

Nama : Muhamad Faqih Azhar

NIM : 0110221092

Kelas : 5TI03 / Jumat Pagi / A-109

Tugas 1 Konversi Citra Warna ke Grayscale dan Biner

Yellow R = 255 G = 255 B = 0	Orange R = 255 G = 102 B = 0	Green R = 0 G = 255 B = 0
Cyan R = 0 G = 255 B = 255	Violet R = 204 G = 102 B = 204	White R = 255 G = 255 B = 255
Black R = 0 G = 0 B = 0	Turquoise R = 102 G = 255 B = 204	Brown R = 153 G = 102 B = 51

Pertanyaan:

1. Dari gambar diatas, buatlah hasil matriks citra *grayscale* nya?
2. Buatlah hasil matriks binernya menggunakan *threshold* 150 dan 180?
3. Buatlah program untuk menkonversi citra Warna (gambar bebas) kedalam citra *Grayscale* dan Biner, dengan menggunakan bahasa pemrograman Python?

Jawaban:

1. Konversi Citra Warna ke *Grayscale*

$$\text{Grayscale} = 0.299 R + 0.587 G + 0.114 B$$

$$\begin{aligned} G_{\text{Yellow}} &= (0.299 \times 255) + (0.587 \times 255) + (0.114 \times 0) \\ &= 76.245 + 149.685 + 0 \\ &= 225.93 \rightarrow 226 \end{aligned}$$

$$\begin{aligned} G_{\text{Orange}} &= (0.299 \times 255) + (0.587 \times 102) + (0.114 \times 0) \\ &= 76.245 + 59.874 + 0 \\ &= 136.119 \rightarrow 136 \end{aligned}$$

$$\begin{aligned} G_{\text{Green}} &= (0.299 \times 0) + (0.587 \times 255) + (0.114 \times 0) \\ &= 0 + 149.685 + 0 \end{aligned}$$

$$= 149.685 \rightarrow 150$$

$$\begin{aligned} G_{\text{Cyan}} &= (0.299 \times 0) + (0.587 \times 255) + (0.114 \times 255) \\ &= 0 + 149.685 + 29.07 \\ &= 178.755 \rightarrow 179 \end{aligned}$$

$$\begin{aligned} G_{\text{Violet}} &= (0.299 \times 204) + (0.587 \times 102) + (0.114 \times 204) \\ &= 60.996 + 59.874 + 23.256 \\ &= 144.126 \rightarrow 144 \end{aligned}$$

$$\begin{aligned} G_{\text{White}} &= (0.299 \times 255) + (0.587 \times 255) + (0.114 \times 255) \\ &= 76.245 + 149.685 + 29.07 \\ &= 255 \end{aligned}$$

$$\begin{aligned} G_{\text{Black}} &= (0.299 \times 0) + (0.587 \times 0) + (0.114 \times 0) \\ &= 0 + 0 + 0 \\ &= 0 \end{aligned}$$

$$\begin{aligned} G_{\text{Turq...}} &= (0.299 \times 102) + (0.587 \times 255) + (0.114 \times 204) \\ &= 30.498 + 149.685 + 23.256 \\ &= 203.439 \rightarrow 203 \end{aligned}$$


$$\begin{aligned} G_{\text{Brown}} &= (0.299 \times 153) + (0.587 \times 102) + (0.114 \times 51) \\ &= 45.747 + 59.874 + 5.814 \\ &= 111.435 \rightarrow 111 \end{aligned}$$

Jadi, berikut ini adalah hasil konversi Citra Warna di atas ke Citra Grayscale

226	136	150
179	144	255
0	203	111


2. Konversi Citra *Grayscale* ke Biner

226	136	150
179	144	255
0	203	111


 $T = 150$

1	0	1
1	0	0
0	1	0

226	136	150
179	144	255
0	203	111


 $T = 180$

1	0	1
0	0	0
0	1	0

3. Berikut ini adalah tautan Github untuk program konversi citra Warna

<https://github.com/FaqihAzh/image-processing>