4.

0	1	1	0
1	3	4	3
2	2	3	2
1	0	2	1

citra asli

dibagi 2 blok
Blok kiri (W_1)
Blok kanan (W_2)

Blok W_1

0	1	0	0
1	3	0	1
2	2	1	1
1	0	0	0

Mencari nilai Tresholding

$$\frac{0+1+1+3+2+2+1+0}{8} = \frac{10}{8} = 1{,}25 \approx T = 1$$

hasil Tresholding W_1 ($1 \leq 1 \leq 0$)

Blok W_2

1	0	0	0
4	3	1	1
3	2	1	0
2	1	0	0

Mencari nilai Tresholding

$$\frac{1+0+4+3+3+2+1}{8} = \frac{16}{8} = 2 = T = 2$$

hasil Tresholding W_2 ($1 < 2 \leq 0$)

0	0	0	0
0	1	1	1
1	1	1	0
0	0	0	0

Hasil Tresholding

0	0	1	1
0	0	0	0

Hasil Tresholding

b. Data dari histogram

Graylevel	Frekuensi	P(i)	
0	4	0.25	Kelas 0
1	4	0.25	
2	4	0.25	
3	1	0.125	
4	2	0.125	Kelas 1
Total	16	1.0	

Probabilitas kelas

$$\mu_0 = \frac{0.0.25 + 1.0.25 + 2.0.25 + 3.0.125}{W_0} = \frac{0 + 0.25 + 0.5 + 0.375}{0.875} = \frac{1.125}{0.875} = 1.286$$

$$\mu_1 = \frac{4.0.125}{0.125} = 4.0$$

No.

Date

Hitung Variasi masing² kelas

$$\sigma_0^2 = \frac{1}{w_0} \sum_{i=0}^{3} P(i) \cdot (i - \mu_0)^2$$

Variasi kelas 0

$$\sigma_0^2 = \frac{1}{0.875} [0.25(0 - 1.286)^2 + 0.25(1 - 1.286)^2 + 0.25(2 - 1.286)^2 + 0.125(3 - 1.286)^2]$$

$$= \frac{1}{0.875} [0.25(1.653) + 0.25(0.082) + 0.25(0.510) + 0.125(2.939)]$$

$$= \frac{1}{0,875} [0,413 + 0,021 + 0,128 + 0,367) = \frac{0,929}{0,875} = 1.061$$

Variasi kelas 1

Karena hanya punya satu nilai (4)

$$\sigma_1^2 = 0$$

Hitung Within-Class Variance ($\sigma^2 w$)

$$\sigma_w^2 (T = 3) = w_0 \cdot \sigma_0^2 + w_1 \cdot \sigma_1^2 = 0,875 \cdot 1.061 + 0,125 \cdot 0 = 0,929$$

jadi nilai within-class variance T(3) = 0,929 ≈ 0,93

c. Tresholding terbaik yaitu dari nilai tresholding dengan within-class Variance terkecil

T	Within-class Variance
0	1.36
1	0.87
2	0.36 → nilai terkecil
3	0.93
4	1.16

0	1	1	0
1	3	4	3
2	2	3	2
1	0	2	1

citra asli

0	0	0	0
0	1	1	1
0	0	1	0
0	0	0	0

Hasil tresholding