SOFTWARE ENGINEERING: PROCESS AND TOOLS
ASSIGNMENT 2

Submitted by: Sreelakshmi Pradeep
Student Id: S365464

INTRODUCTION:

The “Guess the Number” game is a guessing game where the player tries to guess a 4-digit number that is randomly generated by the computer. The user can make guesses until he gets the correct answer and he will get hints based on the guesses he made. The hint components include ‘x’, ‘circle’, and ‘-‘. ‘x’ indicates that one digit is correct but in the wrong spot, ‘circle’ indicates that one digit is correct and is in the right spot, and ‘-‘ indicates that the particular digit is not present the 4 digit number. So users can make guesses according to the hints. Users can track their attempts and quit the game whenever they wish to quit the game.

The game is implemented using Python language and Test-Driven Development (TDD) approach is used. We have used the framework ‘unittest’ which enables the creation and execution of test cases. It also identifies the potential issues in the earlier stages and it is sorted.

PROCESS:

We are using Test-Driven Development (TDD) approach. In this approach, we first write the test cases and develop the code in the later stage.

Initial Step: In the initial step, we have set up the initial test structure and test cases for the main class, GuessTheNumberGame. As mentioned earlier we are using ‘unittest’ framework is applied. We have mainly written 3 cases, they are:

1. Valid Guess Handling
2. Incorrect Guess Handling
3. Invalid Guess Handling

1. Valid Guess Handling

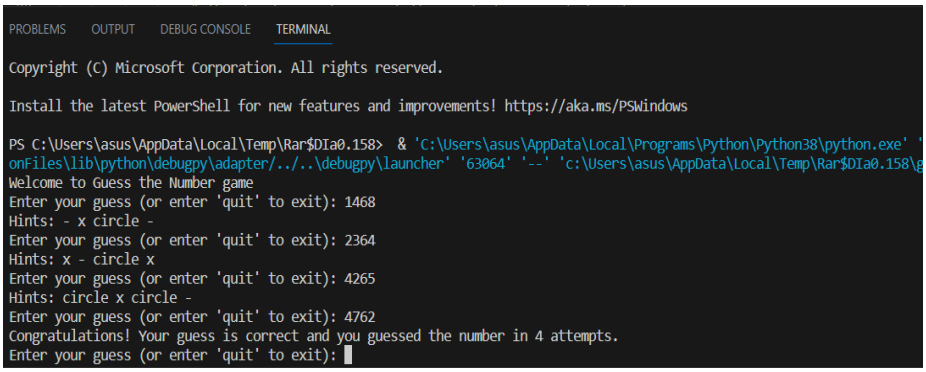
   In this step, when someone enters a valid guess number the game responds correctly. In this case, we have written the code to ensure that the game handles the valid guess made by the user. When the game is started a random 4-digit number is generated and stored. When the player makes a guess, if it is a valid guess, then the play method is called with the guess. Inside this method, the guess is compared with the generated random 4-digit number. If it is a match then we will display the number of attempts taken by the user and give the right feedback to the user. If the guess is invalid, we move forward to the next iteration to handle the incorrect guess.

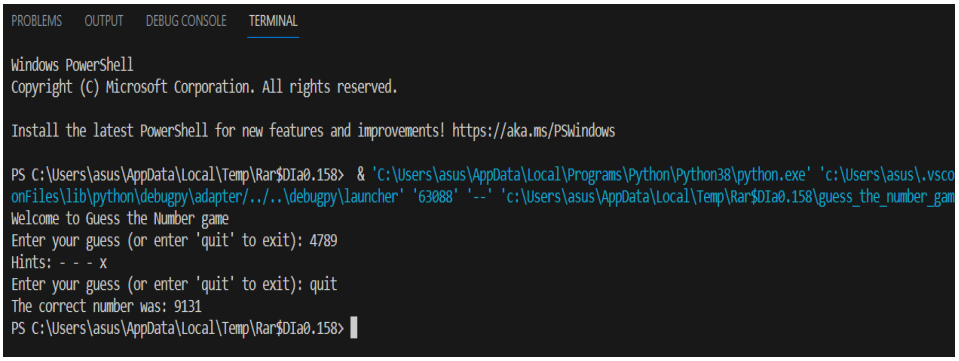
2. Incorrect guess Handling

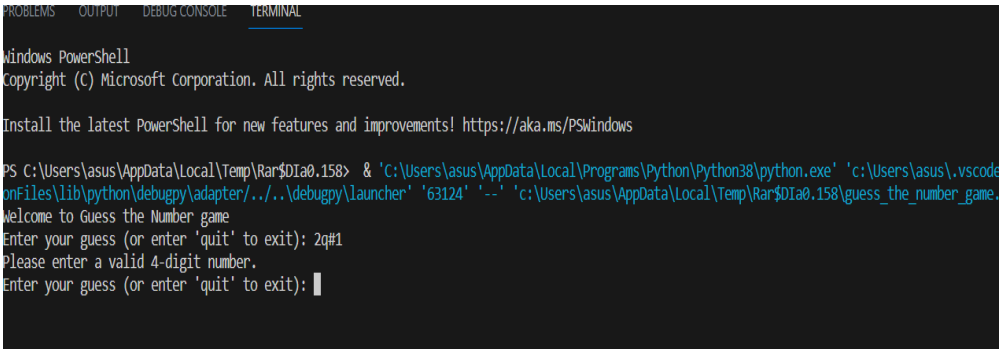
   In this step, we focus on how the game handles the incorrect guesses and provide hints as feedback to the user. The method called check_guess is used to compare the randomly generated number with the player’s guess and provides hints. The hints are returned to the play method and displayed after each guess

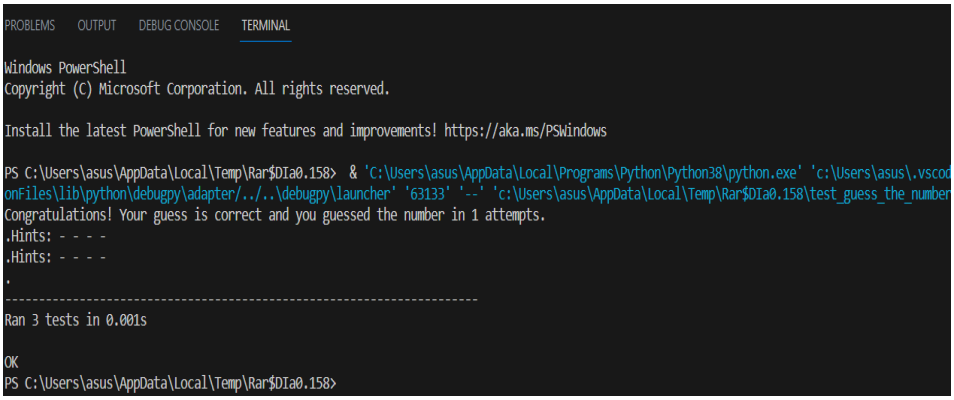
3. Invalid Guess Handling:

In this step, we handle cases if the guess is not a valid 4-digit number, and the iteration continues and prompts the user to enter the guess again. If the input contains any invalid characters or symbols, then we display it as an invalid input and ask for the next guess. This loop continues until a valid guess is made by the user.
The following screenshots show the requirements:









CONCLUSION:

The "Guess The Number" game was implemented by applying the Test-Driven Development approach together with automated unit testing. The possible glitches have been identified and a more robust solution was produced by defining test cases before implementing the code. The 'unittest' framework simplified test case creation and execution, facilitating continuous integration and validating the validity of each component.

GIT HUB LINK: https://github.com/sreelakshmipradeep20/SoftwareEngineering_UnitTesting.git

LESSONS LEARNED:

1. The TDD approach helps us to identify and address the potential glitches of a program at its early stage. It will make our debugging easier.
2. By using this approach it is easy to manage and maintain each segment of the code
3. The automated testing ensures that each component is tested which helps us to make necessary changes for the failed test cases.