John Kircher, BUID: 61489057, due: 12/10/2020

3.1) Images

Figure 2 — Average Dog

Figure 1 — Average Cat
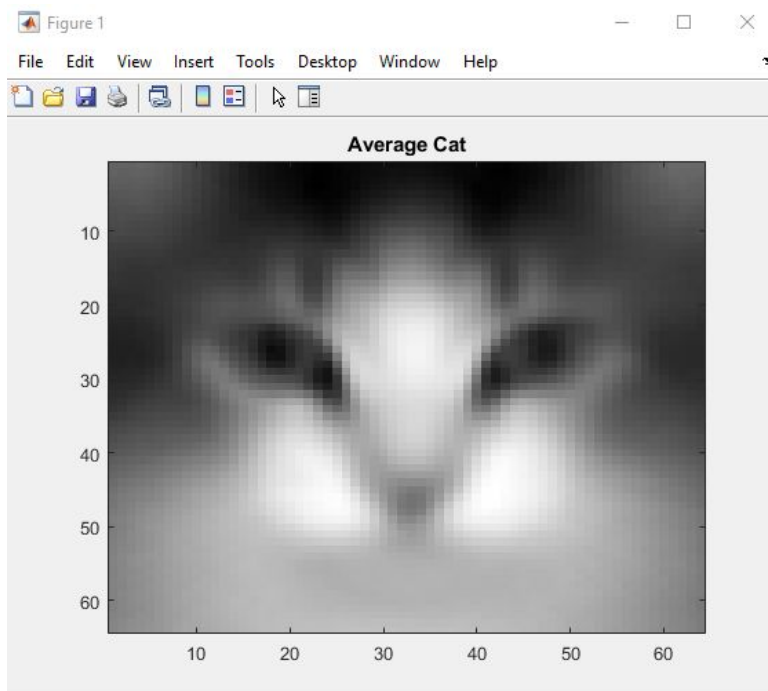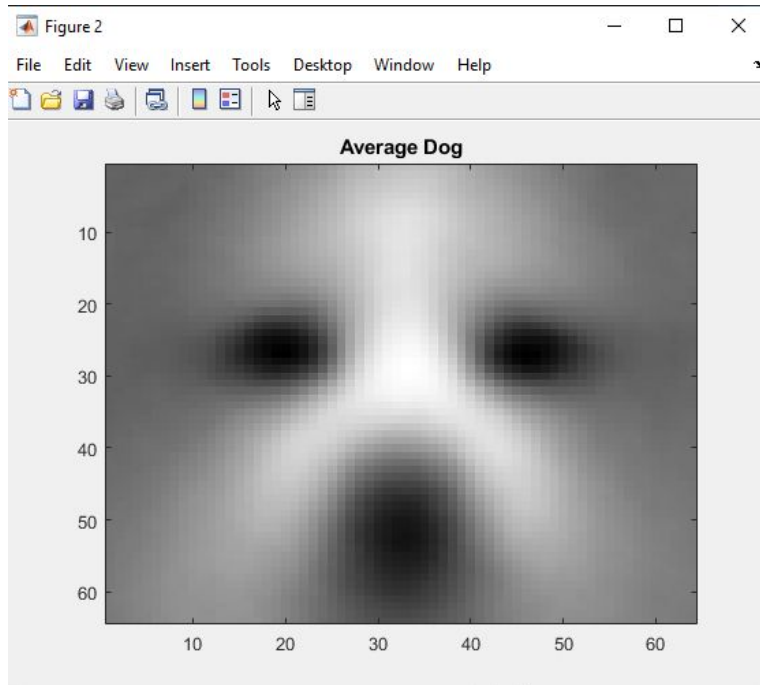
3.6)
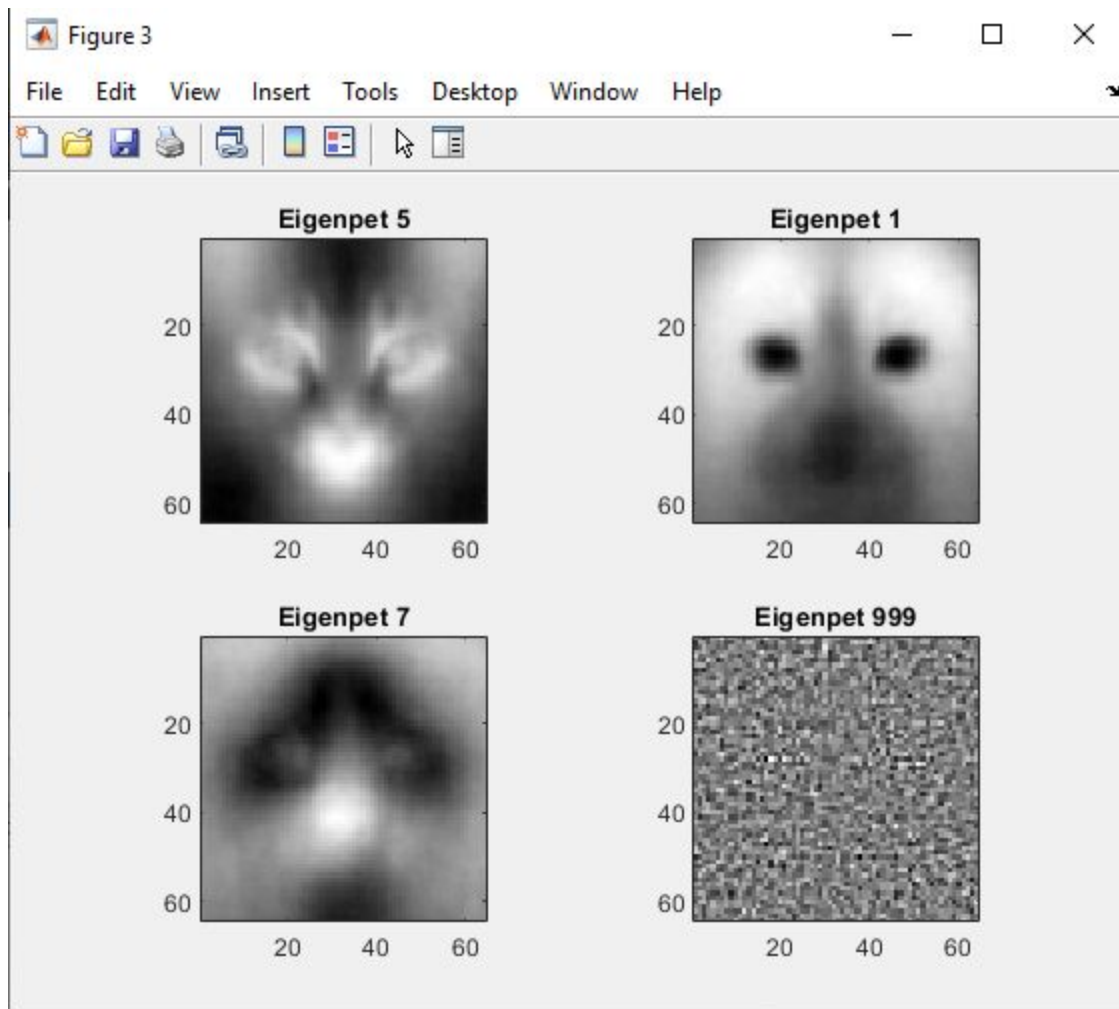
a) Eigenpet 5: Cat
b) Eigenpet 1: Dog
c) Eigenpet 7: No animal but has eyes
d) Eigenpet 999: Pure Noise

3.7) **Which of these values offers the best test error rate for each classifier and what is the corresponding training error rate? How have the training and test error rates changed from your values in Problem 3.4 and 3.5?**

Letting k = 50 offered the best test error rate. For example, the test error rate at this value was 19% for linear discriminant and the perceptron. The corresponding training error rates were 8.8% and 8.7% respectively.

The training and test error rates from both 3.4 and 3.5 have changed. From the lda.m file in 3.4, the test error rate was 16% and the training error rate was 1.2%. From the perceptron file in 3.5 the test error rate was 18% and the training error rate was 0%.

So the test error rate increased from 3.5 and 3.5 slightly, and the training error rate also increased much more, around 8-9%.