Question 1

In [1]:
```
import random

def player_turn(current_number):
    while True:
        try:
            user_input = input("Enter 1, 2, or 3 consecutive numbers starting
            player_moves = list(map(int, user_input))
            if len(player_moves) < 1 or len(player_moves) > 3:
                print("You must enter 1, 2, or 3 numbers.")
                continue
            if player_moves[0] != current_number or any(player_moves[i] != pla
                print("Numbers must start from {} and be consecutive.".format(
                continue
            return player_moves
        except ValueError:
            print("Invalid input. Enter numbers only.")

def computer_turn(current_number):

    num_to_play = random.randint(1, 3)
    computer_moves = list(range(current_number, current_number + num_to_play))
    return computer_moves

def play_game():
    current_number = 1
    while current_number <= 20:

        print("\nPlayer's Turn")
        player_moves = player_turn(current_number)
        current_number = player_moves[-1] + 1
        print("Player played:", player_moves)
        if current_number > 20:
            print("Player Wins!!!")
            break

        # Computer's turn
        print("\nComputer's Turn")
        computer_moves = computer_turn(current_number)
        current_number = computer_moves[-1] + 1
        print("Computer played:", computer_moves)
        if current_number > 20:
            print("Computer Wins!!!")
            break


play_game()
```

```
Player's Turn
Enter 1, 2, or 3 consecutive numbers starting from 1: 1 2
Player played: [1, 2]

Computer's Turn
Computer played: [3]

Player's Turn
Enter 1, 2, or 3 consecutive numbers starting from 4: 6 7
Numbers must start from 4 and be consecutive.
Enter 1, 2, or 3 consecutive numbers starting from 4: 4 5
Player played: [4, 5]

Computer's Turn
Computer played: [6]

Player's Turn
Enter 1, 2, or 3 consecutive numbers starting from 7: 8 9
Numbers must start from 7 and be consecutive.
Enter 1, 2, or 3 consecutive numbers starting from 7: 7 8
Player played: [7, 8]

Computer's Turn
Computer played: [9, 10]

Player's Turn
Enter 1, 2, or 3 consecutive numbers starting from 11: 11 12
Player played: [11, 12]

Computer's Turn
Computer played: [13, 14, 15]

Player's Turn
Enter 1, 2, or 3 consecutive numbers starting from 16: 16 17 18
Player played: [16, 17, 18]

Computer's Turn
Computer played: [19]

Player's Turn
Enter 1, 2, or 3 consecutive numbers starting from 20: 20 21
Player played: [20, 21]
Player Wins!!!
```

Question 2

In [2]:
```
import math


def ncr(n, r):
    return math.factorial(n) // (math.factorial(r) * math.factorial(n - r))


def print_pascals_triangle(rows):
    for n in range(rows):
        row = [ncr(n, r) for r in range(n + 1)]

        print(" " * (rows - n), " ".join(map(str, row)))


rows = int(input("Enter the number of rows for Pascal's Triangle: "))
print_pascals_triangle(rows)
```

```
Enter the number of rows for Pascal's Triangle: 5
      1
     1 1
    1 2 1
   1 3 3 1
  1 4 6 4 1
```

Question 3

In [3]:
```
from collections import Counter


numbers = list(map(int, input("Enter the numbers separated by space: ").split(


frequency = Counter(numbers)


for element, count in frequency.items():
    print(f"Element {element} has come {count} times")
```

```
Enter the numbers separated by space: 1 2 3 1 2 3 4 1 3 2 5 6 5 6 7 7 1 2 5
Element 1 has come 4 times
Element 2 has come 4 times
Element 3 has come 3 times
Element 4 has come 1 times
Element 5 has come 3 times
Element 6 has come 2 times
Element 7 has come 2 times
```

Question 4

In [2]:
```
def read_matrix(filename):
    with open(filename, 'r') as file:
        lines = file.readlines()
        matrix_A = []
        matrix_B = []


        matrix_A.append(list(map(int, lines[0].split())))
        matrix_A.append(list(map(int, lines[1].split())))


        matrix_B.append(list(map(int, lines[3].split())))
        matrix_B.append(list(map(int, lines[4].split())))

    return matrix_A, matrix_B

def add_matrices(matrix_A, matrix_B):

    result = [[0, 0], [0, 0]]


    for i in range(2):
        for j in range(2):
            result[i][j] = matrix_A[i][j] + matrix_B[i][j]

    return result

def print_matrix(matrix):
    for row in matrix:
        print(" ".join(map(str, row)))


filename = 'Matrix.txt'
matrix_A, matrix_B = read_matrix(filename)


result_matrix = add_matrices(matrix_A, matrix_B)


print("Resultant Matrix after Addition:")
print_matrix(result_matrix)
```

```
Resultant Matrix after Addition:
6 8
10 12
```

Question 5

In [4]:
```
import math

class Fraction:
    def __init__(self, numerator, denominator):
        self.numerator = numerator
        self.denominator = denominator

    def __add__(self, other):

        new_numerator = self.numerator * other.denominator + other.numerator *
        new_denominator = self.denominator * other.denominator


        gcd = math.gcd(new_numerator, new_denominator)
        new_numerator //= gcd
        new_denominator //= gcd


        return Fraction(new_numerator, new_denominator)

    def __str__(self):
        return f"{self.numerator}/{self.denominator}"


frac1 = Fraction(1, 2)
frac2 = Fraction(1, 3)

result = frac1 + frac2
print("Result of addition:", result)
```

```
Result of addition: 5/6
```

In [ ]:
```

```