Problem Set 5
PHY670: Astro Statistics
August - November 2025
IISER Mohali

1. Generate a sequence of 10^2 pseudo random numbers with a Gaussian distribution ($\mu = 0$, $\sigma = 1$). Using bins of size 0.05, calculate the frequency distribution. Use χ^2 to determine the best fit values for μ and σ.

2. Generate two such sequences and use the F-test to check whether the two frequency distributions have the same variance or not. Repeat for sequences of 10, 30, 100 and 300 pseudo-random numbers.

3. Generate using a sequence of 10^2 uniformly distributed random numbers x_i between $0-1$, compute the distribution of $y_i = 2(x_i - 0.5)$. Use χ^2 to determine the best fit values for μ and σ by fitting a normal distribution to this data.

4. Repeat the last problem for $y_i = 0.01/(x_i - 0.5)$.