Programming Assignment 4: Rock, Paper, Scissors

COP 3035 - Fall Term 2019
Point Value: 100 points
Project Due Date: Tuesday 11/05/2019

IMPORTANT NOTE: This program is longer and more complex than previous assignments. Be sure to begin work on it as early as possible and attend lectures and recitations for important tips.

Learning Objectives

- To write a program making use of multiple functions in a well-structured design
- To gain experience writing and calling functions to perform various tasks
- To understand and correctly use function parameters and return values
- To gain a deeper knowledge of programming more complex tasks in Python
- To utilize pseudo-random number generation to simulate a game of chance

Problem Statement

Your task is to write a program which simulates the game of *Rock, Paper, Scissors*.

In this game, two people simultaneously choose either rock, paper, or scissors. Whether or not a player wins depends not only on what he or she chooses but also on what his or her opponent chooses. Here are the rules:

Paper covers rock, paper wins.

Scissors cut paper, scissors wins.
Rock breaks scissors, rock wins.
All matching combinations are ties.

In this game, Player 1 will be the program user, and Player 2 will be the computer. Player 1 will use interactive input to choose a move. To generate the choice made by Player 2, use the pseudo-random number generation routines provided in the programming language. Then, use the following rules to obtain the player's choice from the pseudo-random number you obtain:

1 corresponds to rock
2 corresponds to paper
3 corresponds to scissors

Your program must simulate the play of this game, with the following considerations: each player starts with $100. When a player loses, he/she must pay the other player $10. A tie results in no exchange of money. Write your program so that the game is played repeatedly until either (1) one player has no money left or (2) the game has been played 20 times. After each play of the game, print out the following in clear format: the choices each player made (print both the number giving the choice, and the word which describes it), which player won the game (or indicate a tie), and the amount of money each player has left. At the end of the program run print out a summary giving the total number of games actually played, the total number of games each player won, the number of tied games, the percentage of games won by each player, and the identity of the overall winner.

Be sure to print out informative messages at the beginning of the program run, including an output title, a description of the game and its rules, and a description of what will occur during the program run.

PSEUDO-RANDOM NUMBER GENERATION

You must use a pseudo-random number generator to simulate a move for Player 2, using standard Python library routines.

Input

This program asks the user for the choice of 1, 2 or 3, indicating Rock, Paper, or Scissors. You must do error checking on this input and keep prompting the user until

they enter a valid choice. You may assume that the user enters a number when asked for a number.

Output

Your output must follow the course style guidelines and include a report of the events of the game as it is played, including at least all of the elements described earlier in this write-up.

Sample Run and Sample Output

A sample run output is provided to you on the class web site. This output shows an example of running the program and playing only 3 moves; remember, you have to play until either one person runs out of money or up to 20 moves maximum, whichever comes first.

Use Of Functions

Part of your grade on this and **all** future course programming projects will be determined by how well you utilize functions, arguments and parameters appropriately.

Additional Info & Some Hints

To get started: do simpler tasks first, and get them to work before working on the harder tasks. Use the techniques for writing, testing and debugging your code with functions, as discussed in lectures. Add on new tasks, and test and debug them, one at a time.

What File To Turn In, File Naming Requirements, and How to Turn In Your Work using Canvas

You must turn in your Python program source file which must be named as follows (note that you will have to rename the provided file!):

Use this format: *yourLastNameLowerCase_FSUID_p4.py*
Your FSUID will be unique to you, will typically be your FSU email ID, and will be something like "ab23c." Hence file names will look something like "smith_ab23c_p4.py"

Submit your Python file (.py) to Canvas using the Submit button for this assignment. Be sure to download the file after you submit it in order to check that you submitted the correct program file to Canvas and that it was successfully received by Canvas.

Last Update: A. Ford Tyson 7/25/2019
