# Question#1

**Part 1: Code**

**ConnectedNeighbors Function:**

This function is in file' L164066P2aQ1.txt';

**ConnectedSet Function:**

This function is in file' L164066P2aQ1.txt';

**Part 2: Output**

Pixel = (45, 67)

Threshold = 2.

(Black and White Division)

Original Image

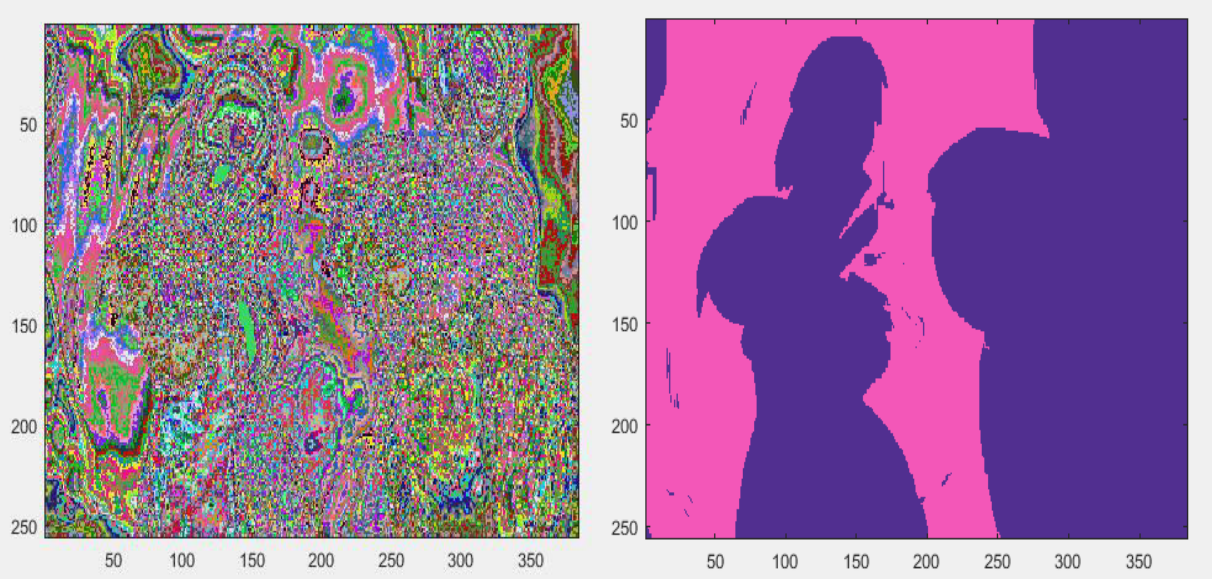
Resultant Image

## Part 3:

```
x=imread ('C: \Users\l164066\Desktop\Orignal.tif');
y=imread ('C: \Users\l164066\Desktop\color.tif');
N=max(x (:));
Image(x);
Colormap (rand (N, 3));
Axis ('image1');
M=max(y (:));
Image(y);
Colormap (rand (M, 3));
Axis ('image2');
```

**Input**

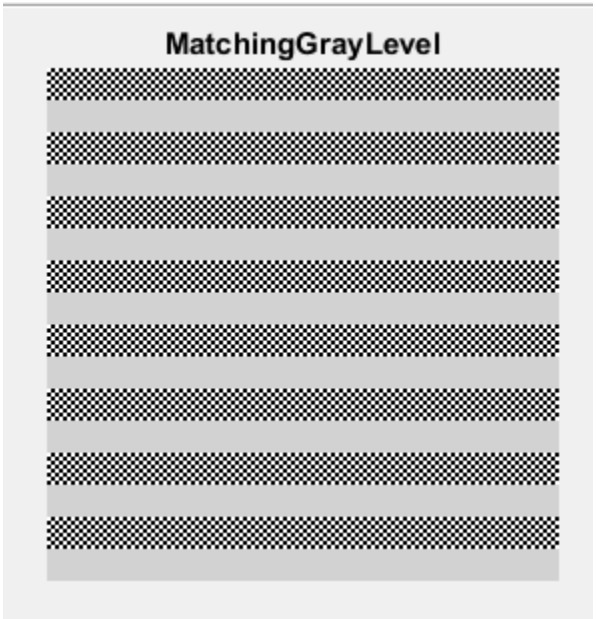
## Output


50
100
150
200
250
50
100
150
200
250
300
350
50
100
150
200
250
50
100
150
200
250
300
350

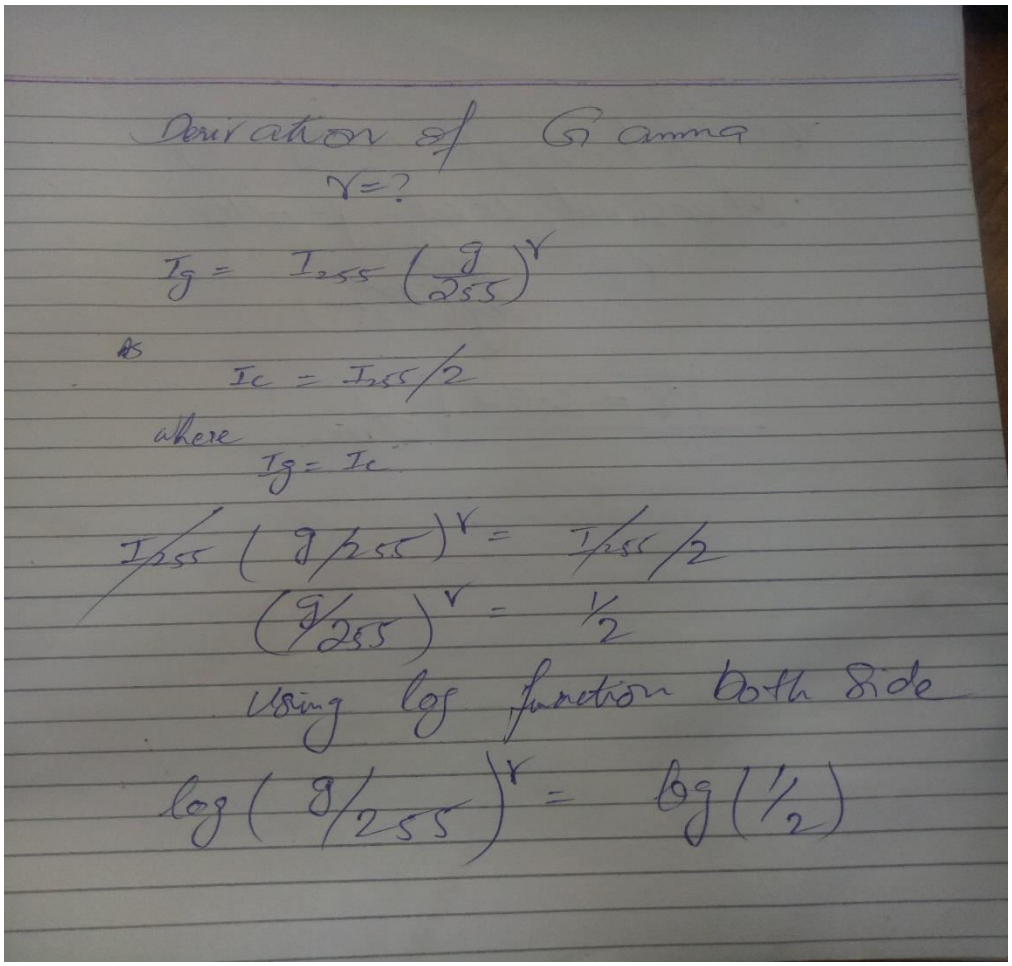
# Question#2

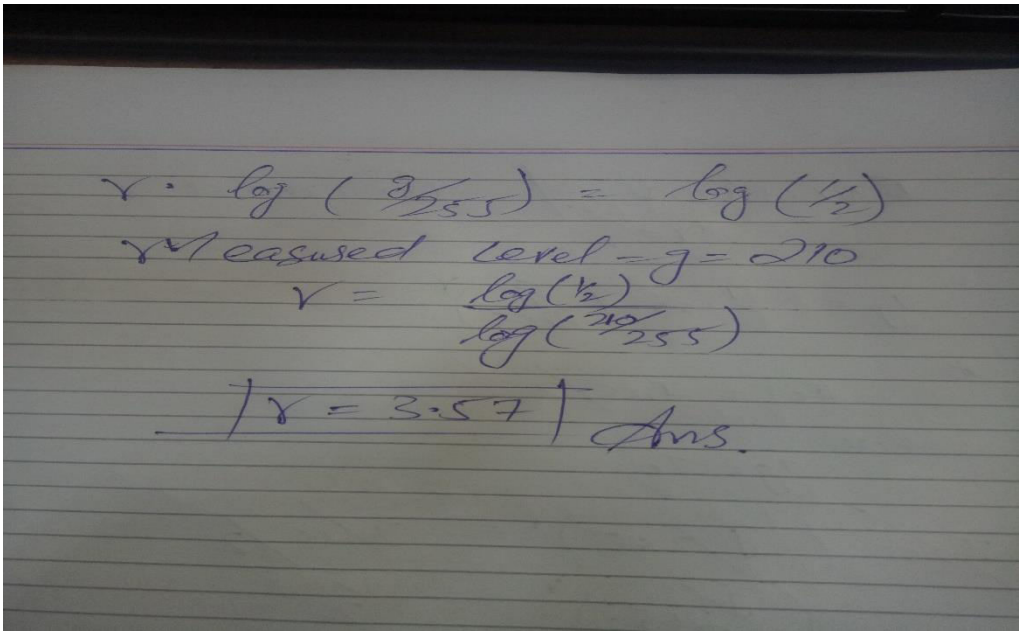
## Part 1:

```
BlackWhitePatch=zeros (4, 4)
BlackWhitePatch (1, 1) =255;
BlackWhitePatch (1, 2) =255;
BlackWhitePatch (2, 1) =255;
BlackWhitePatch (2, 2) =255;
BlackWhitePatch (3, 3) =255;
BlackWhitePatch (3, 4) =255;
BlackWhitePatch (4, 3) =255;
BlackWhitePatch (4, 4) =255;
Line=zeros (16, 64);
x=BlackWhitePatch;
line =
[x,x,x,x,x,x,x,x,x,x,x,x,x,x,x,x;x,x,x,x,x,x,x,x,x,x,x,x,x,x,x,x;x,x,x,x,x,x,
x,x,x,x,x,x,x,x,x,x;x,x,x,x,x,x,x,x,x,x,x,x,x,x,x,x];
line2 = zeros (16,256);
line2 = [line, line, line, line];
MatchingGrayLevel= zeros (256,256);
gray_MatchingGrayLevel = zeros (16,256);
gray_MatchingGrayLevel (1:16, 1:256) = 210;
MatchingGrayLevel=[line2;gray_MatchingGrayLevel;line2;gray_MatchingGrayLevel;
line2;gray_MatchingGrayLevel;line2;gray_MatchingGrayLevel;line2;gray_Matching
GrayLevel;line2;gray_MatchingGrayLevel;line2;gray_MatchingGrayLevel;line2;gra
y_MatchingGrayLevel];
Imshow (MatchingGrayLevel, [0,256]), title ('MatchingGrayLevel'), colormap ('gray');
```



**Part 2:**


Derivation of Gamma
γ=?
$I_g = I_{255}\left(\frac{g}{255}\right)^{\gamma}$
As
$I_c = I_{255}/2$
where
$I_g = I_c$
$I_{255}\left(g/255\right)^{\gamma} = I_{255}/2$
$\left(g/255\right)^{\gamma} = 1/2$
Using log function both side
$\log\left(g/255\right)^{\gamma} = \log(1/2)$


$\gamma \cdot \log\left(g/255\right) = \log(1/2)$
γ Measured level = g = 210
$\gamma = \frac{\log(1/2)}{\log(210/255)}$
γ = 3.57 Ans.

## Part 3:

```
Img = imread ('C: \Users\l164066\Desktop\linear.tif');
Imshow (img);
Gamma = 3.57;
Correction = 255*(double (img)/255). ^ (double (1/3.57));
Figure (2);
Image (uint8 (Correction) +1);
Set (GCA, 'Box', 'off');
Axis ('image');
Graymap = [0:255; 0:255; 0:255]'/255;
Colormap (graymap);
```

**Input Image**

**Output Gamma Corrected Image**