or 'quit' to stop): quit
Thanks for playing!
```

Conclusion

This project successfully implements a Rock-Paper-Scissors game with an AI opponent in Python. The AI randomly selects its moves, ensuring an unpredictable gameplay experience. Further improvements could involve AI learning patterns based on user inputs. This project serves as a foundational example of game AI implementation using Python.