Digital Image Processing   Assignment-2

Name: Abhishek BVS
AM.EN.U4CSE17213

Q7]

(i)

0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
10	10	10	10	10	10	10
10	10	10	10	10	10	10
10	10	10	10	10	10	10
10	10	10	10	10	10	

y ↑ x →

Sobel x

$$\begin{matrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{matrix}$$

Constructed

$$\begin{matrix} 1 & 0 & -1 \\ 2 & 0 & -2 \\ 1 & 0 & -1 \end{matrix}$$

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

←

Sobel Y

$$\begin{matrix} -1 & -2 & -1 \\ 0 & 0 & 0 \\ 1 & 2 & 1 \end{matrix}$$

Constructed

$$\begin{matrix} 1 & 2 & 1 \\ 0 & 0 & 0 \\ -1 & -2 & -1 \end{matrix}$$

0	0	0	0	6
-40	-40	-40	-40	-40
-40	-40	-40	-40	-40
0	0	0	0	0
0	0	0	0	0

(ii)

	0	0	0	0	0	10	10
0	0	0	0	0	10		10
0	0	0	0	10	10		10
0	0	0	10	10	10		10
0	0	10	10	10	10		10
10	10	10	10	10	10		10
10	10	10	10	10	10		10

Sobel x

0	0	0	-40	-30
0	0	-30	-30	-10
0	-30	-30	-10	0
-20	-30	-10	0	0
-10	-10	0	0	0

Sobel X

0	0	0	-20	-10
0	0	-30	-30	-10
0	-30	-30	-10	0
-40	-30	-10	0	0
-30	-10	0	0	0

(iii)

	0	0	0	10	10	10	10
2	0	0	10	10	10		10
0	0	0	10	10	10		10
0	0	2	10	10	10		10
0	0	2	10	10	10		10
0	0	0	10	10	10		10
0	0	0	10	10	10		10

Sobel x

0	-40	-40	0	0
0	-40	-40	0	0
0	-40	-40	0	0
0	-40	-40	0	0
0	-40	-40	0	0

Sobel y

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

Detects vertical edges

Q8]

Input image (7×7):

	0	0	0	0	10	10
0	0	0	0	0	10	10
0	0	0	0	10	10	10
0	0	0	10	10	10	10
0	0	10	10	10	10	10
10	10	10	10	10	10	10
10	10	10	10	10	10	10

Kernel -1

0	1	0
1	-4	1
0	1	0

Convoluted

0	1	0
1	-4	1
0	1	0

Result 1 (5×5):

0	0	0	20	-10
0	0	20	-20	0
0	20	-20	0	0
20	-20	0	0	0
-10	0	0	0	0

Kernel -2

1	1	1
1	-8	1
1	1	1

Convoluted

1	1	1
1	-8	1
1	1	1

Result 2 (5×5):

0	0	10	40	-30
0	10	30	-30	-10
10	30	-30	-10	0
40	-30	-10	0	0
-10	-10	0	0	0