Problem - 4 (Spring 2026)

Due date: 17 February, 2026

1. Write a computer program using the inverse-transform technique to generate the Rayleigh distribution with a parameter $\sigma > 0$, which is given by

$$\begin{aligned} f(x) &= \frac{x}{\sigma^2} e^{-\frac{x^2}{2\sigma^2}} \quad \text{if } x > 0 \\ &= 0 \qquad\qquad\quad \text{Otherwise} \end{aligned}$$

2. Use the rejection technique to obtain a Gaussian distribution. Assume that the mean and variance are zero and unity, respectively.

   Note: You may use an external random number generator for generating uniform random variates.