# USE CASE 2

Develop an application to perform plotting probabilities using matplotlib

Here is a simple Python application that plots probability distributions using matplotlib.

This example plots Binomial and Normal probability distribution curves.

✅ Requirements

Make sure you have the following installed:

pip install matplotlib numpy scipy

🧠 Python Application Code

import numpy as np

import matplotlib.pyplot as plt

from scipy.stats import binom, norm

# ----- Binomial Distribution -----

n = 10 # number of trials

p = 0.5 # probability of success in each trial

x = np.arange(0, n+1)

binomial\_prob = binom.pmf(x, n, p)

# ----- Normal Distribution -----

mean = 0

std\_dev = 1

x\_norm = np.linspace(-4, 4, 1000)

normal\_prob = norm.pdf(x\_norm, mean, std\_dev)

# ----- Plotting -----

plt.figure(figsize=(10, 5))

# Plot Binomial

plt.subplot(1, 2, 1)

plt.stem(x, binomial\_prob, basefmt=" ")

plt.title("Binomial Distribution (n=10, p=0.5)")

plt.xlabel("Number of Successes")

plt.ylabel("Probability")

# Plot Normal

plt.subplot(1, 2, 2)

plt.plot(x\_norm, normal\_prob)

plt.title("Normal Distribution (mean=0, std=1)")

plt.xlabel("Value")

plt.ylabel("Probability Density")

plt.tight\_layout()

plt.show()

🎯 What This Does

Distribution Meaning

Binomial Probability of getting k successes in n trials.

Normal Continuous bell-shaped probability curve.

This program creates two plots side-by-side:

A stem plot for the Binomial distribution.

A smooth curve for the Normal distribution.

If you want, I can now: ✅ Convert this into a GUI application (Tkinter / PyQt)

✅ Add user input fields

✅ Add multiple probability distributions (Poisson, Geometric etc.)