Problem 1: Face Detection

OBJECTIVE: In this project, we have used the Eigen faces technique discussed in class to write a Matlab program for face recognition and also for face detection.

IMPLEMENTATION: In this project, initially we are provided with a set of images known as the training data. Using this training data, we train our program to recognize faces using the following approach:

- Obtain a 4D vector of size N where N is number of images in our training set
- After we have obtained a vector which contains the set of images given, we obtain the mean image.
- Then we find the difference between the input image and the mean image.
- Apply the binary mask to each image, to zero-out the background.
- We have an array that contains each image vector, we compute the Eigen faces using the Matlab function svd.

After training our program, we now test it using the following approach:

- We transform a test image into its Eigen face components. First we compare our input image with our mean image and multiply their difference with each eigenvector of the matrix.
- We now determine which face class provides the best description for the input image. This is done by minimizing the Euclidean distance

RESULT: