1. Write a Python Program to Display Fibonacci Sequence Using Recursion?

ANS: def fibonacci\_recursive(n):

if n <= 0:

return []

elif n == 1:

return [0]

elif n == 2:

return [0, 1]

else:

fib\_sequence = fibonacci\_recursive(n - 1)

fib\_sequence.append(fib\_sequence[-1] + fib\_sequence[-2])

return fib\_sequence

if \_\_name\_\_ == "\_\_main\_\_":

try:

num\_terms = int(input("Enter the number of terms for the Fibonacci sequence: "))

if num\_terms <= 0:

print("Please enter a positive integer.")

else:

fib\_sequence = fibonacci\_recursive(num\_terms)

print("Fibonacci Sequence:")

print(fib\_sequence)

except ValueError:

print("Invalid input. Please enter a valid integer.")

1. Write a Python Program to Find Factorial of Number Using Recursion?

ANS: def factorial\_recursive(n):

if n == 0 or n == 1:

return 1

else:

return n \* factorial\_recursive(n - 1)

if \_\_name\_\_ == "\_\_main\_\_":

try:

num = int(input("Enter a non-negative integer to find its factorial: "))

if num < 0:

print("Please enter a non-negative integer.")

else:

result = factorial\_recursive(num)

print(f"The factorial of {num} is: {result}")

except ValueError:

print("Invalid input. Please enter a valid non-negative integer.")

1. Write a Python Program to calculate your Body Mass Index?

ANS: def calculate\_bmi(weight, height):

return weight / (height \*\* 2)

if \_\_name\_\_ == "\_\_main\_\_":

try:

weight\_kg = float(input("Enter your weight in kilograms: "))

height\_m = float(input("Enter your height in meters: "))

if weight\_kg <= 0 or height\_m <= 0:

print("Please enter valid non-zero positive values for weight and height.")

else:

bmi = calculate\_bmi(weight\_kg, height\_m)

print(f"Your Body Mass Index (BMI) is: {bmi:.2f}")

except ValueError:

print("Invalid input. Please enter valid numerical values.")

1. Write a Python Program to calculate the natural logarithm of any number?

ANS: import math

if \_\_name\_\_ == "\_\_main\_\_":

try:

num = float(input("Enter a positive number to calculate its natural logarithm: "))

if num <= 0:

print("Please enter a positive number.")

else:

natural\_log = math.log(num)

print(f"The natural logarithm of {num} is: {natural\_log:.2f}")

except ValueError:

print("Invalid input. Please enter a valid numerical value.")

1. Write a Python Program for cube sum of first n natural numbers?

ANS: def cube\_sum\_of\_natural\_numbers(n):

return sum(i\*\*3 for i in range(1, n + 1))

if \_\_name\_\_ == "\_\_main\_\_":

try:

num = int(input("Enter a positive integer (n) to calculate the cube sum of the first n natural numbers: "))

if num <= 0:

print("Please enter a positive integer.")

else:

cube\_sum = cube\_sum\_of\_natural\_numbers(num)

print(f"The cube sum of the first {num} natural numbers is: {cube\_sum}")

except ValueError:

print("Invalid input. Please enter a valid positive integer.")