Reading Assignment: Sections 4-1, 4-2, 4-3 of Papoulis Text Book

Q1: Write down the distribution of following random variables (RVs) and calculate their characteristic functions (CFs) and moment generating functions (MGFs)

(a) Gaussian

(b) Poisson

(c) Exponential

(d) Binomial

Q2: Calculate the mean μ and variance σ^2 of each of the aforesaid RVs (in Q1). Use their respective CFs/MGFs to validate the mean and variance you calculated analytically.

Q3: Use your preferred programming paradigm and plot the distribution of each of the random variables. Vary the parameters to study the shift of the distribution.