CS 105 Assignment 3:

Part I:

2.1: **a)**4*5 **b)**-3.5 **c)**[0.0, 2.1, 6.0; 0.0, -6.6, 3.4; 2.1, 0.3, 1.3; 1.1, 0.0, -2.0] **d)**[6.0, 1.3]

2.3: **a)**[1 3], a=[2 5 8] **b)**[3 3], [2 2 2; 5 5 5; 8 8 8] **c)**2*2, [2 2, 8 8] **d)**1*3, [7 10 13] **e)**1*9, [0 0 0 1 1 1 3 4 5] **f)**3*3, [2 8 2; 5 5 5, 8 2 8] **g)**Empty matrix: 1-by-0, size(e)= 1*0, There is one row, but no columns, so the matrix is empty.

2.6: **a)**[1 4; -1 6] **b)**[2 1; -1 4] **c)**[2 0; 0 4] **d)**[5; 2] **e)**"Error using .*" I think there was an error because the amount of characters in the matrix did not match up, there were 2 rows and 2 columns in a and 2 rows 1 column in c. **f)**[-.4444 1.1111; -0.1111 0.7778] **g)**[-0.5 3.0; 0.0 0.5] **h)**[0.5 1.0; 1.0 16.0]

Part II:

1. If the file is in your current folder in MATLAB, you use: im=double(imread('monkey.png'))
2. To display the image, use: imshow(uint8(im))
3. To convert the image to grayscale, you use: Gray=0.2989*im(:,:,1)+0.5870*im(:,:,2)+0.1140*im(:,:,3)
4. To display the grayscale image, you first type in "figure" to create a new figure window, and you use imshow(uint8(Gray)) to display the Gray image in the new figure.
5. To decrease the image's intensity by half, you use: Gray2=Gray/2
6. To display the image from (5), you open another window and use: imshow(uint8(Gray2))
7. To crop the image in (3) to 100 rows and 50 columns, you use: cropim=im(1:100,1:50)
8. To display the image from (7), you open a new figure window and use: imshow(uint8(cropim))

Part III:

1. If the file is in your current folder in MATLAB, you use: [y, Fs]=audioread('000.mp3)
2. To playback the file loaded in (1), you use: sound(y,Fs)
3. To create a version of the audio data that has 2:1 SNR ratio by adding white noise, you create white noise to add to the audio, A=rand(724032,1) and add it to the audio by using y2=y+0.5*A
4. To playback the data created in (3), you use: sound(y2,Fs)
5. To create a version of the audio data by downsampling it by ¼, you use: y3=y(1:4:end), Fs3=Fs/4
6. To playback the data created in (5), you use: sound(y3,Fs3)

What I learned:

I learned a lot about how to display images and how to play audio data. I thought it was really interesting to learn how to change images to grayscale, and how to darken or brighten an image. I also

thought that being able to change the audio data was really cool because I've never done anything like that before, and it was interesting to hear what happens when you make any drastic changes like taking out 3/4ths of the audio data.