

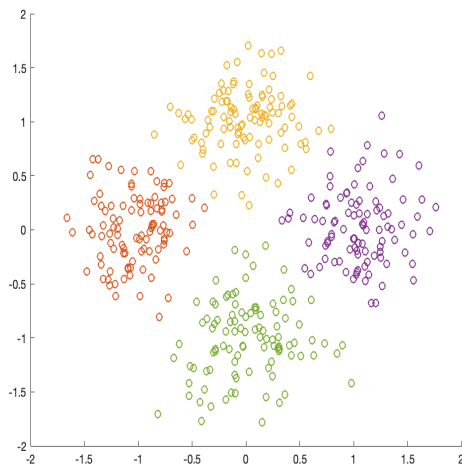
Computer Vision and Pattern Recognition Assignment - 3

Ufuk Dogan

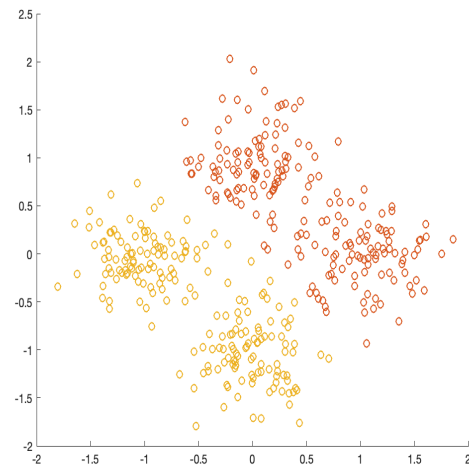
16 June 2019

1 Exercise - 1

- Part A



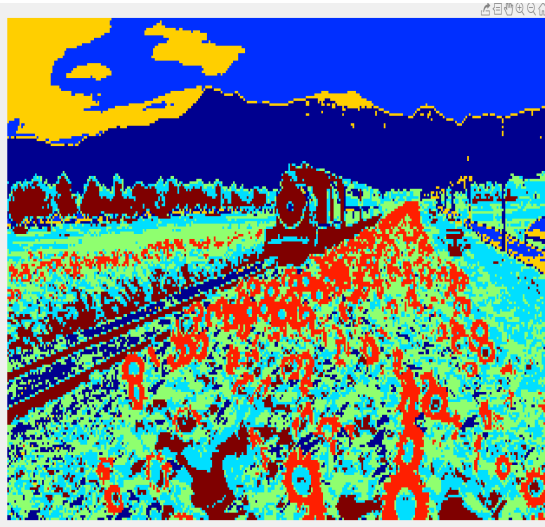
(a) $K = 4$



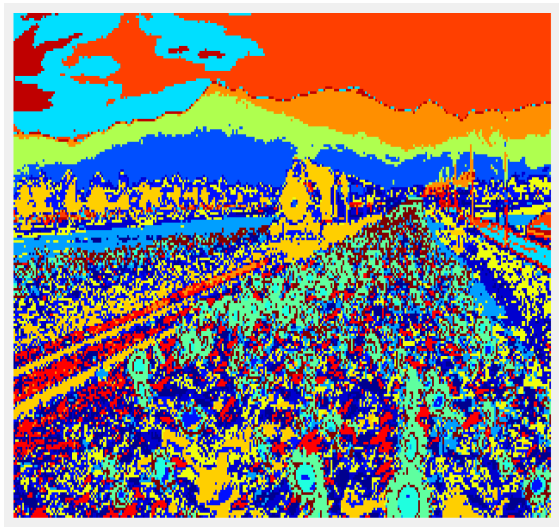
(b) $K = 2$

We choose $k = 4$ because of the Elbow Method which gives us to use the optimal k number in K-Means algorithm regarding our data.

- Part C



(a) $K = 8$



(b) $K = 16$

2 Exercise - 3

- Part A



Figure 3: 10 Components

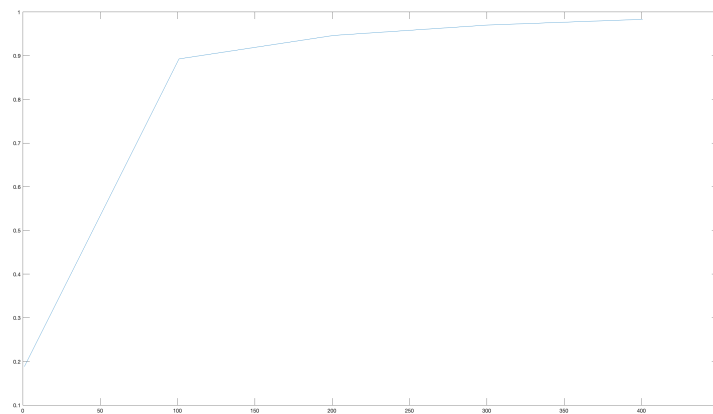


Figure 4: Plot Captured Graph

According to graph, we can say that 101 component will be enough to capture at least %90 percent of the variance.

- Part B



Figure 5: $N = 500$



Figure 6: $N = 100$

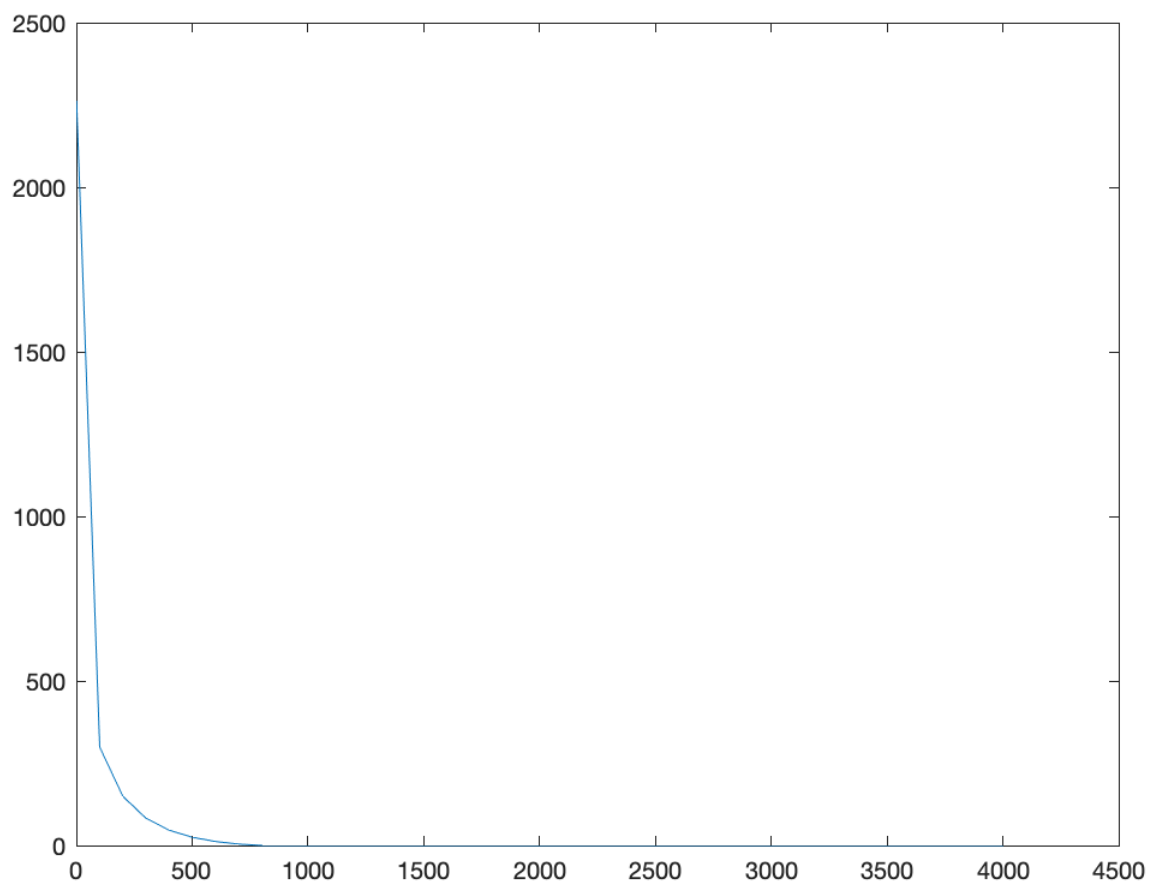


Figure 7: Reconstruction Error

- Part C

On this task my accuracy is 11/100 when I have used 500 as a number of component however, when I have changed it to the 100 I have received 9/100 accuracy. The main reason of this is, PCA could not find the important features of the face that's why the accuracy is poor.