

# Experimental Report

Course name	Digital Image Processing		
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Major	CST	Class	20LC
Experiment Date	22-10-15		
Experimental content	Experiment 2 : Image operation and basic Transformation		

## 1. Purpose and tasks of the experiment

- Become familiar with and master the usage of MATLAB tools.
- Realizing the image algebra operation and basic image transformation.

## 2. Experimental steps and results

Describe the basic steps and main codes of the experiment and give the experimental results with pictures.  
(Delete the red word when submitting the report)

### Step: 1

1. Read an RGB image
2. Transform it into grayscale image and binary image
3. Divide it into three sub-windows in the same window to display RGB image and grayscale image respectively, and note the text title

### Code Explanation:

1. imread= this line of code is to use to read the file.
2. rgb2gray= this line of code is to transform the RGB image to grayscale image.
3. im2bw= this line of code is used to transform the image to binary image.
4. Subplot= divide the graphics window into multiple rectangular sections, each of which can be used for display separately.
5. Imshow= this line of code makes the image appear into the graphics window

```
a=imread('3.jpg')
```

```
i = rgb2gray(a)
```

```
I = im2bw(a,0.5)
```

```
subplot(3,1,1);
```

```
imshow(a);
```

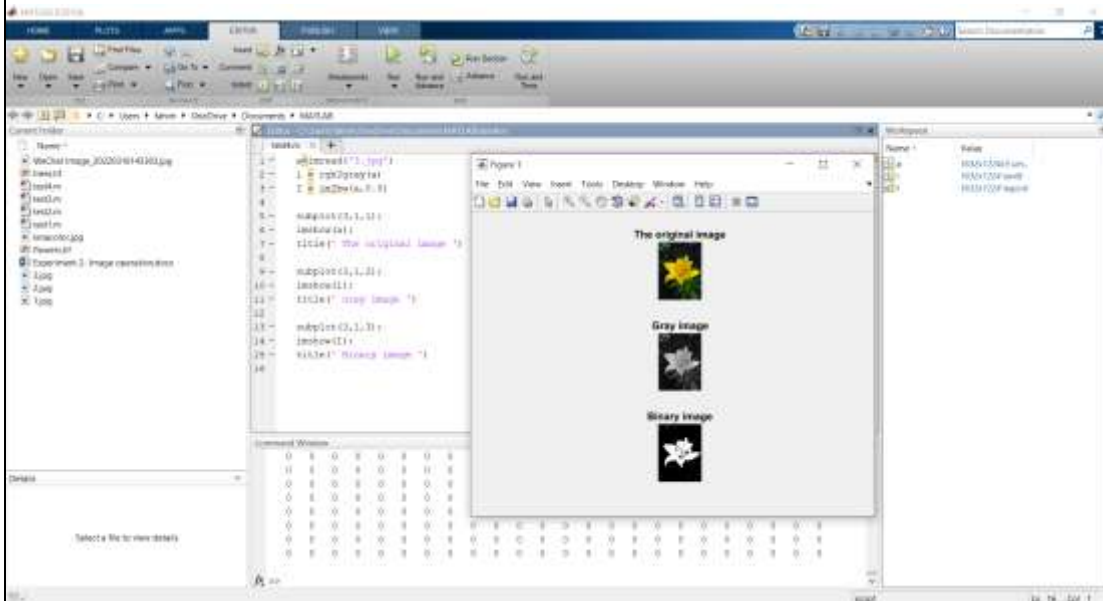
```
title(' The original image ') subplot(3,1,2);
```

```
imshow(i);
```

```
title(' Gray image ') subplot(3,1,3);
```

```
imshow(I);

title(' Binary image ')
```



## **Step : 2**

1. Perform addition, subtraction, multiplication and division on two different images.
2. Divide them into five sub-windows in the same window to display them respectively, and note the text title.

## **Code explanation:**

1. imread= this line of code is to read the file.
2. imresize= this line of code is used to resize the image.
3. imsubtract(A,B)= this of code is to subtract A from B.
4. imadd(A,B)= this line of code is to do addition between A and B.
5. immultiply(A,B)= this line of code is to do multiplication between A and B.

imdivide(A,B)= this line of code is to do division between A and B.

```
a=imread('1.jpg')
```

```
A=imresize(a,[800 800])
```

```
b=imread('2.jpg')
```

```
B=imresize(b,[800 800])
```

```
Z1=imadd(A,B)
```

```
Z2=imsubtract(A,B)
```

```
Z3=immultiply(A,B)
```

```
Z4=imdivide(A,B)
```

```
subplot(3,2,1); imshow(A);title(' original image A')
```

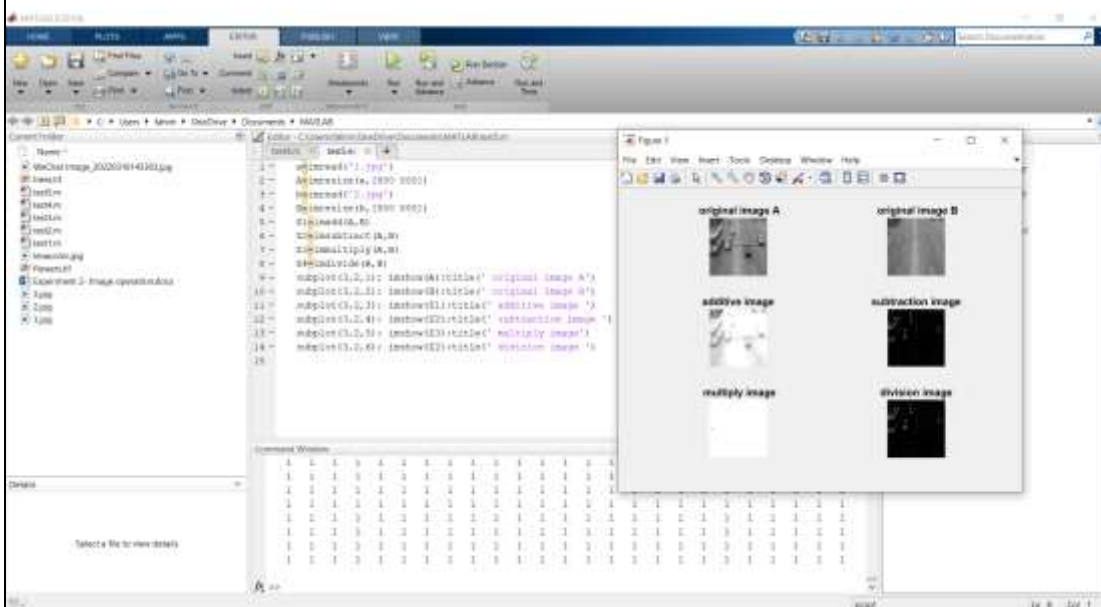
```
subplot(3,2,2); imshow(B);title(' original image B')
```

```
subplot(3,2,3); imshow(Z1);title(' additive image ')
```

```
subplot(3,2,4); imshow(Z2);title(' subtraction image ')
```

```
subplot(3,2,5); imshow(Z3);title(' multiply image')
```

```
subplot(3,2,6); imshow(Z2);title(' division image ')
```



### Step:3

1. Change the grayscale of an image to achieve image brightening, darkening and negative effects.
2. Divide it into four sub-windows in the same window to display them respectively, and annotate the text title.

### Code explanation:

1. imread= this line of code is to read the file.
2. imadjust= this line of code is used to adjust the properties of image. For example change the image's brightness, darkness or edit the effect of the image.

```
a=imread('3.jpg');
```

```
m = imadjust(a,[],[0.5;1]) ;% image brightens
```

```
n = imadjust(a,[],[0;0.5]) ;% image darkened
```

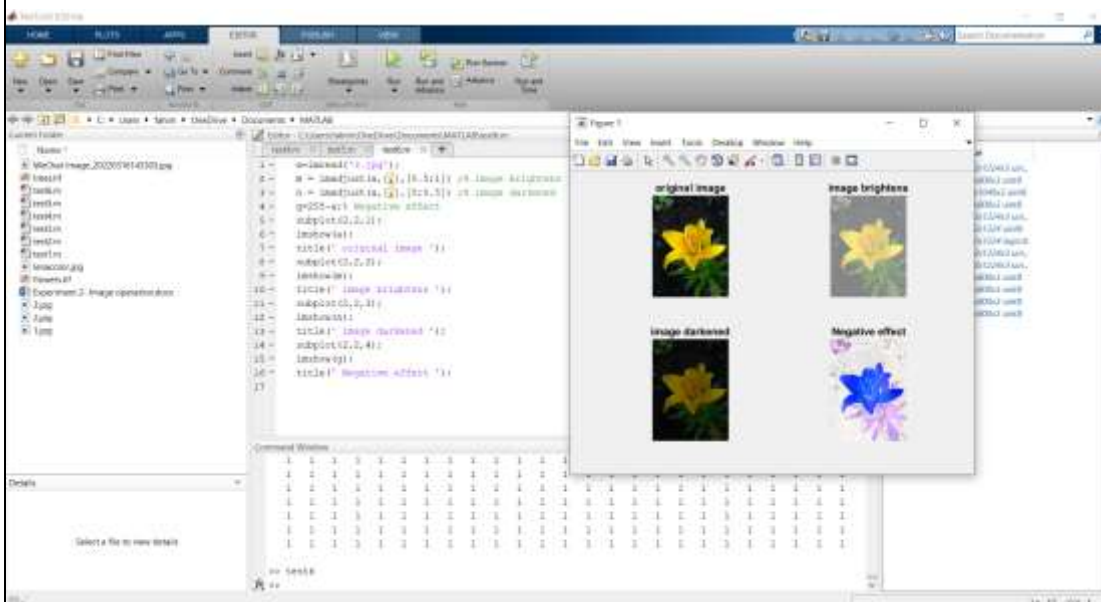
```
g=255-a;% Negative effect
```

```
subplot(2,2,1);
```

```

imshow(a);
title(' original image ');
subplot(2,2,2);
imshow(m);
title(' image brightens ');
subplot(2,2,3);
imshow(n);
title(' image darkened ');
subplot(2,2,4);
imshow(g);
title(' Negative effect ');

```



### 3. Answer the following question?

Analyze the results of algebraic operations on images, and state the possible application fields of image addition, subtraction, multiplication, and division operations.

**Answer:** As we can see from part 2 of this experiment that doing algebraic operation on images changes properties between the two images. For example doing subtraction between A and B leads to deletion of parts that are not matching in A and B. Examples of other algebraic operations can be taken from part 2 of this experiment. The possible application fields of image addition, subtraction, multiplication and division operation are below:

Medical filed, Astronomy, Computer generated graphics, etc.

#### **4. Experimental experience**

**It means your feelings and your harvest**

Learning the use of algebraic operation was very entertaining. After a little bit of self -study the code of MATLAB is more understandable to me. Now I can change image brightness darkness. Also learn image convert gray and binary image using code. Easily we can convert an image using MATLAB