Question 1 (10 marks)

Write a MATLAB program as following instructions:

- input a gray-scale image '1.tif'.
- apply canny filter on the image
- define a threshold as the 10% of the maximum of the gradient magnitude. Then for each pixel, if the gradient magnitude is smaller than the threshold, change the gradient magnitude to zero. Show corresponding image.
- Utilize the Hough transform to detect the two lines and process edge linking.
- Note: Utilize subplot to plot 4 images, including original image, the processed gradient magnitude, hough transform with largest two points, detected two lines in the original images.
- Note: you need to provide sufficient comments on the codes.

Question 2 (20 marks)

Write a MATLAB program as following instructions:

- input a gray-scale image '2.tif'
- Add pepper noise to the image, choose one of suitable mean filters and one of the suitable Order-Statistics filter to remove noise. Use subplot to plot 4 images, including original image, noise image, image after the first kind of filter, image after the second kind of filter
- Add salt and pepper noise to the image, separate the image into six parts, apply ostu threshold on each part of the image. Use subplot to plot 3 images, including original image, image with the noise, the image after the processing.
- Note: you need to provide sufficient comments on the codes.

Question 3 (10 marks)

Write a MATLAB program following instructions:

- input a gray-scale image 'lena.bmp'
- separate this image into four parts: left up, right up, left down, and right down.
- For each part, we apply butterworth low pass filtering, laplacian filtering, ideal high pass filtering, and ideal low pass filtering.
- Use subplot to plot two images, including original image and the image after the processing
- Note: you need to provide sufficient comments on the codes.