

# ASSIGNMENT 3

OKOLOCHA RENEALD UDOCHUKWU

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ELECT

(2017288.0)

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

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

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

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

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

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

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 2 & -1 & 1 & 2 & 1 & -3 \\ 1 & 3 & -3 & -1 & 2 & 1 \\ 5 & 2 & -1 & -1 & 2 & 1 \\ -3 & -1 & 2 & 3 & 1 & 3 \\ 4 & 3 & 1 & -6 & -3 & -2 \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 20 \\ -15 \\ -3 \\ 16 \\ -27 \end{bmatrix}$$

$$f_1 = \frac{a_{21}}{a_{11}} = \frac{2}{1} = 2$$

$$f_2 = \frac{a_{31}}{a_{11}} = \frac{1}{1} = 1$$

$$f_3 = \frac{a_{41}}{a_{11}} = \frac{5}{1} = 5$$

$$f_4 = \frac{a_{51}}{a_{11}} = \frac{-3}{1} = -3$$

$$f_5 = \frac{a_{61}}{a_{11}} = \frac{4}{1} = 4$$

ITER 1

$$\begin{array}{c}
 1 \quad -2 \quad 1 \quad 3 \quad -1 \\
 \left[ \begin{array}{cccccc}
 2-(2 \times 1) & -1-(2 \times 1) & 1-(2 \times 2) & 2-(2 \times 3) & 1-(2 \times 3) & -3-(2 \times -1) \\
 1-(1 \times 1) & 3-(1 \times 1) & -3-(1 \times 2) & -1-(1 \times 3) & 2-(1 \times 3) & 1-(1 \times -1) \\
 5-(5 \times 1) & 2-(5 \times 1) & -1-(5 \times 2) & -1-(5 \times 3) & 2-(5 \times 3) & 1-(5 \times -1) \\
 3-(-3 \times 1) & -1-(-3 \times 1) & 2-(-3 \times 2) & 3-(-3 \times 3) & 3-(-3 \times 3) & 3-(-3 \times -1) \\
 4-(4 \times 1) & 3-(4 \times 1) & 1-(4 \times 2) & -6-(4 \times 3) & -3-(4 \times 3) & -2-(4 \times -1)
 \end{array} \right]
 \end{array}$$

$$\begin{array}{c}
 T_1 \\
 T_2 \\
 T_3 \\
 T_4 \\
 T_5 \\
 T_6
 \end{array}
 =
 \begin{array}{c}
 4 \\
 20 - (2 \times 4) \\
 -15 - (1 \times 4) \\
 -3 - (5 \times 4) \\
 -16 - (3 \times 4) \\
 -27 - (4 \times 4)
 \end{array}$$

ITER 2

$$\begin{array}{c}
 G_{12} \\
 0 \\
 0 \\
 0 \\
 0 \\
 0
 \end{array}
 \begin{array}{c}
 1 \\
 -3 \\
 2 \\
 -3 \\
 2 \\
 -1
 \end{array}
 \begin{array}{c}
 -2 \\
 5 \\
 -1 \\
 9 \\
 -4 \\
 9
 \end{array}
 \begin{array}{c}
 1 \\
 0 \\
 -2 \\
 -6 \\
 6 \\
 -10
 \end{array}
 \begin{array}{c}
 3 \\
 -5 \\
 -1 \\
 -13 \\
 10 \\
 -15
 \end{array}
 \begin{array}{c}
 -1 \\
 -1 \\
 2 \\
 6 \\
 0 \\
 2
 \end{array}
 \begin{array}{c}
 T_1 \\
 T_2 \\
 T_3 \\
 T_4 \\
 T_5 \\
 T_6
 \end{array}
 =
 \begin{array}{c}
 4 \\
 12 \\
 -19 \\
 -23 \\
 28 \\
 -43
 \end{array}$$

$$G_{12} = \frac{q_{32}'}{q_{22}'} = \frac{2}{-3}$$

$$G_{22} = \frac{q_{42}'}{q_{22}'} = \frac{-3}{-3} = 1$$

$$G_{32} = \frac{q_{52}'}{q_{22}'} = \frac{2}{-3}$$

$$G_{42} = \frac{q_{62}'}{q_{22}'} = \frac{-1}{-3} = \frac{1}{3}$$



$$\begin{array}{l}
 1 \quad 1 \quad -2 \quad 1 \quad 3 \quad -1 \\
 0 \quad -3 \quad 5 \quad 0 \quad -5 \quad -1 \\
 0 \quad 2 - \left(-\frac{2}{3} \times 3\right) \quad -1 - \left(-\frac{2}{3} \times 5\right) \quad -2 - \left(-\frac{2}{3} \times 0\right) \quad -5 - \left(-\frac{2}{3} \times 5\right) \quad -1 - \left(-\frac{2}{3} \times -1\right) \\
 0 \quad -3 - (1 \times 3) \quad 9 - (1 \times 5) \quad -6 - (1 \times 0) \quad -13 - (1 \times 5) \quad 6 - (1 \times -1) \\
 0 \quad 2 - \left(-\frac{2}{3} \times 3\right) \quad -4 - \left(-\frac{2}{3} \times 5\right) \quad 6 - \left(-\frac{2}{3} \times 0\right) \quad 10 - \left(-\frac{2}{3} \times 5\right) \quad 0 - \left(-\frac{2}{3} \times -1\right) \\
 0 \quad -1 - \left(\frac{1}{3} \times 3\right) \quad 9 - \left(\frac{1}{3} \times 5\right) \quad -10 - \left(\frac{1}{3} \times 0\right) \quad -15 - \left(\frac{1}{3} \times 5\right) \quad 2 - \left(\frac{1}{3} \times -1\right)
 \end{array}$$

$$\begin{array}{l}
 T_1 \\
 T_2 \\
 T_3 \\
 T_4 \\
 T_5 \\
 T_6
 \end{array}
 =
 \begin{array}{l}
 4 \\
 12 \\
 -19 - \left(-\frac{2}{3} \times 12\right) \\
 -23 - (1 \times 12) \\
 28 - \left(-\frac{2}{3} \times 12\right) \\
 -43 - \left(\frac{1}{3} \times 12\right)
 \end{array}$$

ITER 3

$$\begin{array}{l}
 1 \quad 1 \quad -2 \quad 1 \quad 3 \quad -1 \\
 0 \quad -3 \quad 5 \quad 0 \quad -5 \quad -1 \\
 0 \quad 0 \quad 2.33333 \quad -2 \quad -4.33333 \quad 1.33333 \\
 0 \quad 0 \quad 4 \quad -6 \quad -8 \quad 7 \\
 0 \quad 0 \quad -0.66667 \quad 6 \quad 6.66667 \quad -0.66667 \\
 0 \quad 0 \quad 7.33333 \quad -10 \quad -13.3333 \quad 2.33333
 \end{array}
 \begin{array}{l}
 T_1 \\
 T_2 \\
 T_3 \\
 T_4 \\
 T_5 \\
 T_6
 \end{array}
 =
 \begin{array}{l}
 4 \\
 12 \\
 -11 \\
 -35 \\
 36 \\
 -47
 \end{array}$$

$$H_1 = \frac{a_{43}}{a_{33}} = \frac{4}{2.33333} = 1.714$$

$$H_2 = \frac{a_{53}}{a_{33}} = \frac{-0.66667}{2.33333} = -0.2857$$

$$\begin{array}{cccccc}
 1 & 1 & -2 & 1 & 3 & -1 \\
 0 & -3 & 5 & 0 & -5 & 1 \\
 0 & 0 & 2.333333 & -2 & 4.33333 & 1.333333 \\
 0 & 0 & 4.8 - (1.714 \times 2.33333) & -6 - (1.714 \times 2) & 8.3333 - (1.714 \times 4.3333) & 7 - (1.714 \times 1.3333) \\
 0 & 0 & -0.66667 - (-0.2857 \times 2.33333) & 6 - (-0.2857 \times 2) & 6.66667 - (-0.2857 \times 4.33333) & -0.66667 - (-0.2857 \times 1.33333) \\
 0 & 0 & 7.33 - (3.143 \times 2.33) & -10 - (3.143 \times 2) & -13.33 - (3.143 \times 4.33) & 1.33 - (3.143 \times 1.33)
 \end{array}$$

$$\begin{array}{l}
 T_1 \\
 T_2 \\
 T_3 \\
 T_4 \\
 T_5 \\
 T_6
 \end{array}
 =
 \begin{bmatrix}
 4 \\
 12 \\
 -11 \\
 -35 - (1.714 \times -11) \\
 36 - (-0.2857 \times -11) \\
 -47 - (3.143 \times -11)
 \end{bmatrix}$$

Iter 4								
1	1	-2	1	3	-1	$T_1$	=	4
0	-3	5	0	5	-1	$T_2$		12
0	0	2.33	-2	-4.33	1.33	$T_3$		-11
0	0	0	-2.571	-0.571	4.714	$T_4$		-16.14
0	0	0	5.429	5.429	-0.286	$T_5$		32.86
0	0	0	-3.714	0.286	-1.857	$T_6$		-12.43

$$I_1 = \frac{q_{51}^{III}}{q_{44}^{III}} = \frac{5.429}{-2.571} = -2.11$$

$$I_2 = \frac{q_{56}^{III}}{q_{44}^{III}} = \frac{-3.714}{-2.571} = 1.45$$



1	1	-2	1	3	-1
0	-3	5	0	-5	-1
0	0	2.33	-2	-4.33	1.33
0	0	0	2.571	-0.571	4.714
0	0	0	5.429 - (2.571 x -2.11)	5.429 - (-2.11 x 0.5)	4.714 - (-2.11 x 1.714)
0	0	0	-3.714 - (1.45 x 2.571)	0.286 - (1.45 x 0.5)	-1.8571 - (1.45 x 4.714)

$$\begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -16.14 \\ 32.88 - (-2.11 \times -16.14) \\ -12.4386 - (1.45 \times -16.14) \end{bmatrix}$$

ITER 5

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 2.33 & -2 & 4.33 & 1.33 \\ 0 & 0 & 0 & -2.571 & 0.571 & 4.714 \\ 0 & 0 & 0 & 0 & 4.22 & 9.667 \\ 0 & 0 & 0 & 0 & 1.11 & 8.667 \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -16.14 \\ -1.22 \\ -10.89 \end{bmatrix}$$

$$J_1 = \frac{q_{55}^{(III)}}{q_{55}^{(III)}} = \frac{1.11}{4.22} = 0.263$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 2.33 & -2 & 4.33 & 1.33 \\ 0 & 0 & 0 & -2.571 & 0.571 & 4.714 \\ 0 & 0 & 0 & 0 & 4.22 & 9.667 \\ 0 & 0 & 0 & 0 & 1.11 - (0.263 \times 4.22) & 8.667 - (0.263 \times 9.667) \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix}$$

$$= \begin{bmatrix} 4 \\ 12 \\ -11 \\ -16.4 \\ -1.22 \\ -10.89 - (0.263 \times -1.22) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & 5 & -1 \\ 0 & 0 & 2.33 & 2 & -4.33 & 1.33 \\ 0 & 0 & 0 & -2.571 & -0.571 & 4.714 \\ 0 & 0 & 0 & 0 & 4.22 & 9.67 \\ 0 & 0 & 0 & 0 & 0 & -11.21 \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -16.44 \\ -1.22 \\ 11.21 \end{bmatrix}$$

$$T_6 = \frac{11.21}{-11.21} = 1$$

$$T_5 = \frac{-1.22 - 9.675(1)}{4.22} = 2$$

$$T_4 = \frac{-16.44 - 4.714(1) + 0.571(2)}{-2.571} = 4$$

$$T_3 = \frac{-11 - 1.33(1) + 4.33(2) - 2(4)}{2.33} = 3$$

$$T_2 = \frac{12 + 1(1) - 5(2) - 0 + 5(3)}{-3} = -2$$

$$T_1 = \frac{4 + 1(1) - 3(2) - 1(4) + 2(3) - 1(-2)}{1} = 1$$