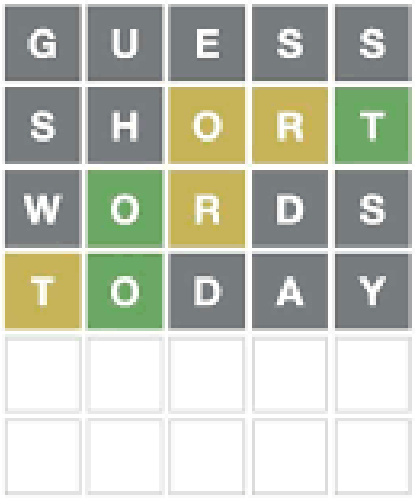
Computational Problem Solving Wordle

CSCI-603 Lab 4

6/6/2023



1 Introduction

Many of you may be familiar with the on-line game Wordle, developed by Josh Wardle, and purchased by the New York Times in 2022.

You will be implementing a plain-text user interface (PTUI), i.e., a console window, version of the game.

The purpose of this lab is to have you practice all the different Python built-in collection data types discussed in lecture.

2 Implementation

You will implement a command-line application to play the game. The program will read in from the standard input and print the results in the standard output.

2.1 Main Program

You will implement a main program called `wordle.py` that processes the user commands from the standard input. The program may receive the secret word as command-line argument:

```
python wordle [1st-secret-word]
```

The argument is optional, if the user doesn't provide the secret word, the program will pick a random word from the collection of legal words. If the secret word is provided, you may assume it is a valid word of five characters long. Having the option of running the program with a preset secret word is very convenient for testing. Make sure you implement this feature correctly, we will use it for evaluating your solution.

If the user provides an incorrect number of arguments, the program will display the following message and terminate gracefully:

```
Usage: wordle [1st-secret-word]
```

When the program runs, it will initialize everything to play the game. Then, it will display a message like the following and prompt the user to enter a command:

```
Welcome to Wordle App!
Commands:
    new: Start a new game
    guess <word>: Make a guess
    cheat: Show the secret word
    help: This help message
    quit: End the program
>
```

2.2 Application Commands

The application will offer the following commands. The suggested order of implementation is:

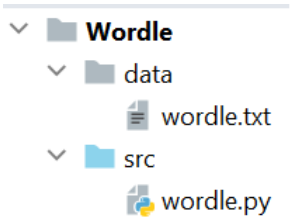
1. `help`: print the list of available commands
2. `quit`: end the program
3. `new`: start a new game with a new secret word
4. `cheat`: display the secret word, useful for testing
5. `guess word`: evaluate the guess against the secret word

2.2.1 `new` command

The `new` command will reset everything and start a new game selecting a new secret word. The secret word will be selected randomly from the collection of legal words.

```
> new
> cheat
Secret word: TEACH
> new
> cheat
Secret word: WAXEN
```

Download this data.zip file, extract it and copy the `data` folder into the root of your project. This directory contains a file with the collection of legal words in the program, `wordle.txt`. The project structure should look as follows:



Random

To select the secret word you will need to use the `randint` function from the `random` module. The function `randint(a,b)` returns a random integer in the range `[a,b]`.

```
>>> random.randint(1,10)
7
```

2.2.2 `cheat` command

The `cheat` command displays the secret word. Revealing the secret word does not change the game's state.

```
> cheat
Secret word: WAXEN
>
```

2.2.3 `guess` command

The `guess` command will evaluate the given word against the secret word. If the word is not provided, the program must show an error and prompt the user to enter a new command.

The program will also report an error, if the user enters an illegal word. A word is considered to be illegal if it doesn't have the required length or doesn't exist in the collection of legal words.

Notice that the guess command should be case insensitive. Users can type the guess words in uppercase, lowercase or capitalized.

```
> guess
Invalid command!
Commands:
    new: Start a new game
    guess <word>: Make a guess
    cheat: Show the secret word
    help: This help message
    quit: End the program
> guess tiny
Illegal word.
> guess f@ke1
```

```
Illegal word.
>
```

If the word is legal, the program will compare the guess against the secret word and mark it according to the rules. Then, it will display the following information in this specific order:

- All the guesses made so far for the current secret word
- The letters the user has entered so far for all the guesses for the current secret word
- The number of *completed* attempts made to guess the current secret word
- A message like won/lost

```
> guess ocean
Num of guesses: 1 of 6
OCEAN
 *
Letters used: {'A', 'O', 'C', 'E', 'N'}
> guess crick
Num of guesses: 2 of 6
OCEAN
 *
CRICK
  ^^^
Letters used: {'K', 'I', 'R', 'A', 'O', 'C', 'E', 'N'}
```

3 Sample Run

Here is a more comprehensive sample run.

```
Welcome to Wordle App!
Commands:
    new: Start a new game
    guess <word>: Make a guess
    cheat: Show the secret word
    help: This help message
    quit: End the program
> cheat
Secret word: HELLO
> guess world
Num of guesses: 1 of 6
WORLD
 * ^
Letters used: {'L', 'D', 'W', 'O', 'R'}

> guess shark
Num of guesses: 2 of 6
WORLD
```

```
 * ^
SHARK
 *
Letters used: {'L', 'D', 'H', 'S', 'A', 'K', 'W', 'O', 'R'}

> guess steel
Num of guesses: 3 of 6
WORLD
 * ^
SHARK
 *
STEEL
   **
Letters used: {'L', 'D', 'H', 'S', 'E', 'A', 'K', 'W', 'O', 'R', 'T'}

> guess hello
Num of guesses: 4 of 6
WORLD
 * ^
SHARK
 *
STEEL
   **
HELLO
^^^^^
Letters used: {'L', 'D', 'H', 'S', 'E', 'A', 'K', 'W', 'O', 'R', 'T'}

You won!!
> whatToDo
Unknown command: whattodo
Commands:
    new: Start a new game
    guess <word>: Make a guess
    cheat: Show the secret word
    help: This help message
    quit: End the program
> new
> cheat
Secret word: BAYOU
> guess mouse
Num of guesses: 1 of 6
MOUSE
 **
Letters used: {'M', 'S', 'E', 'O', 'U'}

> guess noise
Num of guesses: 2 of 6
```

```
MOUSE
 **
NOISE
 *
Letters used: {'I', 'M', 'S', 'E', 'N', 'O', 'U'}

> guess mount
Num of guesses: 3 of 6
MOUSE
 **
NOISE
 *
MOUNT
 **
Letters used: {'I', 'T', 'M', 'S', 'E', 'N', 'O', 'U'}

> guess court
Num of guesses: 4 of 6
MOUSE
 **
NOISE
 *
MOUNT
 **
COURT
 **
Letters used: {'I', 'C', 'T', 'M', 'S', 'E', 'N', 'O', 'R', 'U'}

> guess POUND
Num of guesses: 5 of 6
MOUSE
 **
NOISE
 *
MOUNT
 **
COURT
 **
POUND
 **
Letters used: {'I', 'C', 'T', 'M', 'P', 'D', 'S', 'E', 'N', 'O', 'R', 'U'}

> guess illegal
Illegal word.
> guess round
Num of guesses: 6 of 6
MOUSE
```

```
 **
NOISE
 *
MOUNT
 **
COURT
 **
POUND
 **
ROUND
 **
Letters used: {'I', 'C', 'T', 'M', 'P', 'D', 'S', 'E', 'N', 'O', 'R', 'U'}

You lost!!
The secret word was BAYOU
> quit
Bye!
```

4 Grading

Your grade will be determined as follows:

- 20%: Problem Solving
- 10%: Design
- 60%: Functionality
  - 10%: Proper selection and use of data structures
  - 5%: File reading
  - 5%: Error Handling
  - 40%: Commands
- 10%: Code Style and Documentation

5 Submission

Create a ZIP file named lab4.zip with your all your source code. Submit the ZIP file to the MyCourses assignment before the due date (if you submit another format, such as 7-Zip, WinRAR, or Tar, you will not receive credit for this lab).