

Worksheet 3

Problem 1 Generate $N \gg 1$ uniformly distributed random numbers $\in [0, 1]$ and write a function to compute their probability distribution function.

Problem 2 Generate $N \gg 1$ random numbers drawn from normal distribution $\mathcal{N}[\mu, \sigma^2]$. Verify that the probability distribution function is

$$P(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left[-\frac{(x - \mu)^2}{2\sigma^2}\right] \quad (1)$$

Plot PDFs for 3 different values of (μ, σ) .

Problem 3 Generate $N \gg 1$ random numbers having a Lorentzian density

$$P(x) = \frac{\gamma}{\pi(\gamma^2 + x^2)}. \quad (2)$$

Plot PDFs for 3 different values of γ .