PRT 582

Software Engineering Process and Tools

Submitted To:

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1 Introduction

Firstly, Scrabble is a popular board game in which players try to make words out of a set of letters. While learning the game requires more information, the task is that a player can only play actual words. A legal play, in other words, is a term found in the Scrabble dictionary, which contains most American English words with at least two letters but no proper nouns. The Scrabble game is an application where the Gamer can play it by entering the word and getting the required score response within the time limit.

A software program "Scrabble Game" must generate a random number that will be used to determine the length of the word. Therefore, a user interface must enter any word up to the length limit and a random word generator. The user's input is then matched against a dictionary for the words.

Secondly, to get the value of a specific word, run the application in a timer context. The user would accept only letters from the word. To construct a dictionary with keys and values as pairs, the user must interact with Scrabble terms using computer languages such as Python. Then count the value of the word, including all letters.

As per the development-wise, to interact with the word, the program must first use the dictionary to give values to each letter. Then check that the entered word only has letters in it. Next, the program must construct an error message in the event of any symbol. Finally, set up a testing environment that can accommodate a variety of scenarios. For example, to set the timer value, a timer is required.

Only when it is along with the timer will the testing input be produced. While executing the program in a line or sentence, user input is necessary to enter a value. The value of words is allocated in the ASCCI value (converted from alphabets to numbers) to store all the required alphabets.

Finally, For Testing, A function would be used to test the term. The program would test whether it satisfies all the input are correct words and verifies it. The test case was created before the start of the development of the software.

1.1 Tools Used:

Tools	Technology used for
Python	Python programming language has been chosen to develop the code that calculates the score for the Scrabble Game.
Pytest	For unit Testing, the Pytest framework has been selected to build test scripts in this framework.

2 Process:

Process for developing the program:

Steps	Description
1.	As the program executes the timer starts accordingly.
2.	The user is asked to input the word of random length.
3.	After user inputs, the validation of checking starts for the word: • if matches word length • if it is an alphabet • if it is a valid English word
4.	Once all the conditions of step 3 satisfy, then the calculation of score starts. Else it prompts for correct value.
5.	The calculation of score is done after everything satisfies within the timeframe.
6.	The program finally prints out the output score for correct score, else doesn't provide score.
7.	After the end of the game, the user is asked to input coin to play again.

8.	In the process of Testing, all the input that the user might enter are tested and results for success.

In the program, utilization of TDD and unit testing has been done. In Python, TDD stands for Test-Driven Development. The test cases are developed before the development of the program itself. It is based on three key concepts: collecting failure cases, creating passing cases, and analyzing failure cases.

Case refactoring necessitates primarily. It's mostly a test or module created for specific modules or programs to be tested in a testing environment, either using a unit testing tool or the pytest tool. The library package must be installed before it can be used in the testing environment.

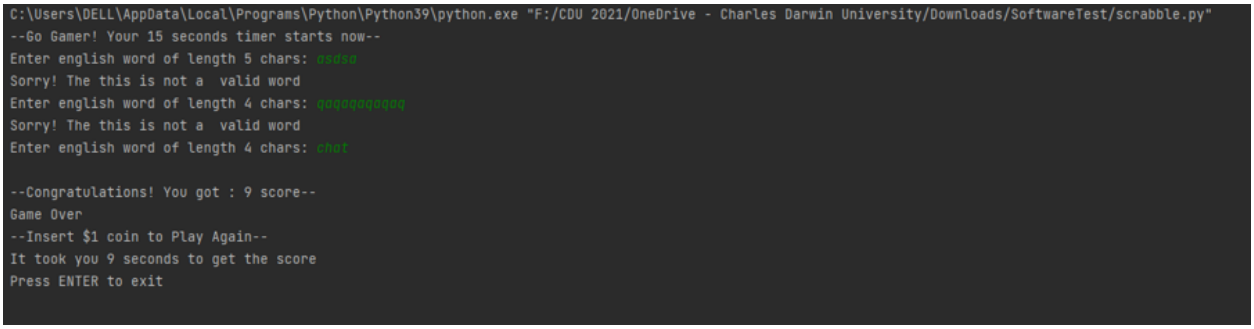
Output:

2.1 For Proper word with correct length:

Prompt for few cases:

2.2 For Not Correct Length:

2.3 For Not Valid Word:



2.4 TDD implementation:

pytest is used to test the code, and the main code is imported. Installing install pip pytest is the initial step in setting up the module. The test cases are predeveloped so that the Testing can be done initially and become more error-free. This was done to make sure there will not be much error occurs during the development phase. To develop tests and code concurrently, use Test Driven Development (TDD) is done.

Few things that make the Testing more reliable is by keeping in one place:
Use the same pytest setup for all tests.
Fixtures should be reused throughout all tests.
Test execution should be made easier.

The test mainly helps missing or to fail the required parameters that are implemented in the function. This type of unit testing is mainly essential for the programs built on an extensive basis of code. This not only shows the test being pass/failed in a specific period but also requires making sure that it could go on for long-run tests.

3 Conclusion:

With the implementation of TDD, it benefits to make a program early as possible as the errors or failures can be known beforehand.

3.1.1 Learnt:

Few things learned while developing the program was any software needs modification in the future. So, testing pre hand makes sure that the error or any factors can be identified quickly even if some functions or changes have been changed in the future. There are many frameworks for unit testing, such as pytest, unittest. Although unittest is good, the pytest has one hand ahead as it is inbuilt to implement in the pycharm.

3.1.2 Went well:

Moreover, few things went well, the implementation of proper code, the requirements are up to the mark except a few. The calculation of the code and formatting went quite well. Not up to the mark:

Finally, few things that didn't go well, the clock in the background was not adequately implemented. Also, the program to be programmed using a GUI would have been a lot better with the visualization.

3.1.3 GitHub Link:

https://github.com/sujanrdm/PRT-582-Software-Testing-Assignment-1.git