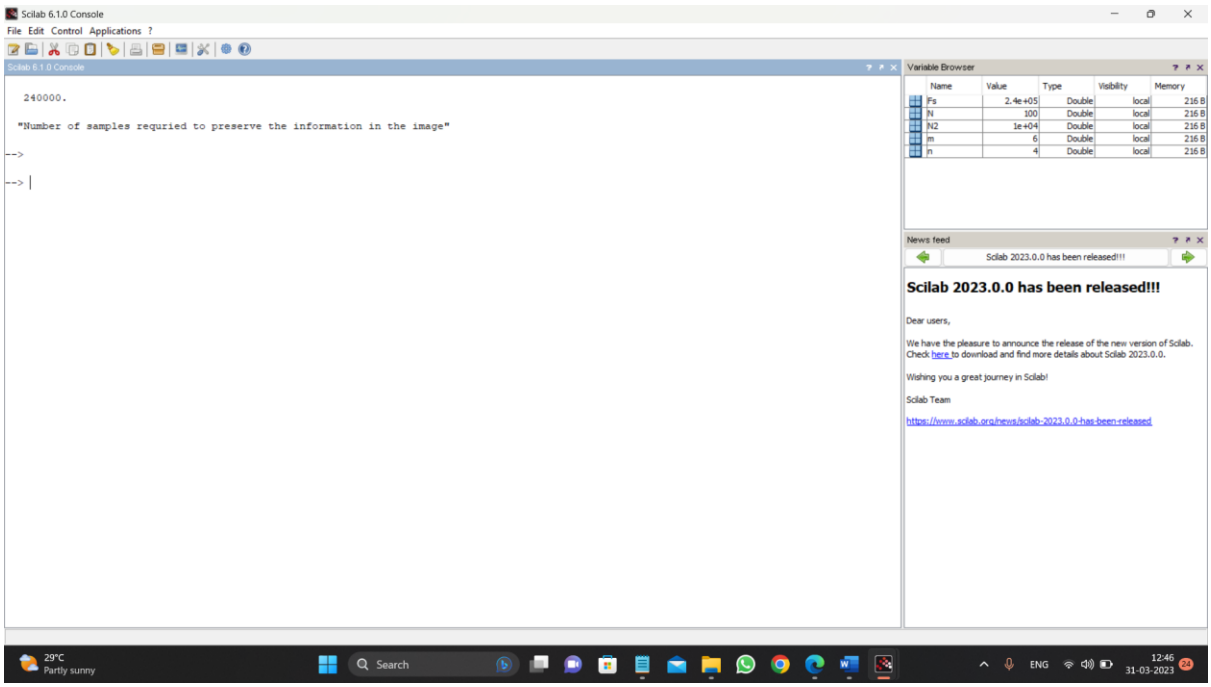
Practical 1

Aim :- Program to calculate number of samples required for an image

Code :-
```
clc ;
close ;
// dimesion of the image in inches
m = 6;
n = 4;
N = 100;
N2= N*N ; // Number of dots per inch in both direction
Fs= m* n * N2 ;
disp ( Fs , 'Number of samples requried to preserve the information in the image')
```

output :-



Practical 2

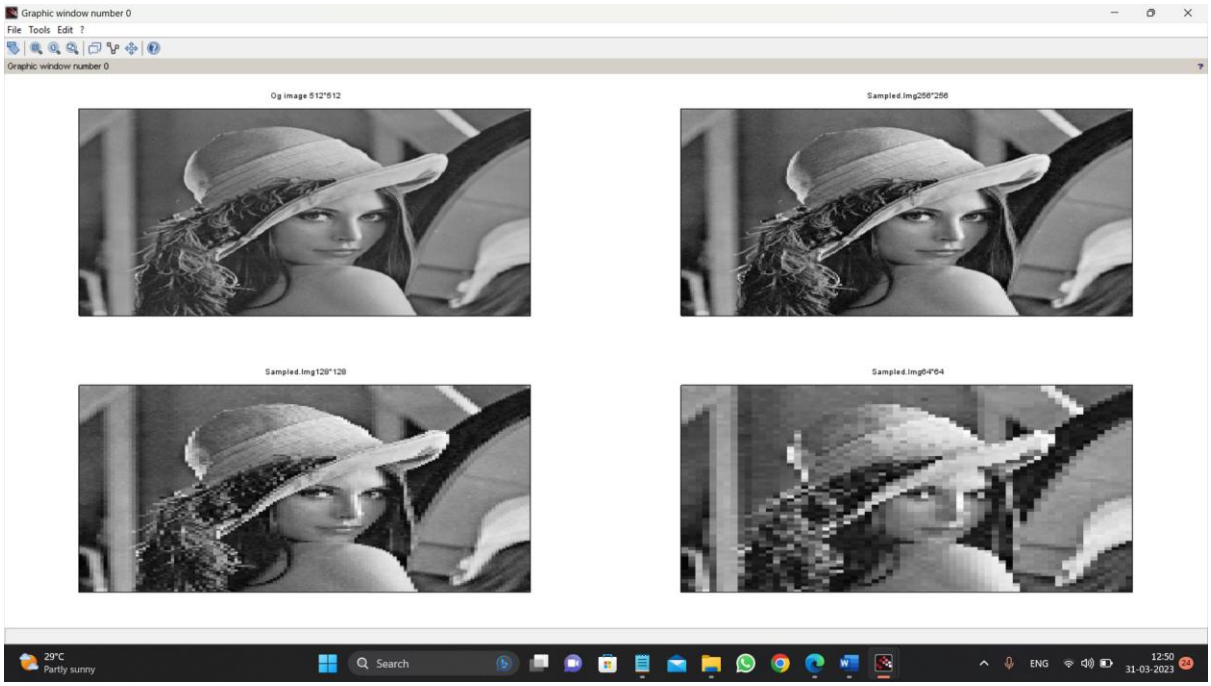
Aim :- Program to study the effects of reducing the spatial resolution of a digital image.

Code :-
```
clc;
clear all;
Img1=imread('lena.png');
Img = rgb2gray(Img1);
```

```
//512*512
subplot (2,2,1),imshow(Img),title('Og image 512*512');
//256*256
Samp=zeros(256);
m=1;
n=1;
for i=1:2:512
   for j=1:2:512
       Samp(m,n)=Img(i,j);
         n=n+1;
      end
      n=1;
      m=m+1;
end
SampImg256=mat2gray(Samp);
subplot(2,2,2);
imshow(SampImg256);
title('Sampled.Img256*256')

///////
Samp=zeros(128);
m=1;
n=1;
for i=1:4:512
   for j=1:4:512
       Samp(m,n)=Img(i,j);
         n=n+1;
      end
      n=1;
      m=m+1;
end
SampImg128=mat2gray(Samp);
subplot(2,2,3),imshow(SampImg128),title('Sampled.Img128*128')

////////////////////

Samp=zeros(64);
m=1;
n=1;
for i=1:8:512
   for j=1:8:512
       Samp(m,n)=Img(i,j);
         n=n+1;
```

```
        end
        n=1;
        m=m+1;
end
SampImg64=mat2gray(Samp);
subplot(2,2,4),imshow(SampImg64),title('Sampled.Img64*64')
```

Output :-



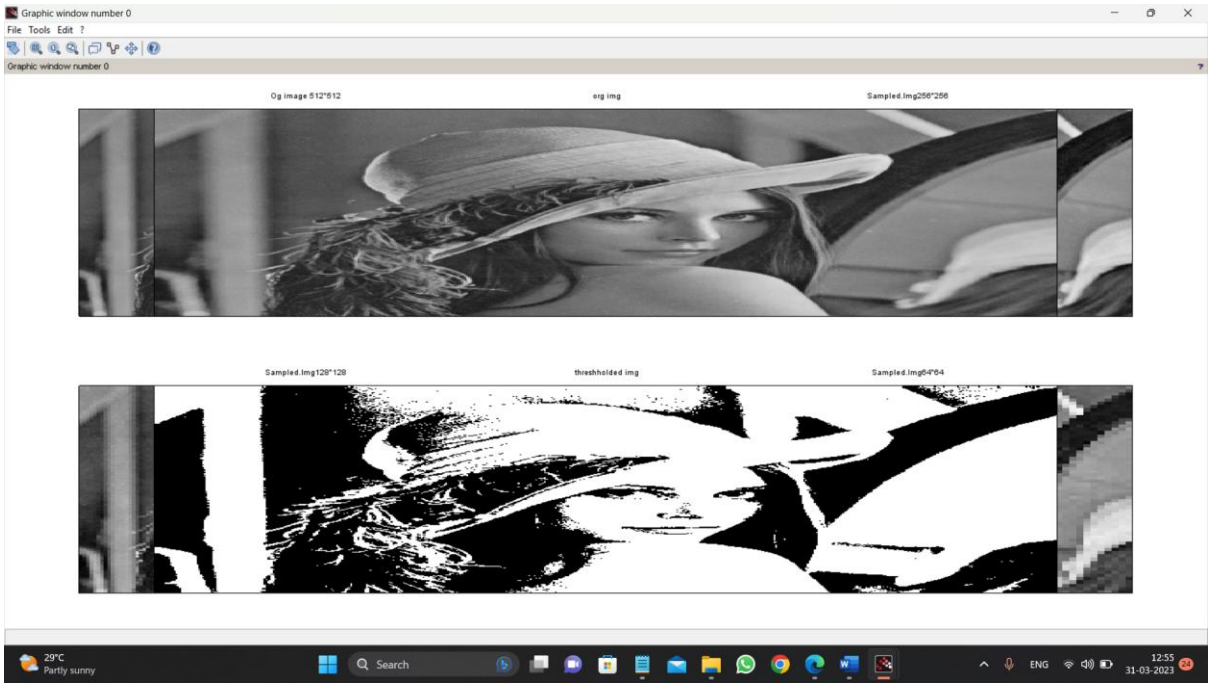
Practical 3

Aim :- Program to perform threshold on an image.

Code :-
```
clc;
clear all;
a=imread('lena.jpeg');
a=rgb2gray(a);
subplot(2,1,1);
imshow(a);
title('org img');
T=100; //threshold value
[r,c]=size(a);
for i=1:r
   for j=1:c
      if (a(i,j)<=T)
         x(i,j)=0;
```

```
        else
            x(i,j)=255;
    end
end
end
x=uint8(x);

subplot(2,1,2);
imshow(x);
title('threshholded img');
```

Output :-



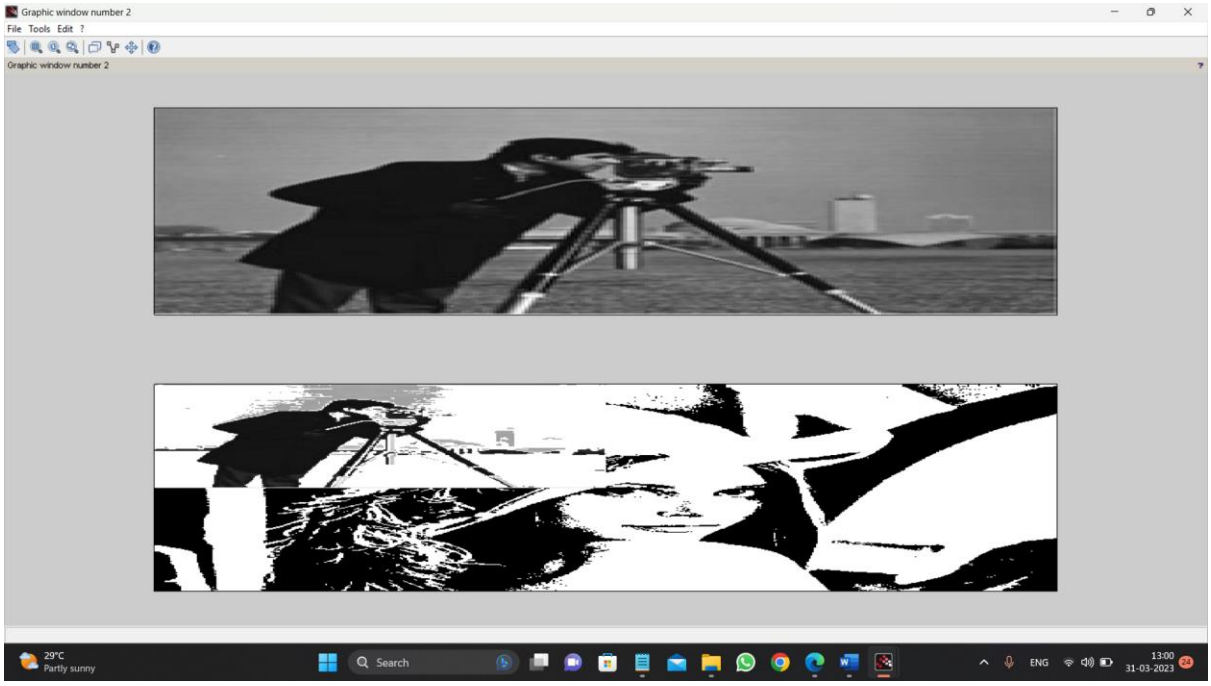
Practical 4

Aim :- Gray-level slicing with and without background.

Code :-
```
clc;
clear all;
a=imread('camera.png');

a1=58; // This value is user defined
b1=158; // This value is user defined
[r,c]=size(a);
figure(2);
subplot(2,1,1);
```

```
imshow(a);
for i=1:r
   for j=1:c
      if (a(i,j)>a1 & a(i,j)<b1)
         x(i,j)=255;
      else
         x(i,j)=a(i,j);
      end
   end
end
x=uint8(x);
subplot(2,1,2);
imshow(x);
```

Output :-



Practical 5

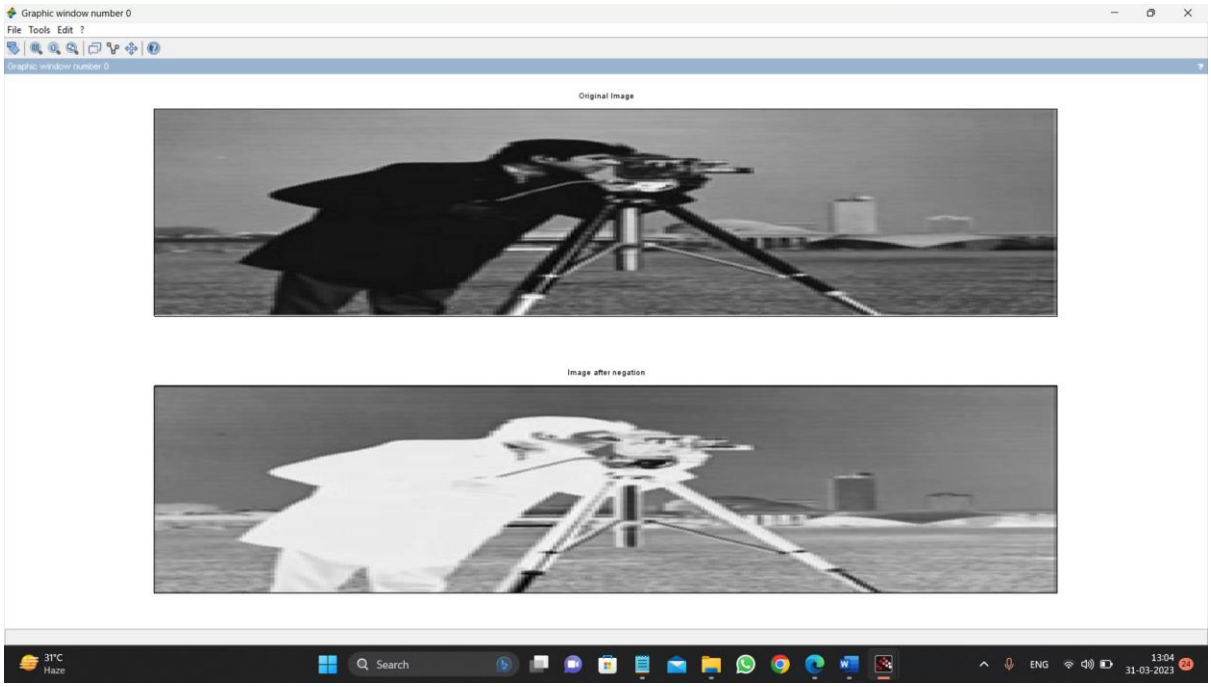
Aim :- Program to perform Image negation.

Code :- *//for gray image*

```
A = imread('camera.png');
A=rgb2gray(A);
subplot(2,1,1);
imshow(A);
```

```
title('Original Image ');

[row col]=size(A);
for x=1:row
   for y=1:col
      A(x,y)=255-A(x,y);
   end
end
subplot(2,1,2);
imshow(A);
title('Image after negation');
```

Output :-



Practical 6

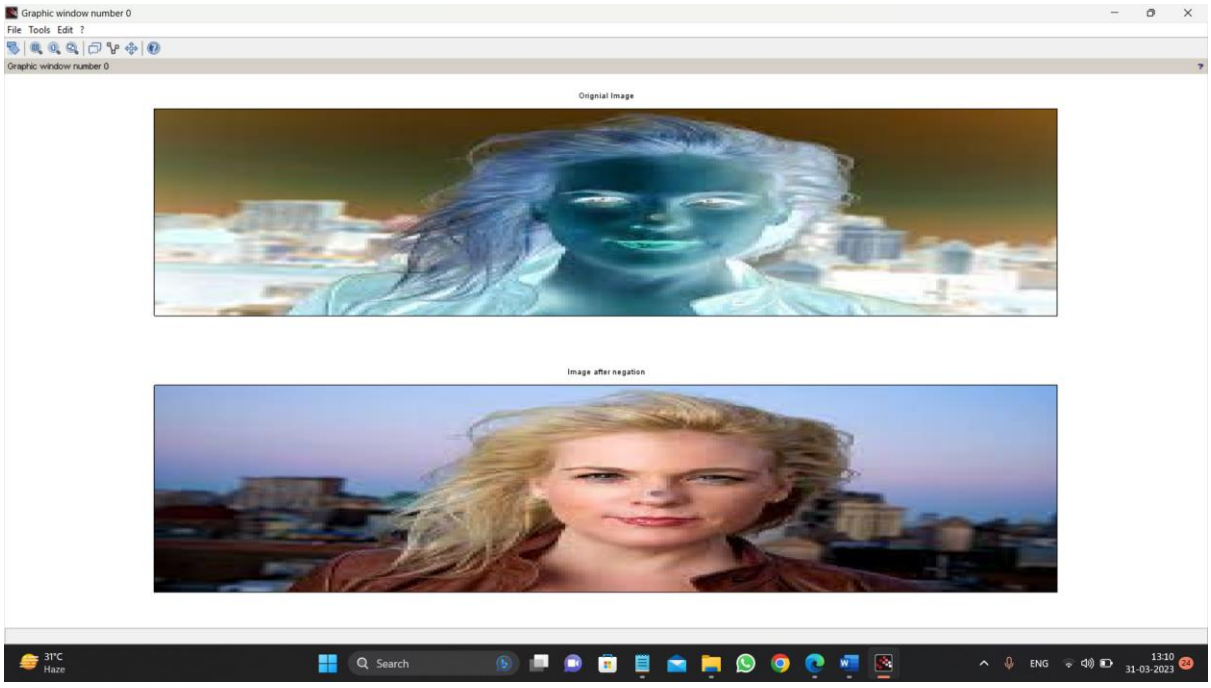
Aim :- Program to perform Image negation(color image).

Code :-

```
A = imread('negimg.jpg');

subplot(2,1,1);
imshow(A);
title('Orignial Image');
R = A(:,:,1);
G = A(:,:,2);
B = A(:,:,3);
```

```
[row col]=size(A);
for x=1:row
   for y=1:col
      R(x,y)=255-R(x,y);
      G(x,y)=255-G(x,y);
      B(x,y)=255-B(x,y);
   end
end

A(:,:,1)=R;
A(:,:,2)=G;
A(:,:,3)=B;

subplot(2,1,2);
imshow(A);
title('Image after negation');
```

Output :-



Practical 7

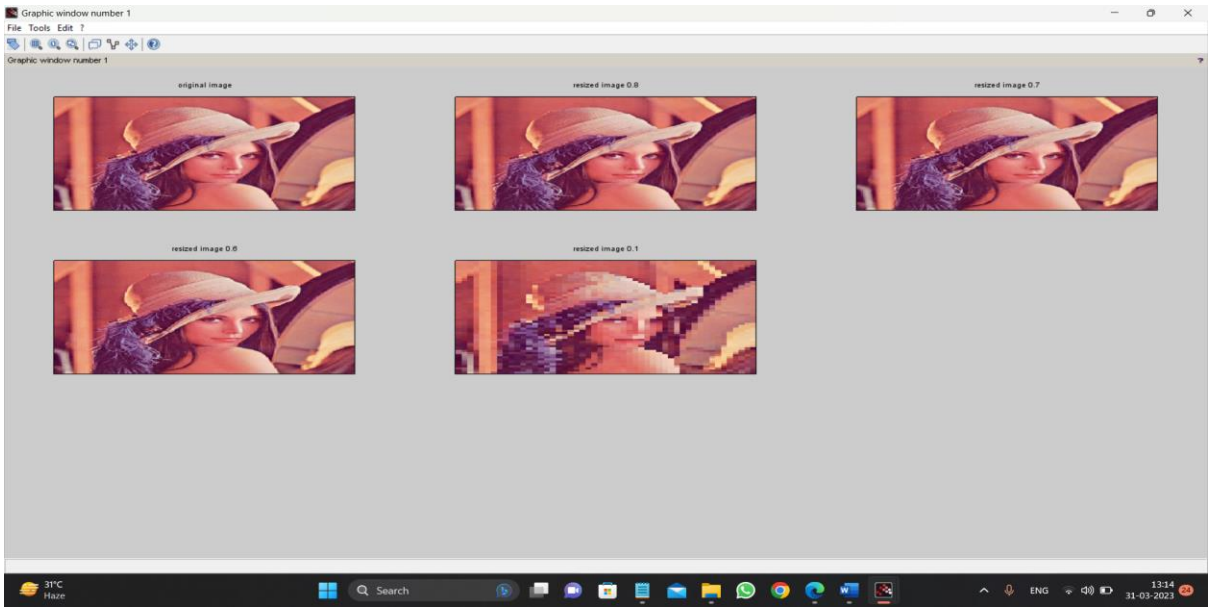
Aim :- Program to study the effects of varying the number of intensity levels in a digital image.

Code :-

```
clc;
```

```
clear all;
figure(1)

subplot(3,3,1);
i=imread('lena.jpeg');
imshow(i);
title('original image');
subplot(3,3,2);
j1=imresize(i,0.8);
imshow(j1);
title('resized image 0.8');

subplot(3,3,3);
j2=imresize(i,0.7);
imshow(j2);
title('resized image 0.7');

subplot(3,3,4);
j3=imresize(i,0.6);
imshow(j3);
title('resized image 0.6');

subplot(3,3,5);
j4=imresize(i,0.1);
imshow(j4);
title('resized image 0.1');
```

Output :-

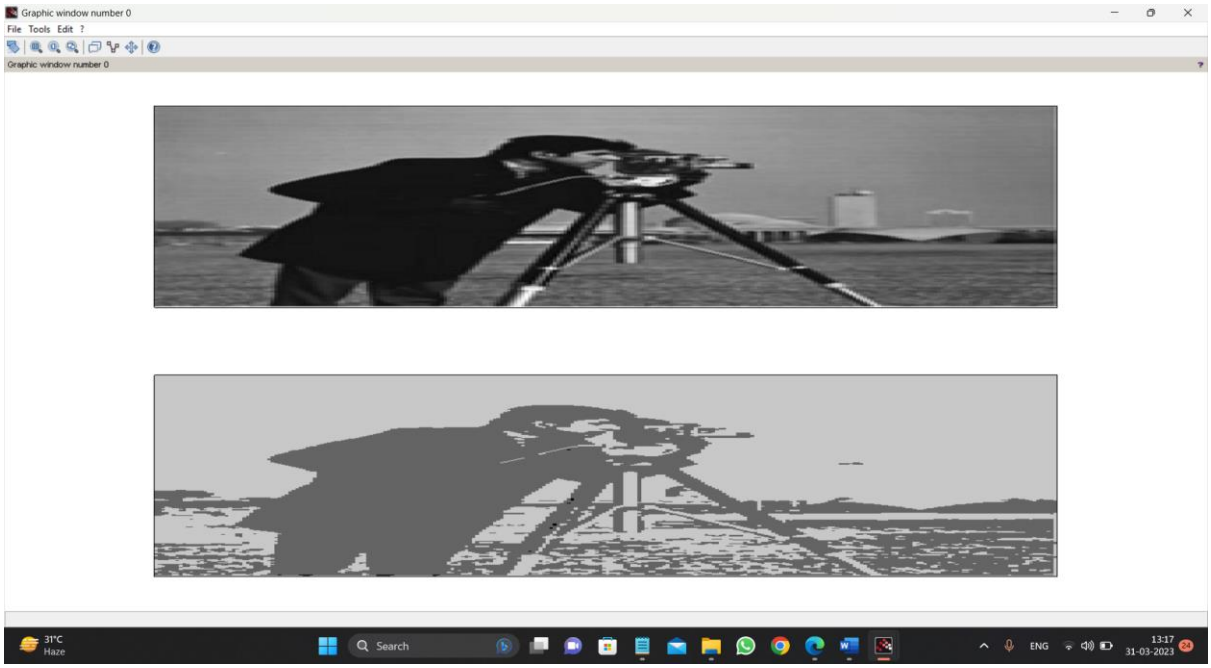


Practical 8

Aim :- Program to perform Log transformation.

Code :-
```
clc;
clear all;
a=imread('camera.png');
a=rgb2gray(a);
subplot(2,1,1);
imshow(a);
s=a;
c=1;
[r1,c1]=size(a);
for i=1:r1
    for j=1:c1
        b=double(a(i,j));
        s(i,j)=c*log10(1+b);
    end
end

new1=uint8(s*100);
//imshow(new1);
subplot(2,1,2);
imshow(new1);
```

Output :-

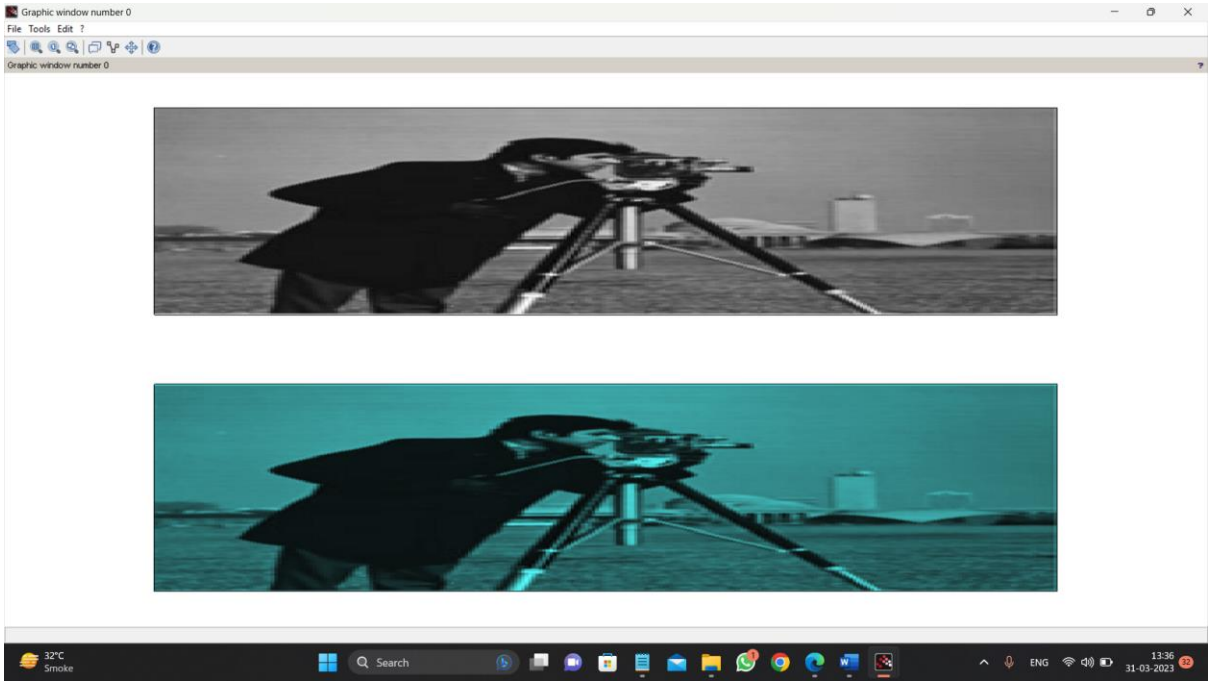


Practical 9

Aim :- 9-Power-law transformations.

Code :-
```
clc;
clear all;
a=imread('camera.png');
[r,c]=size(a);
subplot(2,1,1);
imshow(a);
x=a;
G=0.8;
for i=1:r
   for j=1:c
      b=double(a(i,j));
      x(i,j)=b^G;
      end
end
new1=uint8(x);
subplot(2,1,2);
imshow(new1);
```

Output :-

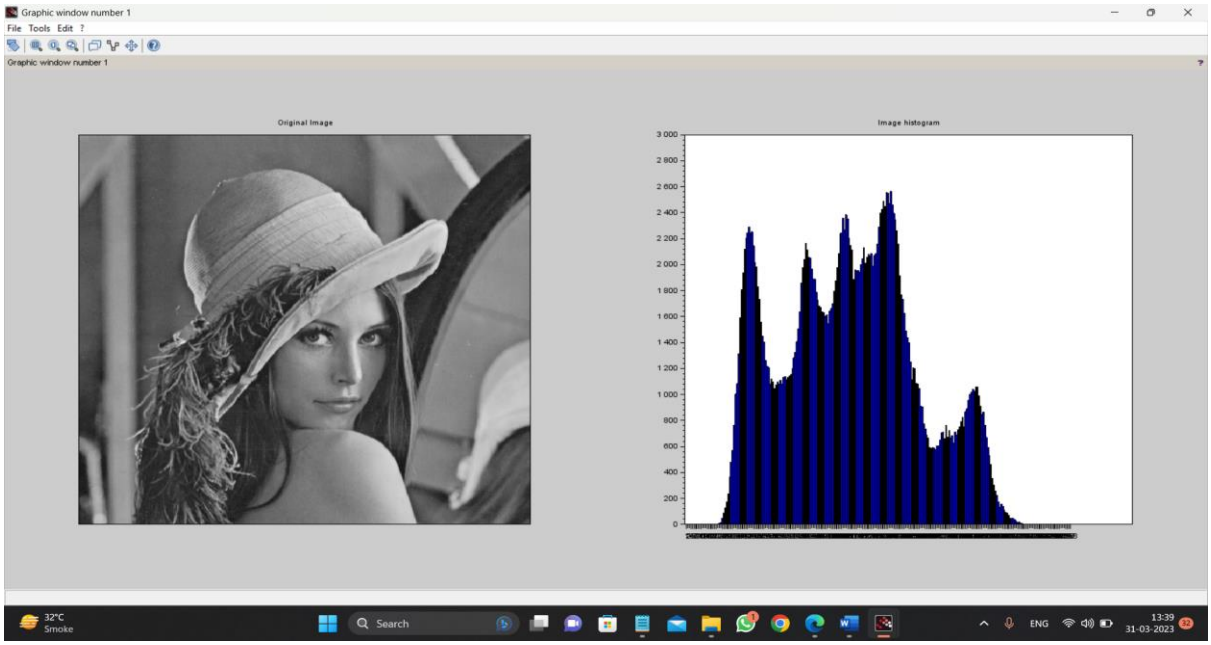


Practical 10

Aim :- Program to plot the histogram of an image.

Code :-
```
clc;
clear all;
a=imread('lena.jpeg');
a=rgb2gray(a);
h=zeros(1,258);
[r,c]=size(a);
for i=1:r
   for j=1:c
      if (a(i,j)==0)
         h(0)=h(0)+1;
      end
      k=a(i,j);
      h(k)=h(k)+1;
   end
end
figure(1);
subplot(1,2,1);
imshow(uint8(a));
title('Original Image')
subplot(1,2,2);
bar(h);
title('Image histogram');
```

Output :-

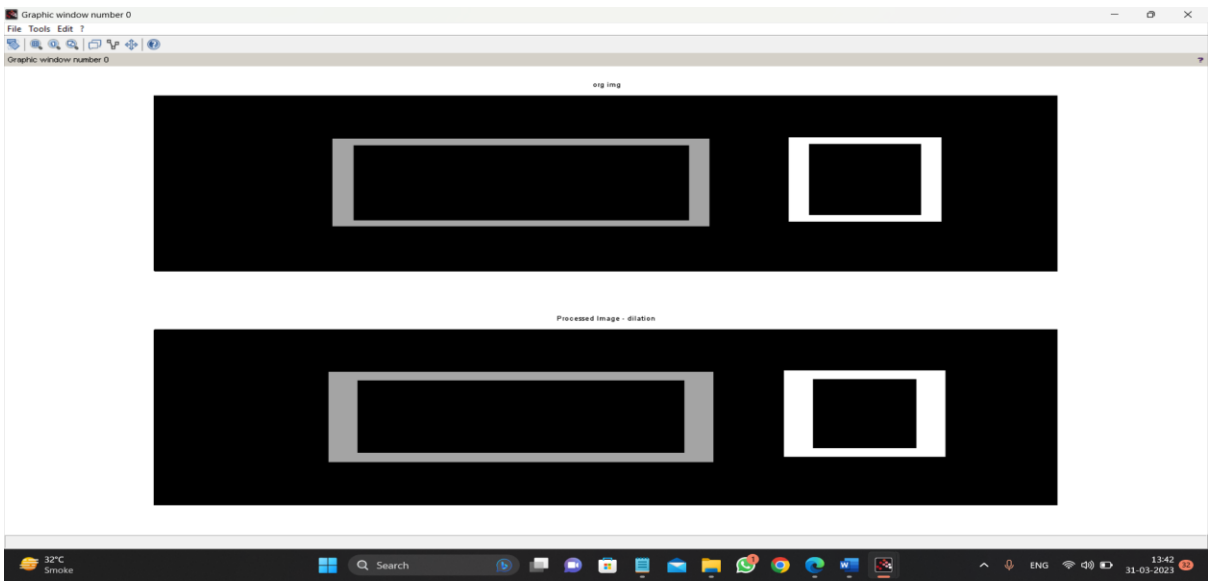


Practical 11

Aim :- Program to apply dilation

Code :-
```
clc;
clear all;
a=imread('rectb.png');
a=rgb2gray(a);
d=a;
A1=a;
[r,c]=size(d);
subplot(2,1,1);
imshow(a);
title('org img');
m=[1 1 1;1 1 1;1 1 1];
// m=ones(5,5);
for i=2:1:r-1
for j=2:1:c-1
new=[(m(1)*d(i-1,j-1)) (m(2)*d(i-1,j)) (m(3)*d(i-1,j+1)) (m(4)*d(i,j-1))
(m(5)*d(i,j)) (m(6)*d(i,j+1)) (m(7)*d(i+1,j-1)) (m(8)*d(i+1,j))
(m(9)*d(i+1,j+1))];
A1(i,j)=max(new);
end
subplot(2,1,2);
imshow(A1);title('Processed Image - dilation');
end
```

Output :-

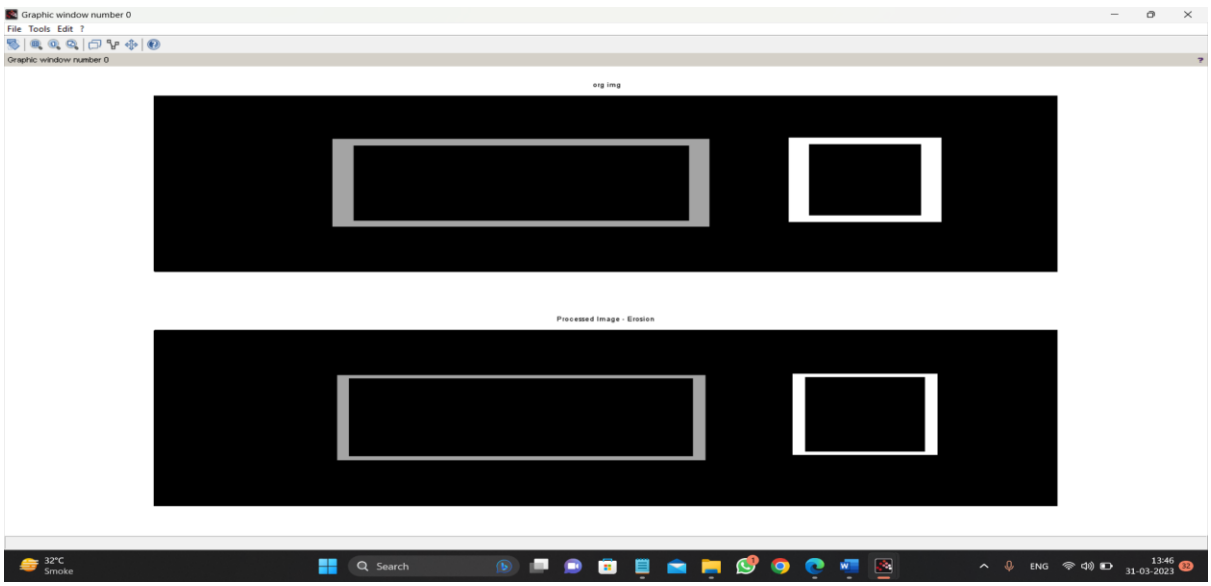


Practical 12

Aim :- Program to apply erosion.

Code :-
```
clc;
clear all;
a=imread('rectb.png');
a=rgb2gray(a);
subplot(2,1,1);
imshow(a);
title('org img');
A1=a;
d=a;
[r,c]=size(d);
m=[1 1 1;1 1 1;1 1 1];
// m=ones(5,5);
for i=2:1:r-1
for j=2:1:c-1
    new=[(m(1)*d(i-1,j-1)) (m(2)*d(i-1,j)) (m(3)*d(i-1,j+1)) (m(4)*d(i,j-1))
(m(5)*d(i,j)) (m(6)*d(i,j+1)) (m(7)*d(i+1,j-1)) (m(8)*d(i+1,j))
(m(9)*d(i+1,j+1))];
A1(i,j)=min(new);
end
subplot(2,1,2);
title('org img');imshow(A1);title('Processed Image - Erosion');
end
```

Output :-

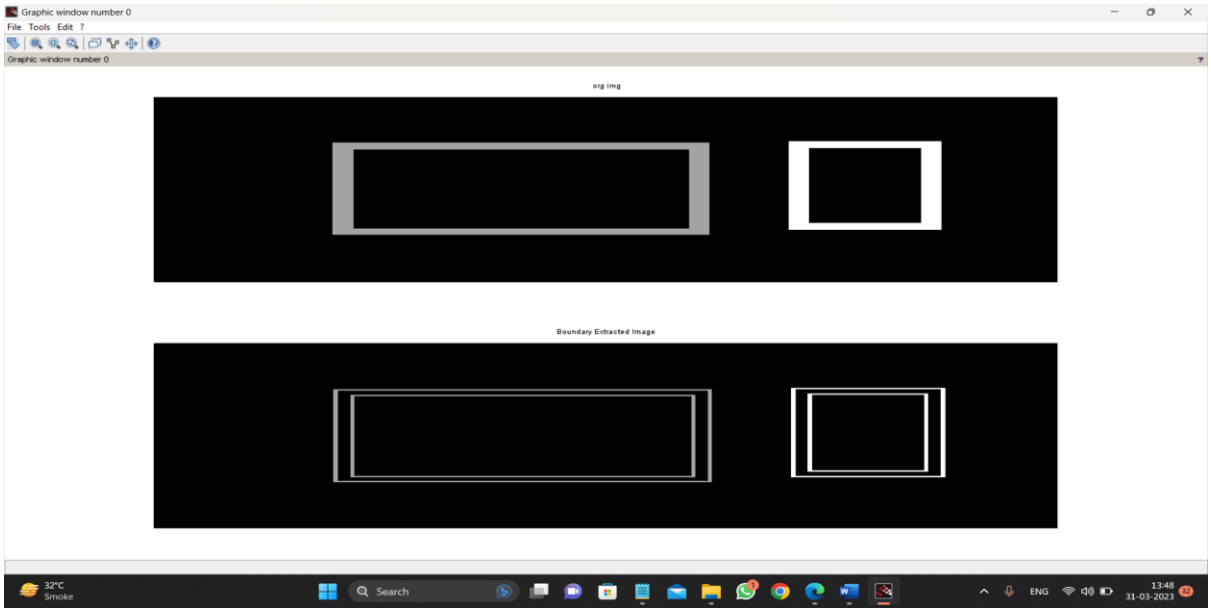


Practical 13

Aim :- Program for detecting boundary of an image.

Code :-
```
clc;
clear all;
a=imread('rectb.png');
a=rgb2gray(a);
subplot(2,1,1);
imshow(a);
title('org img');
d=a;
[r,c]=size(d);
m=[1 1 1;1 1 1;1 1 1];
for i=2:1:r-1
for j=2:1:c-1
new=[(m(1)*d(i-1,j-1)) (m(2)*d(i-1,j)) (m(3)*d(i-1,j+1))
(m(4)*d(i,j-1)) (m(5)*d(i,j)) (m(6)*d(i,j+1))
(m(7)*d(i+1,j-1)) (m(8)*d(i+1,j)) (m(9)*d(i+1,j+1))];
A2(i,j)=min(new);
aa(i,j)=d(i,j)-A2(i,j);
end
end
subplot(2,1,2);
imshow(aa);title('Boundary Extracted Image');
```

Output :-

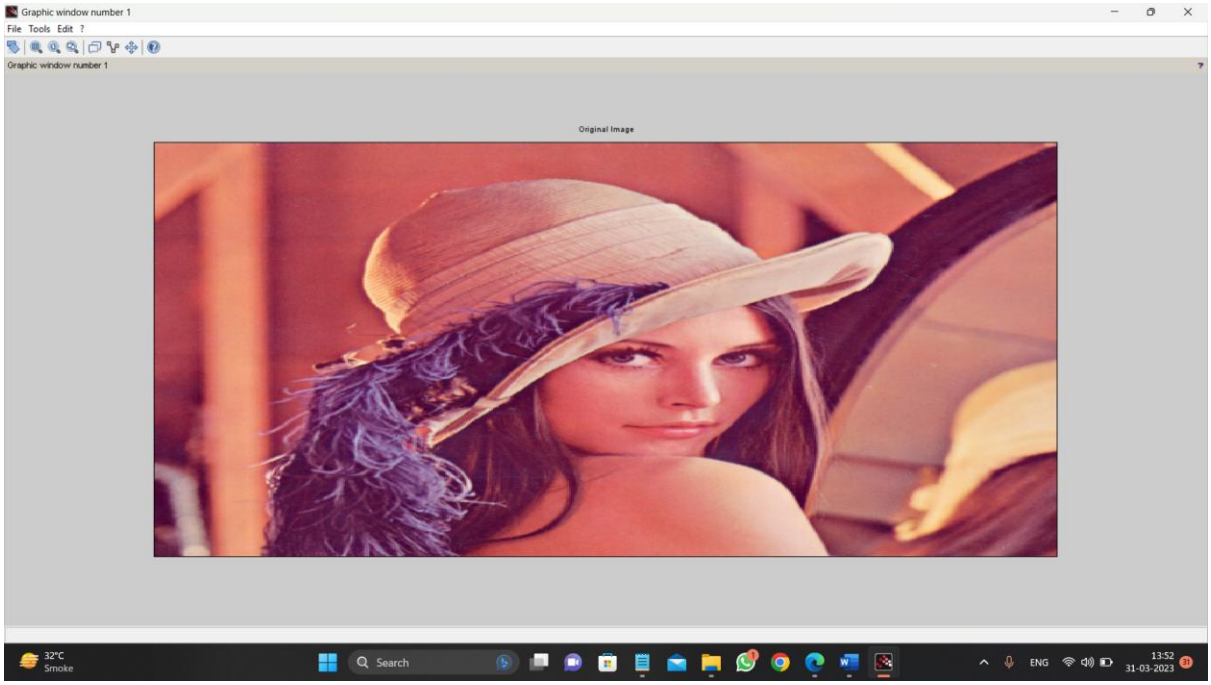


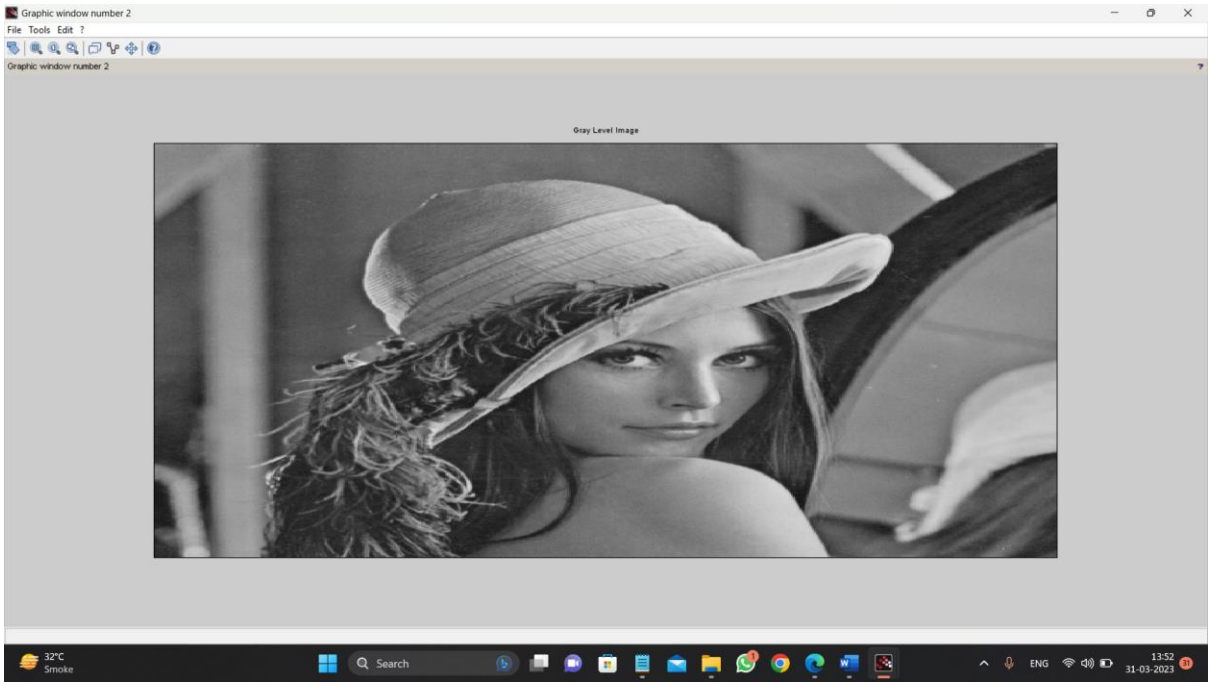
Practical 14

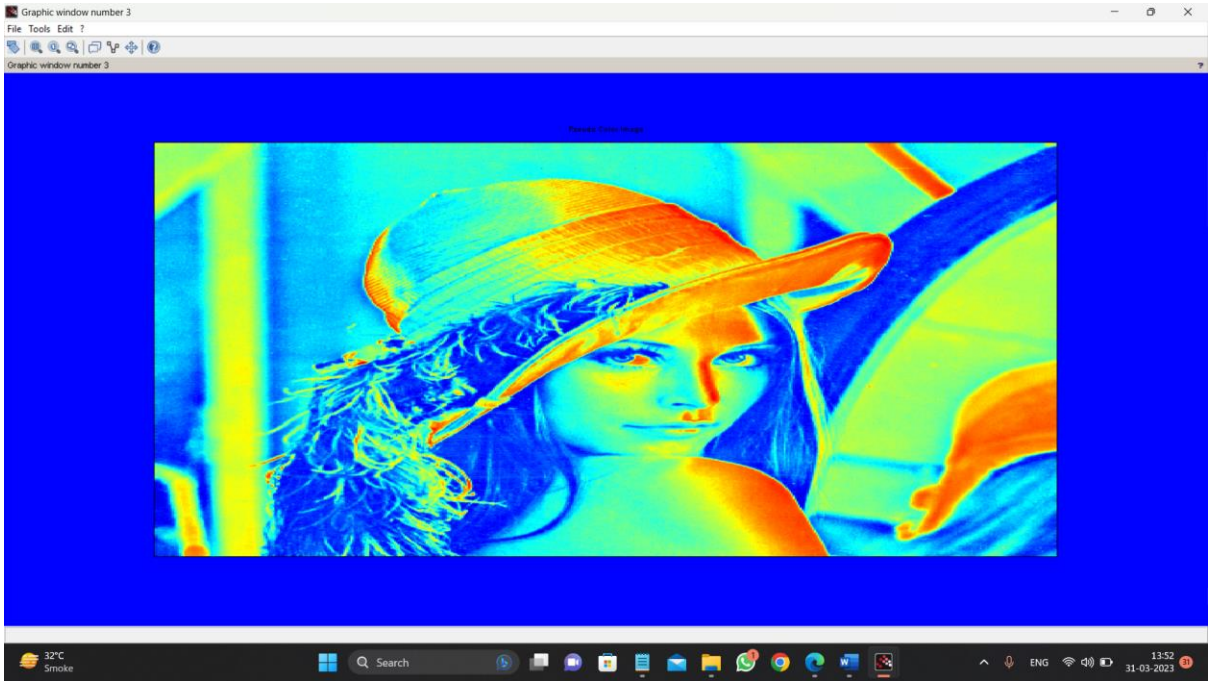
Aim :- Program to apply false colouring(pseudo) on a gray scale image

Code :-
```
clc;
close;
a = imread('lena.jpeg');

//Displaying Original RGB image
figure(1);
imshow(a);
title("Original Image")

//Displaying Gray level image
b = rgb2gray(a);
figure(2);
imshow(b);
title("Gray Level Image")

//Displaying False coloring(Pseudo) image
figure(3)
imshow(b,jetcolormap(256));
title("Pseudo Color Image");
```

Output :-







Practical 15

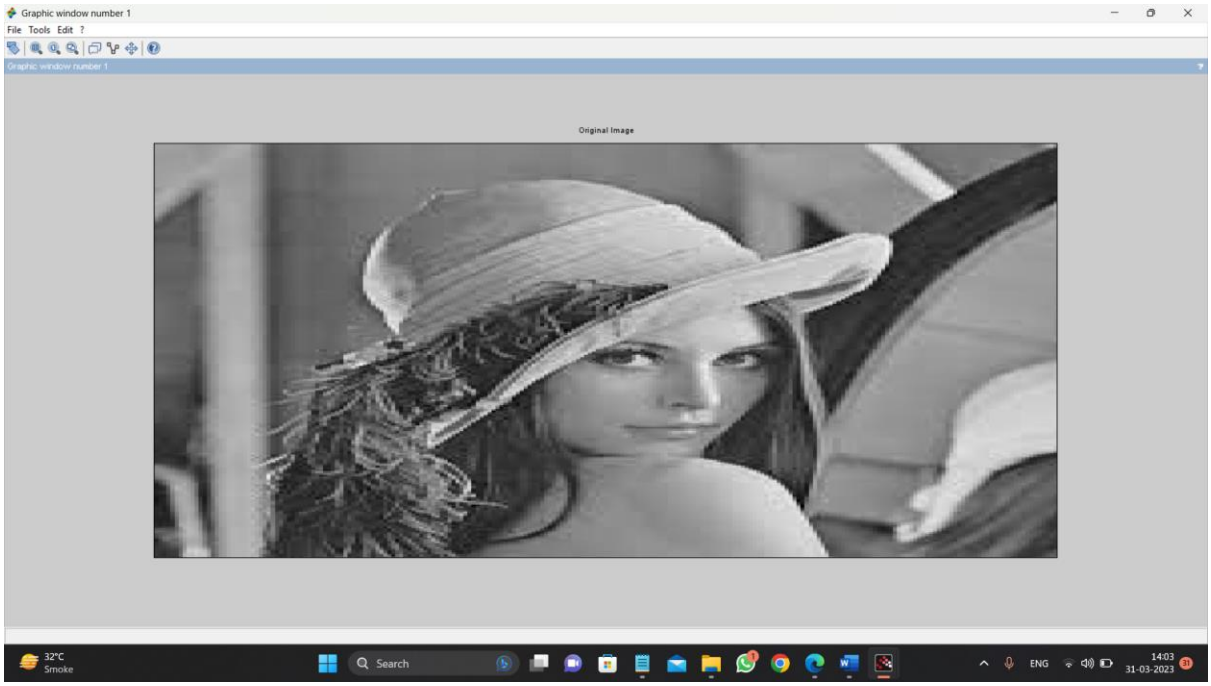
Aim :- Program to apply color to gray image

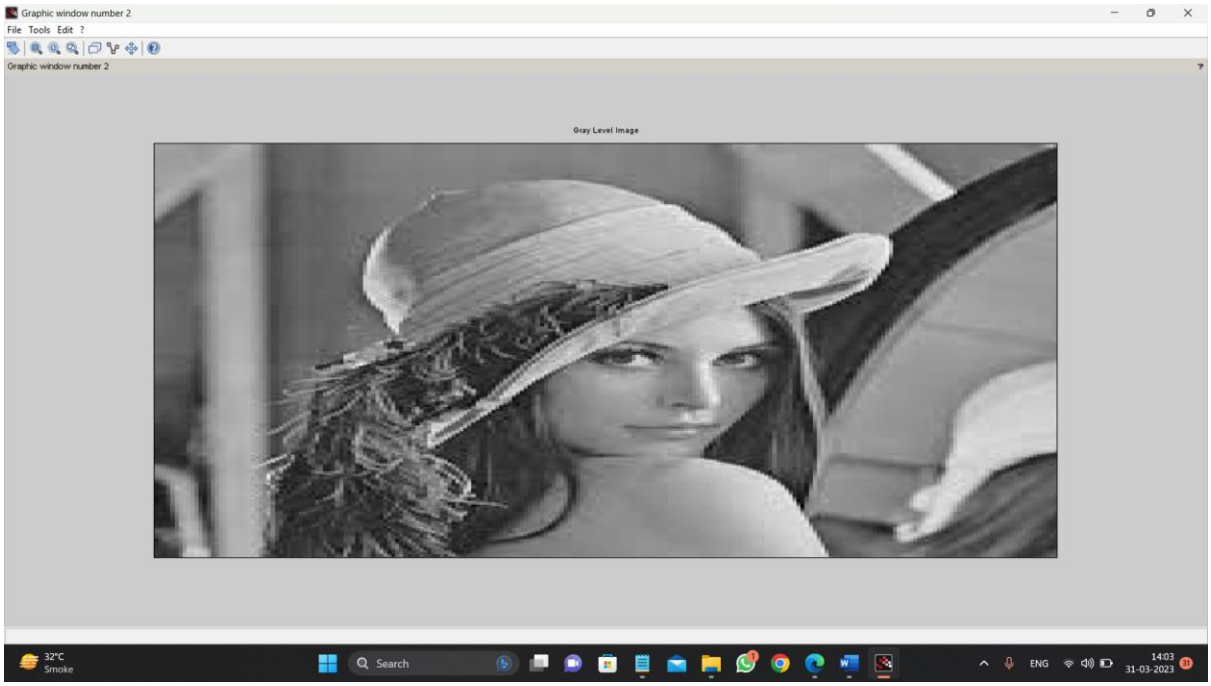
Code :-

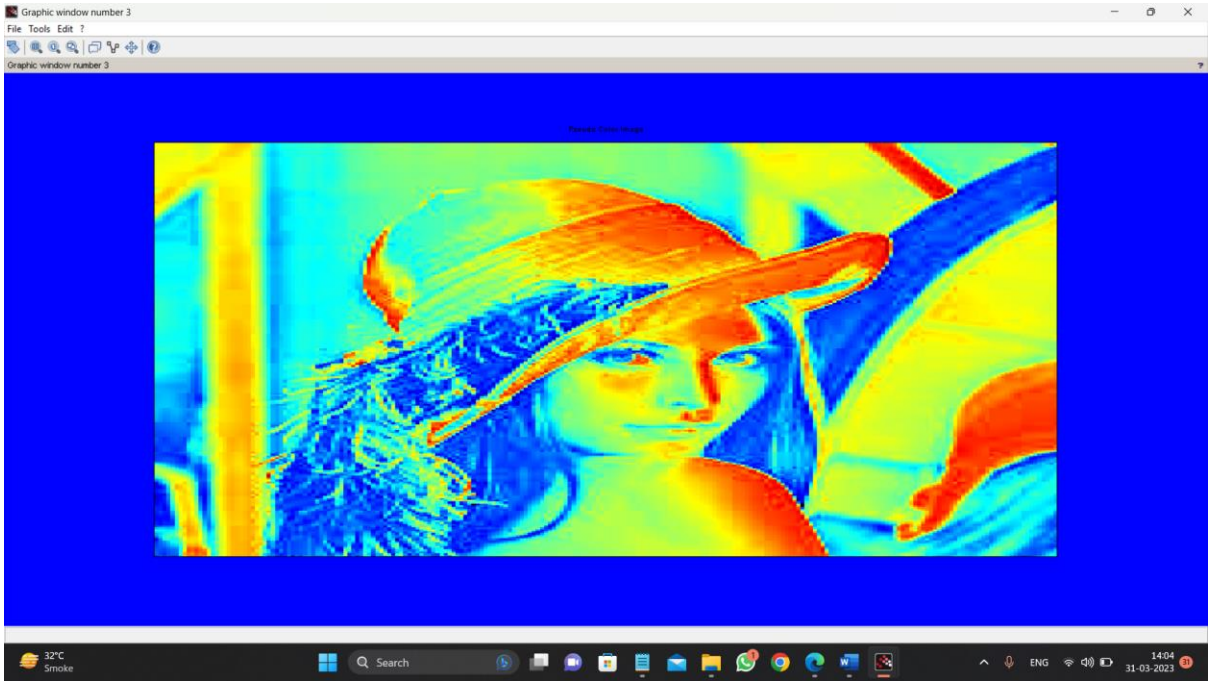
```
clc;
close;

a = imread('lenag.jpeg');
```

```
//Displaying Original RGB image
figure(1);
imshow(a);
title("Original Image")

//Displaying Gray level image
b = rgb2gray(a);
figure(2);
imshow(b);
title("Gray Level Image")

//Displaying False coloring(Pseudo) image
figure(3)
imshow(b,jetcolormap(256));
title("Pseudo Color Image");
```

Output :-




Graphic window number 2
File Tools Edit ?
Graphic window number 2
Gray Level Image
32°C
Smoke
Search
ENG
14:03
31-03-2023


Graphic window number 3
File Tools Edit ?
Graphic window number 3
32°C
Smoke
Search
ENG
14:04
31-03-2023