

Homework #2 Introduction to Computing

Due: February 14, 2009 (Saturday at 11:59 PM)

Rock, Paper, Scissors Program

Write a program that lets the user play the game of Rock, Paper, Scissors against the computer. When two people play, each person pumps an arm up and down three times in unison while counting to three (“1”, “2”, “3”) out loud. On “3”, both players independently shape their hand to resemble either:



rock



paper



scissors

The winner is determined by the following rules:

“Rock smashes scissors”	If one player chooses rock and the other player chooses scissors, then the player with rock wins.
“Scissors cut paper”	If one player chooses scissors and the other player chooses paper, then the player with scissors wins.
“Paper covers rock”	If one player chooses paper and the other player chooses rock, then the player with paper wins.

If both players make the same choice, the process is repeated until there is a clear winner.

On the computer, we’ll need to substitute the text “rock”, “paper”, or “scissors” for the hand gestures. Your program should allow a human player to play rock-paper-scissors against the computer repeatedly. After each game, prompt the user with a question like: “Do you want to play again (Y/N)?”. When they ultimately quit, your program should output the following statistics:

- the number of times the human player won
- the number of times that the computer won
- the percentage of times that the computer won
- the average number of “gestures” needed to determine a winner overall

For each game the general algorithm you’ll need to follow is:

1. Have your program randomly chose one of the strings “rock”, “paper”, or “scissors” by using the “choice” function from the “random” module. At the top of your program, you’ll need to import the “choice” function using the following code:

```
from random import choice          # put at the beginning of your program
```

Then, whenever you want to randomly select one of those string, call the choice function as:

```
computersChoice = choice(["rock", "paper", "scissors"])
```

Don’t display the computer’s choice yet.

2. Prompt the user to enter their choice of “rock”, “paper”, or “scissors” at the keyboard (use `input_raw`)

3. Display the computer’s choice and declare a winner based on the above rules.

Name: _____

When you write your program, be sure to use:

- meaningful variable names with good style (i.e., use CamelCase or use_underscores)
- comments at the start of the program **and** before each function describing what they do (see Program 3-3 on pp. 88-90)
- a main function (see Program 3-3 on pp. 88-90) located at the top of program with a call to it at the bottom to start execution
- global constants where appropriate with good style (ALL_CAPS_AND_UNDERSCORES). (Put your global constants after your initial comments describing the program and before your main function definition so they can be found and changed easily in future versions of your program.)

Submit your homework electronically at http://math-cs.cns.uni.edu/~schafer/submit/which_course.cgi

Submit the following files:

- **rockPaperScissors.py** (your Python program)
- **design.doc** (or design.txt, or design.rtf) a document describing the design of your program including a hierarchy chart and a little text