Lab - 8
CSL2010: Introduction To Machine Learning
AY 2022-23

PCA on Images, LDA

(Due: 28 Sep 2022, 11:59 PM)

General Instructions

1. You need to upload a zip ***<Lab8_Your_Roll_No>.zip***, which contains one file for the task in ***<Lab8_Your_Roll_No>.py*** format and the report for the entire assignment in ***<Lab8_Your_Roll_No>.pdf*** format.
2. Provide your colab file link in the report. **Make sure that your file is accessible**.
3. Submit a single report mentioning your observations for all the tasks.
4. Report/Cite any resources you have used while attempting the assignment.
5. Attempt (1), (2) and (3) during the lab.

[Problem 1] :- **[25 Marks]**

Dataset - It is a huge dataset, we need to only take 10 classes from it.(Check the code in demo on how to import a subset of the dataset)
This dataset contains greyscale images of the faces of different people.

1. Import the Olivetti Dataset, perform some meaningful Exploratory Data Analysis, and choose the number of principal components based on reconstruction error. **[10 Marks]**

2. Apply PCA with the chosen value of number of components from the above question. Visualize the mean faces for each class, and top 'k' eigen faces. Vary the value of k from 3 to 6. **[15 Marks]**

[Problem 2] :- **[10 Marks]**

1. Import the Iris Dataset, perform exploratory analysis, and classify it using LDA, and number of components of your choice. **[10 Marks]**

Resources:
Reconstruction Error PCA
Importing Olivetti Dataset
LDA vs PCA on iris dataset