**EX.NO: 3**

**DATE:**

**Handle numerical operations using math and random number functions**

**AIM:**

To perform numerical operations using Python's math and random libraries.

**PROCEDURE:**

**Import the necessary libraries**:

• The math module provides mathematical functions such as trigonometric, logarithmic,

and power functions.

• The random module allows generating random numbers and performing operations

related to randomness.

**Operations using math module**:

• Perform basic operations such as square root, power, logarithm, and trigonometric

functions.

**Operations using random module:**

• Generate random integers, floating-point numbers, and random values from lists.

• Use various functions like random(), randint(), uniform(), and choice() for random

**operations.**

**PROGRAM:**

import math

import random

**# 1. Using math module for numerical operations**

**# Square root**

num = 25

sqrt\_val = math.sqrt(num)

print(f"Square root of {num}: {sqrt\_val}")

**# Power (num raised to the power of 3)**

power\_val = math.pow(num, 3)

print(f"{num} raised to the power of 3: {power\_val}")

**# Logarithmic function (natural log of num)**

log\_val = math.log(num)

print(f"Natural log of {num}: {log\_val}")

**# Trigonometric functions (sin, cos, tan)**

angle = math.radians(45) # Converting degrees to radians for trigonometric functions

sin\_val = math.sin(angle)

cos\_val = math.cos(angle)

tan\_val = math.tan(angle)

print(f"Sine of 45 degrees: {sin\_val}")

print(f"Cosine of 45 degrees: {cos\_val}")

print(f"Tangent of 45 degrees: {tan\_val}")

**# 2. Using random module for random number operations**

**# Generating a random integer between 1 and 100**

random\_int = random.randint(1, 100)

print(f"Random integer between 1 and 100: {random\_int}")

**# Generating a random floating-point number between 0 and 1**

random\_float = random.random()

print(f"Random floating-point number between 0 and 1: {random\_float}")

**# Generating a random floating-point number between a specified range (5.5 to 10.5)**

random\_uniform = random.uniform(5.5, 10.5)

print(f"Random floating-point number between 5.5 and 10.5: {random\_uniform}")

**# Choosing a random element from a list**

choices = ['apple', 'banana', 'cherry', 'date']

random\_choice = random.choice(choices)

print(f"Random choice from list: {random\_choice}")

**# Shuffling a list randomly**

random.shuffle(choices)

print(f"Shuffled list: {choices}")

**OUTPUT:**

**Square root of 25:** 5.0

**25 raised to the power of 3**: 15625.0

**Natural log of 25**: 3.2188758248682006

**Sine of 45 degrees**: 0.7071067811865475

**Cosine of 45 degrees**: 0.7071067811865476

**Tangent of 45 degrees**: 0.9999999999999999

**Random integer between 1 and 100**: 47

**Random floating-point number between 0 and 1**: 0.23864580395600157

**Random floating-point number between 5.5 and 10.5**: 7.732391022837347

**Random choice from list:** cherry

**Shuffled list:** ['banana', 'apple', 'date', 'cherry']

**RESULT:**

Numerical operations such as square root, power, logarithmic calculations, and trigonometric

functions were performed using the math module. Random numbers were generated, and

random operations like selecting and shuffling elements were executed using the random

module.