Problem 3

By random sampling the 16×16 image in a image and compute it with singular decomposition, we can get a series of components in order of its importance (namely, first principal component accounts for as much of the variability in the data). In addition, we accidentally notice these components are in fact Fourier transform basic functions (Wow!). These components can be used for image compression and even with face recognition (Eigenface or Eigenspce). There is a really interesting articles using Eigenspaces to analyze the faces in Miss Korea 2013 Contestants: http://jbhuang0604.blogspot.com/2013/04/miss-korea-2013-contestants-face.html