* Apply region growing on the following image. with initial pt. as (2,2) & threshold as 2. Use 4- connectivity.

	0	1	2	3
0	0	1	2	0
1	2	5	6	1
2	1	4	[7]	3
3	0	2	5	1

→ T= 2 & Following 4 connectivity from seed pt.

step-1

		6^a	
	4	$[7]^a$	3
		5^a	

$|7-6| = 1 \Rightarrow$ Traceable

$|7-5| = 1 \Rightarrow$ Traceable.

$|7-4| = 3 \Rightarrow$ Non Traceable

$|7-3| = 4 \Rightarrow$ —||—

step 2 ⇒ Considering next seed pt. as 6 & 5 (from 4 connectivity results)

		2	
	5^a	$[6]^a$	1
		7^a	
		5^a	

	5^a	6^a	
		7^a	
	2	$[5]^a$	1

Step 3 - Considering next seed pt. as 5 (pt. generated from previous result

	1		
2	5[a]	6[a]	
	4	7[a]	
		5[a]	

4 is not traceable as it is already covered by 4 connecti of first seed pt.

Step 4 ⇒ Final Answer

0	0	0	0
0	1	1	0
0	0	1	0
0	0	1	0

* Apply region growing on the followng with seed pt as 6 & threshold as 3.

5	6	6	7	6	7	6	6
6	7	6	7	5	5	4	7
6	6	4	4	3	2	5	6
5	4	5	4	2	3	4	6
0	3	2	3	3	2	4	7
0	0	0	0	2	2	5	6
1	1	0	1	0	3	4	4
1	0	1	0	2	3	5	4.

→ If connectivity is not given, assume 8 connectivity.

T = 3

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

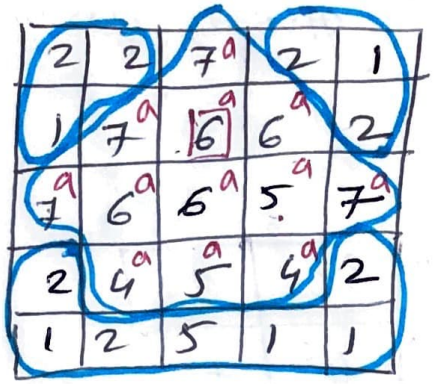
Final Ans -

1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
1	1	1	0	0	0	1	1
1	1	1	0	0	0	1	1
0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0

3) Apply region growing. Assume seed value = 6 with 8 connectivity & threshold = 3. How many segments are identified?

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

→



$T = 3$

seed value = 6.

No. of segments = 4.

* Apply region splitting & merging on the foll. image with threshold = 3. (3)

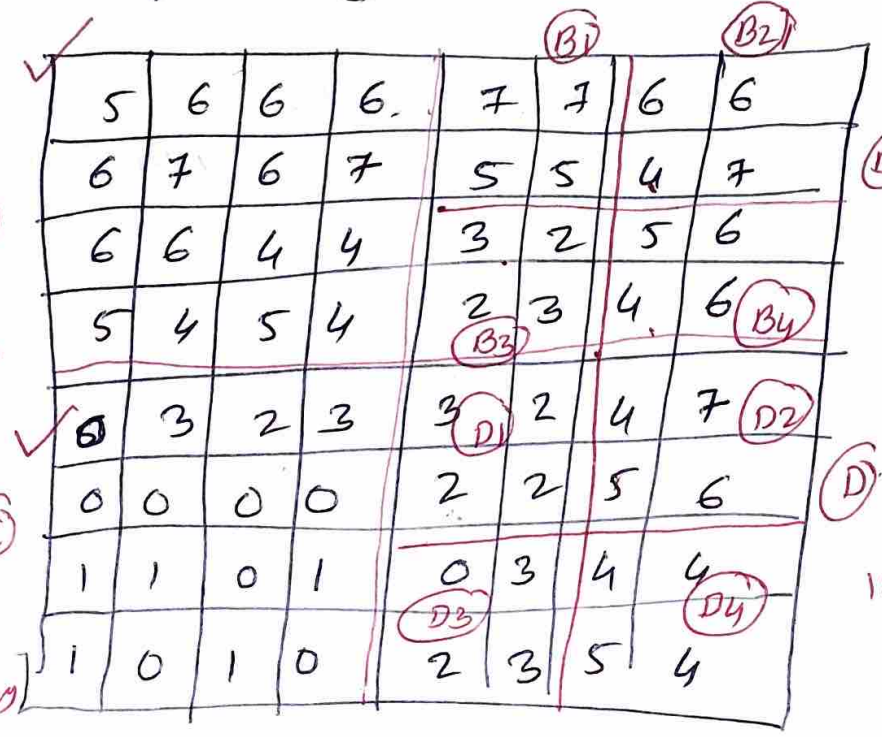
5	6	6	6	7	7	6	6
6	7	6	7	5	5	4	7
6	6	4	4	3	2	5	6
5	4	5	4	2	3	4	6
0	3	2	3	3	2	4	7
0	0	0	0	2	2	5	6
1	1	0	1	0	3	4	4
1	0	1	0	2	3	5	4

→ Cond^n ⇒ Abs diff bet^n Min val & max value ≤ 3.

Min val = 0, Max val = 7

$|7-0| = 7 > 3$.

∴ Split regions into 4.



Merging: check adjacent regions, if they are within threshold, merge.

1) Consider A & B1 regions.

max 7, min = 4 |7-4| = 3.

merge into AB1

2) Consider AB1 & B2

max = 7, min = 4 |7-4| = 3

merge into AB1B2

3) Consider AB1B2 & B4

max = 7, min = 4, |7-4| = 3

merge into AB1B2B4

4) Consider AB1B2B4 & D2.

max = 7 min = 4, |7-4| = 3.

merge into AB1B2B4D2

5) Consider AB1B2B4D2 & D4

max = 7, min = 4,

merge into AB1B2B4D2D4

Final

5	6	6	6	7	7	6	6
6	7	6	7	5	5	4	7
6	6	4	4	5	2	5	6
5	4	5	4	2	3	4	6.
0	3	2	3.	3	2	4	7
0	0	0	0	2	3	5	6
1	1	0	1	0	3	4	4
1	0	1	0	2	3	5	4.

No more merging possible.