CSE438:Digital Image Processing
[Fall23]

Lab 1

Submitted for
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Submitted by
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Question 1

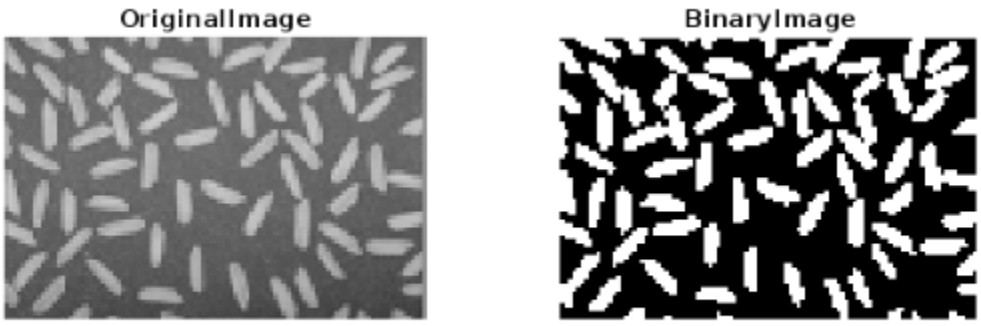
```
binaryImage = imread('img1.png');
perimeter4 =sum(sum(bwperim(binaryImage, 4)));
perimeter8 =sum(sum(bwperim(binaryImage, 8)));
disp(['4-connected Perimeter: ', num2str(perimeter4)]);
disp(['8-connected Perimeter: ', num2str(perimeter8)]);
```

Output

```
4-connected Perimeter: 263  263  263
8-connected Perimeter: 360  360  360
```

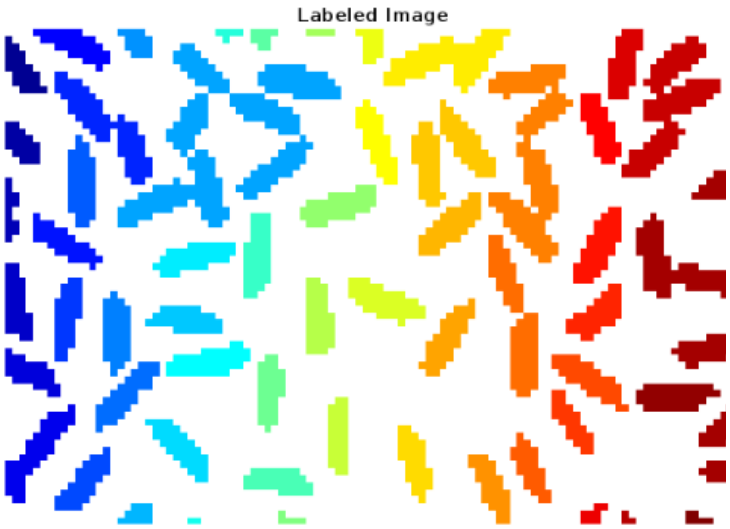
Question 2

```
originalImage = imread('img2.png');
grayImage = rgb2gray(originalImage);
threshold = 128;
binaryImage = grayImage> threshold;
subplot(1,2,1);
imshow(originalImage); title('OriginalImage');
subplot(1,2,2);
imshow(binaryImage); title('BinaryImage');
imwrite(binaryImage,'binary_image.png');
```



Question 3

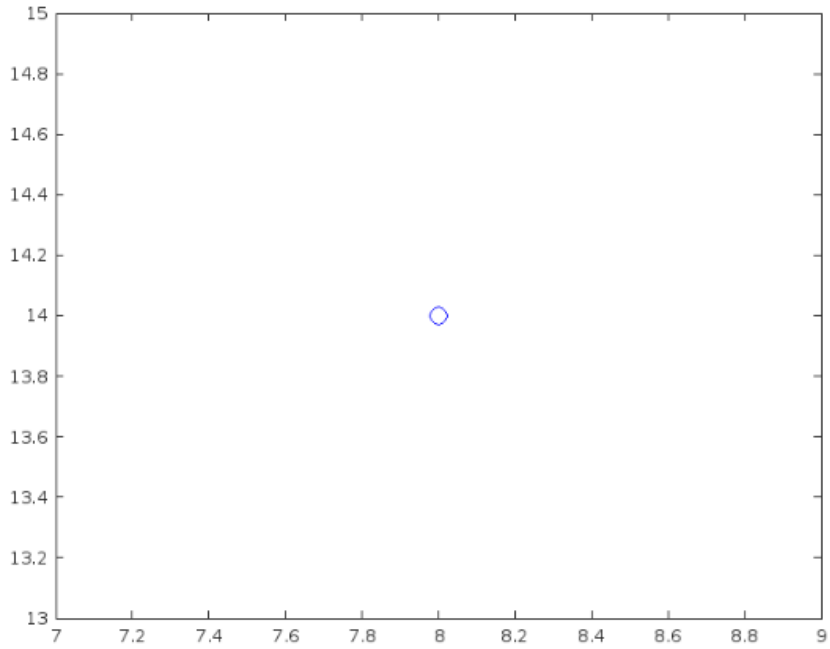
```
binaryImage = imread('binary_image.png');
[labelImage, numObjects] = bwlabel(binaryImage, 8);
figure; imshow(label2rgb(labelImage));
title('Labeled Image');
disp(['Number of Objects: ', num2str(numObjects)]);
```



Number of objects 56

Question 4

```
image= imread('img2.png');
point1= [2,4];
point2= [8, 14];
euclidean_distance =sqrt(sum((point1 - point2).^2));
imshow(image);
plot(point1(1),point1(2), 'ro', 'MarkerSize',10);
plot(point2(1),point2(2), 'bo', 'MarkerSize',10);
text(point1(1),point1(2) + 20, ['Distance: '
num2str(euclidean_distance)],'Color', 'g','FontSize', 12);
```



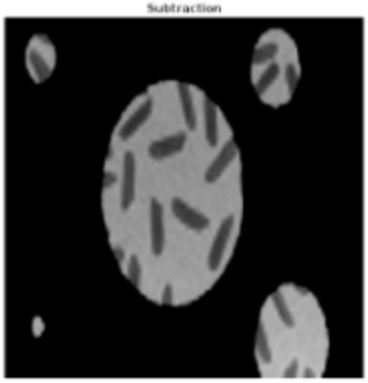
Question 5

```
I1=imread("img1.png");
I2=imread("img2.png");
I1=imresize(I1, [500,500]);
I2=imresize(I2, [500,500]);
Add_Image=imadd(I1,I2);
imshow(Add_Image);
title('Addition');
Sub_Image=imsubtract(I1,I2);
figure,imshow(Sub_Image);
title('Subtraction');
Mul_Image=immultiply(I1,I2);
figure,imshow(Mul_Image);
title('Multiplication');
Div_Image= imdivide(I1,I2);
figure,imshow(Div_Image);
title('Division');
```

Addition

Multiplication

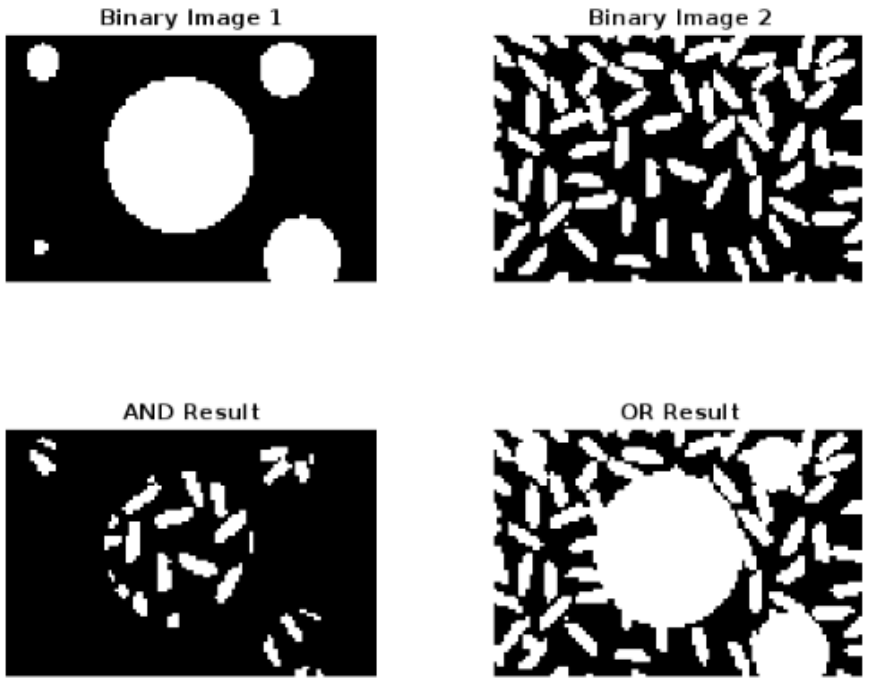
Subtraction



Division

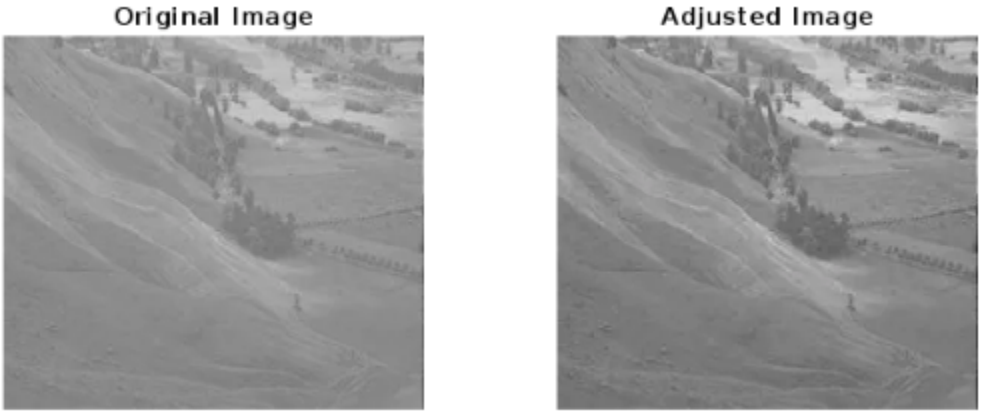
Question 6

```
img1 = imread('img1.png');
img2 = imread('img2.png');
binary_img1 = im2bw(img1);
binary_img2 = im2bw(img2);
result_and = binary_img1 & binary_img2;
result_or = binary_img1 | binary_img2;
result_not_img1 = ~binary_img1;
subplot(2,2,1);
imshow(binary_img1);
title('Binary Image 1');
subplot(2,2,2);
imshow(binary_img2);
title('Binary Image 2');
subplot(2,2,3);
imshow(result_and);
title('AND Result');
subplot(2,2,4);
imshow(result_or);
title('OR Result');
imwrite(result_and, 'result_and.png');
imwrite(result_or, 'result_or.png');
```



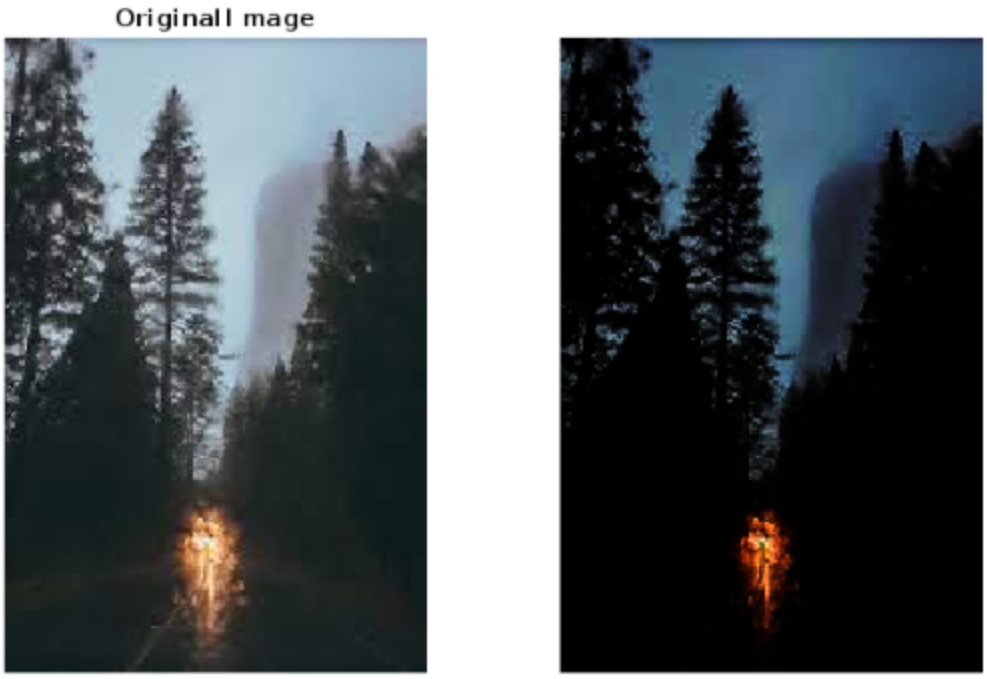
Question 7

```
originalImage = imread('img6.png');
adjustedImage = imadjust(originalImage, [0.2 0.9]);
figure; subplot(1,2,1); imshow(originalImage);
title('Original Image'); subplot(1,2,2);
imshow(adjustedImage);
title('Adjusted Image');
```



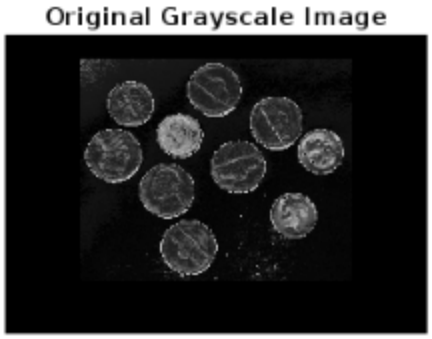
Question 8

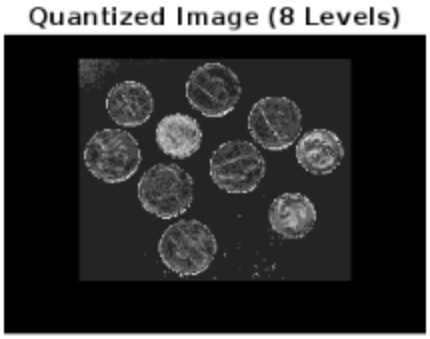
```
originalImage = imread('img7.jpg'); brightnessFactor = 3.5;
brightenedImage = imadjust(originalImage, [], [], brightnessFactor);
figure;
subplot(1,2,1);
imshow(originalImage);
title('OriginalI mage');
subplot(1,2,2);
imshow(brightenedImage); t
itle('Brightened Image');
```



Question 9

```
originalImage = imread('img8.png');
numLevels = 8;
quantizedImage = imquantize(originalImage, linspace(0, 255, numLevels));
figure;
subplot(1, 2, 1);
imshow(originalImage);
title('Original Grayscale Image');
subplot(1, 2, 2);
imshow(quantizedImage, []);
title('Quantized Image (8 Levels)');
```





Question 10

```
I3 = imread('img3.png');
Negative_Image = 255 - I3;
subplot(1, 2, 1);
imshow(I3, 'InitialMagnification', 'fit');
title('Original');
subplot(1, 2, 2);
imshow(Negative_Image, 'InitialMagnification', 'fit');
title('Negative Image');
```