CONVOLUTION

Input

$$\begin{bmatrix} 1 & 2 & 0 & 1 & 3 \\ 4 & 1 & 0 & 2 & 1 \\ 2 & 3 & 1 & 0 & 1 \\ 1 & 2 & 0 & 1 & 3 \\ 3 & 1 & 2 & 3 & 0 \end{bmatrix}$$

Kernal

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

Output

$$\begin{bmatrix} & & \\ & 3 & \\ & & \end{bmatrix}$$

Output(1,2) = (2×1)+(0×0)+(1×−1)+(1×1)+(0×0)+(2×−1)+(3×1)+(1×0)+(0×−1)

=2+0−1+1+0−2+3+0−0

=3

CONVOLUTION

Input

5×5

$$\begin{bmatrix} 1 & 2 & 0 & 1 & 3 \\ 4 & 1 & 0 & 2 & 1 \\ 2 & 3 & 1 & 0 & 1 \\ 1 & 2 & 0 & 1 & 3 \\ 3 & 1 & 2 & 3 & 0 \end{bmatrix}$$

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AISCIENCES

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CONVOLUTION

input − kernal + 1

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CONVOLUTION

$5 - 3 + 1$

Input

5×5

$$\begin{bmatrix} 1 & 2 & 0 & 1 & 3 \\ 4 & 1 & 0 & 2 & 1 \\ 2 & 3 & 1 & 0 & 1 \\ 1 & 2 & 0 & 1 & 3 \\ 3 & 1 & 2 & 3 & 0 \end{bmatrix}$$

Kernal

3×3

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

Output

3×3

$$\begin{bmatrix} ? & 3 & ? \\ & & \\ & & \end{bmatrix}$$

Output(1,2) = (2×1)+(0×0)+(1×−1)+(1×1)+(0×0)+(2×−1)+(3×1)+(1×0)+(0×−1)

=2+0−1+1+0−2+3+0−0

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CONVOLUTION

$$5 - 3 + 1 = 3$$

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Kernal
3×3

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