Q4 of Assignment 2 of CS215

Part1 :

From the plots of eigen values, one thing that we can observe clearly is
that the eigen values decrease rapidly which implies that only few eigen values are large,
which in turn implies that the variation in many dimensions is very less.
The variance is higher than 784 only in very few dimensions.
This implies that the eigen values which are significant are very less than 784.
This can be observed for the plots and also, if we check the number of eigen
values greater than 1% of the max eigen value, we clearly know that it is
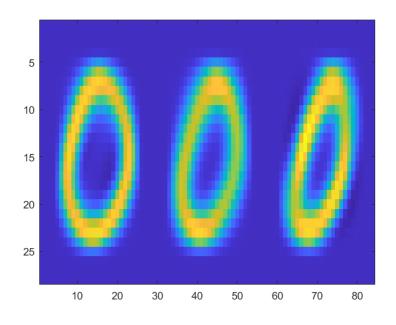far lower than 784.
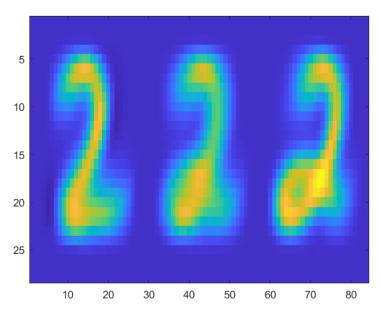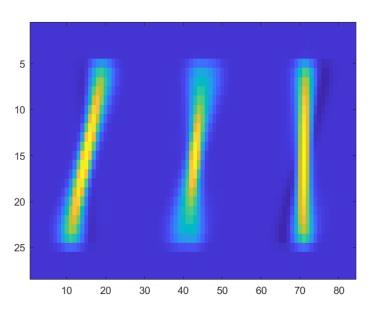If we increase the limit to 10% then the number of eigen values further decreases.

Part2 :

We can observe that the images present on either side of the middle image
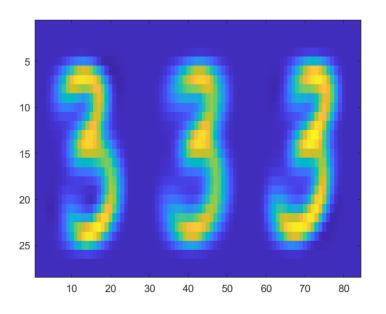are slightly inclined towards it.
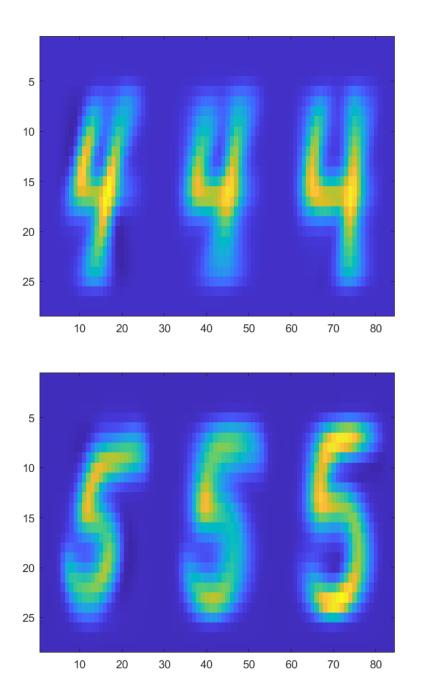For digit 1, the left image leans towards the mean image and that is how people write the digit 1.

*All images from results folder are added here as there are total of 20 images. 10 are from each digits(3 times),
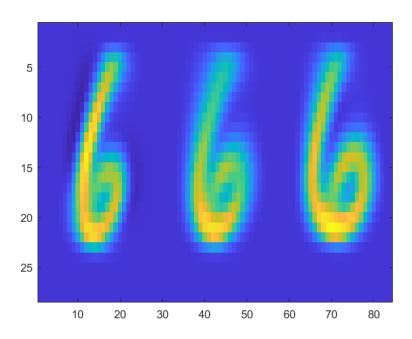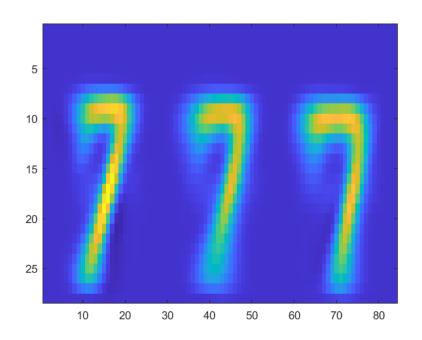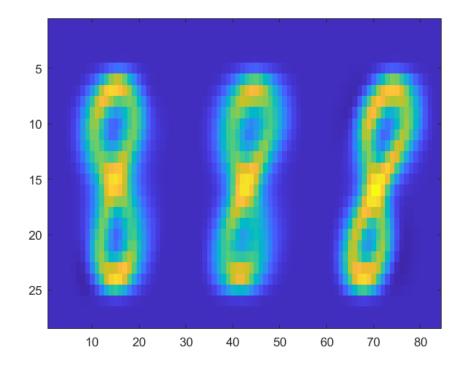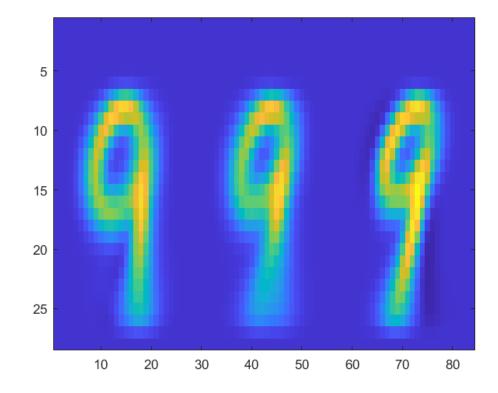rest are for the sorted eigen values corresponding to each digit.*

Decreasing order of eigen values

For digit 0

Decreasing order of eigen values

For digit 1

Decreasing order of eigen values

For digit 2

Decreasing order of eigen values

For digit 3

For digit 4

For digit 5

For digit 6

For digit 7

Decreasing order of eigen values For digit 8

For digit 9