**# Arithmatic Operators:**

**# Write a Python program to calculate the area and perimeter of a rectangle.**

# o Input: Length and width of the rectangle.

# o Output: Area and Perimeter

# length = float(input("Enter the length of the rectangle:"))

# width = float(input("Enter the width of the rectangle:"))

# area = length \* width

# place = 2\*(length + width)

# print(f"the area of rectangle is: {area:.2f}")

# print(f"the perimater of the rectangle is: {place:.2f}")

# Create a Python program to compute the result of a mathematical

# expression: (a+b)2+(a−b)2(a+b)^2 + (a-b)^2(a+b)2+(a−b)2.

# o Input: Values of a and b

# def mathamatical\_expression(a,b):

# result = (a + b) \*\* 2 + (a-b) \*\*2

# return result

# try:

# a = float(input("Enter the value of a: "))

# b = float(input("Enter the value of b: "))

# result = mathamatical\_expression(a, b)

# print(f"the result of the expression (a+b)^2 + (a-b)^2 is:{result}")

# except ValueError:

# print("Please enter a valid numeric values for a and b.")

**# Relational Operators:**

# **Write a Python program that compares two numbers and prints whether the**

**# first number is greater than, less than, or equal to the second number**

# a = 20

# b = 10

# print(a > b)

# print(a < b)

# print(a >= b)

# print(a <= b)

# **Check if a person is eligible to vote (age >= 18).**

# def check\_voting\_eligibility(age):

# if age >= 18:

# print("You are eligible to vote.")

# else:

# print("You are not eligible to vote.")

# try:

# age = int(input("Enter your age: "))

# if age < 0:

# print("Please enter a valid age.")

# else:

# check\_voting\_eligibility(age)

# except ValueError:

# print("Please enter a valid integer for age.")

**# Logical Operators:**

**# Write a Python program to check if a number is divisible by both 3 and 5.**

# def divisibility(number):

# if number % 3 == 0 and number % 5 == 0:

# print(f"{number} is divisible by both 3 and 5.")

# else:

# print(f"{number} is not divisible by both 3 and 5.")

# try:

# number = int(input("Enter a number :"))

# divisibility(number)

# except ValueError:

# print("please enter a valid integer")

**# Write a program to determine whether a year is a leap year. A year is a leap**

# year if:

# o It is divisible by 4 and not divisible by 100, or

# o It is divisible by 400

# def leap\_year(year):

# if(year % 4== 0 and year % 100 != 0) or (year % 400 == 0):

# return True

# else:

# return False

# try:

# year = int(input("Enter a year:"))

# if leap\_year(year):

# print(f"{year} is a leap year.")

# else:

# print(f"{year} is not a leap year.")

# except ValueError:

# print("please enter a valid integer for the year.")

**# Bitwise Operator:**

# **Write a Python program to compute the bitwise AND, OR, and XOR of two**

**# integers.**

**# o Input: Two integers.**

# def bitwise\_operators(num1, num2):

# \_and = num1 & num2

# \_or = num1 | num2

# \_xor = num1 ^ num2

# return \_and, \_or, \_xor

# try:

# num1 = int(input("Enter the first integer :"))

# num2 = int(input("Enter the second integer :"))

# and\_result, or\_result, xor\_result = bitwise\_operators(num1, num2)

# print(f"Bitwise And of {num1} and {num2} is: {and\_result}")

# print(f"Bitwise OR of {num1} and {num2} is: {or\_result}")

# print(f"Bitwise XOR of {num1} and {num2} is: {xor\_result}")

# except ValueError:

# print("Please enter a valid integers.")

# **Assignment Operator:**

**# Write a Python program to calculate the compound interest.**

# o Formula: A=P(1+r/n)ntA = P(1 + r/n)^{nt}A=P(1+r/n)nt

# o Use +=, \*=, etc., for intermediate calculations.

# o Input: Principal P, rate r, number of times interest applied per time period n, and time t

# def compound\_interest():

# Pricipal = float(input("Enter the principal amount (P): "))

# rate = float(input("Enter the annual interest rate: "))

# num\_times = int(input("Enter the number of times applied per time period: "))

# time\_period = float(input("Enter the time (t): "))

# term = 1 + rate / num\_times

# term \*\*= (num\_times \* time\_period)

# A = Pricipal \* term

# print(f"The compound amount after {time\_period} years is: {A:.2f}")

# print(f"The compound interest earned is: {A - Pricipal:.2f}")

# compound\_interest()

# **Write a Python program to perform cumulative addition and multiplication**

**# on a list of numbers using assignment operators.**

# def cumulative(numbers):

# sum = 5

# product = 6

# for num in numbers:

# sum += num

# product \*= num

# return sum, product

# numbers = list(map(float, input("Enter a list of numbers separated by spaces: ").split()))

# sum\_result, product\_result = cumulative(numbers)

# print(f"Cumulative sum: {sum\_result}")

# print(f"Cumulative product: {product\_result}")

**# Special Operators:**

# 1. Identity Operator:

# 2. Membership Operator:

**# Identity Operator**:

# it is used to identify the address of the two ojects or two values.

# a =100

# b = a

# print(id(a))

# print(id(b))

# print(a is b)

# Create a Python program that initializes two lists with the same elements

# but compares their memory locations using is and is not.

# a = [10, 20, 30, 40]

# b = [10, 20, 30, 40]

# print(id(a))

# print(id(b))

# print(a is b)

# print(a is not b)

# **Membership Operator:**

# A membership operator is used to check if a value or variable is present in a sequence such as

# a list, tuple, string, set or dict.

# string = 'python is very easy language to learn'

# list = [10, 20, 30, 40]

# print('language' in string)

# print(30 in list)

# def check\_list(element, lst):

# if element in lst:

# print(f"Element '{element}' exists in the list.")

# else:

# print(f"Element '{element}' does not exist in the list.")

# list = input("Enter a list of elements separated by spaces: ").split()

# element = input("Enter the element to check: ")

# check\_list(element, list)