Homework 01

Re-submit Assignment

Due Jan 29 by 10pm **Points** 100 **Submitting** a file upload

Rock, Paper, Scissors (https://en.wikipedia.org/wiki/Rock%E2%80%93paper%E2%80%93scissors) is a popular game played by kids, old and young. Both players simultaneously choose one of "rock", "paper", or "scissors" and share their choice with their opponent using hand signals. The outcome of a game is determined by:

- rock beats scissors (rock smashes scissors)
- scissors beats paper (scissors cut paper)
- paper beats rock (paper covers rock)
- a tie occurs if both players choose the same option, e.g. both choose 'paper'

Your assignment is to implement an interactive rock, paper, scissors game that allows a human to play against a computer. The human enters her choice and the computer randomly chooses a choice from "rock", "paper", "scissors".

Specifically, your program should:

1. Allow the human player to play a possibly infinite number of games - continue playing until the human quits
2. Ask the human to enter, 'r', 'p', 's' for "rock", "paper", "scissors", or 'q' to exit the game
3. Randomly choose 'rock', 'paper', or 'scissors' for the computer's move (see below for hints)
4. Compare the human's and computer's moves to determine the winner or a tie and report the result to the user
5. The game should continue until the human chooses to stop by entering 'q' when asked for a move.

Here's the output of my implementation as an example (Your output may differ):

```
Please choose 'R', 'P', 'S' or 'Q' to quit: r
rock beats scissors - You win!
Please choose 'R', 'P', 'S' or 'Q' to quit: p
Tie: we both chose paper
Please choose 'R', 'P', 'S' or 'Q' to quit: s
rock beats scissors - I win!
Please choose 'R', 'P', 'S' or 'Q' to quit: q
Thanks for playing!
```

Hints:

- Python's random module includes a function to randomly choose from a list of choices, e.g.

```
from random import choice

def get_computer_move() -> str:
    """ randomly choose and return one of 'rock', 'paper', 'scissors' """
    move: str = choice(['rock', 'paper', 'scissors'])
    return move
```

- There are several ways to determine the winner (or tie) for each game. The simplest approach is to use an if/elif/else statement that compares the human's and computer's move. I recommend this approach if you're new to programming with Python. A more advanced approach is to use a dictionary, e.g. result[(human, computer)] = winner/tie so result[('rock', 'paper')] == 'computer' because the human chose 'rock', the computer chose 'paper', and 'paper' beats 'rock' so the computer wins this game. You may choose either of these approaches or any other solution of your choice.
- Be sure to include type hints for every function's return type, parameters, and local variables.
- Be sure to run your program and convince yourself (and me) that your program is working properly.
- If you're new to programming, you'll find a **partial solution in Canvas.**

Deliverables:

Upload your Python program with a name that reflects HW01 plus your name. Please don't name the file HW01.py but rather include both HW01 and your name to help me to distinguish your submission from other students.

Note: your code **must** include type hints to specify the return type of every function and the type of every parameter and variable.

Your score for the assignment is based upon the correctness and structure of your code. I'm looking for elegant and concise solutions that are easy to read and understand. I will run your program to insure that it works properly, but I'm also looking for "good" code, i.e. nice structure, well documented, easy to understand, etc.

Please let me know if you have any questions about the assignment, the code, etc.

Note: do not simply submit a solution you found from the web. I know how to use Google too and I'm very familiar with the solutions found on the web.