**ADITYA AMIN**

**ASSIGN : 06**

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

def fibonacci(n):

"""Function to calculate and display Fibonacci sequence using recursion."""

if n <= 1:

return n

else:

return (fibonacci(n-1) + fibonacci(n-2))

# Input the number of terms in Fibonacci sequence

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

# Check if the input is valid

if num\_terms <= 0:

print("Invalid input! Number of terms should be a positive integer.")

else:

print("Fibonacci sequence:")

for i in range(num\_terms):

print(fibonacci(i))

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

def factorial(n):

"""Function to calculate factorial of a number using recursion."""

if n == 0:

return 1

else:

return n \* factorial(n - 1)

# Input the number to find factorial

num = int(input("Enter a positive integer to find its factorial: "))

# Check if the input is valid

if num < 0:

print("Invalid input! Number should be a positive integer.")

else:

result = factorial(num)

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

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

def calculate\_bmi(weight, height):

# Function to calculate Body Mass Index (BMI).

height\_m = height / 100 # Convert height from centimeters to meters

bmi = weight / (height\_m \*\* 2)

return bmi

# Input weight and height from the user

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

height = float(input("Enter your height in centimeters: "))

# Check if the inputs are valid

if weight <= 0 or height <= 0:

print("Invalid input! Weight and height should be positive numbers.")

else:

bmi = calculate\_bmi(weight, height)

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

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

import math

# Input number from the user

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

# Check if the input is valid

if num <= 0:

print("Invalid input! Number should be positive.")

else:

# Calculate natural logarithm using math.log()

result = math.log(num)

# Display the result

print(f"The natural logarithm of {num} is: {result:.4f}")

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

def cube\_sum(n):

"""Function to calculate the cube sum of first n natural numbers."""

total = 0

for i in range(1, n+1):

total += i\*\*3

return total

# Input the value of n from the user

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

# Check if the input is valid

if n <= 0:

print("Invalid input! n should be a positive integer.")

else:

result = cube\_sum(n)

print(f"The cube sum of the first {n} natural numbers is: {result}")