

0. Find the difference of conv2, filter2, imfilter functions in matlab by using help command.

1. Read the image file 'roundImage.png' and store it into 'ri' variable. (imread())

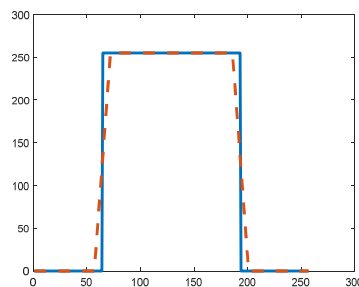
2. Low pass filter

a) Make 15x15 average filter and store in into 'af' variable.

b) Apply the filter 'af' onto 'ri' and store the result into 'afr' variable.

c) Display the variable 'ri' and 'afr' within the same window.

d) Plot the center profiles of 'ri' and 'afr' and overlay the graphs in the same plot as shown below.  
(plot(), hold)



e) Describe your observation about the difference between two profiles/images.

3. Filter generation: make filters using fspecial() and check the value of filters.

a) Make a 3x3 gaussian filter with standard deviation 0.5 and store it into 'gf'.

b) Make a 3x3 laplacian filter with alpha = 0.5 and store it into 'lf'.

c) Make a 3x3 prewitt filter and store it into 'pf'.

d) make a 3x3 sobel filter and store it into 'sf'.

4. Directional filters: *'sobel'* and *'prewitt'* are basic high pass filters with directional property.

- a) Apply filters 'sf' and 'pf' onto 'ri' and store the result into 'sfr1' and 'pfr1' respectively.
- b) Display 'sfr1' and 'pfr1' within the same figure.
- c) Get the omni-directional edges of 'ri' and store the results into 'sfr2' and 'pfr2' variables. (Use 'sobel' and 'prewitt' filters)
- d) Get the difference image between 'sfr2' and 'pfr2' and take the absolute value. Store the result into 'df'.
- e) Display the variable 'sfr2' , 'pfr2' and 'df' within the same window. Think about the difference between sobel and prewitt filters.

5. Application of high pass filter

- a) Read the image file 'chest.png' and store it into 'chest' variable. Change the data type to double.
- b) Apply the filter 'lf' onto 'chest' and store the result into 'lfChest' variable.
- c) Use 'lfChest' to make the 'chest' image sharper and store it into 'new\_chest' variable.
- d) Display the variable 'chest' , 'lfChest' and 'new\_chest' within the same window.