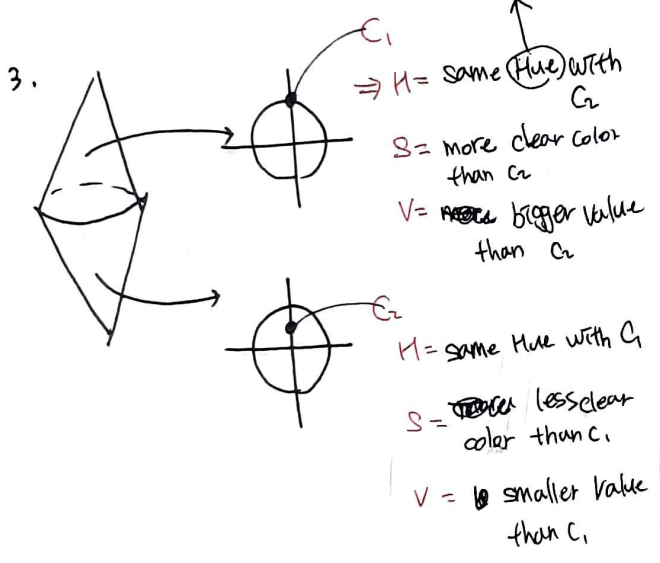
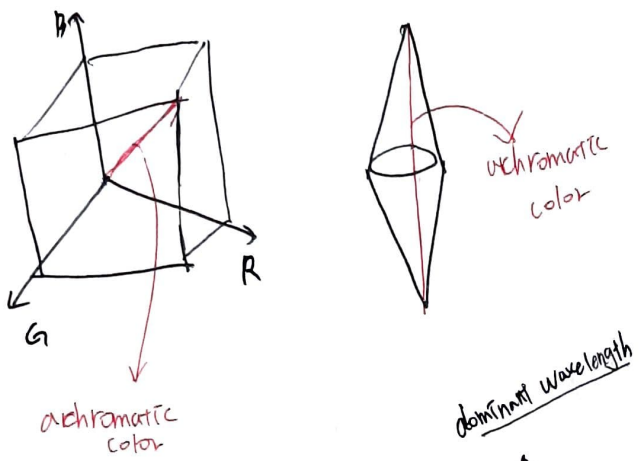


1. $8 \times 3 \times 1920 \times 1080 \times 30 \times 3600$
 = 625. no G13

2.



$\Rightarrow H = \text{same}$
 $S = C_1$ is Larger
 $V = C_1$ is Larger

4. i) if gamma is below 1,
 the range of dark pixels in an image would be expanded

ii) if gamma is above 1,
 the range of bright pixels in an image would be expanded.

5. ONPP PP-7

negative

BP	B4	np	n4
Sp	5p	b4	6p
4p	44	3p	34
14	1p	24	2p

6. Increase both value

7. decrease 5th parameter value

8. ①

```
int main()
{
    Mat src = imread("lena.png");
    Mat yuvChannels[3]; ①
    split(src, yuvChannels);
}
```

```
int main()
{
    Mat src = imread("lena.png", 1);
    imshow("R", src[2]); (not yuv)
    waitkey(0);
    return 0;
}
```

change 0 to 1
 use BGR and R-channel is 2.

9. waitkey(500/4ps);

Put this code below the
"imshow (~)"

↓

while (1) {

cap >> frame;

imshow ("Window", frame);

waitkey(500/4ps);

}

12. 3x3

40 →

40	20	40
40	40	40
40	40	40

→ change all
value to 40
In the mesh

45 → change all value to 45
In the mesh

65 → change all value in the mesh
to 65

10

no → change all value in the mesh
to no.

13.

0	1	2	...
6	7	8	...
12	13	14	...
18	19	20	...
24	25	26	...

0.097

~~16 16 16~~ ← average gray = 1.23...

≈ 1.3

multiply this
to Input

16
16.895 ≈ 0.8 multiply this to input

16 ← mid

average ≈ 0.8

10. on 31, 8 bin

0 N3 : 1 bin : $\frac{4}{48} \rightarrow 0.833333333$

4 N4 : 2 bin : $\frac{4}{48} \rightarrow 0.833333333$

8 N11 : 3 bin : $\frac{4}{48} \rightarrow 0.833333333$

12-15 4 bin : $\frac{4}{48} \rightarrow 0.833333333$

16-19 5 bin : $\frac{4}{48} \rightarrow 0.833333333$

20-23 6 bin : $\frac{4}{48} \rightarrow 0.833333333$

24-27 7 bin : $\frac{4}{48} \rightarrow 0.833333333$

28-31 8 bin : $\frac{4}{48} \rightarrow 0.833333333$

11.

40 → 40

45 → 45

65 → 65

no → no

14.

15	15	15	15
15	0	0	15
0	0	0	15
15	15	0	15

15.

	5	10	30	40
	5	10	30	40
	5	5	25	40
	5	5	25	40

$$g_{\text{green}} = 2 \times \begin{bmatrix} & & \\ & & \\ 10 & & \end{bmatrix} - \begin{bmatrix} 0 & 2 & 0 \\ 1 & 2 & 6 \\ 0 & 1 & 0 \end{bmatrix}$$

10 →

10	18	60
P	18	54
10	P	50

20

30 →

20	54	80
18	54	12
10	45	80

	6	
2	6	8
	5	

45 →

10	18	60
P	P	45
10	P	50

	2	
1	1	5
	1	

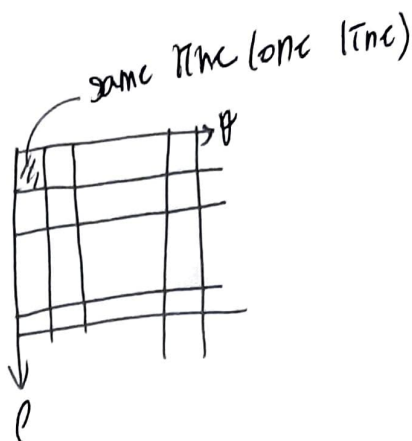
25 →

20	54	80
P	45	12
10	45	80

	6	
7	5	8
	5	

60.6

16



i) the number of pixels
on the line

ii) same with number of pixels
on image.

17.

$$g_x = (5 + 10 + 10) - (5 + 10 + 10) = 0$$

$$g_y = 40 - 20 = 20$$

$$\mu = \sqrt{0^2 + 20^2} = 20$$

$$\mu = 0$$

$$g_x = 0, g_y = 0 \rightarrow 0 \quad \mu = 0$$

$$g_x = (5 + 20 + 10) - (50 + 20 + 10) = 0$$

$$g_y = (10 + 10 + 60) - (5 + 10 + 5) = 40 - 20 = 20$$

$$\mu(d, y) = \sqrt{0^2 + 20^2} = 20$$