1. Download the example image Balloon.tif and write a program that is able to complete the following tasks:  
- Load image 'Balloon.tif' and convert it into a grayscale image, denoted with 'img1'  
- Apply Fourier transform to img1 using MATLAB buildin function fft (and fftshift) and display the amplitude and phase matrices using abs and angle functions   
- Create a Gaussian lowpass filter and apply it to the Fourier coefficients of img1.  
- Perform inverse Fourier transform using ifft to recover the filtered image and display it to screen  
- Create a Gaussian highpass filter and apply it to the Fourier coefficients of img1. Using inverse Fourier transform to recover the filtered image and display it to screen   
- Decompose the original img1 with wavelet transform. Display the wavelet coefficients as an image. Note: you will need to rescale the values to be in the range of [0 255]; otherwise, the image appears black.  
- Reconstruct the edge map from the detail subbands. Hint: set the approximation subband to zero. Save the reconstructed edge map into an image.   
- Compute the energy, entropy, and homogeneity features for both processed edge maps and calculated the differences.   
  
2. Write programs that are able to complete the following tasks:  
- develop a chain code function that take 4-direction neighborhood.   
- develop a normalized chain code function   
- develop a differential chain code function   
- implement a fourier descriptor function   
- write a script program to test the chain code functions and fourier decriptor function using circles and rectangles.   
- implement shape distribution function   
  
Use comments in the program. Save 1 and 2 in different files.