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Invers Matriks

1. $A = \begin{bmatrix} 3 & 1 & 0 \\ 2 & 1 & 1 \\ 6 & 2 & 2 \end{bmatrix}$ dengan metode adjoin

adjoin = transpose matriks kofaktor A

- matriks kofaktor untuk matriks A =

$$C = \begin{pmatrix} \begin{vmatrix} 1 & 1 \\ 2 & 2 \end{vmatrix} & -\begin{vmatrix} 2 & 1 \\ 6 & 2 \end{vmatrix} & \begin{vmatrix} 2 & 1 \\ 6 & 2 \end{vmatrix} \\ -\begin{vmatrix} 1 & 0 \\ 2 & 2 \end{vmatrix} & \begin{vmatrix} 3 & 0 \\ 6 & 2 \end{vmatrix} & -\begin{vmatrix} 3 & 1 \\ 6 & 2 \end{vmatrix} \\ \begin{vmatrix} 1 & 0 \\ 1 & 1 \end{vmatrix} & -\begin{vmatrix} 3 & 0 \\ 2 & 1 \end{vmatrix} & \begin{vmatrix} 3 & 1 \\ 2 & 1 \end{vmatrix} \end{pmatrix} \rightarrow C = \begin{bmatrix} 0 & 2 & -2 \\ -2 & 6 & 0 \\ 1 & -3 & 1 \end{bmatrix}$$

- transpose matriks kofaktor A

$$C^T = \begin{bmatrix} 0 & -2 & 1 \\ 2 & 6 & -3 \\ -2 & 0 & 1 \end{bmatrix}$$

$$\begin{aligned} \det(A) &= a_{31} C_{31} + a_{32} C_{32} + a_{33} C_{33} \\ &= 6 \cdot 1 + 2 \cdot -3 + 2 \cdot 1 \\ &= 6 + -6 + 2 = 2 \end{aligned}$$

$$A^{-1} = \frac{1}{2} \begin{bmatrix} 0 & -2 & 1 \\ 2 & 6 & -3 \\ -2 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 0 & -1 & \frac{1}{2} \\ 1 & 3 & -\frac{3}{2} \\ -1 & 0 & \frac{1}{2} \end{bmatrix}$$

2. $B = \begin{bmatrix} 6 & -2 & 0 \\ 9 & -1 & 1 \\ 3 & 7 & 5 \end{bmatrix}$ dengan Gauss Jordan

$$\left(\begin{array}{ccc|ccc} 6 & -2 & 0 & 1 & 0 & 0 \\ 9 & -1 & 1 & 0 & 1 & 0 \\ 3 & 7 & 5 & 0 & 0 & 1 \end{array}\right)$$

1. $H_1\left(\frac{1}{6}\right) = \left(\begin{array}{ccc|ccc} 1 & -\frac{1}{3} & 0 & \frac{1}{6} & 0 & 0 \\ 9 & -1 & 1 & 0 & 1 & 0 \\ 3 & 7 & 5 & 0 & 0 & 1 \end{array}\right)$

2. $H_{21}(-9) = \left(\begin{array}{ccc|ccc} 1 & -\frac{1}{3} & 0 & \frac{1}{6} & 0 & 0 \\ 0 & 2 & 1 & -\frac{3}{2} & 1 & 0 \\ 3 & 7 & 5 & 0 & 0 & 1 \end{array}\right)$

3. $H_{31}(-3) = \left(\begin{array}{ccc|ccc} 1 & -\frac{1}{3} & 0 & \frac{1}{6} & 0 & 0 \\ 0 & 2 & 1 & -\frac{3}{2} & 1 & 0 \\ 0 & 8 & 5 & -\frac{1}{2} & 0 & 1 \end{array}\right)$

4. $H_{32}(-4) = \left(\begin{array}{ccc|ccc} 1 & -\frac{1}{3} & 0 & \frac{1}{6} & 0 & 0 \\ 0 & 2 & 1 & -\frac{3}{2} & 1 & 0 \\ 0 & 0 & 1 & \frac{11}{2} & -4 & 1 \end{array}\right)$

5. $H_2\left(\frac{1}{2}\right) = \left(\begin{array}{ccc|ccc} 1 & -\frac{1}{3} & 0 & \frac{1}{6} & 0 & 0 \\ 0 & 1 & \frac{1}{2} & -\frac{3}{4} & \frac{1}{2} & 0 \\ 0 & 0 & 1 & \frac{11}{2} & -4 & 1 \end{array}\right)$

6. $H_{23}\left(-\frac{1}{2}\right) = \left(\begin{array}{ccc|ccc} 1 & -\frac{1}{3} & 0 & \frac{1}{6} & 0 & 0 \\ 0 & 1 & 0 & -\frac{7}{2} & \frac{5}{2} & -\frac{1}{2} \\ 0 & 0 & 1 & \frac{11}{2} & -4 & 1 \end{array}\right)$

7. $H_{12}\left(\frac{1}{3}\right) = \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & -1 & \frac{5}{6} & -\frac{1}{6} \\ 0 & 1 & 0 & -\frac{7}{2} & \frac{5}{2} & -\frac{1}{2} \\ 0 & 0 & 1 & \frac{11}{2} & -4 & 1 \end{array}\right)$

$$A^{-1} = \begin{pmatrix} -1 & \frac{5}{6} & -\frac{1}{6} \\ -\frac{7}{2} & \frac{5}{2} & -\frac{1}{2} \\ \frac{11}{2} & -4 & 1 \end{pmatrix}$$