



61FIT3SS1

Python Programming - Fall 2021

Assignment 1

Guessing a number is a game between two players. Player 1 picks a random number from 1 to 100 and keep it secret. In each turn, player 2 tries to guess this number. If the guessed number is incorrect, the player 1 will tell the player 2 whether the guessed number is bigger or smaller than the secret number. Based on this information, the player 2 keeps trying to make a successful guess. The game ends when the player 2 guesses correctly or stop playing.

Question 1 (5 points):

Write a Python program that simulates the guessing game between a computer (player 1) and a player (player 2). If the player guesses correctly, your program should print out the total number of guesses the player has made. If the player decides to stop playing, the program should print out the secret number. A screenshot demonstrates the interface between computer and player.

```
I have a secret number in 1 to 100!
Guess a number (enter 0 to quit): 25
You guessed too small!
Guess a number (enter 0 to quit): 75
You guessed too high!
Guess a number (enter 0 to quit): 60
You guessed too high!
Guess a number (enter 0 to quit): 40
You guessed too small!
Guess a number (enter 0 to quit): 55
You guessed too high!
Guess a number (enter 0 to quit): 45
You guessed too small!
Guess a number (enter 0 to quit): 50
You guessed too small!
Guess a number (enter 0 to quit): 52
You guessed too high!
Guess a number (enter 0 to quit): 51
Congratulations you did it in 9 try
```

```
I have a secret number in 1 to 100!
Guess a number (enter 0 to quit): 70
You guessed too high!
Guess a number (enter 0 to quit): 30
You guessed too small!
Guess a number (enter 0 to quit): 50
You guessed too high!
Guess a number (enter 0 to quit): 0
The secret number is: 31
Better Luck Next time!
```

Question 2 (2 points):

Let *MinGuess* be a minimum guesses that player 2 takes to win the game for any value of the secret number. Describe the best guessing strategy to win the game? What is the value of *MinGuess*? Explain how you calculate *MinGuess* value?

Question 3 (3 points):

Write a Python program that simulates the guessing game between a player (player 1) and a computer (player 2). Your program should implement the best guessing strategy in Question 2, so that the computer can win the game in a minimum number of guesses. In each turn, computer will guess a number and player will answer by enter a character: 'c' for correct guess; 'h' if the guessed number is bigger than the player's number; 'l' if the guessed number is smaller than the player's number.

A screenshot demonstrates the interface between computer and player.

```
Please pick a random number in 1 to 100 and keep it secret. I will try to guess your number!
Is 50 your number?
Enter c if it is correct. Enter h if my guessed number is bigger than your. Other wise enter l h
Is 25 your number?
Enter c if it is correct. Enter h if my guessed number is bigger than your. Other wise enter l l
Is 37 your number?
Enter c if it is correct. Enter h if my guessed number is bigger than your. Other wise enter l l
Is 43 your number?
Enter c if it is correct. Enter h if my guessed number is bigger than your. Other wise enter l l
Is 46 your number?
Enter c if it is correct. Enter h if my guessed number is bigger than your. Other wise enter l l
Is 48 your number?
Enter c if it is correct. Enter h if my guessed number is bigger than your. Other wise enter l h
Is 47 your number?
Enter c if it is correct. Enter h if my guessed number is bigger than your. Other wise enter l c
I did it in 7 try
```

Submission Instruction

Please create a new folder named 61fit3wpr_assignment1_<your student ID>. In the folder, create the following files:

- question1.py : contains your program code for Question 1
- question2.docx: contains your answer for Question 2
- question3.py: contains your program code for Question 3

Please compress your folder into a .zip file and submit this file via MS Teams.