Nama : Irwan April Liansah
NPM : 2213020151
Kelas : 3A

Tugas 1 Pengolahan Citra

1.) P x 1 = 213, 80, 155

G = (0,299 x 213) + (0,5870 x 80) + (0,1140 x 155)

= 63,687 + 46,96 + 17,67 = 128,317

P x 2 = 211, 200, 155

G = (0,299 x 211) + (0,5870 x 200) + (0,1140 x 155)

= 63,089 + 117,4 + 17,67 = 198,159

P x 3 = 213, 222, 12

G = (0,299 x 213) + (0,587 x 222) + (0,114 x 12)

= 63,687 + 130,314 + 1,368 = 195,369

P x 4 = 24, 60, 122

G = (0,299 x 24) + (0,587 x 60) + (0,114 x 122)

= 7,176 + 35,22 + 13,908 = 56,304

P x 5 = 153, 155, 154

G = (0,299 x 153) + (0,587 x 155) + (0,114 x 154)

= 45,747 + 90,985 + 17,556 = 154,288

P x 6 = 15, 25, 155

G = (0,299 x 15) + (0,587 x 25) + (0,114 x 155)

= 4,485 + 14,675 + 17,67 = 36,83

P x 7 = 212, 9, 19

G = (0,299 x 212) + (0,587 x 9) + (0,114 x 19)

= 63,388 + 5,283 + 2,166 = 70,837 =

P x 8 = 8, 8, 100

G = (0,299 x 8) + (0,587 x 8) + (0,114 x 100)

= 2,392 + 4,696 + 11,4 = 18,488 =

P x 9 = 143, 100, 123

G = (0,299 x 143) + (0,587 x 100) + (0,114 x 123)

= 42,757 + 58,7 + 14,022 = 115,479 =

2.) ambil nilai intensitas dengan rumus :

I = (0,2989 x R) + (0,5870 x G) + (0,1140 x B)

Jika I ≥ 110 piksel maka diberi nilai 1 (putih)

Jika I ≤ 110 piksel maka diberi nilai 0 (hitam)

Baris 1,

1. (213, 80, 155)

I = (0,2989 x 213) + (0,5870 x 8) + (0,1140 x 155)

= 63,66657 + 46,96 + 17,67 = 128,30 ≥ 110 = 1 //

2. (24, 60, 122)

I = 7,1736 + 35, 22 + 13,908

= 56,30 ≤ 110 = 0

3. (212, 9, 19)

I = 63,3668 + 5,283 + 2,166

= 70,82 ≤ 110 = 0

Baris 2,

1. (211, 200, 155)

I = 63,0679 + 117, 4 + 17,67

= 198,1379 ≥ 110 = 1

2. (153, 155, 154)

I = 45, 2217 + 90, 985 + 17, 556

= 153, 76 ≥ 110 = 1

3. (8, 8, 100)

I = 2,3912 + 4, 696 + 11, 4

= 18, 49 ≤ 110 = 0

Baris 3,

1. (213, 222, 12)

I = 63, 6657 + 130, 314 + 1, 368

= 195, 35 ≥ 110 = 1

2. (15, 25, 155)

I = 4, 4835 + 14, 675 + 17, 67

= 36, 83 ≤ 110 = 0

3. (143, 100, 123)

I = 42, 2237 + 58, 7 + 14, 022

= 114, 94 ≥ 110 = 1

Hasil akhir dalam konversi biner

$$\begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \end{pmatrix}$$

→ Baris pertama

→ kedua

→ ketiga

Soal 3. Index setiap pixel berdasar color pallete

Rumus jarak Euclidean Jarak = $\sqrt{(R_1-R_2)^2+(G_1-G_2)^2+(B_1-B_2)^2}$

1. Piksel (1,1) = (213, 80, 155)
   - Hitam = $\sqrt{(213-0)^2+(80-0)^2+(155-0)^2}$ = $\sqrt{45369+6400+24025}$ = $\sqrt{75794}$ = 275,24
   - Merah = $\sqrt{1764+6400+24025}$ = $\sqrt{32189}$ = 179,42
   - Hijau = $\sqrt{45369+30625+24025}$ = $\sqrt{100019}$ = 316,14
   - Biru = $\sqrt{45369+6400+10000}$ = $\sqrt{61769}$ = 248,54

3. Piksel (1,3) = ([redacted]) (212, 9, 19)
   - Hitam = $\sqrt{44944+81+361}$ = $\sqrt{45386}$ = 213,14
   - Merah = $\sqrt{1849+81+361}$ = $\sqrt{2291}$ = 47,87
   - Hijau = $\sqrt{44944+60516+361}$ = $\sqrt{105821}$ = 325,32
   - Biru = $\sqrt{44944+81+55696}$ = $\sqrt{100721}$ = 317,47

2. Piksel (1,2) = (24, 60, 122)
   - Hitam = $\sqrt{576+3600+14884}$ = $\sqrt{19060}$ = 138,02
   - Merah = $\sqrt{53361+3600+14884}$ = $\sqrt{71845}$ = 268,03
   - Hijau = $\sqrt{576+38025+14884}$ = $\sqrt{53485}$ = 231,30
   - Biru = $\sqrt{576+3600+17689}$ = $\sqrt{21865}$ = 147,85

4. Piksel (2,1) = (211, 200, 155)

- Hitam = $\sqrt{44521 + 40000 + 24025} = \sqrt{108546} = 329,48$
- Merah = $\sqrt{1936 + 40000 + 24025} = \sqrt{65961} = 256,92$
- Hijau = $\sqrt{44521 + 3025 + 24025} = \sqrt{71571} = 267,62$
- Biru = $\sqrt{44521 + 40000 + 10000} = \sqrt{94521} = 307,44$

5. Piksel (2,2) = (153, 155, 154)

- Hitam = $\sqrt{23409 + 24025 + 23716} = \sqrt{71150} = 266,88$
- Merah = $\sqrt{10404 + 24025 + 23716} = \sqrt{58145} = 241,14$
- Hijau = $\sqrt{23409 + 10000 + 23716} = \sqrt{57125} = 238,99$
- Biru = $\sqrt{23409 + 24025 + 10201} = \sqrt{57635} = 240,07$

6. Piksel (2,3) = (8,8,100)

- Hitam = $\sqrt{64 + 64 + 10000} = \sqrt{10128} = 100,64$
- Merah = $\sqrt{61009 + 64 + 10000} = \sqrt{71073} = 266,61$
- Hijau = $\sqrt{64 + 61009 + 10000} = \sqrt{71073} = 266,61$
- Biru = $\sqrt{64 + 64 + 24025} = \sqrt{24153} = 155,47$

7. Piksel (3,1) = (213, 222, 12)

- Hitam = $\sqrt{45369 + 49284 + 144} = \sqrt{94797} = 307,93$
- Merah = $\sqrt{1764 + 49284 + 144} = \sqrt{51252} = 226,48$
- Hijau = $\sqrt{45369 + 1089 + 144} = \sqrt{46602} = 215,96$
- Biru = $\sqrt{45369 + 49284 + 59049} = \sqrt{153702} = 392,03$

8. Piksel (3,2) = (15, 25, 155)

- Hitam = $\sqrt{225 + 625 + 24025}$ = $\sqrt{24875}$ = 157,76
- Merah = $\sqrt{57600 + 625 + 24025}$ = $\sqrt{82250}$ = 286,87
- Hijau = $\sqrt{225 + 52900 + 24025}$ = $\sqrt{77150}$ = 277,75
- Biru = $\sqrt{225 + 625 + 10000}$ = $\sqrt{10850}$ = 104,15

9. Piksel (3,3) = (143, 100, 123)

- Hitam = $\sqrt{20449 + 10000 + 15129}$ = $\sqrt{45578}$ = 213,59
- Merah = $\sqrt{12544 + 10000 + 15129}$ = $\sqrt{37673}$ = 194,12
- Hijau = $\sqrt{20449 + 24025 + 15129}$ = $\sqrt{54503}$ = 243,97
- Biru = $\sqrt{20449 + 10000 + 17424}$ = $\sqrt{47873}$ = 218,78

Hasil Akhir :

- Piksel (1,1) = Merah
- Piksel (1,2) = Hitam
- Piksel (1,3) = Merah
- Piksel (2,1) = Merah
- Piksel (2,2) = Hijau
- Piksel (2,3) = Hitam
- Piksel (3,1) = Hijau
- Piksel (3,2) = Biru
- Piksel (3,3) = Merah

Hasil pixel citra terindeks :

255,0,0	0,0,0	2550,0
255,0,0	0,255,0	0,0,0
0,255,0	0,0,255	2550,0