1. Show that the Fisher linear discriminant dimensional reduction coincides with the “plug-in” likelihood ratio test if we assume that the class-conditional densities are $d$-dimensional Gaussians with unknown and unequal means and unknown and equal covariances.

2. Consider the Iris dataset. Convert it to a two-class problem by combining classes 1 and 2.
   a. Find the Fisher linear discriminant function for distinguishing between class 0 and the combined class 1&2.
   b. Evaluate the performance of this dimensional reduction as follows. Using only half of the data, compute the Fisher linear discriminant classifier and the “plug-in” likelihood ratio test. Compare the error performance of the two classifiers on the other remaining half of the dataset.