Assignment 1

1. Simulate rolling two dice simultaneously 10,000 times. Estimate the probability of:
    a. Both dice show the same number.
    b. The sum is greater than 9.
2. We have a bag that contains 100 balls: 50 red balls and 50 blue balls. Select 5 balls at random. What is the probability that 3 of the selected balls are blue and 2 are red?
    a. Write a Python program to simulate this probability.
    b. Run the program with different numbers of trials (e.g., 1000, 10,000, 100,000, etc.).
    c. Observe how the results change as you increase the number of trials.
    d. Compare your simulation results with the calculated probability (using combinatorics or probability theory).
3. Suppose two players play a game where:
    a. Player 1 rolls two six-sided dice and sums the results.
    b. Player 2 rolls three six-sided dice and sums the results.
    c. Write a program to simulate the game 10,000 times and calculate the probability that:
    d. Player 1 wins.
    e. Player 2 wins.
    f. It is a tie.

********** End **********