

Region Growing

1. Apply region growing on the following image with initial point at $(2, 2)$ and threshold value as 2^2 by applying 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

Solution:-

Condition $\Rightarrow (E+8)/2 = T$

1. Absolute difference ≤ 2

2. 4 way connectivity.

3. Seed point = 7 ie position $(2, 2)$.

$$T = 2$$

	0	1	2	3
0	0	1	2	0
1	2	5^a	6^a	1
2	1	A	7^a	3
3	0	2	5^a	1

$$\begin{aligned} 7-6 &= 1 \checkmark \\ 7-4 &= 3 \times \\ 7-5 &= 2 \checkmark \end{aligned}$$

The segmented region is shown in the following figure.

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



Make the pixel marked as a $\text{by } 1$ otherwise 0 .

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

0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	0
2	3	4	5	6	7	8	9	0	1
3	4	5	6	7	8	9	0	1	2
4	5	6	7	8	9	0	1	2	3
5	6	7	8	9	0	1	2	3	4
6	7	8	9	0	1	2	3	4	5
7	8	9	0	1	2	3	4	5	6
8	9	0	1	2	3	4	5	6	7

② Apply region growing on the following image with seed point as 6 and threshold value as 3.

5	6	6	7		6	7	6	6
6	7	6	7	8	5	5	9	7
6	6	1	1		3	2	5	6
5	4	5	4		2	3	1	6
0	3	2	3		3	2	1	7
0	0	0	0		2	2	5	6
1	1	0	1		0	3	1	4
1	0	1	0		2	3	5	4

Seed point = 6. $T = 3$.

Absolute difference ≤ 3 .

As no connectivity is mentioned then take 8 way connectivity.

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

Segmented output image.

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

5 0