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Assignment 2

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x	n_x	$P(x)$	$F(x)$	s	n_s	$P(s)$	$G(s)$
0	4	0.25	0.25	0	7	0.4375	0.4375
1	4	0.25	0.50	1	3	0.1875	0.625
2	4	0.25	0.75	2	2	0.1250	0.750
3	4	0.25	1.00	3	4	0.2500	1

$$x=0; F(0) = 0.25$$

$F(0)$ is close to $G(0)$

Mapping:

$$x=1; F(1) = 0.50$$

$F(1)$ is close to $G(0)$

Input \rightarrow Output

x	s
0	\rightarrow 0
1	\rightarrow 0
2	\rightarrow 2
3	\rightarrow 3

$$x=2; F(2) = 0.75$$

$F(2)$ is close to $G(2)$

$$x=3; F(3) = 1$$

$F(3)$ is close to $G(3)$

2

Given Image \Rightarrow

$$\begin{bmatrix} -1 & 2 & -1 \\ 3 & 0 & 1 \\ -2 & 1 & 2 \end{bmatrix}$$



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Filter : $\begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix}$

Rotated filter : $\begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}$

Output dimension : $(3+3-1) \times (3+1-1)$
 $= 5 \times 3$

Output = $\begin{matrix} & 1 & & 1 & & 1 \\ 0 & - & 0 & - & 0 & - \\ \text{(in computation)} & -1 & -1 & -1 & 2 & -1 & -1 \\ \text{I row} & 3 & 0 & 1 \\ & -2 & 1 & 2 \end{matrix}$

1st step

In computaⁿ

II row :

$$\begin{matrix} & 1 & & -2 & & 1 \\ 0 & -1 & 0 & 2 & 0 & -1 \\ & 3 & 0 & 1 \\ & -2 & 1 & 2 \end{matrix}$$

2nd step

ORIGIN

$$\begin{bmatrix} +1 & -2 & 1 \\ -3 & 0 & -1 \\ 1 & 1 & -3 \\ 3 & 0 & 1 \\ -2 & 1 & 2 \end{bmatrix}$$

Ans. Output

$$\begin{matrix} & 1 & & -2 & & 1 \\ & -3 & 0 & -1 \\ +1 & 3 & 0 & 1 \\ & -2 & 1 & 2 \end{matrix}$$

3rd

$$\begin{matrix} 1 & -2 & 1 \\ -3 & 0 & -1 \\ 1 & 1 & -3 \\ 3 & 0 & 1 \end{matrix}$$

$$\begin{matrix} & 1 & & -2 & & 1 \\ & -3 & 0 & -1 \\ +1 & 1 & & 1 & & -3 \\ & -2 & & 1 & & 2 \end{matrix}$$

4th

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

5th