

Assignment 7

Suppose a PDF is given

$$f(x) = 2 \lambda (x - \mu) e^{\lambda(x-\mu)^2},$$

where $x > \mu, \lambda > 0, \mu > 0$ and λ, μ are the parameters. Create a legend plot of the PDF for the x ranges from $\mu + 0.1$ till 10 with the step size 0.03, for different values of λ & μ (≤ 5). Also do the same for CDF of the given PDF.

Further, generate 5000 random samples (x) from the CDF of the given PDF for the true parameter values $\lambda = 1.5, \mu = 0.25$. Also compare the sample mean (say, \bar{x}) with the population mean. Further compare the values of the manually computed CDF with the programmatically computed CDF, at $x = \bar{x}$. (*Hints: You can use [scipy.integrate](#) to compute the CDF programmatically*)

Note: You must create one single *class* to solve the problem. Also you are not bound to follow the hint, mentioned above, but you have to use any approximation method to solve any kind of integration for that case.