1. **KDE Plot**

   Recall the definition of a KDE: given a sample $x_1, x_2, \ldots, x_n$ from an unknown distribution f the kernel density estimate of f at point x with kernel K_b is defined as

   $$\hat{f}(x; b) = \frac{1}{n} \sum_{i=1}^{n} K_b(x - x_i)$$

   where the kernel must satisfy $\int_{-\infty}^{\infty} K(u)du = 1$ and $K(-u) = K(u)$. The parameter b is known as the bandwidth and controls the width of the kernel used.

   (a) generate data from the exponential distribution with scale 1

   (b) write a function that computes a KDE with a Gaussian kernel. Here the bandwidth refers to the standard deviation of the Gaussian kernel.

   (c) plot both the data you generated as X's and the KDE as a line plot on the same axis

2. **Recreate the Images Below**

   hint: `plt.scatter`