

Programming Assignment 5

Getting Started

This assignment is designed as a practice on programming with loops and strings. The code you will be writing is longer and more sophisticated than in previous assignments, so be sure to get started as soon as possible and allow ample time for testing and debugging. Make sure to complete the assigned practice from class. I also recommend completing the [Chapter 3 Online Quiz](#) and watching the [VideoNotes](#) called **Nested Loop Example and Solution to Programming Project 3.9**.

Programming Project

ScrabblePractice: Find a longer word

worth 20 points

For this project, you will be composing a two-person game. The rules are as follows: the players take turns entering one word at a time. The first word in the sequence is special, because it must be a part of every word entered subsequently. To be fair to the second player, we require that the first word be no longer than 3 characters long. In addition, the rules require that each word, except for the first, be longer than the previous. When one of the players fails to enter a word that satisfies these rules, the game ends.

The program should ask the players to enter their names and also the maximum number of rounds that they would like to play. For each round of the game, the program should let the players take turns in inputting words. If the first word entered consists of more than 3 characters, the game should ask the same player to re-enter the first word again, until the word entered is under 4 characters long. Otherwise, the game should go on to the next player. Each game should terminate with a message declaring the winner, when

1. the entered word does not contain the first word, or
2. the entered word is not longer than the previous one.

The reason for the win should also be stated, as shown in the interaction below.

Here's a sample interaction (user input is shown in bold):

```
Greeting!
Player 1, please enter your name: George
Player 2, please enter your name: Paul
How many rounds would you like to play? 1
-----Playing round 1-----
George, please enter the first word:
cat
Paul, please enter a word containing 'cat': location
George, please enter a word containing 'cat': caterpillar
Paul, please enter a longer word containing 'cat':obfuscate
OBFUSCATE is not longer than the previous word, CATERPILLAR.
George wins!
-----
FINAL RESULT: George:1 -- Paul:0
```

The program terminated the game because Paul entered **obfuscate** which is not longer than the previous word **caterpillar**.

Here is another example, which illustrates how the program repeats asking for the first word, until it is 3 characters or shorter.

```
Greeting!
Player 1, please enter your name: Sue
Player 2, please enter your name: Alice
How many rounds would you like to play? 1
-----Playing round 1-----
Sue, please enter the first word
hello
The word must have at most 3 letters. Please try again:
Sue, please enter the first word
world
The word must have at most 3 letters. Please try again:
Sue, please enter the first word
One
Alice, please enter a longer word containing 'one': clone
Sue, please enter a longer word containing 'one': obertone
Alice, please enter a longer word containing 'one': crocodile
CROCODILE does not contain ONE.
Sue wins!
-----
FINAL RESULT: Sue:1 -- Alice:0
```

The program terminated the game when Alice entered 'crocodile', which does not contain the first word 'one'.

After you've implemented and tested the program for just one round, extend it to run multiple rounds, displaying the round number and the final result as shown in the third interaction in the end of this handout.

Other requirements:

- The words can be entered in any combination of uppercase and lowercase letters.
- When one of the players enters a word that doesn't satisfy the rules of the game, the program must print a message stating which rule was violated as shown in the following lines of the above examples: **CROCODILE does not contain ONE.** or **OBFUSCATE is not longer than the previous word, CATERPILLAR.** When both rules are violated, **both violations should be reported** and the words should be shown in all uppercase letters.

For multiple rounds, the following requirements apply (illustrated in the interaction that follows):

- Each round is started with displaying the round number and ends with the declaration of the winner.
- Players take turns in starting the new round of the game.
- The rounds are played until one of the players wins more than half of the requested number of rounds. So, in the example below, even though 5 rounds are requested the game stops after 3 wins by one of the players.
- The output ends with the declaration of the final result in the format that's shown, always displaying the winner first.

```

Greetings!
Player 1, please enter your name: Sam
Player 2, please enter your name: Josh
How many rounds would you like to play? 5
-----Playing round 1-----
Sam, please enter the first word
top
Josh, please enter a longer word containing 'top': stop
Sam, please enter a longer word containing 'top': topology
Josh, please enter a longer word containing 'top':topography
Sam, please enter a longer word containing 'top': topographic
Josh, please enter a longer word containing 'top': oops
OOPS does not contain TOP.
OOPS is not longer than the previous word, TOPOGRAPHIC
Sam wins!
-----Playing round 2-----
Josh, please enter the first word
ROM
Sam, please enter a longer word containing 'rom':from
Josh, please enter a longer word containing 'rom': Romanesque
Sam, please enter a longer word containing 'rom': foo
FOO does not contain ROM
FOO is not longer than the previous word, ROMANESQUE.
Josh wins!
-----Playing round 3-----
Sam, please enter the first word
elm
Josh, please enter a longer word containing 'elm':helmet
Sam, please enter a longer word containing 'elm': steelmaker
Josh, please enter a longer word containing 'elm': overwhelmed
Sam, please enter a longer word containing 'elm': elm
ELM is not longer than the previous word, OVERWHELMED.
Josh wins!
-----Playing round 4-----
Josh, please enter the first word
fur
Sam, please enter a longer word containing 'fur':furore
Josh, please enter a longer word containing 'fur':further
Sam, please enter a longer word containing 'fur':Sulfurize
Josh, please enter a longer word containing 'fur':Desulfurize
Sam, please enter a longer word containing 'fur':hmmm
HMMM does not contain FUR.
HMMM is not longer than the previous word, DESULFURIZE.
Josh wins!
-----
FINAL RESULT: Josh:3 -- Sam:1

```

The **grading schema** is as follows:

1. 12 points for correctly* running just one round,
2. 6 points for correctly* running a multi-round game,
3. 2 points for style.

*Make sure to address all content and formatting requirements!