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Kelas - D

Convolution

① Soal

⇒ Matriks Sumber

$$\begin{bmatrix} 1 & 4 & 1 \\ 2 & 5 & 3 \end{bmatrix}$$

⇒ Matriks Kernel

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

⇒ Convolution

$$\begin{bmatrix} 1 & 4 & 1 \\ 2 & 5 & 3 \end{bmatrix}_{3 \times 2} * \begin{bmatrix} 1 & -1 \end{bmatrix}_{2 \times 2} = \begin{bmatrix} ? & ? & ? & ? \\ ? & ? & ? & ? \\ ? & ? & ? & ? \end{bmatrix}_{4 \times 3}$$

⇒ Maka.

$$\begin{array}{ccc} & 1 & 4 & 1 \\ -1 & 1 & 2 & 5 & 3 \\ & 1 & -1 & & \end{array} \Rightarrow -1(0) + 2 = 2$$

$$\begin{array}{ccc} & 1 & 4 & 1 \\ & -1 & 2 & 5 & 3 \\ & 1 & -1 & & \end{array} \Rightarrow -1(2) + 5 = 3$$

$$\begin{array}{ccc} & 1 & 4 & 1 \\ & 2 & -1 & 5 & 1 & 3 \\ & 1 & -1 & & \end{array} \Rightarrow -5 + 3 = -2$$

$$\begin{array}{ccc} -1 & 1 & 1 & 4 & 1 \\ 1 & 1 & 2 & 5 & 3 \end{array} \Rightarrow 1(1) + 1(2) = 3$$

$$\begin{array}{ccc} -1 & 1 & 1 & 4 & 1 \\ 1 & 2 & 1 & 5 & 3 \end{array} \Rightarrow -1 + 4 + 2 + 5 = 10$$

$$\begin{array}{ccc} 1 & -1 & 4 & 1 & 1 \\ 2 & 1 & 5 & 1 & 3 \end{array} \Rightarrow -4 + 1 + 5 + 3 = 5$$

$$\begin{array}{ccc} 1 & 4 & -1 & 1 & 1 \\ 2 & 5 & 1 & 3 & 1 \end{array} \Rightarrow 4 + 3 + 0 + 0 = 2$$

$$\begin{array}{ccc} -1 & 1 & 1 & 1 & 4 & 1 \\ 2 & 5 & 3 & & \end{array} \Rightarrow 1 + 4 = 5$$

$$\begin{array}{ccc} -1 & 1 & 1 & 1 & 4 & 1 \\ 2 & 5 & 3 & & \end{array} \Rightarrow 4 + 1 = 5$$

$$\begin{array}{cccc} & 1 & 1 & 1 \\ \bullet & 1 & 1 & 1 \\ & 2 & 5 & 3 \end{array} \Rightarrow 4$$

• Maka hasil konvolusinya adalah

$$g(n, m) = \begin{bmatrix} 1 & 5 & 5 & 4 \\ 3 & 10 & 5 & 2 \\ 2 & 3 & -2 & -3 \end{bmatrix}$$