Exp no: 1

Calculating values of random data using NumPy for mathematical formulas 1)Euclidean distance between two points 2) Dot Product of two Vectors 3)Solving a System of Linear Equations

**AIM:**

To calculate the values for the mathematical formulas using NumPy library

**INTEGRATED DEVELOPMENT ENVIRONMENT (IDE) REQUIRED:**

JUPYTER NOTEBOOK

**REQUIRED LIBRARIES FOR PYTHON:**

∙ Numpy

**PROGRAM:**

**Calculating the Euclidean Distance Between Two Points**

Import numpy as np

defeuclidean\_distance(p, q):return np.sqrt(np.sum((q - p) \*\* 2))

# Example usage

p = np.array([1, 2])

q = np.array([4, 6])

distance = euclidean\_distance(p, q)

print(“Output for Calculating the Euclidean Distance Between Two Points is: “,distance)

**Calculating the Dot Product of Two Vectors**

Import numpy as np

A = np.array([1, 3, -5])

B = np.array([4, -2, -1])

dot\_product = np.dot(A, B)

print(“Output for dot product of two vectors A and B is “,dot\_product)

**Solving a System of Linear Equations**

import numpy as np

# Coefficients matrix A and result vector b

A = np.array([[3, 1], [1, 2]])

b = np.array([9, 8])

# Solve for x

x = np.linalg.solve(A, b)

print(“Output solution of System of Linear Equations is “,x)

**Result:**

Exercise 1 -Output for Calculating the Euclidean Distance between Two Points is: 5.0.

Exercise 2 –Output for dot product of two vectors A and B is 3

Exercise 3 -Output solution of System of Linear Equations is [2. 3.]