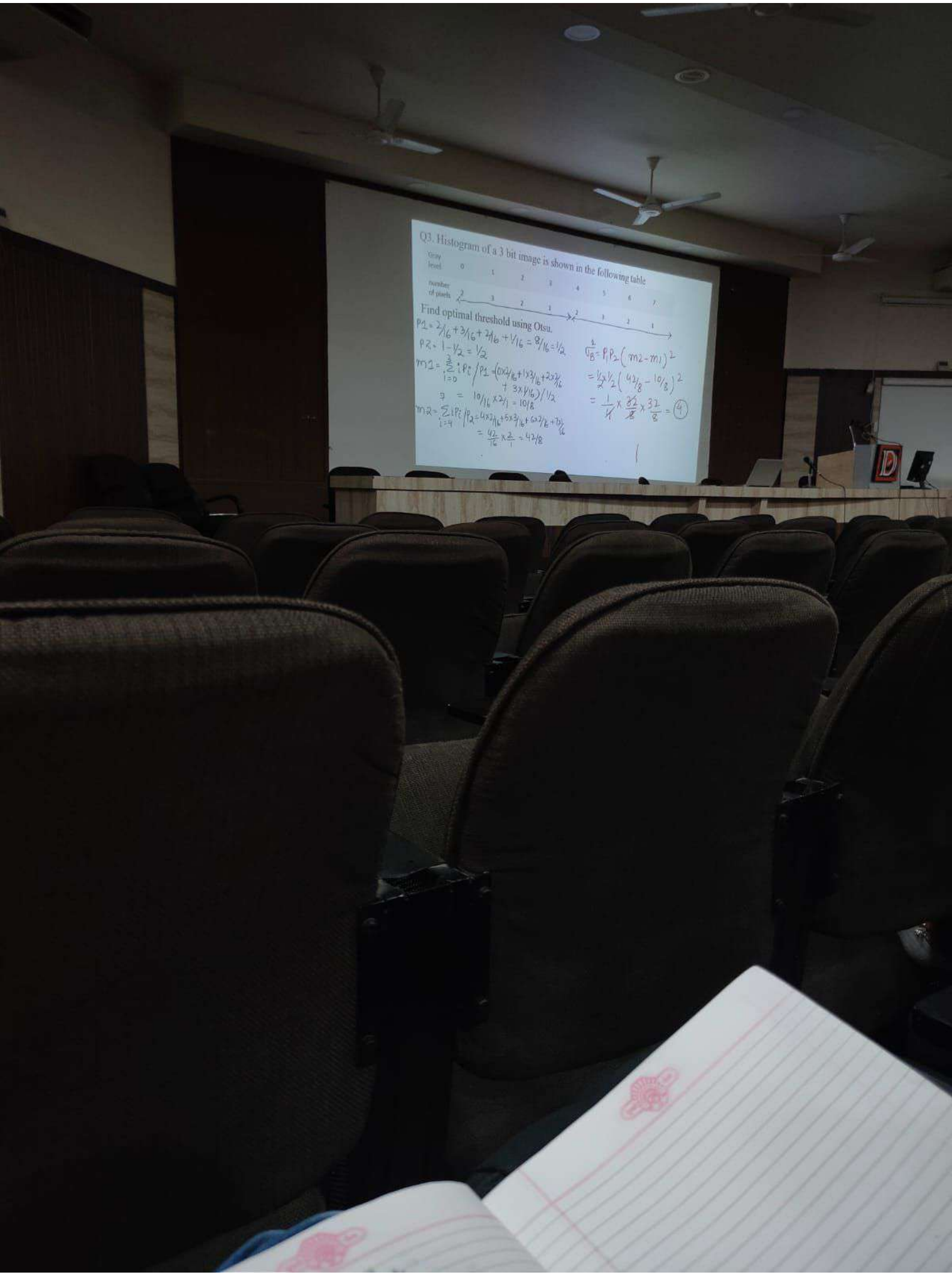
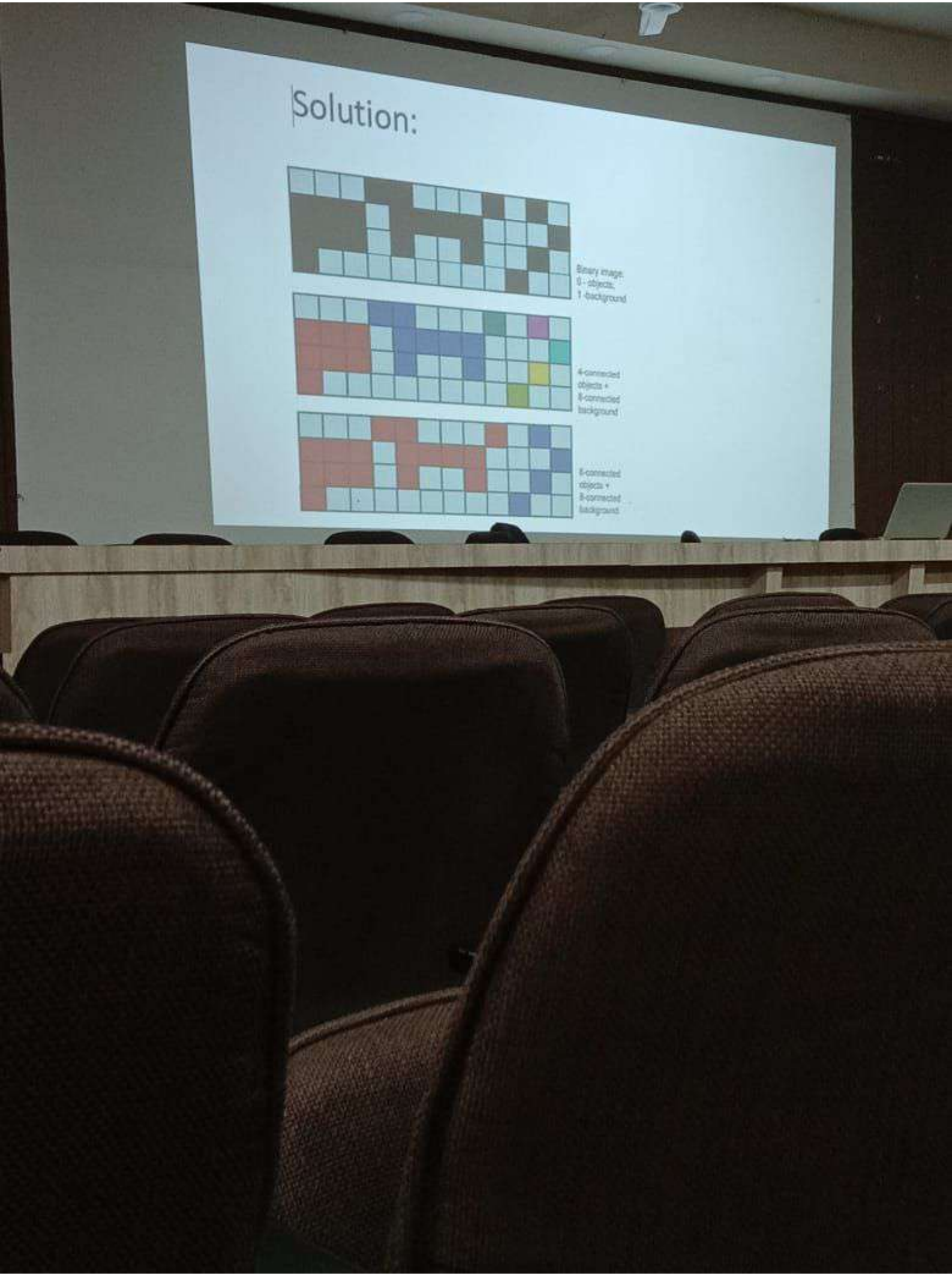
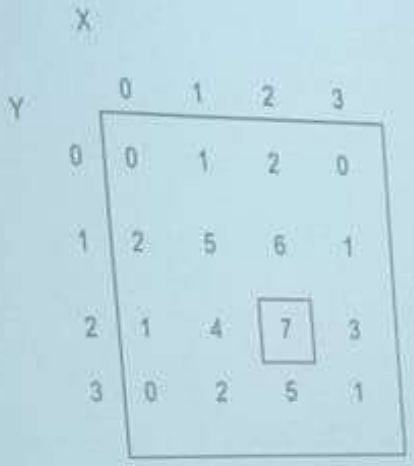

• For image of shown in figure below , segment foreground and background using region growing method. Seed pixels are shown with red boundary and condition for similarity is |seed-f(x,y)|<1
• Show your results for 1) 8 connectivity 2) 4- connectivity
Binary image:
0 - objects
1- background


Q3. Histogram of a 3 bit image is shown in the following table
Gray level
number of pixels
Find optimal threshold using Otsu.
P1 = 2/16 + 3/16 + 2/16 + 1/16 = 8/16 = 1/2
P2 = 1 - 1/2 = 1/2
m1 = Σ i Pi / P1 = (0x2/16 + 1x3/16 + 2x2/16 + 3x1/16) / 1/2
= 10/16 x 2/1 = 10/8
m2 = Σ i Pi / P2 = 4x2/16 + 5x3/16 + 6x2/16 + 7x1/16
= 42/16 x 2/1 = 42/8
σB = P1 P2 (m2 - m1)^2
= 1/2 x 1/2 (42/8 - 10/8)^2
= 1/4 x 32/8 x 32/8 = 4


Solution:


Solution:
Binary image:
0 - objects;
1 -background
4-connected
objects +
8-connected
background
8-connected
objects +
8-connected
background

Q2. Apply region growing on the following image. Initial point at (2,2). Threshold is 2. Use 4 connectivity.



Q3. Histogram of a 3 bit image is shown in the following table

Gray level	0	1	2	3	4	5	6	7
number of pixels	2	3	2	1	2	3	2	1

Find optimal threshold using Otsu.

$P_1 = 2/16 + 3/16 + 2/16 + 1/16 = 8/16 = 1/2$

$P_2 = 1 - 1/2 = 1/2$

$m_1 = \sum_{i=0}^{3} i P_i / P_1 = (0\times 2/16 + 1\times 3/16 + 2\times 2/16 + 3\times 1/16)/1/2$

$= 10/16 \times 2/1 = 10/8$

$m_2 = \sum_{i=4} i P_i / P_2 = 4\times 2/16 + 5\times 3/16 + 6\times 2/16 + 7\times 1/16$

$= \frac{42}{16} \times \frac{2}{1} = 42/8$

$\sigma_B^2 = P_1 P_2 (m_2 - m_1)^2$

$= 1/2 \times 1/2 (42/8 - 10/8)^2$

$= \frac{1}{4} \times \frac{32}{8} \times \frac{32}{8} = (4)$

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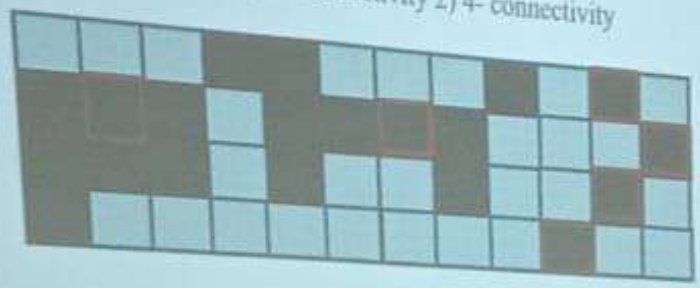

Binary image:
0 - objects;
1 -background

Q3. Histogram of a 3 bit image is shown in the following table

Gray level	0	1	2	3	4	5	6	7
number of pixels	2	3	2	1	2	3	2	1

Find optimal threshold using Otsu.

Q3. Histogram of a 3 bit image is shown in the following table

Gray level	0	1	2	3	4	5	6	7
number of pixels	2	3	2	1	2	3	2	1

Find optimal threshold using Otsu.

$P1 = 2/16 + 3/16 + 2/16 + 1/16 = 8/16 = 1/2$

$P2 = 1 - 1/2 = 1/2$

$m1 = \sum_{i=0}^{3} iPi / P1 = (0\times2/16 + 1\times3/16 + 2\times2/16 + 3\times1/16)/1/2$

$q = 10/16 \times 2/1 = 10/8$

$m2 = \sum_{i=4} iPi / P2 = 4\times2/16 + 5\times3/16 + 6\times2/16 + 7\times1/16$

$= \frac{42}{16} \times \frac{2}{1} = 42/8$