Histogram Matching

Modifying one image based on the contrast of another one.

1. First equalize the histogram of both images $\left((L-1)\sum_{j=0}^{k} pr(r_j)\right)$
2. Map each pixel of image A to B. $G(z_q) = S_k$
3. Modify A according to B. $z_q = G^{-1}(S_k)$

ex//

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

Image A

Pixel Value	Histogram (freq)	Equalized Hist (cdf)
0	4	4
1	5	9
2	3	12
3	6	18
4	7	25

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

Image B
(Target)

Pixel Value	Histogram	Equalized Hist
0	4	4
1	6	10
2	5	15
3	5	20
4	5	25

Map each pixel in A based on it's equalized histogram, to the value of B.

A   eq.A
0 → 4 → look at → 4 → 0
1 → 9 → what 4 → 10 → 1
2 → 12 → corresponds → 10 → 1 →
3 → 18 → in B → 15 → 2
4 → 25 → (find the → 25 → 4
          closest
          value)

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

Modified A

* Changes:
0 → 0
1 → 1
2 → 1
3 → 2
4 → 4