1 GAMES IN PYTHON

1.1 Guess a number from one to ten!

In this game you have to guess a number between 1 and 10. Please introduce the number in the box below. You have as many tries as you want, but it would be better if you guess it in the first try!

In [ ]:
```
from random import randint

def check_equal(num1, num2):

    '''
    Returns True if num1 and num2 are equal
    '''

    return num1 == num2

def guess_the_num():

    '''
    Plays the game Guess The Number. Player has to guess a number between
    1 and 10. When the number is guessed, the game ends and the number of
    tries is shown in screen.
    '''

    counter = 1

    #A random number between 1 and 10 is generated. Player has to guess this number.
    rand_num = randint(1, 10)

    #Player is asked to introduce a number between 1 and 10
    user_num = int(input('Please introduce a number from 1 to 10: '))

    #If player wins the game in the first attempt, a message is shown on screen.
    if check_equal(rand_num, user_num):
        print('Congratulation, you have won in your first attempt')

    else:

        #If number is not guessed in the first try, Player is asked to input a number
        #until it matches the one stored in
        #rand_num
        while not check_equal(rand_num, user_num):

            #Counter variable is incremented in each attempt to guess the number
            counter += 1

            user_num = int(input('You have failed. Please try again: '))

            #When player reaches its fifth try, a warning message is shown on screen.
            if counter == 5 and not check_equal(rand_num, user_num):
                print('This is your fifth attempt. Please think your number more carefully')

        #Finally, when player guesses the number correctly, a message showing the number of
        #attempts is displayed.
        print('\n')
        print(f'Congratulations, you have guessed the number in your attempt number {counter}!')

guess_the_num()
```

1.2 Rock, Paper, Scissors game

You get to play the famous Rock, Paper and Scissors game but this time you can do it on a computer. Please introduce your desired hand (rock, paper or scissors) in the box below. At the end of round 3, the winner will be decided!

In [ ]:
```
from random import choice

def round_winner(computer_hand, user_hand, hands, computer_counter, user_counter):

    '''
    Takes the computer hand and the user hand in a game of rock paper scissors and
    calculates who the winner is. Also, it increments the counters that help to determine
    who the global winner is after 3 rounds.

    The winner is calculated as follows:

        * Rock beats scissors
        * Scissors beat paper
        * Paper beats rock
    '''

    #User hand and computer hand are compared using the rules described in the docstring.
    #Only computer wins and ties are evaluated in the control flow, since the rest of the
    #cases will be user wins.
    #After each use, the respective counter (computer_counter or user_counter) is incremented.

    if user_hand == hands[0] and computer_hand == hands[1]:
        print('Computer wins')
        computer_counter += 1

    elif user_hand == hands[1] and computer_hand == hands[2]:
        print('Computer wins')
        computer_counter += 1

    elif user_hand == hands[2] and computer_hand == hands[0]:
        print('Computer wins')
        computer_counter += 1

    elif user_hand == computer_hand:
        print('Tie')

    else:
        print('User wins')
        user_counter += 1

    return computer_counter, user_counter


def global_winner(computer_counter, user_counter):

    '''
    Takes the round counters for the computer and for the user and calculates who the global
    winner is after 3 rounds. Computer counter and user counter are compared and the largest
    wins the game. No value is returned since everything is printed.
    '''

    if computer_counter > user_counter:
        print('The game is over. Computer wins the game!')

    elif computer_counter < user_counter:
        print('The game is over. User wins the game!')

    else:
        print("The game is over. It's a draw!")


def rps():

    '''
    Plays the game of rock paper scissors for 3 rounds. User is asked to introduce a
    hand, while computer hand is generated randomly. A score is kept every round.
    Winner is decided after 3 rounds.
    '''

    hands = ['rock', 'paper', 'scissors']
    game_counter = 0
    computer_counter = 0
    user_counter = 0

    while game_counter < 3:

        #Computer hand is chosen randomly using the choice function in a list with all
        #the possible hands.
        computer_hand = choice(hands)

        #User is asked for the hand he wishes to play with.
        user_hand = input('Please select a hand to play: ').lower()

        #The chosen hands are then printed.
        print(f'Computer plays {computer_hand} and user plays {user_hand}\n')

        #The winner is calculated with the winner function, which returns the computer winner
```

```
        #counter and the user winner counter
        computer_counter, user_counter = round_winner(computer_hand, user_hand, hands, computer_counter, user_counter)

        #After each iteration of the game, the game counter is incremented.
        game_counter += 1

        #Finally, general information is displayed.
        print(f'Game counter {game_counter}')
        print('\n')
        print(f'Score:\nComputer: {computer_counter}\nUser: {user_counter}\n')
        print('-' * 10)

    #To decide who is the global winner, the computer_counter and the user_counter are compared.
    global_winner(computer_counter, user_counter)

rps()
```

1.3 Rock, Paper, Scissors, Lizard, Spock

Does Rock, Paper, Scissors seem boring to you? You can now play the extended version of Rock, Paper, Scissors, Lizard and Spock to unlock new fun! Just introduce your desired hand in the box below and check if you won the game. Don't bother, at the end of every game your will have the possibility to play again as many times as you want.

In [6]:
```
from random import choice

def random_hand_picker(dictionary):

    '''
    Receives a dictionary, chooses a key randomly and returns it with it corresponding value.
    '''
    #List function is applied to the dictionary to obtain a list of the keys.
    keys_list = list(dictionary)

    #A random key is chosen from the list of keys.
    random_key = choice(keys_list)

    #The value linked to the random key is also obtained.
    random_value = dictionary[random_key]

    return random_key, random_value

def who_wins(user_num, computer_num):

    '''
    This function determines who the winner is in the Rock, Paper, Scissors, Lizard, Spock game based on the values of
    hands chosen by the players.

    To determine the winner, the following rules are applied:

        * If the difference between both numbers is odd, the bigger number wins.

        * If the difference between both numbers is even:
            - If both numbers are the same, the game is a tie.
            - If numbers are not the same, the smaller number wins.

    This rules are derived from observing the mathematical relationship between the possible hands.
    Depending on the case, user_num, computer_num or 0 are returned after the execution of the function.
    '''

    #The difference between the user value is calculated by subtracting the user value to the computer value.
    difference = user_num - computer_num

    #If the difference is even, the maximum is returned.
    if difference % 2 != 0:
        return max(user_num, computer_num)

    #If both values are equal, a zero is returned. This simbolizes a draw.
    elif user_num == computer_num:
        return 0

    #If none of the previous cases are True, the numbers must be even and not equal. Minimum value is returned.
    else:
        return min(user_num, computer_num)

def rpslz():

    '''
    Plays the game of Rock, Paper, Scissors, Lizard, Spock.
    User is asked to input which hand he wishes to plays, while the computer hand is chosen randomly.
    Each hand is assigned a numerical value that allows later on to calculate the winner.
    After each round, player is asked is he wishes to play again.
    '''

    #The hands dictionary is initialized. A value is assigned to each key.
    hand_dict = {'rock': 1, 'paper': 2, 'scissors': 3, 'spock': 4, 'lizard': 5}

    play_again = 'y'

    while play_again == 'y':

        #User is asked to input the hand he wishes to play with.
        user_hand = input('Please choose a hand between Rock, Paper, Scissors, Lizard and Spock: ').lower()

        #The value of the user hand is also obtained
        user_num = hand_dict[user_hand]

        #The computer hand is generated randomly in a custom function.
        computer_hand, computer_num = random_hand_picker(hand_dict)

        #The chosen hands are displayed.
        print(f'Computer has chosen {computer_hand} and user has chosen {user_hand}')

        #The winner number is selected in a custom function.
        winner_num = who_wins(user_num, computer_num)

        #The winner is printed on screen.
        if winner_num == computer_num:
            print("Computer wins the game!")

        elif winner_num == user_num:
```

```
            print("User wins the game!")

        else:
            print("It's a draw!")

        #User is presented with the option to play again.
        play_again = input("Do you want to play again? Introduce 'y' to play again or 'n' to stop playing: ").lower()
        print('\n')

rpslz()
```