Task Report

Task:1 KNN & PCA analysis

Some Results

Result1: The Mahalanobis distance measure with k=199 and 35 , 75 & 100 principal components achieved an accuracy of 11.5% in face recognition. The computation time for this configuration was 0.744 seconds.

Result2: Using the Euclidean distance measure with k=9 and 40, 55 & 100 principal components, the face recognition system achieved an accuracy of 12.5%. The computation time for this configuration was 0.114 seconds.

Result3: Using the cosine distance measure with k=155,19 and 30, 65, 100 principal components, the face recognition algorithm achieved an accuracy of 13%. The computation time for this configuration was 0.13546 seconds.

So, the best Computational time was 0.114 seconds with accuracy of 12.5%, but there is slightly more computational time 0.13546 seconds is required for gaining accuracy of 13%.
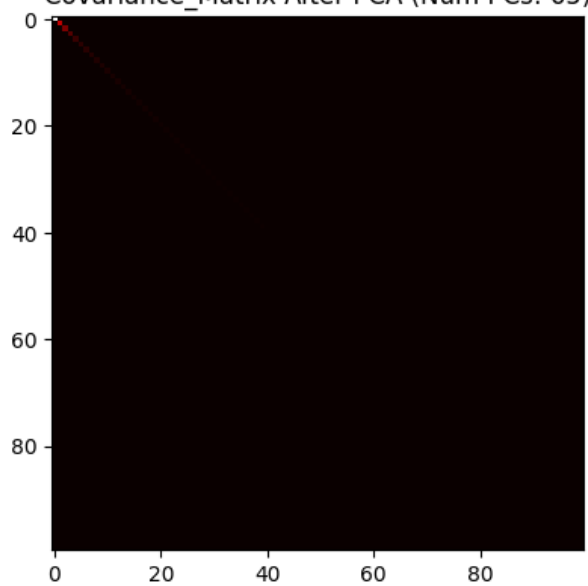
So, the best accuracy gained is 14% with computational time 0.140 seconds
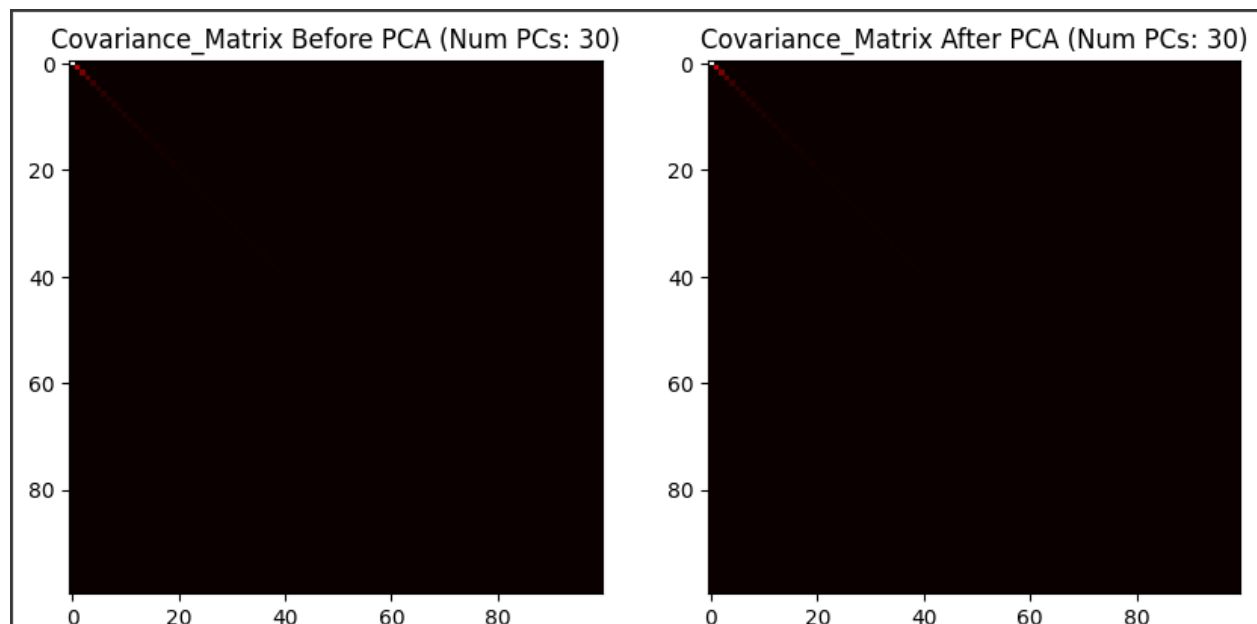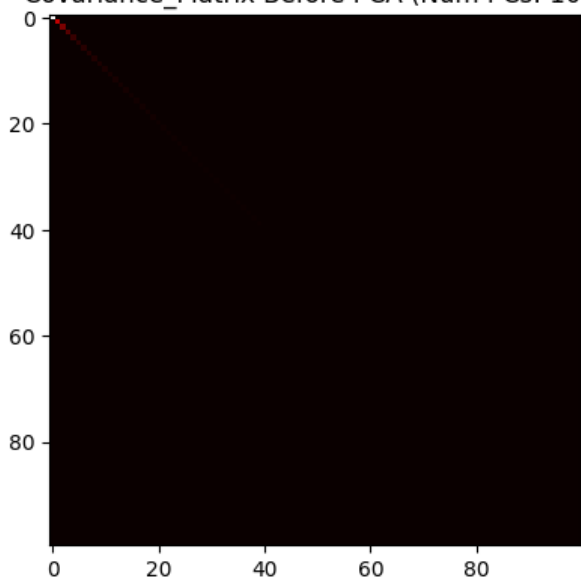
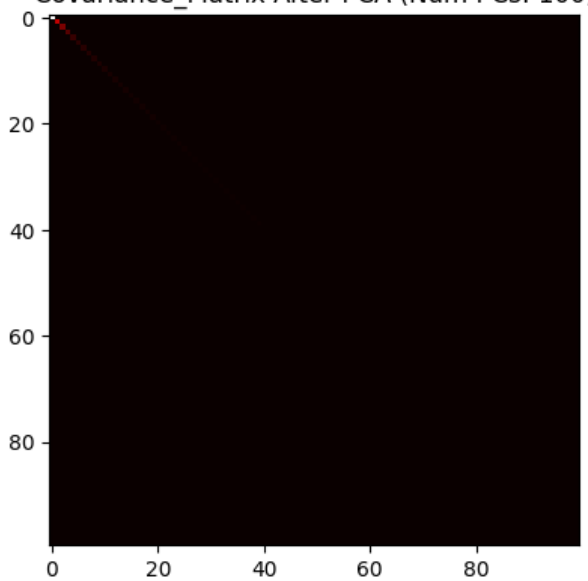Covariance_Matrix Before PCA (Num PCs: 65)
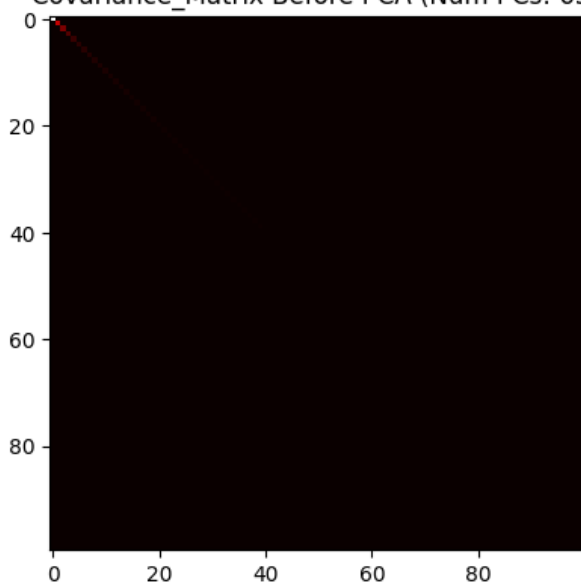
Covariance_Matrix After PCA (Num PCs: 65)

Covariance_Matrix Before PCA (Num PCs: 100)

Covariance_Matrix After PCA (Num PCs: 100)

Task:2 Interactive Foreground Segmentation

The K-means clustering technique is used in this code to do image segmentation. It requires two inputs: a test image and a seed image. To start the clustering, the user chooses certain seed pixels from the seed image. The seed pixels are then subjected to K-means clustering, and a predetermined number of clusters (N) are chosen for the foreground and background. Based on the distance between each pixel in the test image and the chosen clusters, probabilities are calculated for each pixel. The segmented image that results after assigning each pixel to the class (foreground or background) with the highest likelihood is then returned.

But I can't evaluate the results because after assigning the pixels to the test image the execution goes on for a very very long time. This may be due to less computational resources of my local machine even when N value is reduced.