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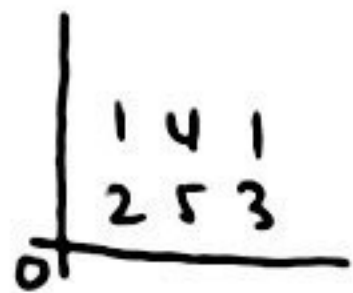
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Pemrosesan Sinyal Optimasi

Diberikan

$x(n_1, n_2)$

$h(n_1, n_2)$



$**$



konvolusikan sinyal diatas ...

$$y(n_1, n_2) = \sum_{k_1=-\infty}^{\infty} \sum_{k_2=-\infty}^{\infty} x(k_1, k_2) h(n_1 - k_1, n_2 - k_2)$$

langkah pertama. cerminkan $h(n_1, n_2)$ sehingga didapatkan



shg konvolusikan sinyal sebagai berikut

$$\left(\begin{array}{l} \circ \begin{array}{ccc} & 1 & 4 & 1 \\ 0 & -1 & (1 \cdot 2) & 5 & 3 \end{array} \Leftrightarrow -1(0) + (2) = 2 \\ \circ \begin{array}{ccc} & 1 & 4 & 1 \\ (-1 \cdot 3) & (1 \cdot 5) & 3 \end{array} \Leftrightarrow -1(2) + 5 = 3 \\ \circ \begin{array}{ccc} & 1 & 4 & 1 \\ 2 & (-1 \cdot 5) & (1 \cdot 3) \end{array} \Leftrightarrow -5 + 3 = -2 \\ \circ \begin{array}{ccc} & 1 & 4 & 1 \\ 2 & 5 & (-1 \cdot 3) & 1 \end{array} \Leftrightarrow -3 + 1(0) = -3 \end{array} \right)$$

$$\left(\begin{array}{l} \circ \begin{array}{ccc} & 1 & 4 & 1 \\ -1 & (1 \cdot 1) & 4 & 1 \\ & 1 & (1 \cdot 2) & 5 & 3 \end{array} \Leftrightarrow 1(1) + 1(2) = 3 \\ \circ \begin{array}{ccc} & 1 & 4 & 1 \\ (-1 \cdot 1) & (1 \cdot 4) & 1 \\ & (1 \cdot 2) & (1 \cdot 5) & 3 \end{array} \Leftrightarrow -1 + 4 + 2 + 5 = 10 \\ \circ \begin{array}{ccc} & 1 & 4 & 1 \\ 1 & (-1 \cdot 4) & (1 \cdot 1) \\ & 2 & (1 \cdot 5) & (1 \cdot 3) \end{array} \Leftrightarrow -4 + 1 + 5 + 3 = 5 \\ \circ \begin{array}{ccc} & 1 & 4 & 1 \\ 1 & 4 & (-1 \cdot 1) & 1 \\ & 2 & 5 & (1 \cdot 3) & 1 \end{array} \Leftrightarrow -1 + 3 + 0 + 0 = 2 \end{array} \right)$$

$$\begin{pmatrix}
 \begin{array}{l}
 \circ \quad \begin{array}{ccc} -1 & 1 & \\ & 1 & (1,1) \end{array} \begin{array}{cc} 4 & 1 \end{array} \Leftrightarrow 1 \\
 \quad \quad \quad \begin{array}{cc} 2 & -3 \end{array}
 \end{array} \\
 \\
 \circ \quad \begin{array}{ccc} -1 & 1 & \\ & 1 & (1,1) \end{array} \begin{array}{ccc} & & 1 \end{array} \begin{array}{cc} (4,1) & 1 \end{array} \Leftrightarrow 1+4 \equiv 5 \\
 \quad \quad \quad \begin{array}{ccc} 2 & 5 & 3 \end{array}
 \end{array} \\
 \\
 \circ \quad \begin{array}{ccc} -1 & 1 & \\ & 1 & (1,4) \end{array} \begin{array}{ccc} & & 1 \end{array} \begin{array}{cc} (1,1) & 1 \end{array} \Leftrightarrow 4+1 \equiv 5 \\
 \quad \quad \quad \begin{array}{ccc} 2 & 5 & 3 \end{array}
 \end{array} \\
 \\
 \circ \quad \begin{array}{ccc} & -1 & 1 \\ & 1 & (1,4) \end{array} \begin{array}{ccc} & & 1 \end{array} \begin{array}{cc} (1,4) & 1 \end{array} \Leftrightarrow 4 \\
 \quad \quad \quad \begin{array}{ccc} 2 & 5 & 3 \end{array}
 \end{array}
 \end{pmatrix}$$

sehingga hasil akhir yang didapat

$$q(n_1, n_2) = \begin{array}{c|cccc}
 & 1 & 5 & 5 & 4 \\
 & 3 & 10 & 5 & 2 \\
 & 2 & 3 & -2 & -3 \\
 \hline
 \end{array}$$
