Question 1:

Answer:- (https://www.programiz.com/online-compiler/7EGBEY7bzkhG1)

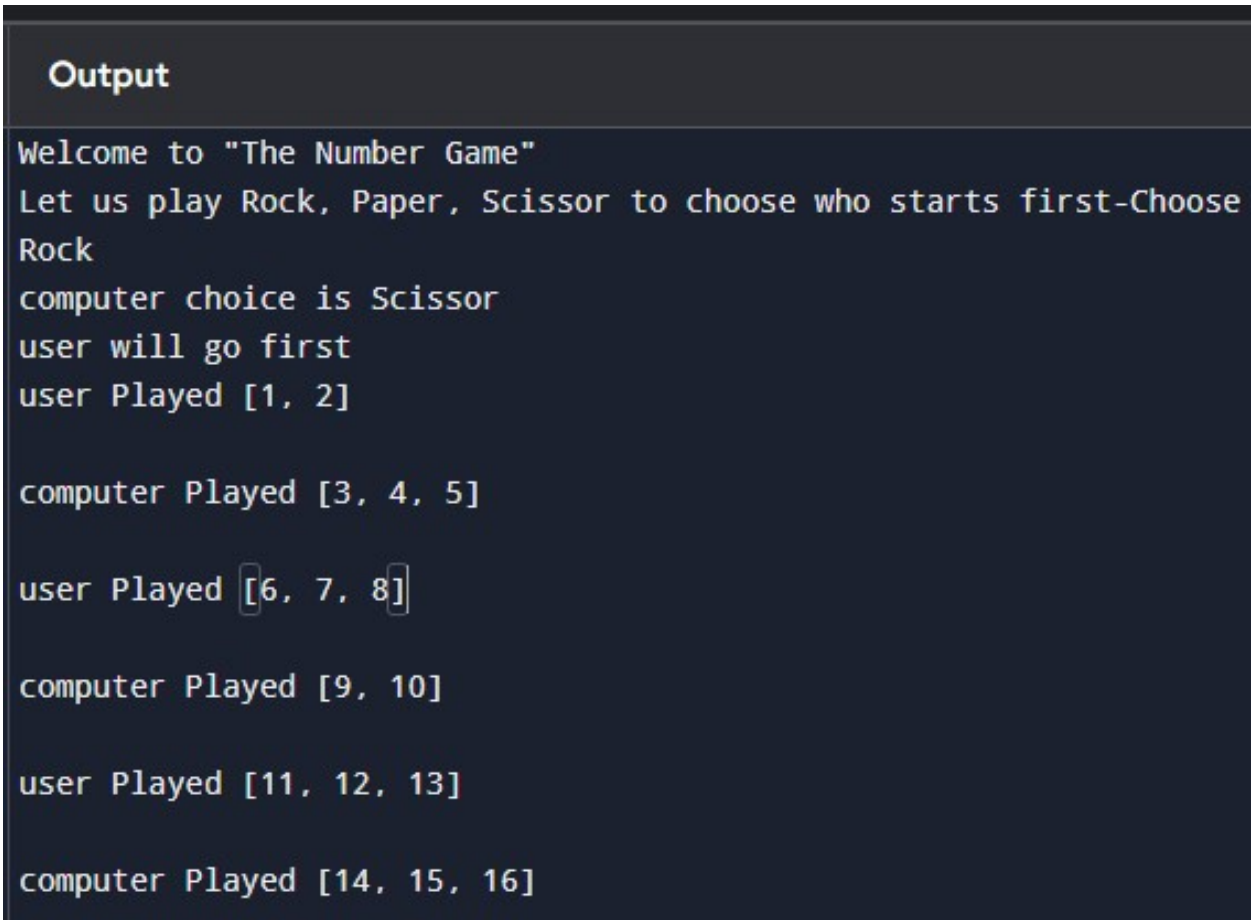
```
import random
print('Welcome to "The Number Game"')
from random import randint
user_input=input("Let us play Rock, Paper, Scissor to choose who starts first-Choose one of the above 3\n")
choices=["Rock","Paper","Scissor"]
computer_choice=choices[randint(0,2)]
print(f'computer choice is {computer_choice}')
starting_choices=[user_input,computer_choice]
if user_input=="Rock":
    if computer_choice=="Paper":
        print("computer will go first")
        player1="computer"
    else:
        print("user will go first")
        player1="user"
elif user_input=="Paper":
    if computer_choice=="Scissor":
        print("computer will go first")
        player1="computer"
    else:
        print("user will go first")
        player1="user"
elif user_input=="Scissor":
    if computer_choice=="Rock":
        print("computer will go first")
        player1="computer"
    else:
        print("user will go first")
        player1="user"
player=player1
start=1
game=True
while game==True:

    random_step=randint(1,2)
    if random_step==1:
        end=start+1
        if end<20:
            selected_number=[start,end]
            start=start+2
            print(f'{player} Played {selected_number}\n')
        elif end>=20:
            end=20
            selected_number=[start,end]
            print(f'{player} Played {selected_number} and {player} own the game\n')
            game=False

    elif random_step==2:
        end=start+2
        if end<20:
            selected_number=[start,start+1,end]
            print(f'{player} Played {selected_number}\n')
            start=start+3
```

```
        elif end>=20:
            end=20
            selected_number=[start,start+1,end]
            print(f'{player} Played {selected_number} and {player} own the game\n')
            game=False
    if player!="computer":
        player="computer"
    elif player!="user":
        player="user"
```

Output:-

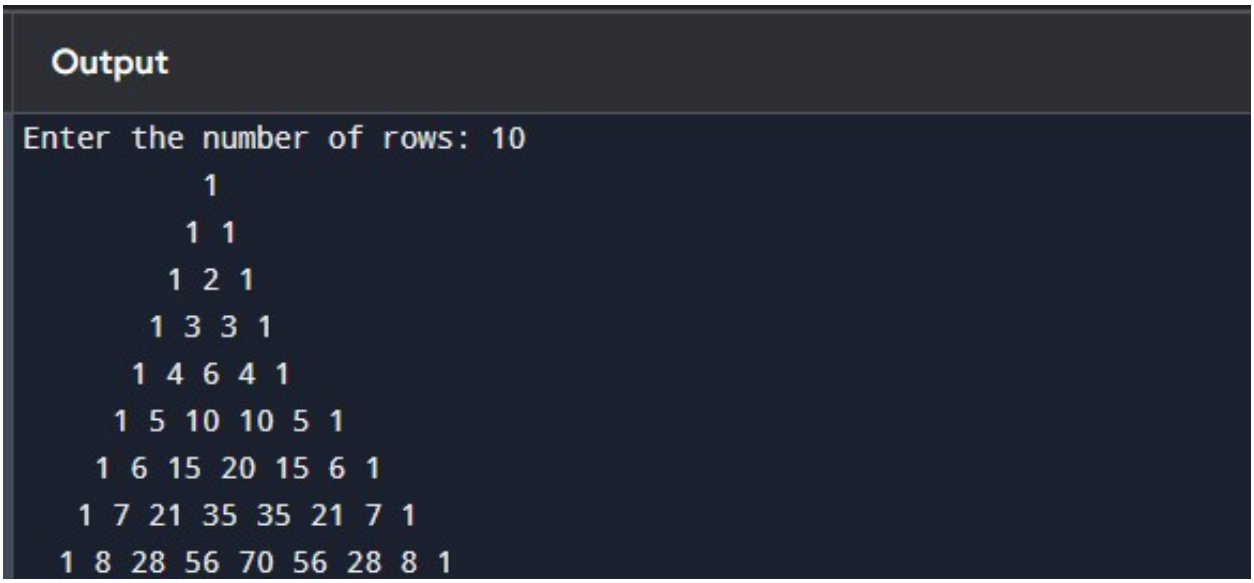


Question 2:

Answer:

```
import math
def ncr(n, r):
    return math.comb(n, r)
def pascals_triangle(rows):
    for i in range(rows):
        print(" " * (rows - i), end="")
        for j in range(i + 1):
            print(ncr(i, j), end=" ")
        print()
rows = int(input("Enter the number of rows: "))
```

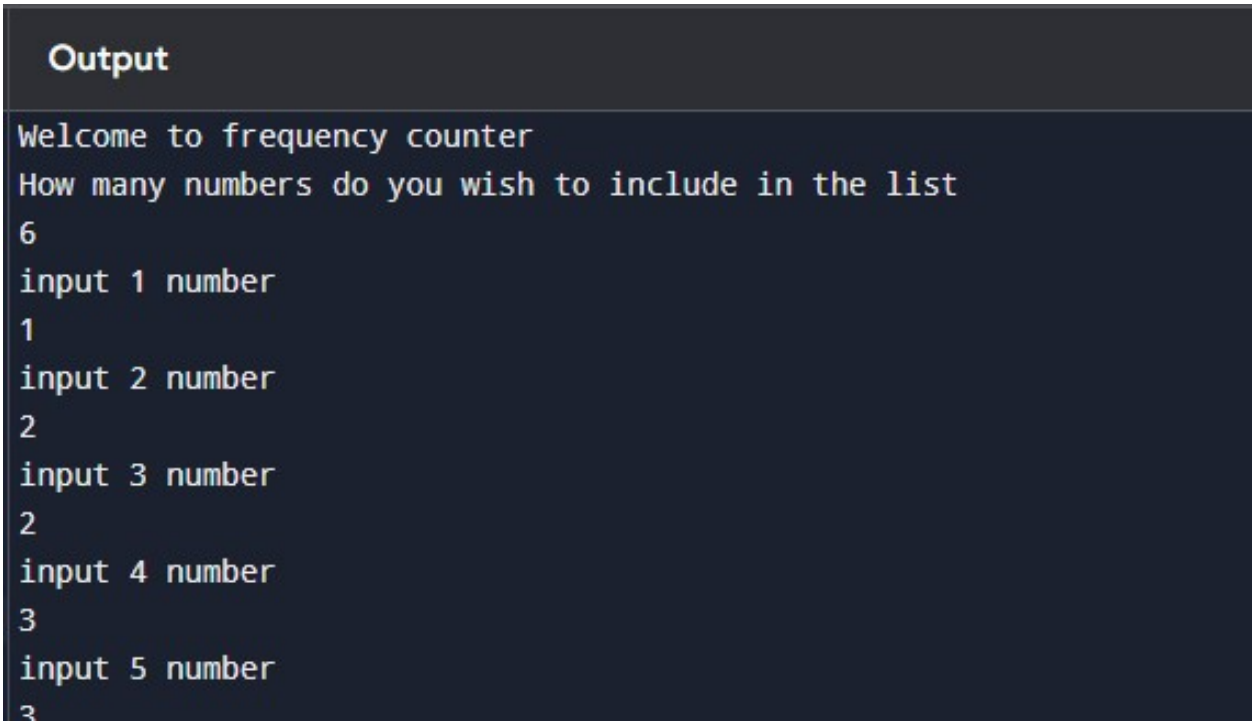
pascals_triangle(rows)



Question 3:

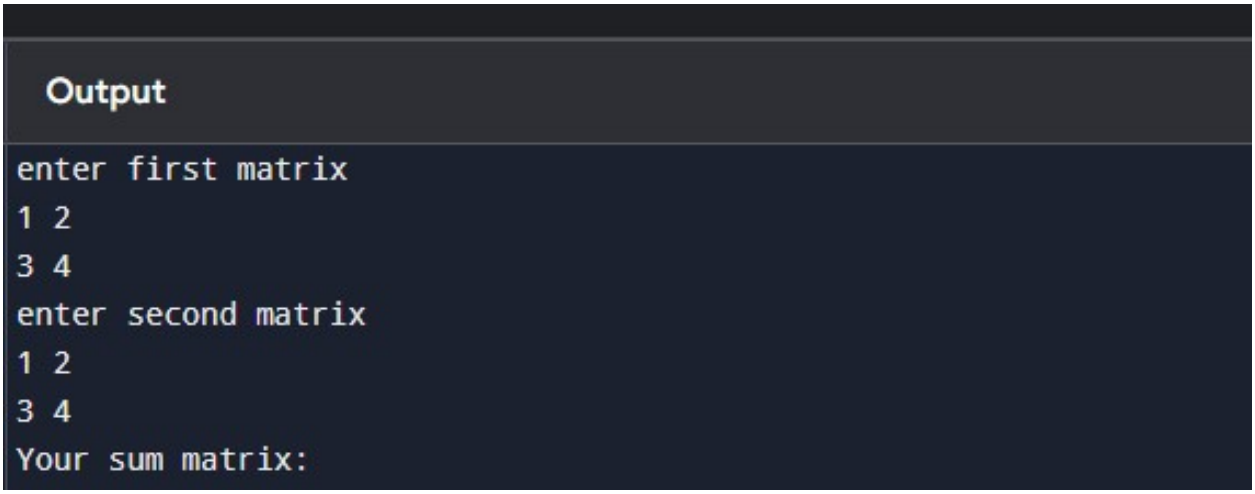
Answer:

```
print("Welcome to frequency counter")
numbers=int(input('How many numbers do you wish to include in the list\n'))
list_of_numbers=[]
import collections
for number in range(1,numbers+1):
    select_number=int(input(f'input {number} number\n'))
    list_of_numbers.append(select_number)
print(f'the list of numbers is {list_of_numbers}')
frequency = collections.Counter(list_of_numbers)
print(dict(frequency))
```



Question 4:-

```
print("enter first matrix");
x1=[list(map(int,input().split())) for i in range(2)]
print("enter second matrix")
x2=[list(map(int,input().split())) for j in range(2)]
for i in range(2):
    for j in range(2):
        x1[i][j]+=x2[i][j]
print("Your sum matrix:")
for row in x1:
    print(*row)
```



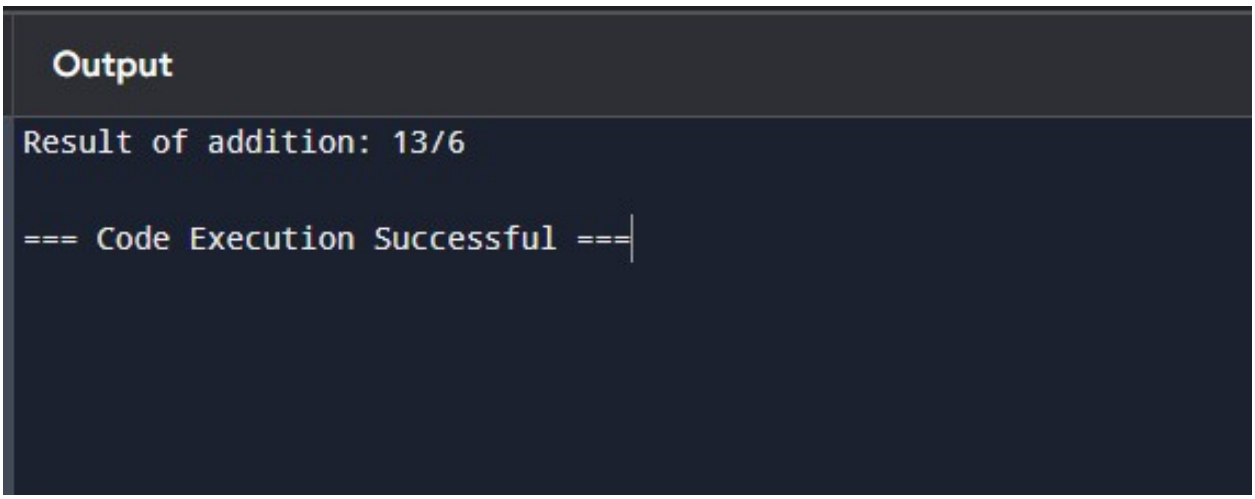
Question 5:-

Answer:-

```
from math import gcd

class Fraction:
    def __init__(self, numerator, denominator):
        self.numerator = numerator
        self.denominator = denominator
        self.simplify()
    def simplify(self):
        common_divisor = gcd(self.numerator, self.denominator)
        self.numerator //= common_divisor
        self.denominator //= common_divisor
    def __add__(self, other):
        new_numerator = self.numerator * other.denominator + other.numerator * self.denominator
        new_denominator = self.denominator * other.denominator
        return Fraction(new_numerator,new_denominator)
    def __str__(self):
        return f"{self.numerator}/{self.denominator}"


f1 = Fraction(5, 6)
f2 = Fraction(4, 3)
result = f1 + f2
print("Result of addition:", result)
```


Output
Result of addition: 13/6
=== Code Execution Successful ===