**CS663, Assignment 4** **Yash Sanghvi, Pradyot Prakash**
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Question 2

## Problem Statement

Display in your report the reconstruction of any one face image from the Yale database usingvk 2, 10, 20, 50, 75, 100, 125, 150, 175 values. Plot the 25 eigenvectors (eigenfaces) corresponding to the 25 largest eigenvalues using the subplot or subimage commands in MATLAB

## Implementation Details

We have chosen a single test image for showing both the top 25 eigenfaces and reconstruction of one face image.

1. For the first part we take the top k eigenvectors and the corresponding coefficients for the test image. Multiply the coefficients to the eigenvectors, add them and then to the mean to obtain the reconstructed image using the top k eigenvectors and then reshape it to its original shape.

2. For the second section, to plot the top 25 eigenvectors, we take the $k^{th}$ eigenvector and reshape the column vector into its original size i.e from (sizeX *sizeY X 1) to (sizeX X sizeY).

## Result Images

Figure 1. The eigenface reconstruction for the top k eigenvectors. 'k' increases from left to right and then top to bottom. Note that the image at the bottom right is the true image

Figure2. Top 25 eigenvectors for the same test image as in Figure 1.