PROBLEM 3

This problem is about eigenimages and Principal Component Analysis. The accompanying document PCA.pdf provides a nice, thorough explanation of the brief summary of PCA and eigenvectors we discussed in class. Please read through the whole document to solidify your understanding of eigenimages and PCA.

As for execution, you only have to implement Section 4 of the PCA.pdf (I mean if you insist, I could add more…)

1. Vectorize the training data as explained in Section 4.1

2. Compute the eigenvalues and eigenvectors of the image covariance

3. Reconstruct the first four letters using only *m* eigenvectors, as explained in section 4.

Report must include:

1. **First 12 eigenimages**

2. **Projection coefficients vs. eigenvector numbers**

3. **Resynthesized versions of the original image with different *m***

PLEASE NOTE THAT YOU ONLY NEED TO IMPLEMENT ABOVE MENTIONED PARTS AND IGNORE THE REST.