Image Reconstruction

Tasks to be performed:
1) Perform Singular Value Decomposition (For both square as well as rectangular images). Reconstruct the matrix using top N singular vectors corresponding to top N singular values. Experiment with the values of N. Also try random N singular values instead of top N.
2) Perform Eigen Value Decomposition (If image A is rectangular, use A' *A). Reconstruct the matrix using top N eigen vectors corresponding to top N eigen values. Experiment with the values of N. Also try random N eigen values instead of top N.
3) For colored images with RGB values with 8 bits for each color perform both the experiments mentioned below.
3.1) process each channel separately.
3.2) convert it to one 24-bit number and then do SVD and EVD.
4) Plot the reconstructed image along-with the error image.
5) Extra credit for more experiments and observations.

Data For Image Reconstruction
1) Image one (Use only one image. Image number to choose will be same as group number.)
2) Image two (Use only one image. Image number to choose will be same as group number.)

Linear Regression:

1) There are 3 datasets for linear regression: 1-dimension data, 2-dimension data and Multidimension data.

Data For Linear Regression
1) Download data from here. (Each group has 3 txt files)
- 1-dimension data - <group_number>_1.txt
- 2-dimension data - <group_number>_2.txt
- multidimension data - <group_number>_m.txt

2) For Dimension k, there are k+1 columns in the data. First k columns are the features and last one is the outcome.
3) Use 70% of the data for training, 20% for validation and 10% of data for testing.
4) Be creative in comparing the model outcome (or the model itself) with the actual outcome.
5) Try to make the assignment as illustrative as possible. You should be able to feel everything that you do