

Contents

- Experiment 1 - Basic Image Operations
- Exercise 1 - Reading and displaying the image and image attributes.
- Exercise 2 - Convert gray scale image to binary and store in I1
- Exercise 3 - Extract Red, Green and Blue plane of color image
- Exercise 4 - Display only Red, Green and Blue Planes
- Exercise 5 - Displaying Indexed Images
- Conclusion

```
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% Session ODD 2024-25
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```

Experiment 1 - Basic Image Operations

```
clc;
clear;
close all;
```

Exercise 1 - Reading and displaying the image and image attributes.

```
I = imread('cameraman.tif');
whos I

[r,c] = size(I);
minI = min(min(I));
maxI = max(max(I));
avgI = mean2(I);
ele_no = numel(I);

fprintf("Dimensions of I are %d X %d", r, c);
fprintf("\nMinimum intensity value = %d \nMaximum intensity value = %d", minI, maxI);
fprintf("\nAverage value = %f", avgI);
fprintf("\nNumber of elements in I = %d\n", ele_no);

figure,
imshow(I);
title('Grayscale Image');
```

Name	Size	Bytes	Class	Attributes
I	256x256	65536	uint8	

```
Dimensions of I are 256 X 256
Minimum intensity value = 7
```

Maximum intensity value = 253
Average value = 118.724487
Number of elements in I = 65536

Grayscale Image



Excercise 2 - Convert gray scale image to binary and store in I1

```
I1 = im2bw(I);  
whos I1  
  
figure,  
subplot(1,2,1), imshow(I), title('Gray Scale Image');  
subplot(1,2,2), imshow(I1), title('Binary Image');
```

Name	Size	Bytes	Class	Attributes
I1	256x256	65536	logical	

Gray Scale Image



Binary Image



Exercise 3 - Extract Red, Green and Blue plane of color image

```
A=imread('peppers.png');
whos A

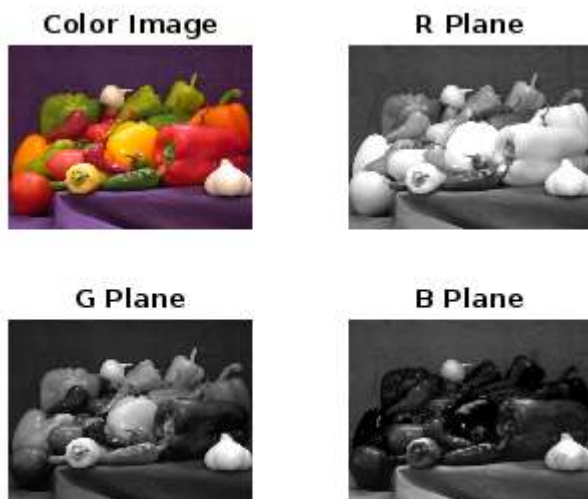
R = A(:,:,1);
whos R

G = A(:,:,2);
whos G

B = A(:,:,3);
whos B

figure,
subplot(2,2,1), imshow(A), title('Color Image')
subplot(2,2,2), imshow(R), title('R Plane')
subplot(2,2,3), imshow(G), title('G Plane')
subplot(2,2,4), imshow(B), title('B Plane')
```

Name	Size	Bytes	Class	Attributes
A	384x512x3	589824	uint8	
Name	Size	Bytes	Class	Attributes
R	384x512	196608	uint8	
Name	Size	Bytes	Class	Attributes
G	384x512	196608	uint8	
Name	Size	Bytes	Class	Attributes
B	384x512	196608	uint8	



Exercise 4 - Display only Red, Green and Blue Planes

```
% Red Plane
A1 = A;
A1(:,:,2) = 0;
A1(:,:,3) = 0;
whos A1

% Green Plane
A2 = A;
A2(:,:,1) = 0;
A2(:,:,3) = 0;
whos A2

% Blue Plane
A3 = A;
A3(:,:,1) = 0;
A3(:,:,2) = 0;
whos A3

figure,
subplot(2,2,1), imshow(A), title('Original Color Image');
subplot(2,2,2), imshow(A1), title('Red Plane');
subplot(2,2,3), imshow(A2), title('Green Plane');
subplot(2,2,4), imshow(A3), title('Blue Plane');
```

Name	Size	Bytes	Class	Attributes
A1	384x512x3	589824	uint8	
Name	Size	Bytes	Class	Attributes
A2	384x512x3	589824	uint8	
Name	Size	Bytes	Class	Attributes

A3

384x512x3

589824 uint8

Original Color Image**Red Plane****Green Plane****Blue Plane**

Exercise 5 - Displaying Indexed Images

```
load trees

figure,
imshow(X,[]);
title("Indexed Image without Map (Grayscale)");

figure,
imshow(X,map);
title("Indexed Image with Map");
```

Indexed Image without Map (Grayscale)**Indexed Image with Map**

Conclusion

```
%Basic image operations such as reading, displaying, grayscale-to-binary image conversion,  
% and color plane extraction were performed successfully. Indexed images were  
% displayed both with and without a colormap. When an individual plane of a colored image was displayed,  
% we observed a grayscale image, as all three RGB planes are required to  
% display colors (other than black, white, and gray).  
% A grayscale image was observed when displaying an indexed image without a colormap, as the  
% RGB values are stored in the colormap.
```