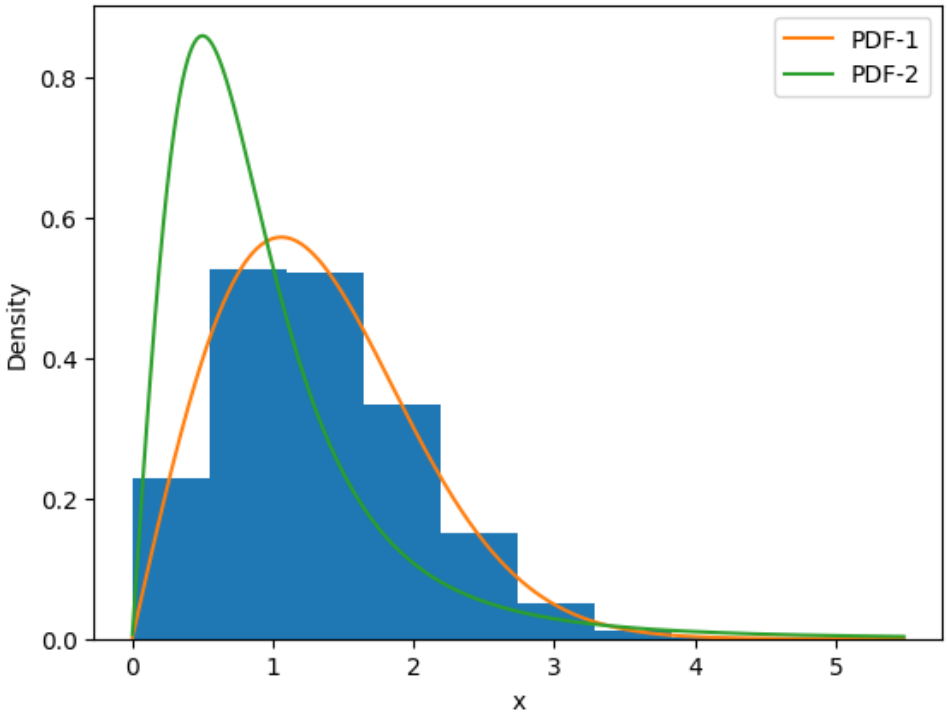
Assignment 10

Suppose you are given a sample (x) (click here to download) and also two PDFs (probability density functions) are given

PDF-1: $$f(x;\lambda,k) = \frac{k}{\lambda}\left(\frac{x}{\lambda}\right)^{k-1} e^{-\left(\frac{x}{\lambda}\right)^k},\ x > 0,\ \lambda > 0,\ k > 0.$$

PDF-2: $$f(x;\lambda,k) = \lambda k \frac{x^{k-1}}{(1+x^k)^{\lambda+1}},\ x > 0,\ \lambda > 0,\ k > 0.$$

Where λ & k are the parameters and the true values for the same are given 1.5 & 2, respectively. Produce same/similar plot like below:



Here in the y-axis, density refers PDF.

What can you observe from the generated (by you) plot? (Viva question). Compute the population mean(μ) and sample mean, population variance(σ) and sample variance. What kind of relationship do you observe between sample variance and population variance? (Viva question)
Further, explain (Viva question),

$$P(|X-\mu| < 2\sigma) \geq 0.75$$