LAB ASSIGNMENT RECORD

On

ECS756

Digital Image Processing using Scilab

COLLEGE OF COMPUTING SCIENCES AND INFORMATION TECHNOLOGY

TMU, MORADABAD

Session 2022 - 2023

Submitted To:

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B.Tech CSE (AI+ML+DL) 7th SEM

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Lab Assignment No:1

S.NO	PROGRAM NAME	PAGE NO	DATE	SIGN	REMARK
1.	WAP to demonstrate some basic commands and functions of SciLab.				
2.	WAP in SciLab to Import any Image and Display it.				
3.	WAP to convert color image (RGB) into Grayscale.				
4.	WAP to print Negative Image from Color Image using SciLab				
5.	WAP to Histogram display on an image. `				
6.	WAP to Affine Transformation - To learn basic image transformation (a)Translation (b)Rotation (c)Scaling.				

Assignment – 2

S.NO	PROGRAM NAME	PAGE NO	DATE	SIGN	REMARK
1.	WAP to understand how frequency distribution can be used to represent an image.				
2.	WAP to enhance the image using median filtering.				
3.	WAP To Implement Low Pass Filter.				
4.	WAP to Implement High Pass Filter.				
5.	WAP To study the effect of the size of the neighborhood on the result of processing.				

Assignment 1

Program 1: WAP to demonstrate some basic commands and functions of SciLab.

Solution:

//Addition

```
 --> 1+2
 ans  = 3
```

//Subtraction

```
--> 3-2
 ans  =1
```

//Multilplication

```
--> 2*3
 ans  = 6
```

// Division

```
--> 5/2
 ans  = 2.5
```

// Matrix Addition

```
[1 2;3 4]+[5 6;7 8]
 ans  =  6.    8.
         10.   12.
```

```
--> A=[1,2,3,4]
```

// length function

```
--> length(A)
 ans  = 4
```

//Transpose of matrix

```
--> A'
 ans  =

   1.
   2.
   3.
   4.
```

// min() function

--> min(A)

ans =

1.

// max() function

--> max(A)

ans = 4

// sqrt() function

--> sqrt(16)

ans = 4.

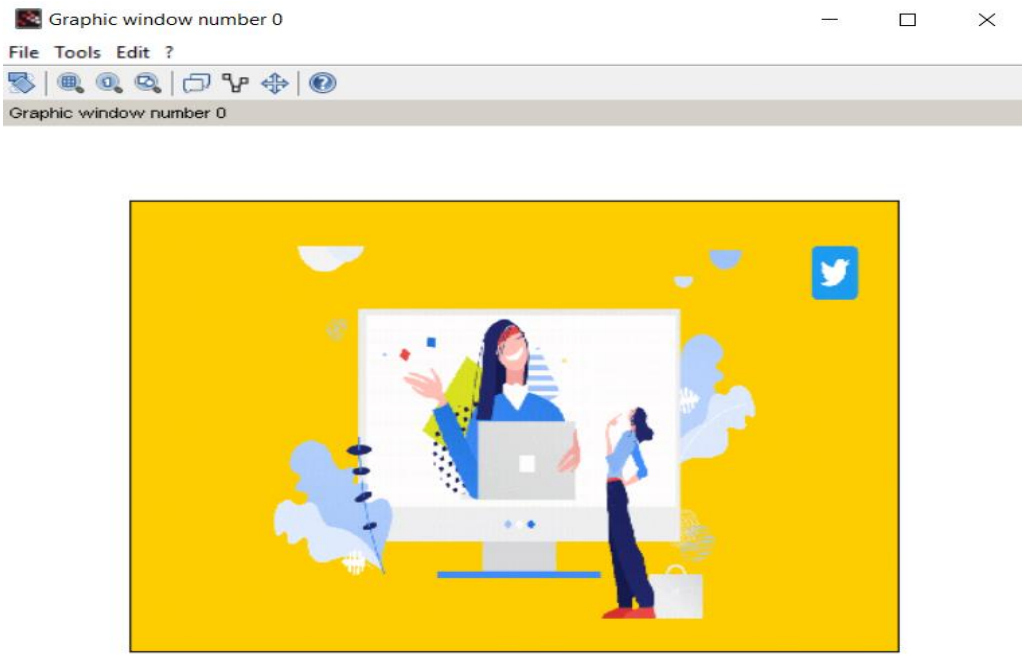
Program 2. WAP in SciLab to Import any Image and Display it.

Solution:

```
image=imread('C:\Users\Atishay\Downloads\twitter.png')

imshow(image)
```

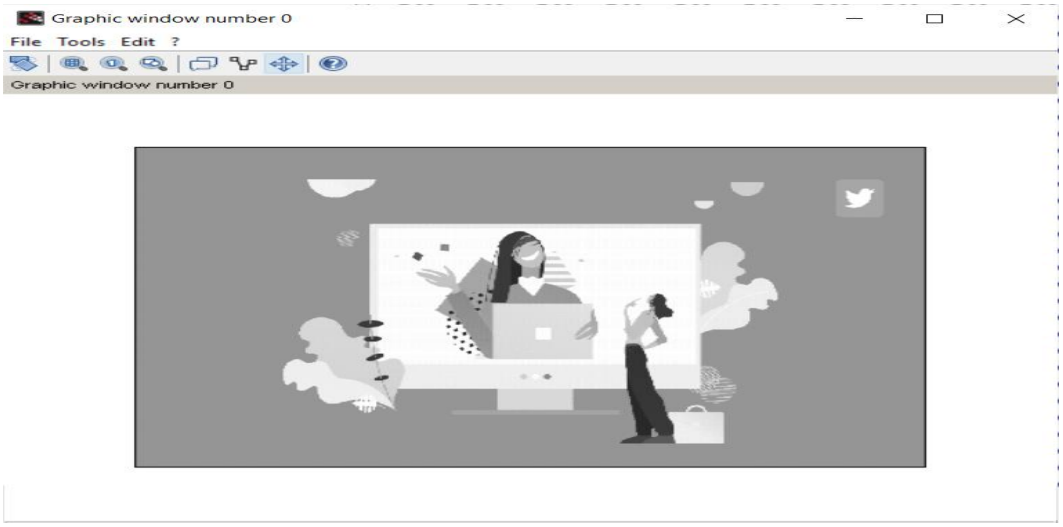
OUTPUT:



Program 3. WAP to convert color image (RGB) into Grayscale.
Solution:

```
image=imread('C:\Users\Atishay\Downloads\twitter.png')
grayy=rgb2gray(image)
Imshow(grayy)
```

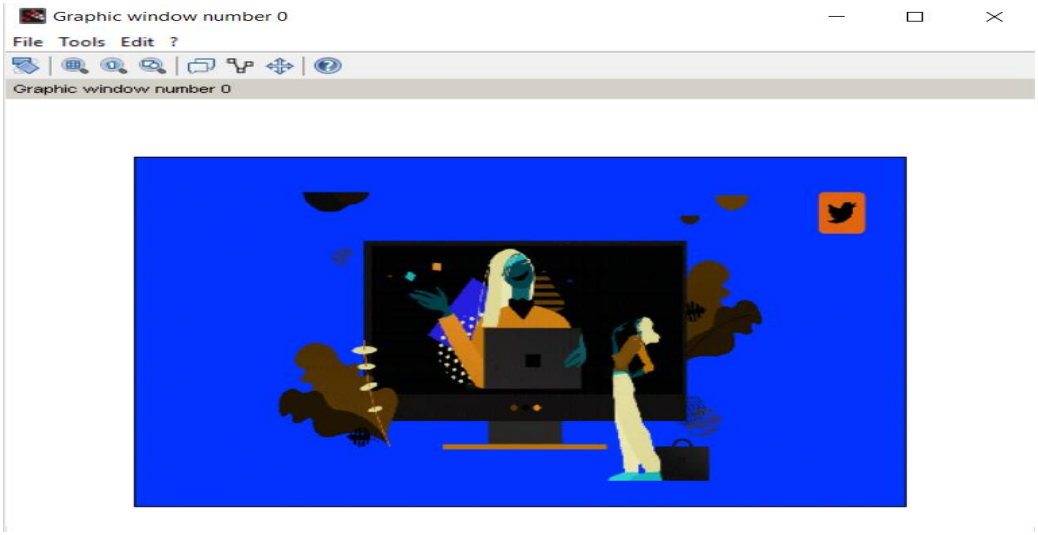
OUTPUT:



Program 4. WAP to print Negative Image from Color Image using SciLab.

Solution:

```
image=imread('C:\Users\Atishay\Downloads\twitter.png')
b=imcomplement(image)
imshow(b)
```

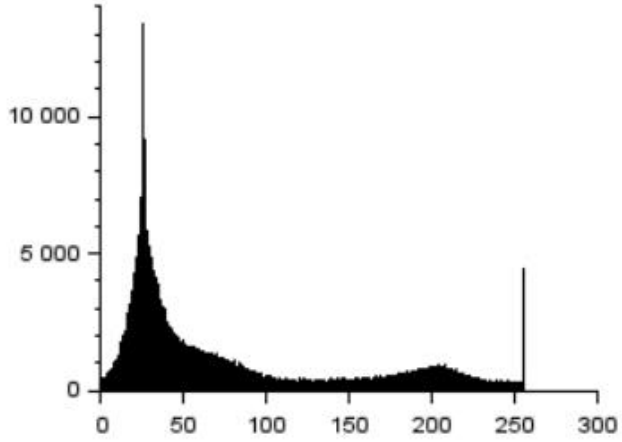


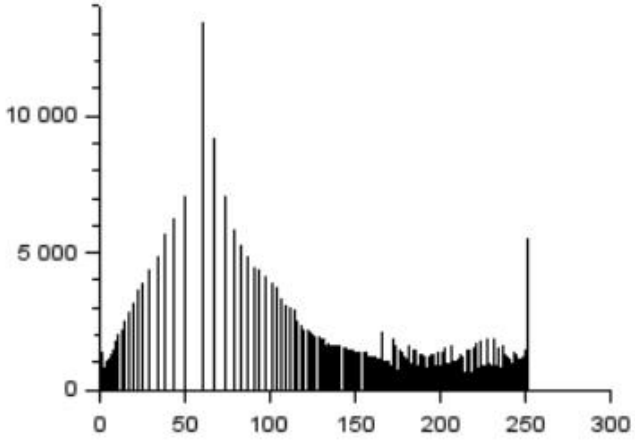
Program 5. WAP to Histogram display and histogram equalization on any Image.

Solution:

```
I=imread('C:\Users\Atishay\Downloads\image.jpg')
Iequal = imhistequal(I);
[qtd, level] = imhist(I);
[qtde, levele] = imhist(Iequal);
subplot(221);
imshow(I);
subplot(222);
plot2d3(level, qtd);
subplot(223);
imshow(Iequal);
subplot(224);
plot2d3(levele, qtde);
```

OUTPUT:





Program 6. WAP to Affine Transformation - To learn basic image transformation

(a) Translation

(b) Rotation

(c) Scailing

Solution: Translation:

```
S=imread('C:\Users\Atishay\Downloads\image.jpg')
subplot(2,2,1);
imshow(S);
// Translation for x  = 20
mat = [  1 0 0;...
        0 1 0;...
       20 0 1];
S2 = imtransform(S,mat,'affine');
subplot(2,2,2);
imshow(S2);
```

Before

After

Rotation:

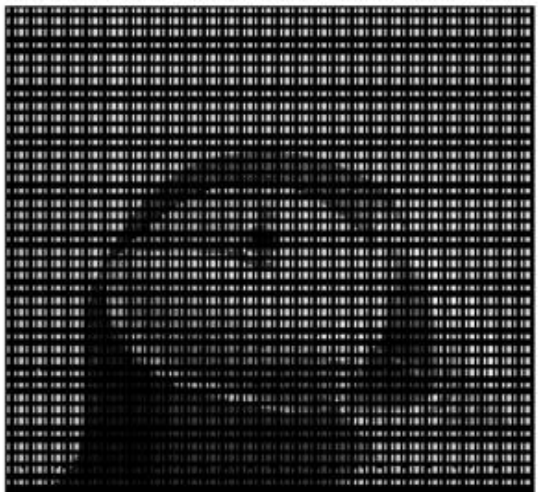
```
S=imread('C:\Users\Atishay\Downloads\image.jpg')
subplot(1,2,1);
imshow(S);
// Rotation for theta  = 45 degree
mat = [ cosd(45) -sind(45);...
        sind(45) cosd(45) ;...
        0       0       ];
 S2 = imtransform(S,mat,'affine');
subplot(1,2,2);
imshow(S2);
```

Scailing:

```
S=imread('C:\Users\Atishay\Downloads\img.jpg');
subplot(1,2,1);
imshow(S);
[m , n ] = size ( S ) ;
for i = 1: m
   for j =1: n
      J (2* i ,2* j ) = S(i , j) ;
   end
end
subplot(1,2,2);
imshow(J)
```

Before Scailing

After Scailing



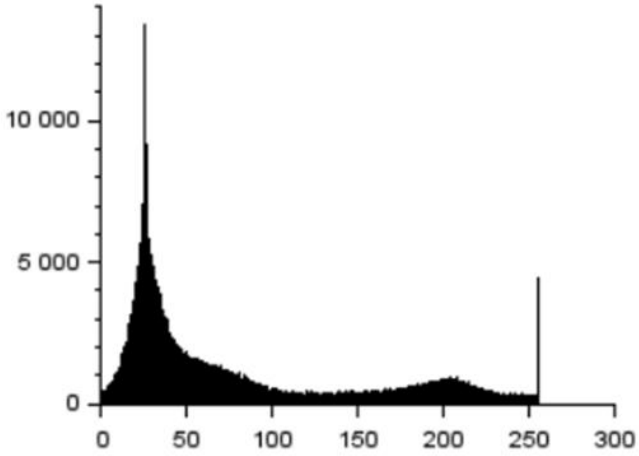
Assignment 2

Program 1. WAP to understand how frequency distribution can be used to represent an image.

Solution:

```
I=imread('C:\Users\Atishay\Downloads\image.jpg')
[qtd, level] = imhist(I);
subplot(221);
imshow(I);
subplot(222);
plot2d3(level, qtd);
```

OUTPUT:



Program 2. WAP to enhance the image using median filtering.

Solution:

```
I=imread('C:\Users\Atishay\Downloads\median_filter.jpg')
Filter_size=[3,3];
 [m,n]=size(I);
 for i=2:m-1
 for j=2:n-1
 d(i,j)=median([I(i-1,j+1),I(i,j+1),I(i+1,j+1);I(i-1,j),I(i,j),I(i+1,j);I(i-1,j-1),I(i,j-1),I(i+1,j-1)]);
  end
  end
imshow(d)
```

OUTPUT:

Before

After

Program 3. WAP To Implement Low Pass Filter.

Solution:
```
a1=imread('C:\Users\Atishay\Downloads\bw.jpg');
a=double(a1);
subplot(1,2,1);
imshow(a1);
[m,n]=size(a);
w=[1 1 1;1 1 1;1 1 1];
for i=2:m-1
   for j=2:n-1
      d(i,j)=[w(1)*a(i-1,j+1)+w(2)*a(i,j+1)+w(3)*a(i+1,j+1)+w(4)*a(i-
1,j)+w(5)*a(i,j)+w(6)*a(i+1,j)+w(7)*a(i-1,j-1)+w(8)*a(i,j-1)+w(9)*a(i+1,j-1)]/9
end
end
e=uint8(d);
subplot(1,2,2);
imshow(e);
```

Before

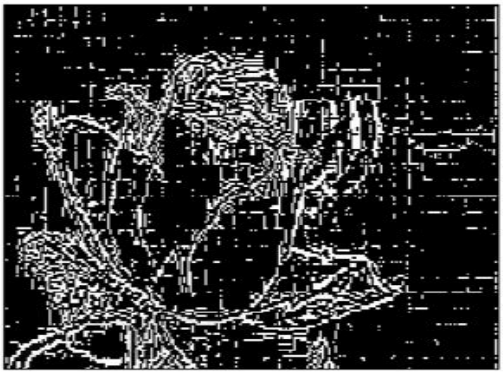
After

Program 4. WAP To Implement High Pass Filter.

Solution:
```
a1=imread('C:\Users\Atishay\Downloads\bw.jpg');
subplot(1,2,1);
imshow(a1);
a=double(a1);
[m,n]=size(a);
w=[-1 -1 -1;-1 8 -1;-1 -1 -1];
for i=2:m-1
   for j=2:n-1
      b(i,j)=[w(1)*a(i-1,j+1)+w(2)*a(i,j+1)+w(3)*a(i+1,j+1)+w(4)*a(i-
1,j)+w(5)*a(i,j)+w(6)*a(i+1,j)+w(7)*a(i-1,j-1)+w(8)*a(i,j-1)+w(9)*a(i+1,j-1)]/9
end
end
c=uint8(b)
subplot(1,2,2);
imshow(c);
```

OUTPUT:

Before **After**



Program 5. WAP To study the effect of the size of the neighborhood on the result of processing.

Solution: Code:

For 2*2 filter

```
I=imread('C:\Users\Atishay\Downloads\median_filter.jpg')
Filter)Size=[2,2]
[m,n]=size(I);
 for i=2:m-1
 for j=2:n-1
 g(i,j)=median([I(i-1,j+1),I(i,j+1),I(i+1,j+1);I(i-1,j),I(i,j),I(i+1,j)]);
  end
  end
imshow(d)
```

For 3*3 filter

```
I=imread('C:\Users\Atishay\Downloads\median_filter.jpg')
Filter_size=[3,3];
 [m,n]=size(I);
 for i=2:m-1
 for j=2:n-1
 d(i,j)=median([I(i-1,j+1),I(i,j+1),I(i+1,j+1);I(i-1,j),I(i,j),I(i+1,j);I(i-1,j-1),I(i,j-1),I(i+1,j-1)]);
  end
  end
imshow(d)
```

OUTPUT:

2*2 neighborhood size

3*3 neighorhood size