Histogram Specification.

Given histogram (a) & (b), modify histogram 'a' as given by histogram 'b'.

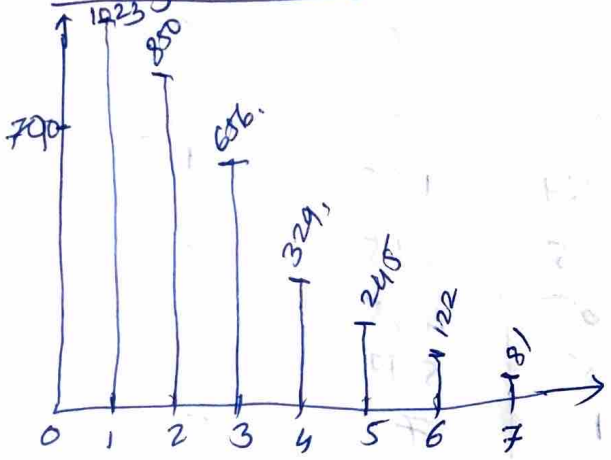
Histogram (a)

Gray level	0	1	2	3	4	5	6	7
No. of pixels	790	1023	850	656	329	245	122	81

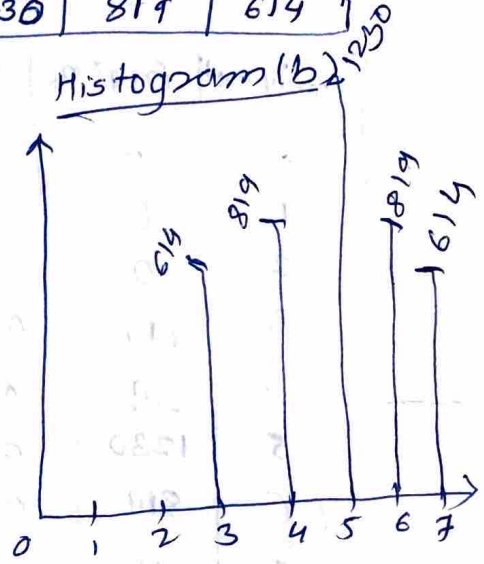
Histogram (b)

Gray level	0	1	2	3	4	5	6	7
No. of pixels	0	0	0	614	819	1230	819	614

→ Histogram (a)



Histogram (b)



step 1 ⇒ Equalize both histogram 'a' & 'b'

Histogram 'a' Equalizatn

Gray level	n_k	$P = \frac{n_k}{N}$	CDF = $\sum p(r_k)$	CDF*(L-1)	Rounding off
0	790	0.19	0.19	1.33	1
1	1023	0.25	0.44	3.08	3
2	850	0.21	0.65	4.55	5
3	656	0.16	0.81	5.67	6
4	329	0.08	0.89	6.23	6
5	245	0.06	0.95	6.65	7
6	122	0.03	0.98	6.86	7
7	81	0.02	1	7	7

N ⇒ 4096

O/P histogram 'a'

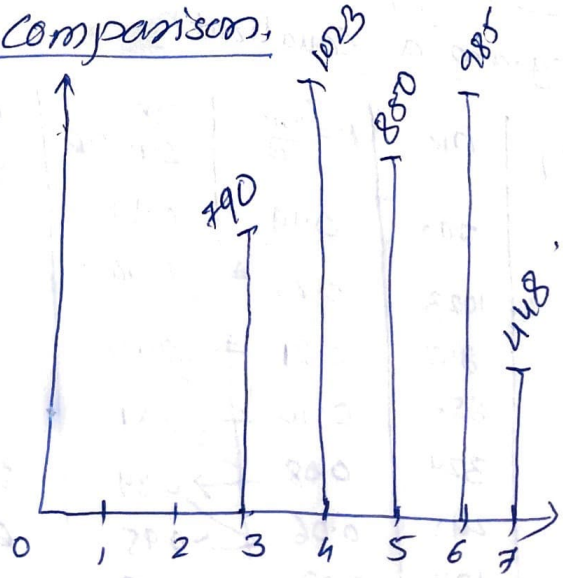
Gray level	Freqn
0	0
1	790
2	~~1023~~ 0
3	~~850~~ 1023
4	0
5	850
6	656+329 = 985
7	245+122+81 = 448

Equalization of histogram 'b'

Gray level	Freqn nk	Pr(rk)	CDF	CDF × L-1	Round off
0	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
(3)	614	0.149	0.149	1.05	(1)
(4)	819	0.20	0.35	2.45	(3)
(5)	1230	0.30	0.65	4.55	(5)
(6)	819	0.20	0.85	5.97	(6)
(7)	614	0.15	1	7	(7)
N:	4096.				

Inverse Transform comparison.

1 → 3
3 → 4
5 → 5
6 → 6
7 → 7



Final result.

Gray levels	0	1	2	3	4	5	6	7
No of pixels	0	0	0	790	1023	850	985	448