I- Enhancement
- Spatial dom (PT)
- Freq dom (PT)
- Combinate dom (1+2)

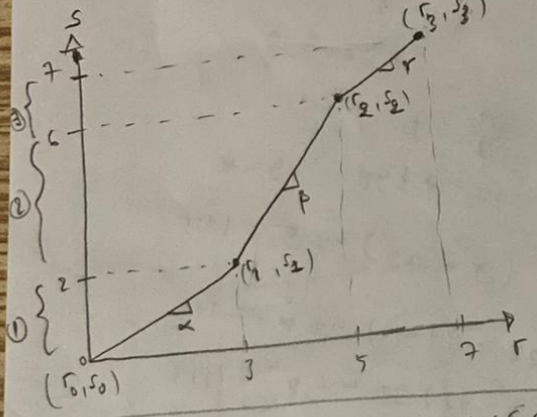
Exercice 1: Find the output S by contrast streaching

$s_1 = 2$, $r_1 = 3$

$s_2 = 2$ $r_2 = 5$

input image →

1	3	5	2
3	6	4	6
2	2	6	5
7	6	4	1



$$\alpha = \frac{s_1 - s_0}{r_1 - r_0} = \frac{s_1}{r_1} = 0,66$$

$$S = \frac{s_1}{r_1} \cdot r \quad ①$$

$$\beta = \frac{s_2 - s_1}{r_2 - r_1} = 2$$

$$S = 2 \cdot (r - r_1) + s_1 \quad ②$$

$$\gamma = \frac{s_3 - s_2}{s_3 - r_2} = 0,5$$

$$S = 0,5\,(r - r_2) + s_2 \quad ③$$

$$S = \begin{cases} \frac{s_1}{r_1} \cdot r = 0,66 \cdot r & ; \ 0 < r \leq 3 \\ 2 \cdot (r - r_1) + s_1 & ; \ 3 < r \leq 5 \\ 0,5\,(r - r_2) + s_2 & ; \ 5 < r \leq 7. \end{cases}$$

by puting r values due to the equations we get output like:

2	2	6	1
6	7	4	7
1	1	7	6
7	7	4	1

output

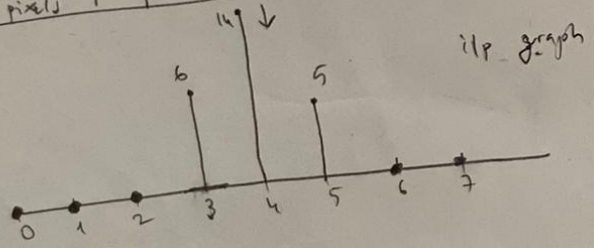
Exercise 2 : An example of histogram equilasation.

input.

4	4	4	4	4
3	4	5	4	3
3	5	5	5	3
3	4	5	4	3
4	4	4	4	4

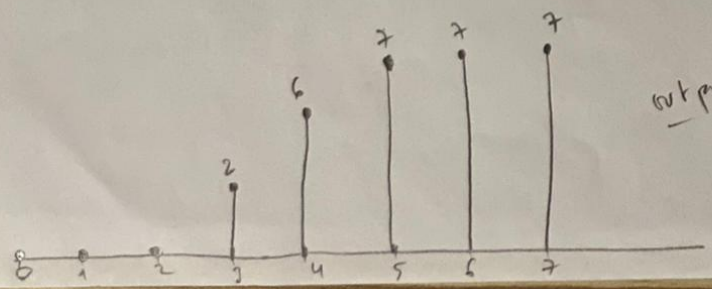
high pixel no is 5 which is 3 bits.
$2^3 = 8$ so the gray level value is [0 → 7]

gray level value	0	1	2	3	4	5	6	7
n_k number of pixels	0	0	0	6	14	5	0	0



ilp graph

gray level no	n_k	PDF	CDF S_k	$S_k \times 7$	Hist equal level
0	0	0/25 = 0	0	0	0
1	0	0/25 = 0	0	0	0
2	0	0/25 = 0	0	0	0
3	6	6/25 = 0,24	0,24	1,68	2
4	14	14/25 = 0,56	0,80	5,6	6
5	5	5/25 = 0,2	1	7	7
6	0	0	1	7	7
7	0	0	1	7	7



output histo graph