

Nama = Mahesa Difa Ramadhan

Kelas = 3A

NPM = 2013020048.

"Pengolahan Citra"

- 3.) Untuk menentukan jarak setiap pixelnya, kita menggunakan rumus jarak euclidean.

$$d = \sqrt{(R_1 - R_2)^2 + (G_1 - G_2)^2 + (B_1 - B_2)^2}$$

Baris 1
(213, 80, 155) } warna Terdekat = Merah (index 1)

* Jarak ke Hitam (0, 0, 0)

$$\begin{aligned} d &= \sqrt{(213-0)^2 + (80-0)^2 + (155-0)^2} \\ &= \sqrt{45369 + 6400 + 24025} \\ &= \sqrt{75794} \\ &= 275,23 \end{aligned}$$

* Jarak ke Merah (255, 0, 0)

$$\begin{aligned} d &= \sqrt{(213-255)^2 + (80-0)^2 + (155-0)^2} \\ &= \sqrt{1764 + 6400 + 24025} \\ &= \sqrt{32189} \\ &= 179,46 \end{aligned}$$

* Jarak ke Hijau (0, 255, 0)

$$\begin{aligned} d &= \sqrt{(213-0)^2 + (80-255)^2 + (155-0)^2} \\ &= \sqrt{45639 + 30625 + 24025} \\ &= \sqrt{100019} \\ &= 316,22 \end{aligned}$$

* Jarak ke Biru (0, 0, 255)

$$\begin{aligned} d &= \sqrt{(213-0)^2 + (80-0)^2 + (155-255)^2} \\ &= \sqrt{45369 + 6400 + 10000} \\ &= \sqrt{61769} \\ &= 248,54 \end{aligned}$$

Pixel (24, 60, 122) = warna terdekat = hitam (Index 0)

* Hitam

$$\begin{aligned}d &= \sqrt{(24-0)^2 + (60-0)^2 + (122-0)^2} \\&= \sqrt{576 + 3600 + 14884} \\&= \sqrt{19060} \\&= 138,03\end{aligned}$$

* Merah

$$\begin{aligned}d &= \sqrt{(24-255)^2 + (60-0)^2 + (122-0)^2} \\&= \sqrt{53361 + 3600 + 14884} \\&= \sqrt{71845} \\&= 268,09\end{aligned}$$

* Hijau

$$\begin{aligned}d &= \sqrt{(24-0)^2 + (60-255)^2 + (122-0)^2} \\&= \sqrt{576 + 38025 + 14884} \\&= \sqrt{53485} \\&= 231,28\end{aligned}$$

* Biru

$$\begin{aligned}d &= \sqrt{(24-0)^2 + (60-0)^2 + (122-255)^2} \\&= \sqrt{576 + 3600 + 17689} \\&= \sqrt{21865} \\&= ~~147,85~~ 147,85\end{aligned}$$

Pixel (212, 9, 19) = warna Terdekat = merah (Index 1)

* Hitam

$$\begin{aligned}d &= \sqrt{(212-0)^2 + (9-0)^2 + (19-0)^2} \\&= \sqrt{44944 + 81 + 361} \\&= \sqrt{45386} \\&= 213,08\end{aligned}$$

* Merah

$$\begin{aligned}d &= \sqrt{(212-255)^2 + (9-0)^2 + (19-0)^2} \\&= \sqrt{1849 + 81 + 361} \\&= \sqrt{2291} \\&= 47,87\end{aligned}$$

* Hijau.

$$\begin{aligned}d &= \sqrt{(212-0)^2 + (9-255)^2 + (19-0)^2} \\&= \sqrt{44944 + 60516 + 361} \\&= \sqrt{105821} \\&= 325,30\end{aligned}$$

* Biru *

$$\begin{aligned}d &= \sqrt{(212-0)^2 + (9-0)^2 + (19-255)^2} \\&= \sqrt{44944 + 81 + 55696} \\&= \sqrt{100721} \\&= 317,36\end{aligned}$$

Baris ke 2.

Pixel (211, 200, 155) = warna terdekat = merah (index 1)

* Hitam

$$\begin{aligned}d &= \sqrt{(211-0)^2 + (200-0)^2 + (155-0)^2} \\&= \sqrt{44521 + 40000 + 24025} \\&= \sqrt{108546} \\&= 329,56\end{aligned}$$

* Merah

$$\begin{aligned}d &= \sqrt{(211-255)^2 + (200-0)^2 + (155-0)^2} \\&= \sqrt{1936 + 40000 + 24025} \\&= \sqrt{65961} \\&= ~~255~~ 256,86\end{aligned}$$

* Hijau.

$$\begin{aligned}d &= \sqrt{(211-0)^2 + (200-255)^2 + (155-0)^2} \\&= \sqrt{44521 + 3025 + 24025} \\&= \sqrt{71571} \\&= 267,66\end{aligned}$$

* Biru

$$\begin{aligned}d &= \sqrt{(211-0)^2 + (200-0)^2 + (155-255)^2} \\&= \sqrt{44521 + 40000 + 10000} \\&= \sqrt{94521} \\&= 307,46\end{aligned}$$

Pixel (153, 155, 154) = warna Terdekat = Hijau (index 2)

* Hitam

$$\begin{aligned}d &= \sqrt{(153-0)^2 + (155-0)^2 + (154-0)^2} \\&= \sqrt{23409 + 24025 + 23716} \\&= \sqrt{71150} \\&= 266,83\end{aligned}$$

* Merah

$$\begin{aligned}d &= \sqrt{(153-255)^2 + (155-0)^2 + (154-0)^2} \\&= \sqrt{10404 + 24025 + 23716} \\&= \sqrt{58145} \\&= 241,14\end{aligned}$$

* Hijau

$$\begin{aligned}d &= \sqrt{(153-0)^2 + (155-255)^2 + (154-0)^2} \\&= \sqrt{23409 + 10000 + 23716} \\&= \sqrt{57125} \\&= 238,94\end{aligned}$$

* Biru

$$\begin{aligned}d &= \sqrt{(153-0)^2 + (155-0)^2 + (154-255)^2} \\&= \sqrt{23409 + 24025 + 10201} \\&= \sqrt{57635} \\&= 240,06\end{aligned}$$

Pixel (8, 8, 100) = warna terdekat = Hitam (index 0)

✧ Hitam

$$\begin{aligned}d &= \sqrt{(8-0)^2 + (8-0)^2 + (100-0)^2} \\&= \sqrt{64 + 64 + 10000} \\&= \sqrt{10128} \\&= ~~100,64~~ 100,64\end{aligned}$$

✧ Merah

$$\begin{aligned}d &= \sqrt{(8-255)^2 + (8-0)^2 + (100-0)^2} \\&= \sqrt{61009 + 64 + 10000} \\&= \sqrt{71073} \\&= 266,62\end{aligned}$$

✧ Hijau

$$\begin{aligned}d &= \sqrt{(8-0)^2 + (8-255)^2 + (100-0)^2} \\&= \sqrt{64 + 61009 + 10000} \\&= \sqrt{71073} \\&= 266,62\end{aligned}$$

✧ Biru

$$\begin{aligned}d &= \sqrt{(8-0)^2 + (8-0)^2 + (100-255)^2} \\&= \sqrt{64 + 64 + 24025} \\&= \sqrt{24153} \\&= 155,45\end{aligned}$$

Baris 3

Pixel (213, 222, 12) = warna terdekat = Hijau (index 2)

✧ Hitam

$$\begin{aligned}d &= \sqrt{(213-0)^2 + (222-0)^2 + (12-0)^2} \\&= \sqrt{45369 + 49284 + 144} \\&= \sqrt{94797} \\&= 307,92\end{aligned}$$

✧ Merah

$$\begin{aligned}d &= \sqrt{(213-255)^2 + (222-0)^2 + (12-0)^2} \\&= \sqrt{1764 + 49284 + 144} \\&= \sqrt{51252} \\&= 226,54\end{aligned}$$

* Hijau

$$\begin{aligned}d &= \sqrt{(213-0)^2 + (222-255)^2 + (12-0)^2} \\&= \sqrt{45369 + 1089 + 144} \\&= \sqrt{46602} \\&= 215,94\end{aligned}$$

* Biru

$$\begin{aligned}d &= \sqrt{(213-0)^2 + (222-0)^2 + (12-255)^2} \\&= \sqrt{45369 + 49284 + 59049} \\&= \sqrt{153702} \\&= 392,01\end{aligned}$$

Pixel (15, 25, 155) = warna terdekat = Biru (index 3)

* Hitam

$$\begin{aligned}d &= \sqrt{(15-0)^2 + (25-0)^2 + (155-0)^2} \\&= \sqrt{255 + 625 + 24025} \\&= \sqrt{24875} \\&= 157,73\end{aligned}$$

* Merah

$$\begin{aligned}d &= \sqrt{(15-255)^2 + (25-0)^2 + (155-0)^2} \\&= \sqrt{57600 + 625 + 24025} \\&= \sqrt{82250} \\&= 286,86\end{aligned}$$

* Hijau

$$\begin{aligned}d &= \sqrt{(15-0)^2 + (25-255)^2 + (155-0)^2} \\&= \sqrt{255 + 52900 + 24025} \\&= \sqrt{77150} \\&= 277,74\end{aligned}$$

* Biru

$$\begin{aligned}d &= \sqrt{(15-0)^2 + (25-0)^2 + (155-255)^2} \\&= \sqrt{255 + 625 + 10000} \\&= \sqrt{10850} \\&= 104,12\end{aligned}$$

Pixel (143, 100, 123) : warna terdekat = merah (index 1)

*Hitam

$$\begin{aligned}d &= \sqrt{(143-0)^2 + (100-0)^2 + (123-0)^2} \\&= \sqrt{20449 + 10000 + 15129} \\&= \sqrt{45578} \\&= 213,59\end{aligned}$$

*Merah

$$\begin{aligned}d &= \sqrt{(143-255)^2 + (100-0)^2 + (123-0)^2} \\&= \sqrt{12544 + 10000 + 15129} \\&= \sqrt{37673} \\&= 194,07\end{aligned}$$

*Hijau.

$$\begin{aligned}d &= \sqrt{(143-0)^2 + (100-255)^2 + (123-0)^2} \\&= \sqrt{20449 + 24025 + 15129} \\&= \sqrt{59503} \\&= 243,98\end{aligned}$$

*Biru

$$\begin{aligned}d &= \sqrt{(143-0)^2 + (100-0)^2 + (123-255)^2} \\&= \sqrt{20449 + 10000 + 17424} \\&= \sqrt{47873} \\&= 218,75\end{aligned}$$

Kesimpulan

Matrix Index warna berdasarkan color palette

| | | |
|---|---|---|
| 1 | 0 | 1 |
| 1 | 2 | 0 |
| 2 | 3 | 1 |