CSE3018 : Content Based Image and Video Retrieval

Lab - 2

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Q1. Reading the image and displaying size

```
img = imread("adw.JPG");

size(img)

imshow(img);
```

Q2. Converting the image to grayscale and displaying it.

```
img = imread("tro.png");

size(img)

img_gray = rgb2gray(img);

size(img_gray)

subplot(121)

imshow(img)

subplot(122)

imshow(img_gray)
```

Figure 1

Command Window

```
ans =

   620   421     3


ans =

   620   421

>>
```

Q3.

```
img = imread("tro.png");
img_gray = rgb2gray(img);
subplot(121);
imshow(img);
title("input image");
subplot(122);
imshow(img_gray);
title("binary Image")
```

Q4.

```
img = imread("adw.JPG");
%%size(img)
img_gray = rgb2gray(img);
%%size(img_gray)
adj_img = imadjust(img_gray, [0.3,0.7],[]);
bw_img = im2bw(adj_img);
subplot(121);
imshow(adj_img);
title("input image");
subplot(122);
imshow(bw_img);
title("BW Image")
```

Q5.

info = imfinfo("tro.png")

Command Window

```
info =

struct with fields:


Filename: '/MATLAB Drive/CBIR Lab/tro.png'
FileModDate: '11-Aug-2021 12:13:21'
FileSize: 370122
Format: 'png'
FormatVersion: []
Width: 421
Height: 620
BitDepth: 24
ColorType: 'truecolor'
FormatSignature: [137 80 78 71 13 10 26 10]
Colormap: []
Histogram: []
InterlaceType: 'none'
Transparency: 'alpha'
SimpleTransparencyData: []
BackgroundColor: []
RenderingIntent: 'perceptual'
Chromaticities: [0.3127 0.3290 0.6400 0.3300 0.3000 0.6000 0.1500 0.0600]
Gamma: 0.4546
XResolution: 4724
YResolution: 4724
ResolutionUnit: 'meter'
XOffset: []
YOffset: []
OffsetUnit: []
```

```
SignificantBits: []
ImageModTime: []
Title: []
Author: []
Description: []
Copyright: []
CreationTime: []
Software: []
Disclaimer: []
Warning: []
Source: []
Comment: []
OtherText: []
```

Q6.

```
img = imread("adw.JPG");
gray_manual_conv = 0.2989*img(:,:,1)+ 0.5870*img(:,:,2)+0.1140*img(:,:,3);
imshow(gray_manual_conv)
```

Q7.

```
h = 240;
w = 320;
white = uint8(255*ones(h,w));
black = uint8(zeros(h,w));
```

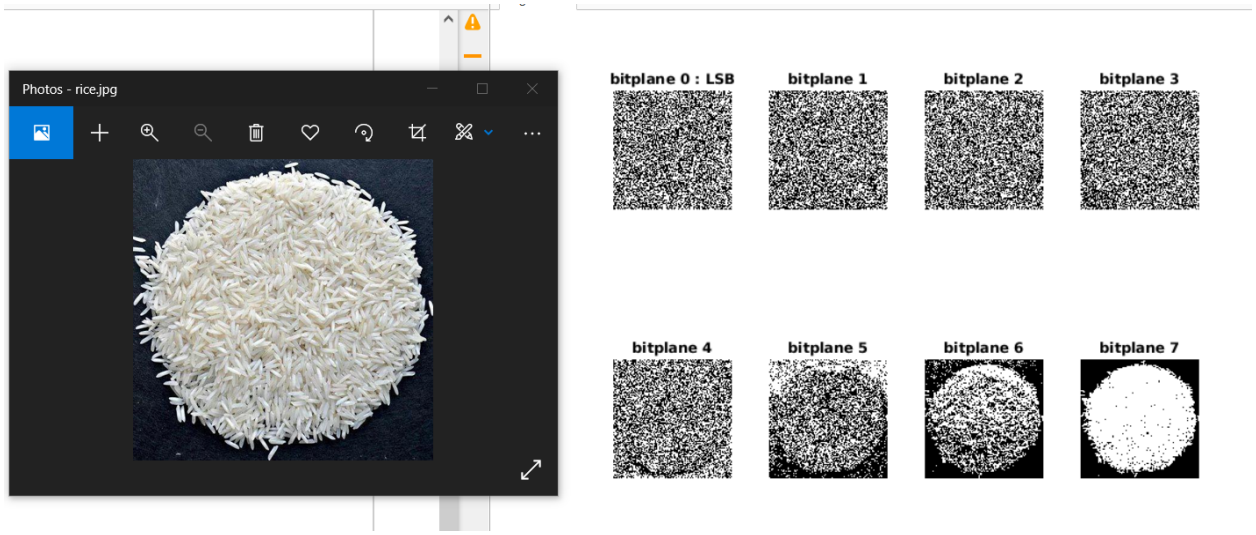
```
white=im2double(white);
black=im2double(black);
figure;
subplot(121);
imshow(white);
subplot(122);
imshow(black);
```

Q8.

```
img_m = imread("rice.jpg");
img = imread("rice.jpg");
img = rgb2gray(img);
img  = double(img);
bp0 = mod(img,2);
bp1 = mod(floor(img/2),2);
bp2 = mod(floor(img/4),2);
bp3 = mod(floor(img/8),2);
```

```
bp4 = mod(floor(img/16),2);
bp5 = mod(floor(img/32),2);
bp6 = mod(floor(img/64),2);
bp7 = mod(floor(img/128),2);
subplot(241);
imshow(bp0);
title("bitplane 0 : LSB");
subplot(242);
imshow(bp1);
title("bitplane 1");
subplot(243);
imshow(bp2);
title("bitplane 2");
subplot(244);
imshow(bp3);
title("bitplane 3");
subplot(245);
imshow(bp4);
title("bitplane 4");
subplot(246);
imshow(bp5);
title("bitplane 5");
subplot(247);
imshow(bp6);
title("bitplane 6");
subplot(248);
```

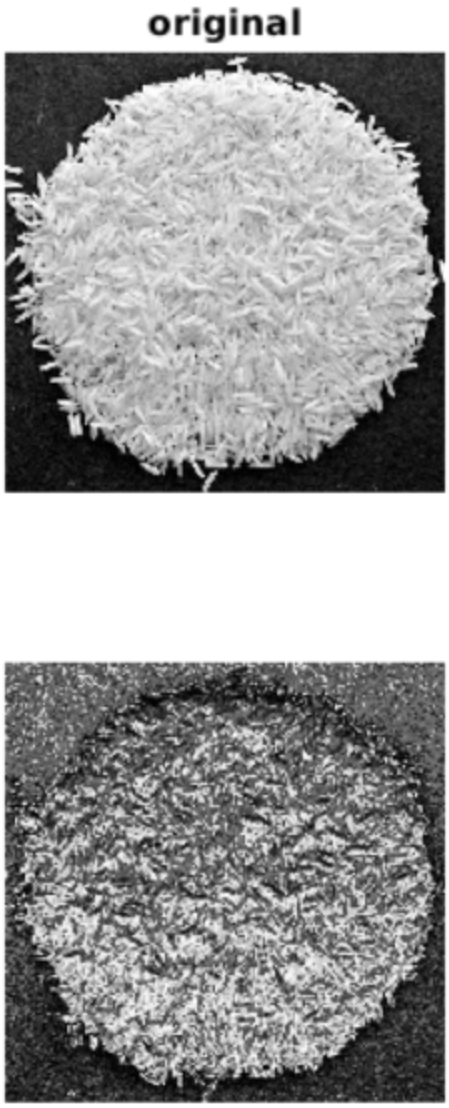
```
imshow(bp7);
title("bitplane 7");
```



Q9.

```
img = imread("rice.jpg");
img = rgb2gray(img);
bp0 = mod(img,2);
bp1 = mod(floor(img/2),2);
bp2 = mod(floor(img/4),2);
bp3 = mod(floor(img/8),2);
bp4 = mod(floor(img/16),2);
bp5 = mod(floor(img/32),2);
bp6 = mod(floor(img/64),2);
bp7 = mod(floor(img/128),2);
bp_all = 2*(2*(2*(2*(2*(2*(2*bp7+bp6)+bp5)+bp4)+bp3)+bp2)+bp1)+bp0;
subplot(211);
imshow(img);
title('original')
```

```
subplot(212);
title('Re constructed')
imshow(bp_all);
```



Q10.

```
img = imread("rice.jpg");
imhist(img);
figure, img_eq = histeq(img);
img_adj = imadjust(img, [0.4,0.86],[0.0,1.0]);
imshow(img_adj);
subplot(311)
title("original");
imshow(img);
subplot(312);
title("img_eq");
imshow(img_eq);
subplot(313);
title("imadjust");
imshow(img_adj);
```

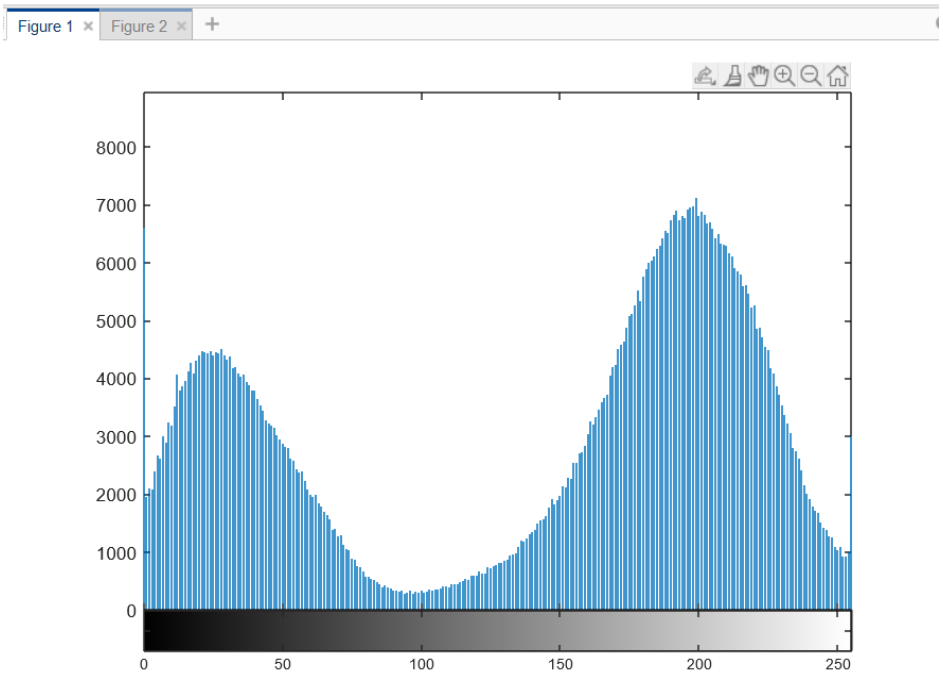
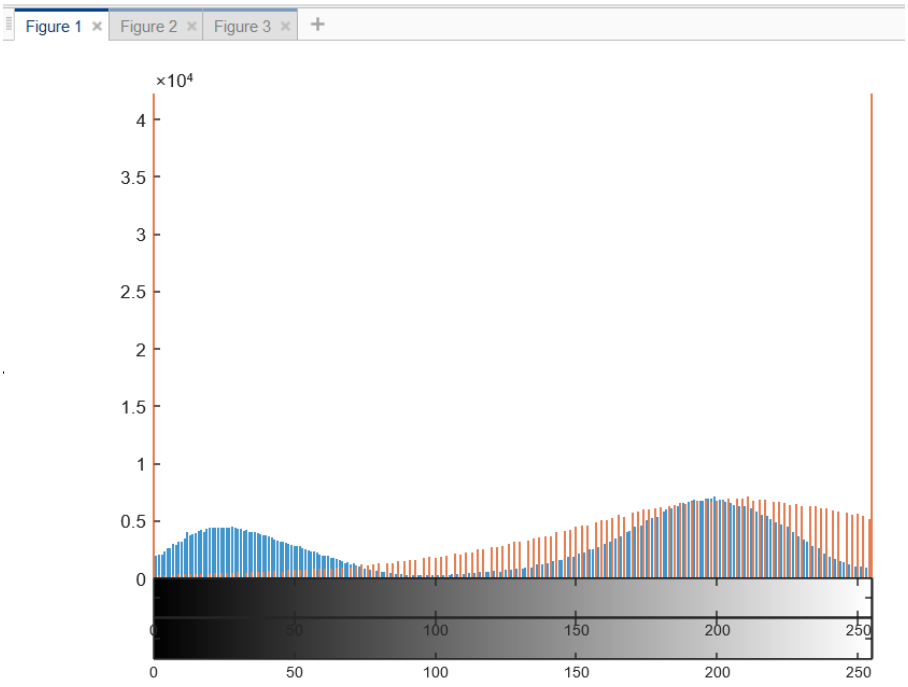


Figure 1
Figure 2
8000
7000
6000
5000
4000
3000
2000
1000
0
0
50
100
150
200
250


Figure 1
Figure 2

Q11.

```
img = imread("rice.jpg");
img_adj = imadjust(img, [0.4,0.86],[0.0,1.0]);
figure;
hold on;
imhist(img);
imhist(img_adj);
hold off;
img = imread("rice.jpg");
img_adj = imadjust(img, [0.4,0.86],[0.0,1.0]);
figure;
imhist(img);
figure;
imhist(img_adj);
```



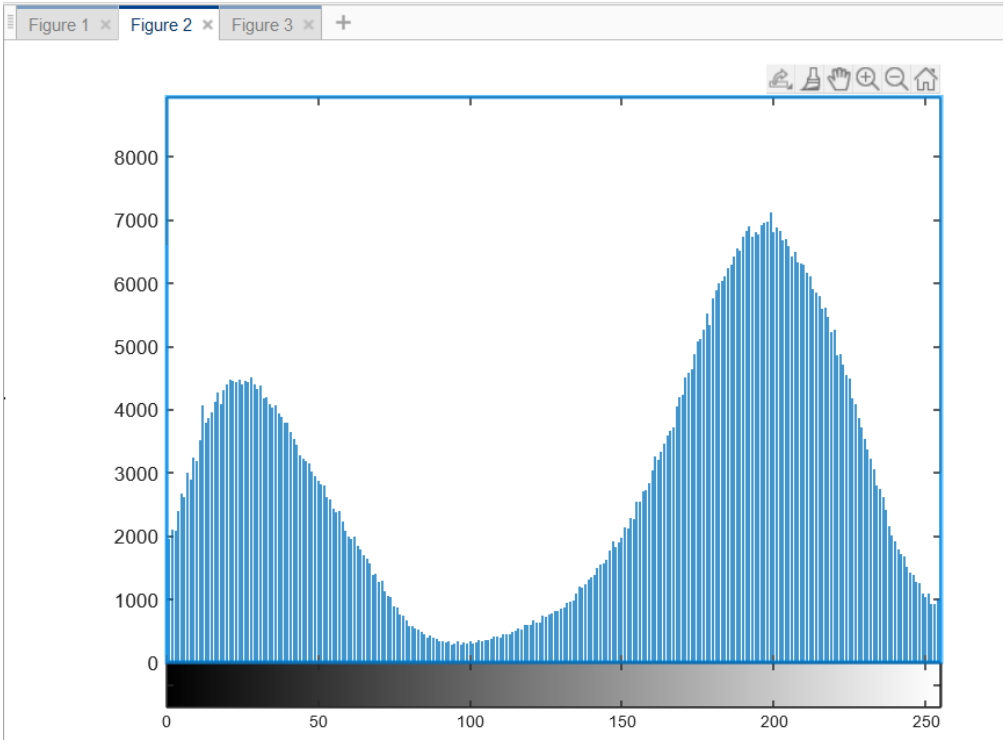


Figure 1
Figure 2
Figure 3
8000
7000
6000
5000
4000
3000
2000
1000
0
0
50
100
150
200
250

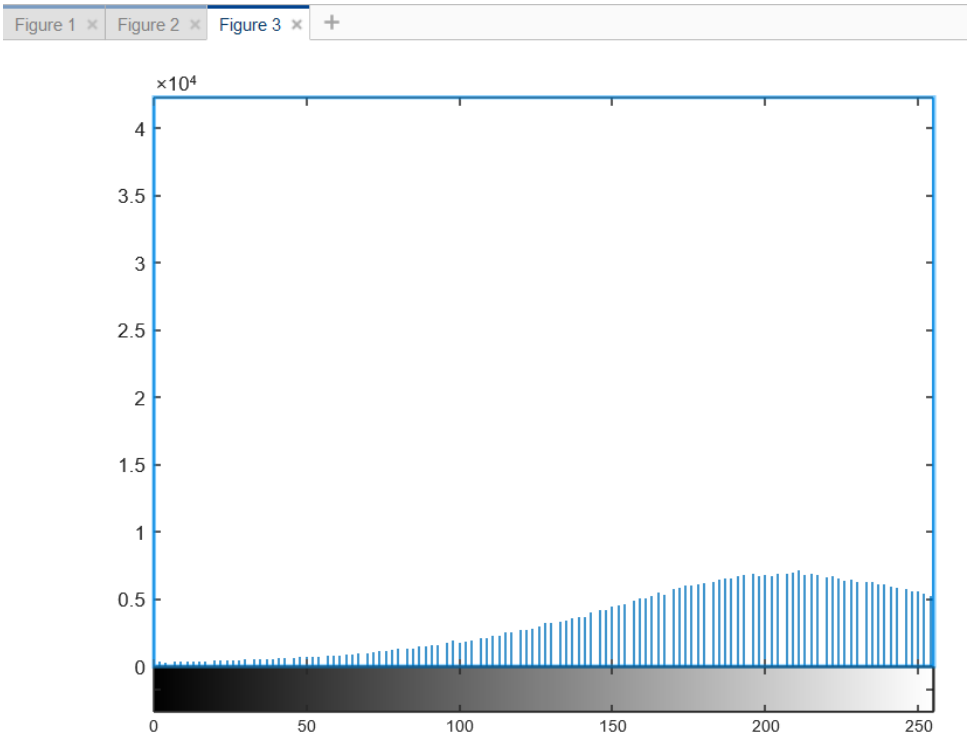
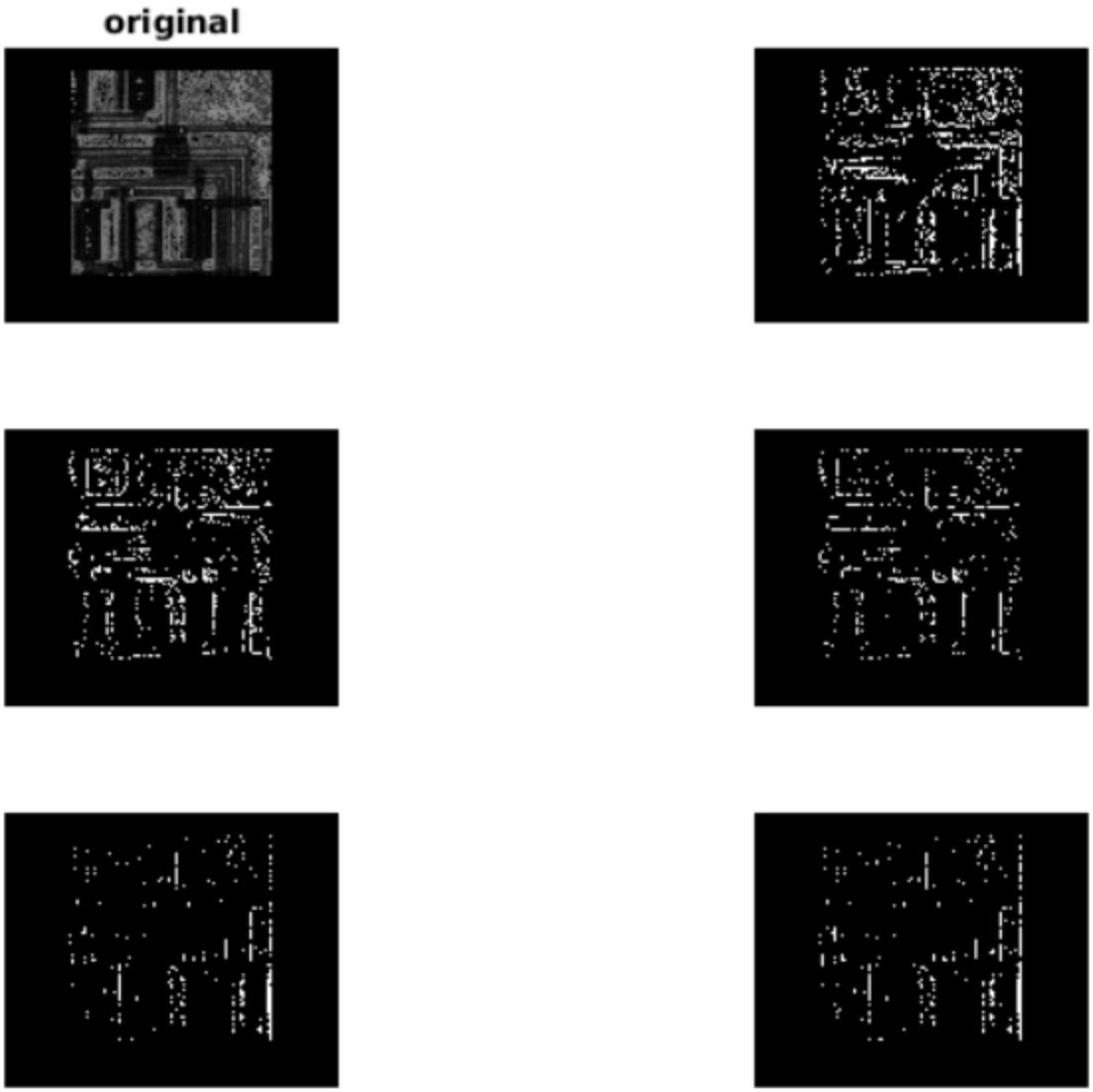


Figure 1
Figure 2
Figure 3
×10⁴
4
3.5
3
2.5
2
1.5
1
0.5
0
0
50
100
150
200
250

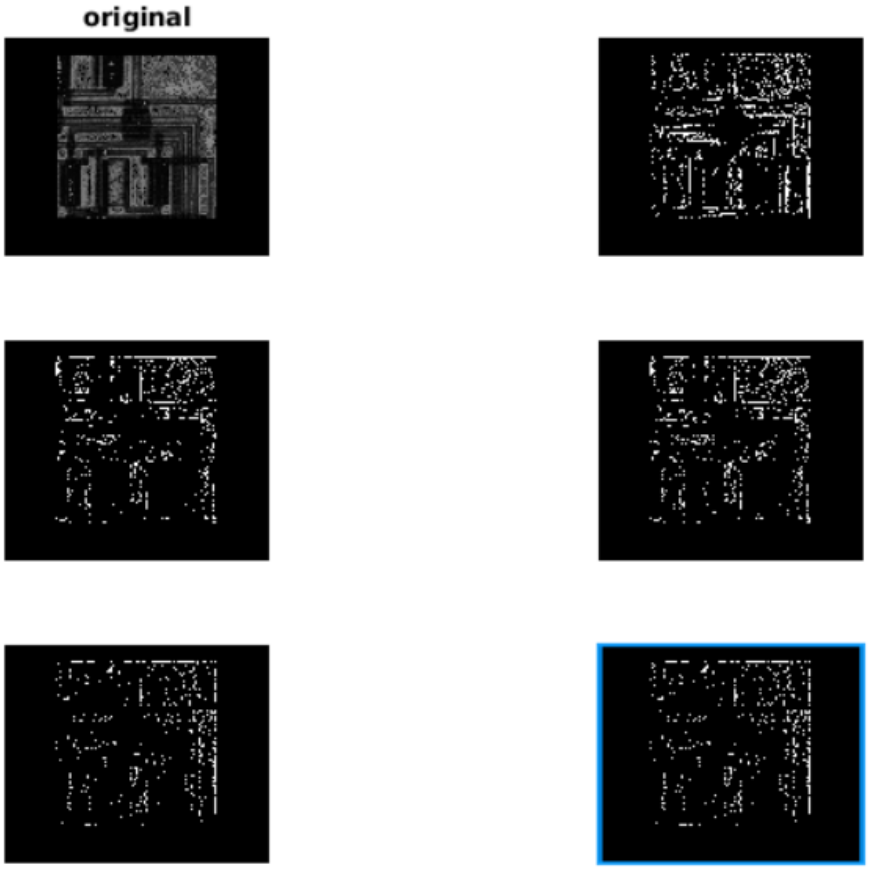
Q12.

```
i = imread('pipe.png');
bw1 = edge(i);
%Prewitt, Roberts, canny, approxcanny, log
bw2 = edge(i,'Sobel');
bw3 = edge(i,'Sobel',0.125);
bw4 = edge(i,'Sobel',0.125,'vertical');
bw5 = edge(i,'Sobel',0.125,'vertical','nothinning');
subplot(321)
imshow(i)
title('original')
subplot(322)
imshow(bw1);
subplot(323)
imshow(bw2);
subplot(324)
imshow(bw3);
subplot(325)
imshow(bw4);
subplot(326)
imshow(bw5);
```

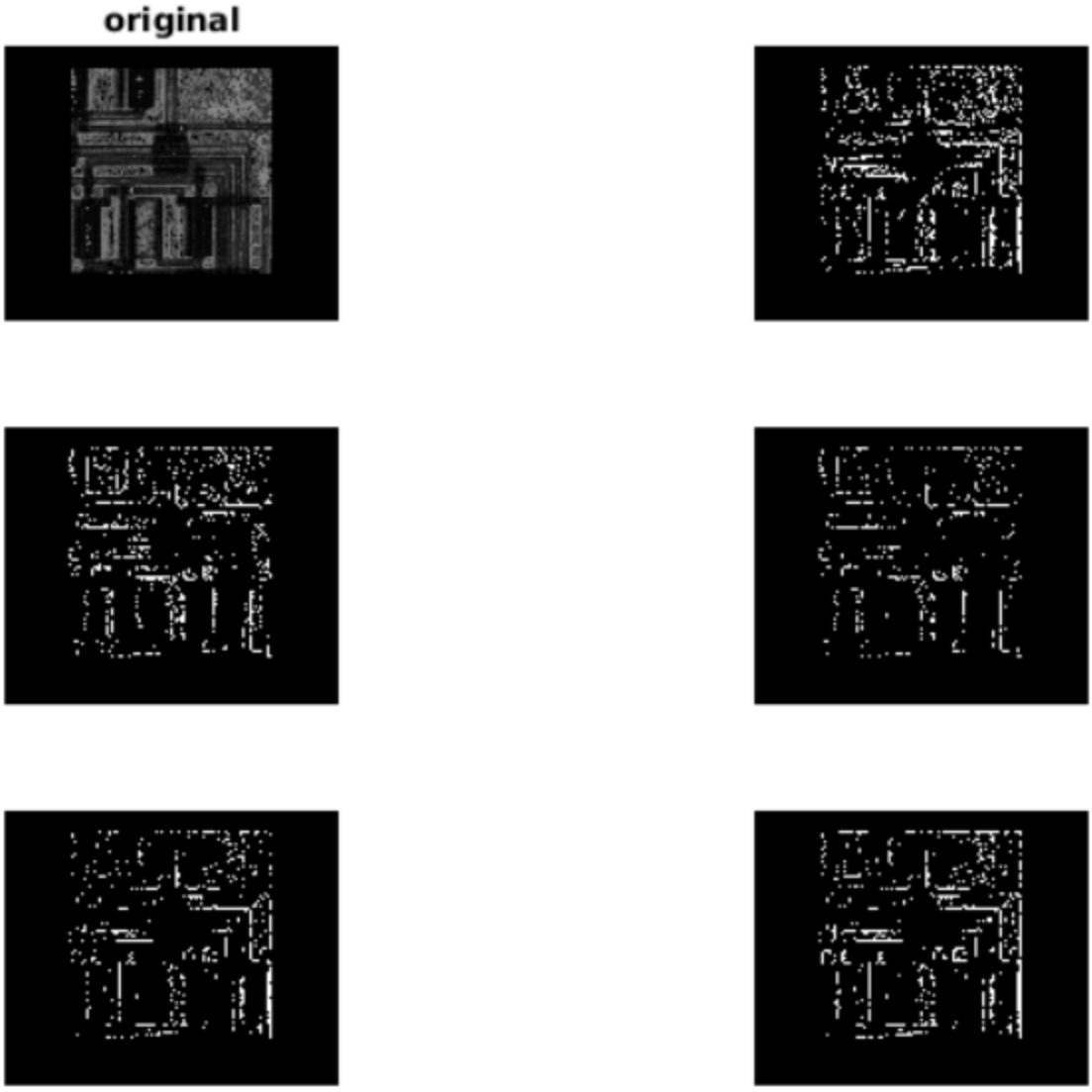



```
i = imread('pipe.png');
bw1 = edge(i);
bw2 = edge(i,'roberts');
bw3 = edge(i,'roberts',0.125);
bw4 = edge(i,'roberts',0.125,'horizontal');
bw5 = edge(i,'roberts',0.125,'horizontal','nothinning');
subplot(321)
imshow(i)
```

```
title('original')
subplot(322)
imshow(bw1);
subplot(323)
imshow(bw2);
subplot(324)
imshow(bw3);
subplot(325)
imshow(bw4);
subplot(326)
imshow(bw5);
```



```
i = imread('pipe.png');
bw1 = edge(i);
%Prewitt, Roberts, canny, approxcanny, log
bw2 = edge(i,'Prewitt');
bw3 = edge(i,'Prewitt',0.125);
bw4 = edge(i,'Prewitt',0.125,'both');
bw5 = edge(i,'Prewitt',0.125,'both','nothinning');
subplot(321)
imshow(i)
title('original')
subplot(322)
imshow(bw1);
subplot(323)
imshow(bw2);
subplot(324)
imshow(bw3);
subplot(325)
imshow(bw4);
subplot(326)
imshow(bw5);
```



CANNY

```
i = imread('pipe.png');
bw1 = edge(i);
bw2 = edge(i,'canny');
bw3 = edge(i,'canny',0.125);
subplot(321)
imshow(i)
title('original')
```

subplot(322)

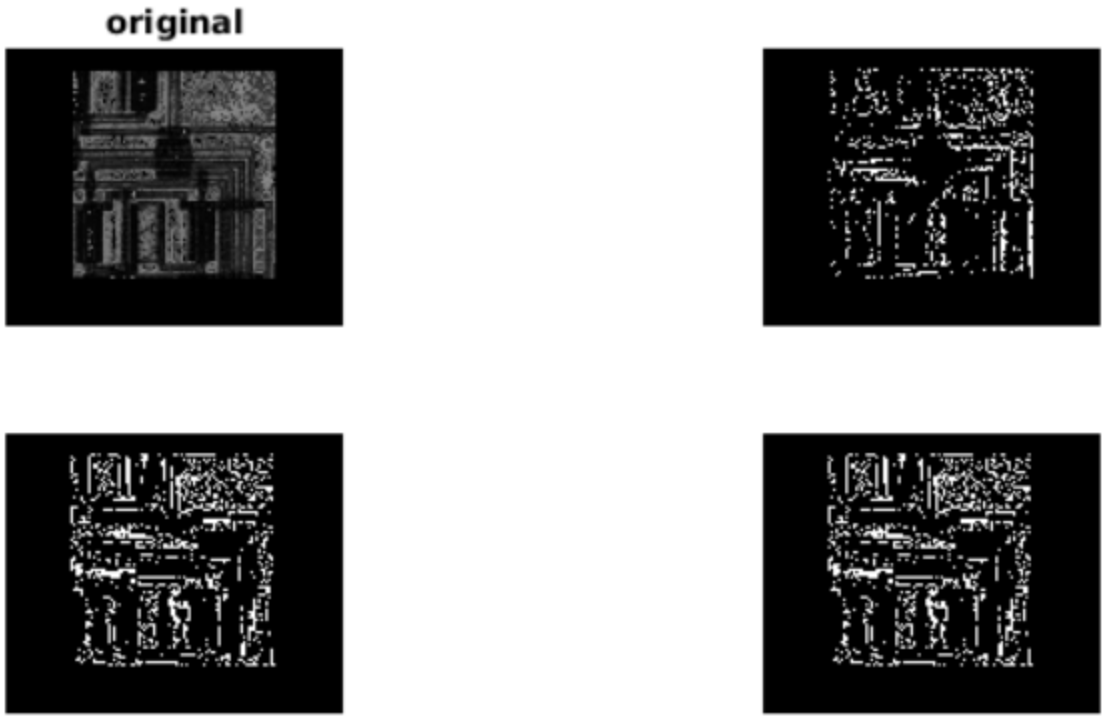
imshow(bw1);

subplot(323)

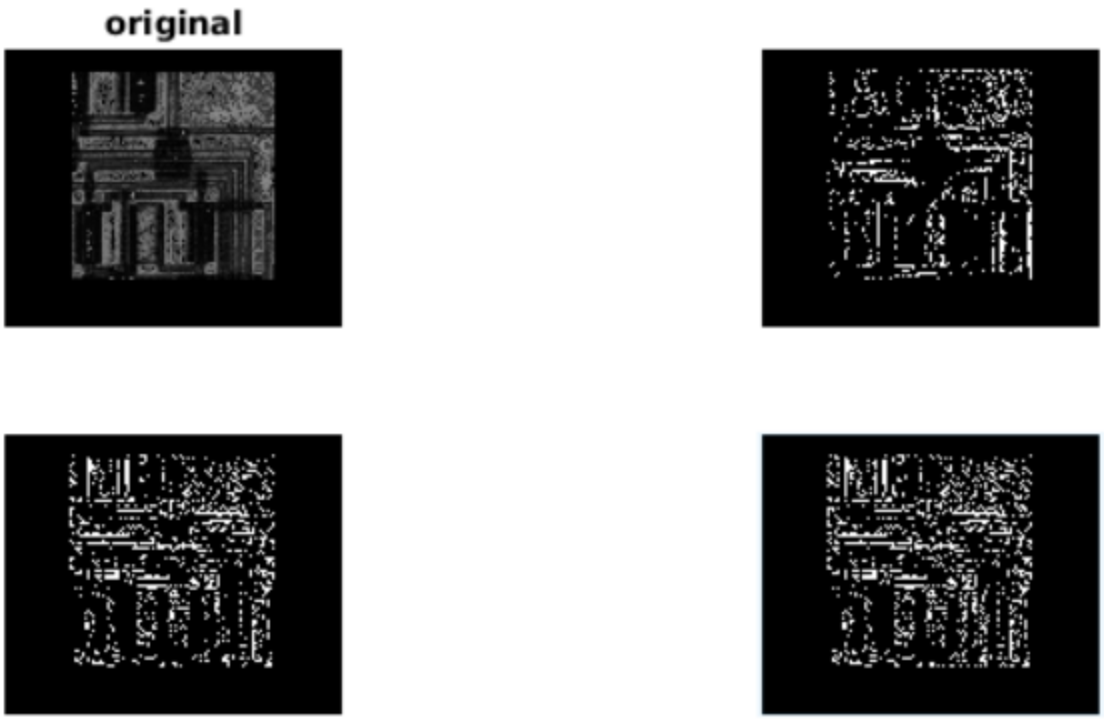
imshow(bw2);

subplot(324)

imshow(bw3);

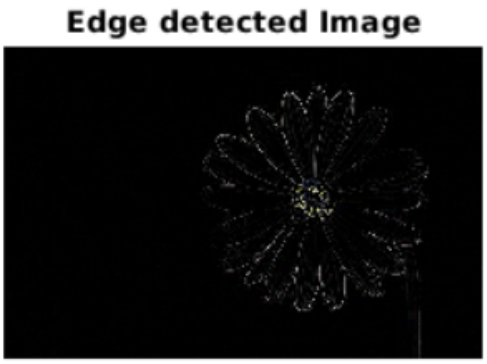


LOG



Q13.

```
newImg = imread('flow.png');
subplot(121)
imshow(newImg);
subplot(122)
H = fspecial('laplacian');
blurred = imfilter(newImg,H);
imshow(blurred);
title('Edge detected Image');
```



Q14.

```
newImg = imread('flow.jpg');
subplot(121)
imshow(newImg);
subplot(122)
H = fspecial('gaussian',[5 5],0.9);
blurred = imfilter(newImg,H);
imshow(blurred);
title('Gaussian Image');
```