

Exercise 5

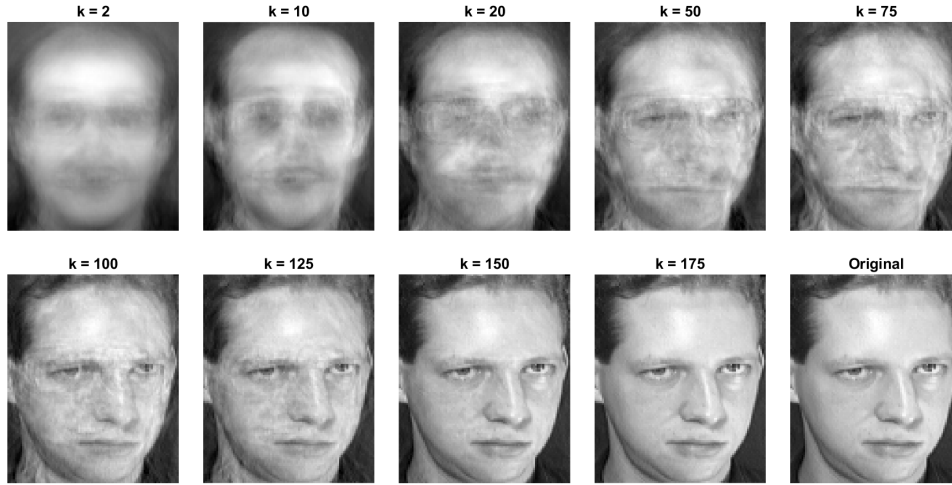


Figure 1: Reconstruction of one face image from the ORL database using $k \in \{2, 10, 20, 50, 75, 100, 125, 150, 175\}$ values. The original face image is also displayed at the end, along with the reconstructed faces. The file chosen is 'ORL\s1\10.pgm', which is a face image belonging to the test set. We can clearly observe that the reconstructed faces for $k = 100$ and above, are distinctly perceivable as a proper human face and resemble the original face image very closely.

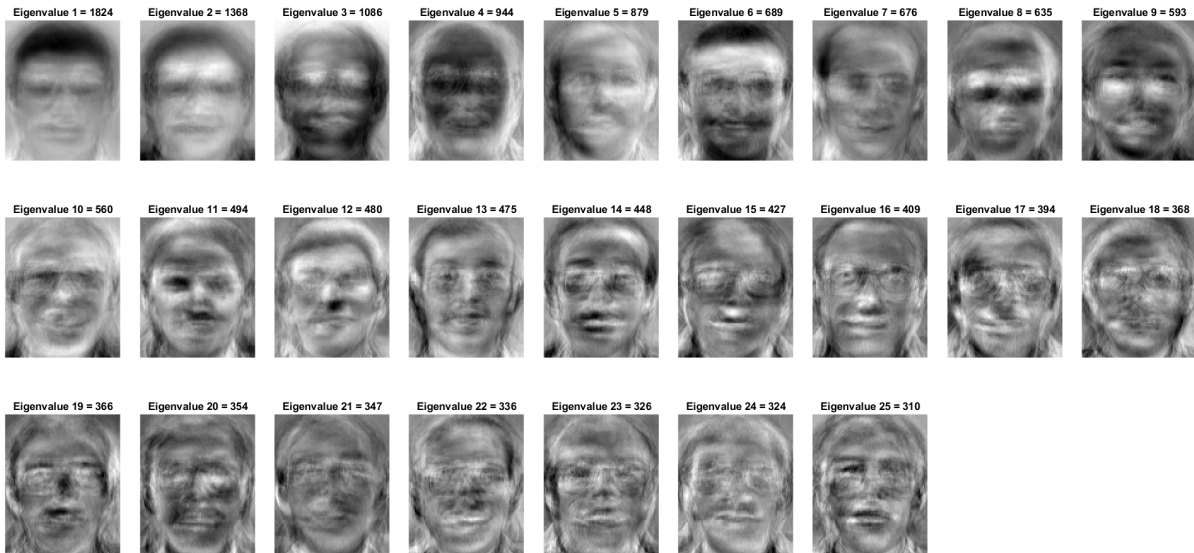


Figure 2: The 25 eigenvectors (eigenfaces) corresponding to the 25 largest eigenvalues. The eigenvalue corresponding to each eigenface is also displayed alongside the eigenface, rounded to the nearest integer. Note that, in order to display these images, the *imshow* command of MATLAB has been used, with the values in each eigenvector scaled to the range $[0, 1]$ using min-max scaling.