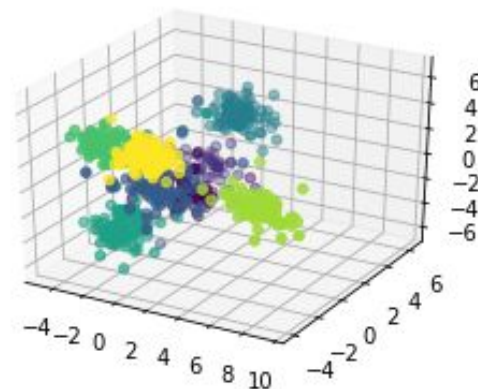


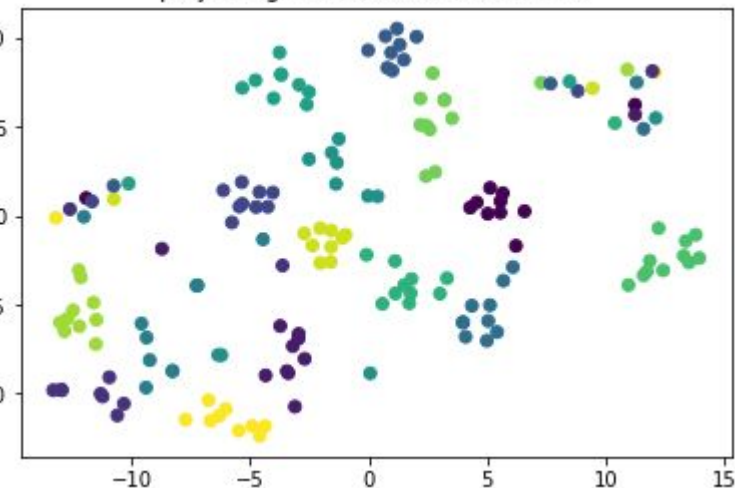
Q1 part 1:

- 18 such images were made. (6 features * 3 datasets), an example is displayed on the right. (iiit-cfw dataset with kernelized lda).
- IIIT-CFW database was difficult to represent with few errors, because there were many eigen vectors with considerable magnitude (the one in **red**)
- Both 3D and 2D TSNE were observed.
- T-SNE brings similar class elements together (plots shown below).

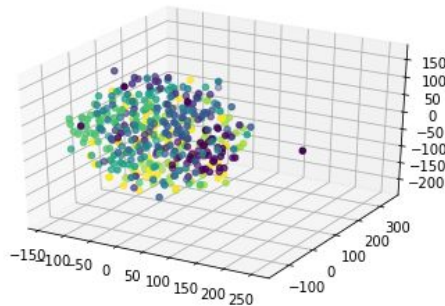
projecting IIIT – CFW dataset
in 3 principal components
method used: **kernel – lda**



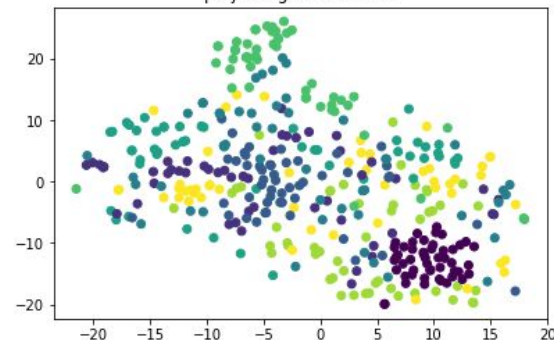
projecting Yale-face-database in 2D



projecting IMFDB in 3D



projecting IMFDB in 2D



Q1 contd..

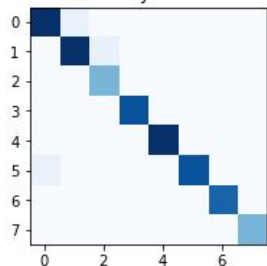
- Details of performance of given 6 features during classification.
- We see that lda and klda are the best
- The image on the right shows table for Dataset IIIT-CFW, two more such tables were made.

IIIT-CFW

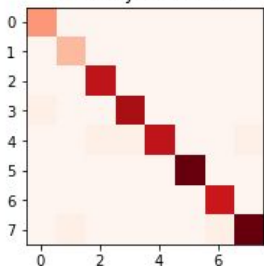
	Feature	Reduced Dimension	Classification Error	Accuracy	F1-score
0	pca	30	47.619%	0.524	0.518
1	lda	10	3.571%	0.964	0.964
2	kernel-pca	30	39.286%	0.607	0.613
3	kernel-lda	10	4.167%	0.958	0.958
4	vgg-features	>4k	32.143%	0.679	0.685
5	resnet-features	>2k	5.357%	0.946	0.947

- Low accuracy .Observed when these methods weren't used.
- High accuracy, Confusion matrix consistently showed that LDA was the best.
(Kernel lda and resnet were also high performing.)
(shown bottom)

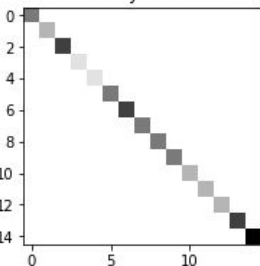
heatmap of confusion matrix
for IMFDB
using kernel-lda
accuracy= 97.0%



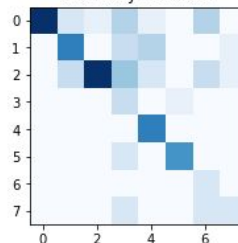
heatmap of confusion matrix
for IIIT-CFW
using resnet-features
accuracy= 96.429%



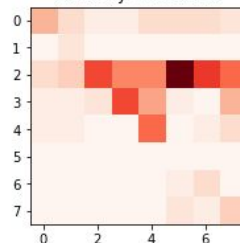
heatmap of confusion matrix
for Yale-face-database
using lda
accuracy= 100.0%



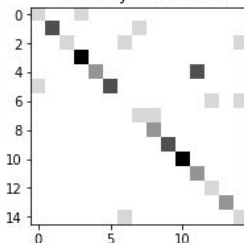
heatmap of confusion matrix
for IMFDB
accuracy = 59.0%



heatmap of confusion matrix
for IIIT-CFW
accuracy = 30.952%



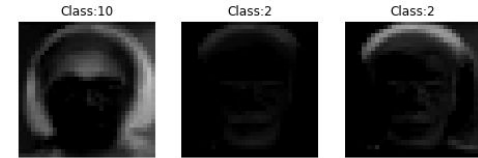
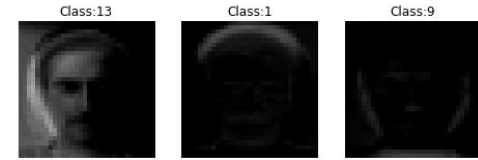
heatmap of confusion matrix
for Yale-face-database
accuracy = 71.429%



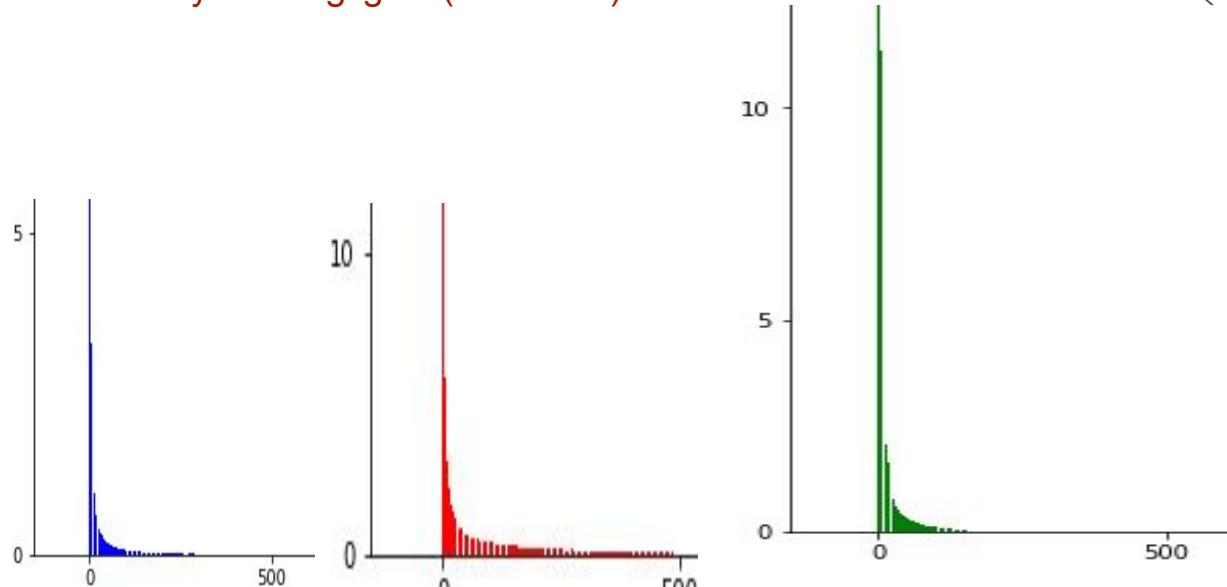
Q1 contd....

- Example of Reconstructed Eigen faces.
- Top 3 eigenvectors were used to reconstruct this.
- Yale-face database and IIIT-CFW showed maximum error . Example below had error of 75%
- **IMFDB = 1** eigenvector of large magnitude
- **IIIT-CFW = many** eigen vectors of considerable magnitude
- **YALE-FACE = few** of large magnitude but after 100th, they are negligible(0)

Yale-face-databasereconstructed



Class:14



Q2 - politicians and film stars binary classification

- Good results were achieved when LDA was used
- Confusion matrix(green)
- T-SNE 3D plot (Yellow)
- >97 % accuracy on repeated trials

Class1: Film-Stars, Class2: politician

