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Pemrosesan Sinyal Operasi D

$$\begin{array}{c} x(n_1, n_2) \\ \begin{array}{|c|} \hline \begin{array}{ccc} 1 & 4 & 1 \\ 2 & 5 & 3 \end{array} \\ \hline \end{array} \\ 0 \end{array} \quad \begin{array}{c} h(n_1, n_2) \\ \begin{array}{|c|} \hline \begin{array}{c} 1 \\ 1 \end{array} \\ \hline \end{array} \\ 0 \end{array}$$

konvolusikan sinyal diatas..

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

Pertama-tama cerminkan $h(n_1, n_2)$



Maka konvolusi sinyal adalah

$$\left[\begin{array}{l} * \begin{array}{c} -1 \\ 1 \end{array} \begin{array}{c} (1,2) \\ (1,2) \end{array} \begin{array}{c} 4 \\ 5 \end{array} \begin{array}{c} 1 \\ 3 \end{array} \Rightarrow -1(0) + (2) = 2 \\ * \begin{array}{c} (-1,1) \\ (1,2) \end{array} \begin{array}{c} 1 \\ 4 \end{array} \begin{array}{c} 5 \\ 3 \end{array} \Rightarrow -1(1) + 5 = 4 \\ * \begin{array}{c} 1 \\ 2 \end{array} \begin{array}{c} (-1,5) \\ (1,3) \end{array} \begin{array}{c} 1 \\ 3 \end{array} \Rightarrow -5 + 3 = -2 \\ * \begin{array}{c} 2 \\ 5 \end{array} \begin{array}{c} 1 \\ (-1,3) \end{array} \begin{array}{c} 1 \\ 1 \end{array} \Rightarrow -7 + 1(0) = -7 \end{array} \right]$$

$$\left[\begin{array}{l} * \begin{array}{c} -1 \\ 1 \end{array} \begin{array}{c} (1,1) \\ (1,2) \end{array} \begin{array}{c} 4 \\ 5 \end{array} \begin{array}{c} 1 \\ 3 \end{array} \Rightarrow 1(1) + 1(2) = 3 \\ * \begin{array}{c} (-1,1) \\ (1,2) \end{array} \begin{array}{c} 1 \\ 4 \end{array} \begin{array}{c} 5 \\ 3 \end{array} \Rightarrow -1 + 4 + 2 + 5 = 10 \\ * \begin{array}{c} 1 \\ 2 \end{array} \begin{array}{c} (-1,4) \\ (1,3) \end{array} \begin{array}{c} 1 \\ 3 \end{array} \Rightarrow -4 + 1 + 5 + 3 = 5 \\ * \begin{array}{c} 1 \\ 2 \end{array} \begin{array}{c} 5 \\ (-1,3) \end{array} \begin{array}{c} 1 \\ 1 \end{array} \Rightarrow -1 + 3 + 0 + 0 = 2 \end{array} \right]$$

$$\left[\begin{array}{l} * \begin{array}{c} -1 \\ 1 \end{array} \begin{array}{c} 1 \\ (1,1) \end{array} \begin{array}{c} 4 \\ 1 \end{array} \begin{array}{c} 1 \\ 3 \end{array} \Rightarrow 4 \\ * \begin{array}{c} -1 \\ (1,1) \end{array} \begin{array}{c} 1 \\ (4,1) \end{array} \begin{array}{c} 1 \\ 5 \end{array} \begin{array}{c} 1 \\ 3 \end{array} \Rightarrow 1+4=5 \\ * \begin{array}{c} -1 \\ (1,4) \end{array} \begin{array}{c} 1 \\ (1,1) \end{array} \begin{array}{c} 1 \\ 5 \end{array} \begin{array}{c} 1 \\ 3 \end{array} \Rightarrow 4+1=5 \\ * \begin{array}{c} 1 \\ 2 \end{array} \begin{array}{c} 4 \\ 5 \end{array} \begin{array}{c} 1 \\ (1,4) \end{array} \begin{array}{c} 1 \\ 3 \end{array} \Rightarrow 4 \end{array} \right]$$

Maka hasil yang didapat ialah

$$q(n_1, n_2) = \begin{array}{c|cccc} 1 & 5 & 5 & 4 \\ 7 & 10 & 5 & 2 \\ \hline 2 & 3 & -2 & -3 \end{array}$$