**DAA Assignment 1 Recursion and Non-Recursion Function (Fibonacci Series)**

**Code:**

def fibonacci\_iterative(n):

sequence = []

a, b = 0, 1

for \_ in range(n):

sequence.append(a)

a, b = b, a + b

return sequence

def fibonacci\_recursion(n):

seq=[]

if n <= 1:

return [0][:n]

elif n == 2:

return [0, 1]

else:

seq = fibonacci\_recursion(n - 1)

seq.append(seq[-1] + seq[-2])

return seq

def calculate\_fibonacci():

try:

n = int(input("Enter a number to calculate Fibonacci sequence: "))

if n < 0:

print("Please enter a positive integer!")

return

print("Choose method:\n1. Iterative\n2. Recursive")

choice = int(input("Enter 1 or 2: "))

if choice == 1:

result = fibonacci\_iterative(n)

print(f"Iterative Fibonacci sequence up to {n}: {result}")

elif choice == 2:

result = fibonacci\_recursion(n)

print(f"Recursive Fibonacci sequence up to {n}: {result}")

else:

print("Invalid choice!")

except ValueError:

print("Invalid input!")

calculate\_fibonacci()

**Output:**

Enter a number to calculate Fibonacci sequence: 6

Choose method:

1. Iterative

2. Recursive

Enter 1 or 2: 1

Iterative Fibonacci sequence up to 6: [0, 1, 1, 2, 3, 5]

Enter a number to calculate Fibonacci sequence: 6

Choose method:

1. Iterative

2. Recursive

Enter 1 or 2: 2

Recursive Fibonacci sequence up to 6: [0, 1, 1, 2, 3, 5]