

ASSIGNMENT III

$$T_1 + T_2 - 2T_3 + T_4 + 3T_5 - T_6 = 4$$

$$2T_1 - T_2 + T_3 + 2T_4 + T_5 - 3T_6 = 20$$

$$T_1 + 3T_2 - 3T_3 - T_4 + 2T_5 + T_6 = -15$$

$$5T_1 + 2T_2 - T_3 - T_4 + 2T_5 + T_6 = -3$$

$$-3T_1 - T_2 + 2T_3 + 3T_4 + T_5 + 3T_6 = 16$$

$$4T_1 + 3T_2 + T_3 - 6T_4 - 3T_5 - 2T_6 = -27$$

~~4T₁ +~~

$$I^{(1)} \left[\begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 2 & -1 & 1 & 2 & 1 & -3 & 20 \\ 1 & 3 & -3 & -1 & 2 & 1 & -15 \\ 5 & 2 & -1 & -1 & 2 & 1 & -3 \\ -3 & -1 & 2 & 3 & 1 & 3 & 16 \\ 4 & 3 & 1 & -6 & -3 & -2 & 27 \end{array} \right]$$

$$A^{(2)} = \left[\begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ \frac{E_2}{2} - E_1 \Rightarrow & 0 & -1.5 & 2.5 & 0 & -2.5 & -0.5 & 6 \\ \frac{E_3}{2} - E_1 \Rightarrow & 0 & 1.5 & -2.5 & -1 & -2 & 2 & -19 \\ \frac{E_4}{5} - E_1 \Rightarrow & 0 & -0.6 & 1.8 & -1.2 & -2.6 & 1.2 & -46 \\ \frac{E_5}{3} - E_1 \Rightarrow & 0 & -0.667 & 1.333 & -2 & -3.333 & 0 & -9.333 \\ \frac{E_6}{4} - E_1 \Rightarrow & 0 & -0.25 & 2.25 & -2.5 & -3.75 & 0.5 & -10.75 \end{array} \right]$$

Divide through by 2 and Swap (pivot) with E_2

$$\overline{A}^{(2)} = \left[\begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & 1 & -0.5 & -1 & 0 & -0.5 & 6 \\ 0 & -1.5 & 2.5 & 0 & 0 & 2 & -19 \\ 0 & -0.6 & 1.8 & -1.2 & 0 & 1.2 & -46 \\ 0 & -0.667 & 1.333 & -2 & -3.333 & 0 & -9.333 \\ 0 & -0.25 & 2.25 & -2.5 & -3.75 & 0.5 & -10.75 \end{array} \right]$$

$$A^{(3)} = \left[\begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & 1 & -0.5 & -1 & -0.5 & 1 & -7.5 \\ 0 & 0 & 1.167 & -1 & -2.167 & 0.667 & -5.5 \\ 0 & 0 & 2.5 & -3 & -4.833 & 3 & -17.167 \\ 0 & 0 & 1.499 & -3.999 & -5.497 & 1 & -23.493 \\ 0 & 0 & 8.5 & -11 & -15.5 & 3 & -32.5 \end{array} \right]$$

Divide through E_2 by 2.5 and swap with E_3 .

$$\overline{A}^{(3)} = \left[\begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & 1 & -0.5 & -1 & -0.5 & 1 & -9.5 \\ 0 & 0 & 1 & -1.2 & -1.933 & 1.2 & -6.867 \\ 0 & 0 & 1.167 & -1 & -2.167 & 0.667 & -5.5 \\ 0 & 0 & 1.499 & -3.999 & -5.497 & 1 & -23.493 \\ 0 & 0 & 8.5 & -11 & -15.5 & 3 & -52.5 \end{array} \right]$$

$$A^{(4)} = \left[\begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & 1 & -0.5 & -1 & -0.5 & 1 & -9.5 \\ 0 & 0 & 1 & -1.2 & -1.933 & 1.2 & -6.867 \\ 0 & 0 & 0 & 0.343 & 0.076 & -0.628 & 2.154 \\ 0 & 0 & 0 & -1.463 & -1.734 & -5.333 & -8.805 \\ 0 & 0 & 0 & -0.094 & 0.109 & -0.847 & 0.6912 \end{array} \right]$$

~~$A^{(4)}$~~ Divide through E_4 by 0.343

$$\overline{A}^{(4)} = \left[\begin{array}{cccccc|c} 1 & 1 & -2 & 1 & 3 & -1 & 4 \\ 0 & 1 & -0.5 & -1 & -0.5 & 1 & -9.5 \\ 0 & 0 & 1 & -1.2 & -1.933 & 1.2 & -6.867 \\ 0 & 0 & 0 & 1 & 0.222 & -1.831 & 6.280 \\ 0 & 0 & 0 & 0 & 0.959 & 2.179 & -0.282 \\ 0 & 0 & 0 & 0 & -1.382 & 10.842 & -15.631 \end{array} \right]$$

Divide $A^{(5)} = \begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$

$A^{(6)} = \begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$

Back From E_1
From E_2
From
From

From
From
 $\pi =$

Divide through by 0.999

$$\overline{A^{(6)}} = \begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & 1 & -0.5 & -1 & -0.5 & 1 \\ 0 & 0 & 1 & -1.2 & -1.933 & 1.2 \\ 0 & 0 & 0 & 1 & 0.222 & -1.831 \\ 0 & 0 & 0 & 0 & 1 & 2.288 \\ 0 & 0 & 0 & 0 & -1.389 & 10.842 \end{bmatrix} = \begin{bmatrix} 4 \\ -9.5 \\ -6.867 \\ 6.280 \\ -0.274 \\ -13.63 \end{bmatrix}$$

$$\overline{A^{(6)}} = \begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & 1 & -0.5 & -1 & -0.5 & 1 \\ 0 & 0 & 1 & -1.2 & -1.933 & 1.2 \\ 0 & 0 & 0 & 1 & 0.222 & -1.831 \\ 0 & 0 & 0 & 0 & 1 & 2.288 \\ 0 & 0 & 0 & 0 & 0 & -10.133 \end{bmatrix} = \begin{bmatrix} 4 \\ -9.5 \\ -6.867 \\ 6.280 \\ -0.274 \\ 10.157 \end{bmatrix}$$

Background Substitution

From \mathcal{E}_6 in $\overline{A^{(6)}}$: $-10.133 \overline{T}_6 = 10.157$

$$\overline{T}_6 = 6002 \underline{-1}$$

From \mathcal{E}_5 : $\overline{T}_5 + 2.288 \overline{T}_6 = 0.274$

$$\overline{T}_5 = -0.274 - 2.288(-1.002)$$

From \mathcal{E}_4 : $\overline{T}_4 = -0.222(1.999) + 1.831(-1.002) + 6.280$

$$\overline{T}_4 = 4.002 \underline{-4}$$

From \mathcal{E}_3 : $\overline{T}_3 = 1.2(40002) + 1.933(1.99) - 10.2(1.00)$

$$\overline{T}_3 = 3.002 \underline{-3}$$

From \mathcal{E}_2 : $\overline{T}_2 = 0.5(3.002) + 4.002 + 0.5(1.999) - 1.00$

$$\overline{T}_2 = -1.996 = -2$$

From \mathcal{E}_1 : $\overline{T}_1 = 4 - (-1.996) + 2(5.002) - 4.002 - 3(1.99)$

$$\overline{T}_1 = 0.999 \underline{-1}$$

$$\overline{T}_1 = 1, \overline{T}_2 = 2, \overline{T}_3 = 3, \overline{T}_4 = 4, \overline{T}_5 = 2 \} \overline{T}_6$$

MATLAB

Function C = Assign 3, (A, B)

A = [11 -2] 3 -1; 2 -1 | 2 -3, | 3 -3 - | 2 |, S2 -1
= | 2 |, S2 -1 - | 2 |, -3 - | 2 3 | 3; 4 | 3 | -6 -3
-2];

B = [4; 20, 15, -3, 16, -27].

i = 1

X = [A, B]

[m, n] = size(X);

While i <= m

If X(i, i) == 0

disp('Diagonal element zero')

return

end

C = X(i, n);

Function X = elimination(X, i)

[m, n] = size(X);

a = X(i, i);

X(i, :) = X(i, :) / a;

for k = 1:m

If k == i

Continue

End

X(k, i) = X(k, i) - X(i, i) * X(k, i);

End