Web/Python Programming Midterm Assignment 2020-1H

1. When N is input, write a function CalcFactorial () that calculates the number N × (N-1) × ⋯ × 1.
   - For example, if you run CalcFactorial (3), this function calculates 3×2×1 and returns 6
   - The name of the function must be CalcFactorial ().
   - The CalcFactorial () function takes only one input parameter.
   - The CalcFactorial () function returns -1 if the input parameter is not an integer.
   - The CalcFactorial () function returns -2 if the input parameter is less than or equal to 0.

2. Create a rock, paper, scissors game.
   - Write the answer between the “Start of Answer” and the “End of Answer” in the answer file.
   - As with the list of caseTypes in the answer, uses strings as “scissor”, “rock” and “paper”.
   - GenerateRandomCaseForComputer () uses Python's built-in random number generation function to generate and return a random word from "scissor", "rock" or "paper".
   - The GenerateRandomCaseForComputer () function has no input parameters
   - The MakeDecision () function receives the user's choice and a computer-generated choice as input parameters, and then tells us whether the user or the computer has won.
   - The MakeDecision () function receives the string corresponding to the user's selection as the first input parameter and the string corresponding to the random number based selection generated by the computer as the second input parameter.
   - The MakeDecision () function returns -1 if the user and computer choices passed as input parameters are not "scissor", "rock" or "paper".
   - The MakeDecision () function decides whether to win or not based on the choice of the user and the computer, and returns the string "User" if the user wins, or the string "Computer" if the computer wins. If it is a draw, it returns the string “Tie”.

3. A prime number is a natural number greater than 1 that cannot be formed by multiplying two smaller natural numbers. For example, 5 is prime. 8 is not prime because it has list of [1,2,4,8] as its divisors. Implement the function isPrime() which determines if a number is prime or not.
   - The parameter of this function are num(int) and L(list). We assume that num is an integer greater than 1 and L is an empty list. This assumption does not need to be checked.
   - The function returns True if num is prime and returns False otherwise. (returns Boolean type).
   - If num is not prime, the list of divisors of num is assigned to L and printed. The list includes 1 and num. When num is prime, L can be any value and is not printed.

4. Create a English word guessing program by implementing following three functions. This program first shows how many letters the answer word is, while hiding the actual alphabets of the answer word. User guesses one

alphabet at a time of this word. The number of chances is limited to the length of the word. If the guessing alphabet is in the word (maybe more than once), the program reveals all of its locations. The answer word and guessing alphabets should all be in capital letters.

4-1) Implement the function getResult(): returns the final result of the game.

- The input parameter of the function is status. status is the current status of the word to be guessed and it is string type. Unknown letter is represented as underbar('_') and revealed letter is represented as it correct alphabet. (For example, 'HIPP_P_TA_US').
- This function returns string type.
- The function returns "You lose" if status includes at least one unknown letter.
- The function returns "You win" if status reveals all of its letters without any unknown letter.

4-2) Implement the function updateStatus(): updates status

- The input parameters of the function are word (the correct answer), x (the single alphabet user entered), status (the current status of the word to be guessed). Input parameters are all string type. The function updates status to new_status and returns new_status (str type).
- This function checks if word contains x. If not, the function assigns the value of current status to new_status and returns new_status.
- If word contains x, then status is updated to new_status by changing the correct location of underbar to the alphabet of x. If x occurs more than two times in word, they are all needs to be found and changed to the alphabet of x. For example, given word = 'HIPPOPOTAMUS', x='P', and status = 'HI_____TA_US', then, updateStatus() returns 'HIPP_P_TA_US'.
- Hint: Use string methods str.count() and str.find(). Not mendatory.

4-3) Implement the function startGame(): you must use getResult() and updateStatus()

- The inpur parameter is word, which is the answer word.
- The function returns "You win" if the user guesses all the alphabets in word in the given chances. The function returns "You lose" if there are still unknown letters left after all chances.
- The local variable count (int type)is the number of chances given to the user. It is initialized as the length of the word. For example, if word='HIPPOPOTAMUS', the number of chances are 12.
- The local variable status (str type) is the current status of the word to be guessed. It is initialized as the underbars in the same length of the word. For example, if word='HIPPOPOTAMUS', status is initialized as '_____'.
- Print the current status of the word to be guessed (status) and the remaining chances (count) every time before the user enters an alphabet. Print the status once more for the last time before the function returns the final result of the game.

```
__________
12 chances. Enter a letter: A
________A___
11 chances. Enter a letter: E
________A___
10 chances. Enter a letter: I
_I______A___
9 chances. Enter a letter: O
_I__O_O_A___
8 chances. Enter a letter: U
_I__O_O_A_U_
7 chances. Enter a letter: S
_I__O_O_A_US
6 chances. Enter a letter: H
HI__O_O_A_US
5 chances. Enter a letter: P
HIPPOPO_A_US
4 chances. Enter a letter: T
HIPPOPOTA_US
3 chances. Enter a letter: M
HIPPOPOTAMUS
You win
```

(a) Program execution example 1

```
__________
12 chances. Enter a letter: A
________A___
11 chances. Enter a letter: E
________A___
10 chances. Enter a letter: I
_I______A___
9 chances. Enter a letter: O
_I__O_O_A___
8 chances. Enter a letter: U
_I__O_O_A_U_
7 chances. Enter a letter: P
_IPPOPO_A_U_
6 chances. Enter a letter: B
_IPPOPO_A_U_
5 chances. Enter a letter: V
_IPPOPO_A_U_
4 chances. Enter a letter: D
_IPPOPO_A_U_
3 chances. Enter a letter: L
_IPPOPO_A_U_
2 chances. Enter a letter: M
_IPPOPO_AMU_
1 chances. Enter a letter: S
_IPPOPO_AMUS
You lose
```

(b) Program execution example 2

Figure 1 Program execution example for Question 4