DA311 Machine Learning Lab

Assignment 5

Date: September 5th, 2023

NOTE: Please spend an hour or so in completing Assignment 4 if not done.

Please download the dataset from the following link:
`https://github.com/tsharma12/IITG-DA311-Machine-Learning-Lab/tree/main/Week5_Dataset`

Task 1

The CSV file dataset (i.e., fisher_discriminant_data.csv) contains 3 columns (2 feature columns and a 1 class column). Perform Fisher's Discriminant Analysis on this two-class dataset and visualize the results after projection.

Task 2

Perform segmentation of background and foreground on the **"cameraman.tif"** image.

(a) Obtain the probability mass function of pixel intensities in the grayscale image.

(b) Calculate the means and variances of background and foreground for each potential threshold value.

(c) Find the threshold that maximizes separation between means in part (b) and minimizes the sum of variances in part (c).

(d) Segment the image using the threshold in [(c)] and display the result.