Contrast stretching:

Contrast stretching is a method that **expands the range of intensity values** in an image so that the dark areas become darker, the bright areas become brighter, and the overall image looks clearer.

3-bit gray level image with size 4*4

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

Given Intensity values of the image

i	0	1	2	3	4	5	6	7
n_i	0	4	4	1	2	2	3	0

We have to become wider the intensity levels of the image using contrast stretching technique

We need to calculate new/enhanced intensity values

i	0	1	2	3	4	5	6	7
n_i	?	?	?	--	---	--	--	---

Now we apply the formula

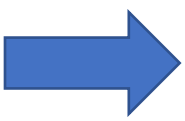
$$L = \frac{(L_{\max} - L_{\min})(m - m_{\min})}{m_{\max} - m_{\min}} + L_{\min}$$

L means Level & m is gray level

$L_{min} = 0, \quad L_{max} = 7$

, $m_{min} = 1, \quad m_{max} = 6$

Now use this formula and put the all relevant values



$$L = \frac{(L_{\max} - L_{\min})\,(m - m_{\min})}{m_{\max} - m_{\min}} + L_{\min}$$

L = (7 -0) * (m-1)/ (6 -1) + 0

L = 7 (m-1) / 5 …… (1)

Put the values of gray levels e.g. m = 1,2. Upto 6

Such as if m = 0 then

Results can achieve through Equation 1

7 * (0-1) /5 = -7/5 = -1.4 which can be considered as 0

Ok Go ahead and find all rest of values and map the final intensity values chart

i	0	1	2	3	4	5	6	7
n_i	4	4	0	1	2	0	2	3

Answer