

Nama : Faiz Hidayat

NIM : 201420026

Kelas : IF3A

1. Misalkan diberikan SPL sebagai berikut dengan eliminasi Gauss:

a.
$$\begin{aligned}x + y + 2z &= 9 \\ 2x + 4y - 3z &= 1 \\ 3x + 6y - 5z &= 0\end{aligned}$$

b.
$$\begin{aligned}x + y + z + w &= 0 \\ x + y + z - w &= 4 \\ x + y - z + w &= -4 \\ x - y + z + w &= 2\end{aligned}$$

2. Jika $\log(10)=1$, $\log(100)=2$, maka $\log(25)=?$ Dan $\log(75)=?$

3. jika $\log(10)=1$, $\log(100)=2$ dan $\log(1000)=3$, maka $\log(90)=?$ Dan $\log(700)=?$

Jawab

1.

a
$$\begin{bmatrix} 1 & 1 & 2 & 9 \\ 2 & 4 & -3 & 1 \\ 3 & 6 & -5 & 0 \end{bmatrix} \begin{bmatrix} i \\ ii \\ iii \end{bmatrix}$$

$$i(-2) + ii = 1(-2) + 2 = 0$$

$$1(-2) + 4 = 2$$

$$2(-2) - 3 = -7$$

$$9(-2) + 1 = -17$$

$$\begin{bmatrix} 1 & 1 & 2 & 9 \\ 0 & 2 & -7 & -17 \\ 3 & 6 & -5 & 0 \end{bmatrix}$$

$$i(-3) + iii = 1(-3) + 3 = 0$$

$$1(-3) + 6 = 3$$

$$2(-3) - 5 = -11$$

$$9(-3) + 0 = -27$$

$$\begin{bmatrix} 1 & 1 & 2 & 9 \\ 0 & 2 & -7 & -17 \\ 0 & 3 & -11 & -27 \end{bmatrix}$$

$$ii\left(\frac{1}{2}\right) = 0\left(\frac{1}{2}\right) = 0$$

$$2\left(\frac{1}{2}\right) = 1$$

$$-7\left(\frac{1}{2}\right) = -\frac{7}{2}$$

$$-17\left(\frac{1}{2}\right) = -\frac{17}{2}$$

$$\begin{bmatrix} 1 & 1 & 2 & 9 \\ 0 & 1 & -\frac{7}{2} & -\frac{17}{2} \\ 0 & 3 & -11 & -27 \end{bmatrix}$$

$$ii(-3)+iii=1(-3)+3=0$$

$$-\frac{7}{2}(-3)-11=-\frac{1}{2}$$

$$-\frac{17}{2}(-3)-27=-\frac{3}{2}$$

$$\begin{bmatrix} 1 & 1 & 2 & 9 \\ 0 & 1 & -\frac{7}{2} & -\frac{17}{2} \\ 0 & 0 & -\frac{1}{2} & -\frac{3}{2} \end{bmatrix}$$

$$iii(-2)=-\frac{1}{2}(-2)=1$$

$$-\frac{3}{2}(-2)=3$$

$$\begin{bmatrix} 1 & 1 & 2 & 9 \\ 0 & 1 & -\frac{7}{2} & -\frac{17}{2} \\ 0 & 0 & 1 & 3 \end{bmatrix}$$

solusi sistem diperoleh dengan teknik penyulihan mundur sebagai berikut :

$$z=3$$

$$y-\frac{7}{2}z=-\frac{17}{2}$$

$$y-\frac{7}{2}(3)=-\frac{17}{2}$$

$$y=\left(-\frac{17}{2}\right)+\frac{21}{2}$$

$$y=2$$

$$x+y+2z=9$$

$$x+2+2(3)=9$$

$$x+8=9$$

$$x=1$$

Diperoleh penyelesaian $x=1, y=2, z=3$

$$\mathbf{b} \begin{bmatrix} 1 & 1 & 1 & 1 & 0 \\ 1 & 1 & 1 & -1 & 4 \\ 1 & 1 & -1 & 1 & -4 \\ 1 & -1 & 1 & 1 & 2 \end{bmatrix}$$

$$1(-1)+1=0$$

$$1(-1)+1=0$$

$$1(-1)+1=0$$

$$1(-1)-1=-2$$

$$0(-1)+4=4$$

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

$$1(-1)+1=0$$

$$1(-1)+1=0$$

$$1(-1)+(-1)=-2$$

$$1(-1)+1=0$$

$$0(-1)+(-4)=-4$$

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

$$1(-1)+1=0$$

$$1(-1)+(-1)=-2$$

$$1(-1)+1=0$$

$$1(-1)+1=0$$

$$0(-1)+2=2$$

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

2. (log(10),1) dan (log(100),2)

$$x_1 = \log(10), \quad y_1 = 1$$

$$x_3 = \log(100), \quad y_3 = 2$$

a.) log(25)

$$x_2 = \log(25) \quad y_2 = ?$$

$$y = y_1 + \frac{(\log(25) - \log(10))(y_3 - y_1)}{\log(100) - \log(10)} = 1 + \frac{(0.3979)1}{1} = 1.3979$$

b.) log(75)

$$x_2 = \log(75) \quad y_2 = ?$$

$$y = y_1 + \frac{(x_2 - x_1)(y_3 - y_1)}{x_3 - x_1}$$

$$y = 1 + \frac{(\log(75) - \log(10))(2 - 1)}{\log(100) - \log(10)} = 1 + \frac{(0.87)1}{1} = 1.87$$

3. (log(10),1) dan (log(100),2) dan (log(1000),3)

$$(1,1) \rightarrow x + y + z = 1$$

$$(2,2) \rightarrow x + 2y + 4z = 2$$

$$(3,3) \rightarrow x+3y+9z=3$$

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 4 & 2 \\ 1 & 3 & 9 & 3 \end{bmatrix}$$

$$1(-1)+1=0$$

$$1(-1)+2=1$$

$$1(-1)+4=3$$

$$1(-1)+2=1$$

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 3 & 1 \\ 1 & 3 & 9 & 3 \end{bmatrix}$$

$$1(-1)+1=0$$

$$1(-1)+3=2$$

$$1(-1)+9=8$$

$$1(-1)+3=2$$

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 3 & 1 \\ 0 & 2 & 8 & 2 \end{bmatrix}$$

$$1(-2)+2=0$$

$$3(-2)+8=2$$

$$1(-2)+2=0$$

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

$$2\left(\frac{1}{2}\right)=1$$

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

$$1(-1)+1=0$$

$$3(-1)+1=-2$$

$$1(-1)+1=0$$

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

$$1(2)+(-2)=0$$

$$1(-3)+3=0$$

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

$$x_1=0 \quad x_2=1 \quad x_3=0$$

$$P_2(x) = x_2$$

$$P(\log(90)) = \log(90)$$

$$P(\log(90)) = 1.954$$

$$P(\log(700)) = x_2$$

$$P(\log(700)) = 2.845$$