Exercise 3

Image processing

1. By hand, compute the DFT of each of the following sequences:



Compare your an\_s\_wer\_ s\_ with those given by Matlab's fft function.

2.. For each of the transforms you computed in the previous question, compute the inverse transform by hand. Verify by The Matlab function ifft

3. Consider the following matrix:



Using Matlab, calculate the DFT of each row.

4. Open up the image engineer.tif:

>> en=imread('engineer.tif');

Experiment with applying the Fourier transform to this image and the following filters:

(a) ideal \_filters (both low and high pass),

(b) Butterworth \_filters,

(c) Gaussian \_filters.

What is the smallest radius of a low pass ideal \_filtersfor which the face is still recognizable?

5. Using your digital camera, produce a digital image of the face of

Somebody you know, and perform the same calculations as in the previous question.