**Task 13 :**

**Program :**

import numpy as np

import matplotlib.pyplot as plt

from scipy.stats import binom, norm, poisson

# Set up the figure

plt.figure(figsize=(15, 5))

# --- 1. Binomial Distribution ---

plt.subplot(1, 3, 1)

n, p = 10, 0.5 # number of trials, probability of success

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

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

plt.bar(x, binomial\_probs, color='skyblue')

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

plt.xlabel('Number of Successes')

plt.ylabel('Probability')

# --- 2. Normal Distribution ---

plt.subplot(1, 3, 2)

mu, sigma = 0, 1 # mean and standard deviation

x = np.linspace(-4, 4, 100)

normal\_probs = norm.pdf(x, mu, sigma)

plt.plot(x, normal\_probs, color='green')

plt.title('Normal Distribution (μ=0, σ=1)')

plt.xlabel('x')

plt.ylabel('Probability Density')

# --- 3. Poisson Distribution ---

plt.subplot(1, 3, 3)

lambda\_val = 3

x = np.arange(0, 15)

poisson\_probs = poisson.pmf(x, lambda\_val)

plt.bar(x, poisson\_probs, color='salmon')

plt.title('Poisson Distribution (λ=3)')

plt.xlabel('Number of Events')

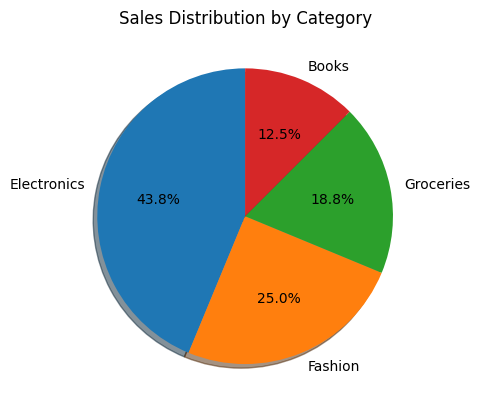
plt.ylabel('Probability')

# Show the plot

plt.tight\_layout()

plt.show()

**output :**

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