1. Find the best k value for K-means clustering:
   * For each dataset, apply the K-means clustering algorithm with varying values of k (number of clusters) and compute the Sum of Squared Errors (SSE) for each k. Plot the SSE values against k.
   * Additionally, calculate the silhouette index for each k and choose the best k based on the highest silhouette index.
2. Compare SSE values for the best k and the known number of classes:
   * For each dataset, run K-means with k equal to the number of actual classes and calculate SSE.
   * Create a table with the following columns: Dataset, Best k (Silhouette), SSE (Best k), and SSE (Known Number of Classes). Fill in the table with appropriate values for each dataset.
3. Find the best Gaussian Mixture Model (GMM) for simulated datasets:
   * Load the simulated datasets 'simulatedx.csv' and 'simulatedy.csv'.
   * For different numbers of components and covariance types, fit a Gaussian Mixture Model to the 'simulatedx.csv' dataset and compute the Bayesian Information Criterion (BIC) for each model.
   * Choose the GMM with the lowest BIC value as the best model.
4. Visualize the best GMM:
   * Plot the 'simulatedx.csv' dataset with points colored according to the best GMM's predicted cluster assignments.

After completing these steps, you will have best values of k for K-means clustering for each dataset, compared the SSE values for different clustering scenarios, and identified the best Gaussian Mixture Model for the simulated data.