NAME: Ademilua Oyinkansola

MATRIC NO: 16/ENG04/005

DEPT: Electricial ENGINEERING

ASSIGNMENT 3 SOLUTION

1. T1 +T2 -2T3 +T4 +3T5 -T6 = 4

2T1 -T2 +T3 + 2T4 +T5 -3T6 =20

T1 -3T2 -3T3 –T4 +2T5 +T6 =-15

5T1 +2T2 – T3 – T4 +2T5 + T6 =-3

-3T1 -T2 +2T3 +3T4 +T5 +3T6 =16

4T1 +3T2 +T3 -6T4 -3T5 -2T6 =-27

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A |  | x |  | b |
| 1 | 1 | -2 | 1 | 3 | -1 |  | T1 |  | 4 |
| 2 | -1 | 1 | 2 | 1 | -3 |  | T2 |  | 20 |
| 1 | 3 | -3 | -1 | 2 | 1 |  | T3 | = | -15 |
| 5 | 2 | -1 | -1 | 2 | 1 |  | T4 |  | -3 |
| -3 | -1 | 2 | 3 | 1 | 3 |  | T5 |  | 16 |
| 4 | 3 | 1 | -6 | -3 | -2 |  | T6 |  | -2 |

F21=2/1 = 2, F31=1/1 = 1, F41=5/1 = 5, F51=-3/1 = -3, F61=4/1 = 4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A |  | t | = | b |
| 1 | 1 | -2 | 1 | 3 | -1 |  | t1 | 4 |
| 0 | -3 | 5 | 0 | -5 | -1 |  | t2 | 12 |
| 0 | 2 | -1 | -2 | -1 | 2 |  | t3 | -19 |
| 0 | -3 | 9 | -6 | -13 | 6 |  | t4 | -23 |
| 0 | 2 | -4 | 6 | 10 | 0 |  | t5 | 28 |
| 0 | -1 | 9 | -10 | -15 | 4 |  | t6 | -43 |

F32=2/-3 = -0.6667 ,F42=-3/-3 = 1 , F52=2/-3 = -0.6667 , F62=-1/-3 = 0.3333

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A |  | t | = | b |
| 1 | 1 | -2 | 1 | 3 | -1 |  | t1 | 4 |
| 0 | -3 | 5 | 0 | -5 | -1 |  | t2 | 12 |
| 0 | 0 | 2.333333 | -2 | -4.33333 | 1.333333 |  | t3 | -11 |
| 0 | 0 | 4 | -6 | -8 | 7 |  | t4 | -35 |
| 0 | 0 | -0.66667 | 6 | 6.666667 | -0.66667 |  | t5 | 36 |
| 0 | 0 | 7.333333 | -10 | -13.3333 | 4.333333 |  | t6 | -47 |
|  |  |  |  |  |  |  |  |  |  |

F43=4/2.333 = 1.714286 , F53=-0.6667/2.333 = -0.28571 , F63=7.3333/2.333 = 3.142857

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A |  | t | = | b |
| 1 | 1 | -2 | 1 | 3 | -1 |  | t1 | 4 |
| 0 | -3 | 5 | 0 | -5 | -1 |  | t2 | 12 |
| 0 | 0 | 2.333333 | -2 | -4.33333 | 1.333333 |  | t3 | -11 |
| 0 | 0 | 0 | -2.57143 | -0.57143 | 4.714286 |  | t4 | -16.1429 |
| 0 | 0 | 0 | 5.428571 | 5.428571 | -0.28571 |  | t5 | 32.85714 |
| 0 | 0 | 0 | -3.71429 | 0.285714 | 0.142857 |  | t6 | -12.4286 |

F54=5.428571/-2.57143 = -2.11111, F64=-3.71429/-2.57143 = 1.444444

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A |  | t | = | b |
| 1 | 1 | -2 | 1 | 3 | -1 |  | t1 | 4 |
| 0 | -3 | 5 | 0 | -5 | -1 |  | t2 | 12 |
| 0 | 0 | 2.333333 | -2 | -4.33333 | 1.333333 |  | t3 | -11 |
| 0 | 0 | 0 | -2.57143 | -0.57143 | 4.714286 |  | t4 | -16.1429 |
| 0 | 0 | 0 | 0 | 4.222222 | 9.666667 |  | t5 | -1.22222 |
| 0 | 0 | 0 | 0 | 1.111111 | -6.66667 |  | t6 | 10.88889 |

F65=1.11111/4.2222 = 0.26316

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A |  | t | = | b |
| 1 | 1 | -2 | 1 | 3 | -1 |  | t1 | 4 |
| 0 | -3 | 5 | 0 | -5 | -1 |  | t2 | 12 |
| 0 | 0 | 2.333333 | -2 | -4.33333 | 1.333333 |  | t3 | -11 |
| 0 | 0 | 0 | -2.57143 | -0.57143 | 4.714286 |  | t4 | -16.1429 |
| 0 | 0 | 0 | 0 | 4.222222 | 9.666667 |  | t5 | -1.22222 |
| 0 | 0 | 0 | 0 | 0 | -9.21053 |  | t6 | 11.21053 |

|  |  |
| --- | --- |
| t6 | -1.21714 |
| t5 | -0.28947 |
| t4 | 4.110677 |
| t3 | -1.03293 |
| t2 | -4.83338 |
| t1 | 2.30812 |

|  |  |
| --- | --- |
| b. gauss elimination |  |
| A | t | b |  |
| 1 | 1 | -2 | 1 | 3 | -1 | t1 | 4 |  |
| 2 | -1 | 1 | 2 | 1 | -3 | t2 | 20 |  |
| 1 | 3 | -3 | -1 | 2 | 1 | t3 | -15 |  |
| 5 | 2 | -1 | -1 | 2 | 1 | t4 | -3 |  |
| -3 | -1 | 2 | 3 | 1 | 3 | t5 | 16 |  |
| 4 | 3 | 1 | -6 | -3 | -2 | t6 | -27 |  |
|  |  |  |  |  |  |  |  |  |
| A | t | b | fa ctor |
| 1 | 1 | -2 | 1 | 3 | -1 | t1 | 4 |  |
| 0 | -3 | 5 | 0 | -5 | -1 | t2 | 12 | 2 |
| 0 | 2 | -1 | -2 | -1 | 2 | t3 | -19 | 1 |
| 0 | -3 | 9 | -6 | -13 | 6 | t4 | -23 | 5 |
| 0 | 2 | -4 | 6 | 10 | 0 | t5 | 28 | -3 |
| 0 | -1 | 9 | -10 | -15 | 2 | t6 | -43 | 4 |
|  |  |  |  |  |  |  |  |  |
| A | t | b | factor |
| 1 | 1 | -2 | 1 | 3 | -1 | t1 | 4 |  |
| 0 | -3 | 5 | 0 | -5 | -1 | t2 | 12 |  |
| 0 | 0 | 2.333333 | -2 | -4.33333 | 1.333333 | t3 | -11 | -0.66667 |
| 0 | 0 | 4 | -6 | -8 | 7 | t4 | -35 | 1 |
| 0 | 0 | -0.66667 | 6 | 6.666667 | -0.66667 | t5 | 36 | -0.66667 |
| 0 | 0 | 7.333333 | -10 | -13.3333 | 2.333333 | t6 | -47 | 0.333333 |
|  |  |  |  |  |  |  |  |  |
| A | t | b | factor |
| 1 | 1 | -2 | 1 | 3 | -1 | t1 | 4 |  |
| 0 | -3 | 5 | 0 | -5 | -1 | t2 | 12 |  |
| 0 | 0 | 2.333333 | -2 | -4.33333 | 1.333333 | t3 | -11 |  |
| 0 | 0 | 0 | -2.57143 | -0.57143 | 4.714286 | t4 | -16.1429 | 1.714286 |
| 0 | 0 | 0 | 5.428571 | 5.428571 | -0.28571 | t5 | 32.85714 | -0.28571 |
| 0 | 0 | 0 | -3.71429 | 0.285714 | -1.85714 | t6 | -12.4286 | 3.142857 |
|  |  |  |  |  |  |  |  |  |
| A | t | b | factor |
| 1 | 1 | -2 | 1 | 3 | -1 | t1 | 4 |  |
| 0 | -3 | 5 | 0 | -5 | -1 | t2 | 12 |  |
| 0 | 0 | 2.333333 | -2 | -4.33333 | 1.333333 | t3 | -11 |  |
| 0 | 0 | 0 | -2.57143 | -0.57143 | 4.714286 | t4 | -16.1429 |  |
| 0 | 0 | 0 | 0 | 4.222222 | 9.666667 | t5 | -1.22222 | -2.11111 |
| 0 | 0 | 0 | 0 | 1.111111 | -8.66667 | t6 | 10.88889 | 1.444444 |
|  |  |  |  |  |  |  |  |  |
| A | t | b | factor |
| 1 | 1 | -2 | 1 | 3 | -1 | t1 | 4 |  |
| 0 | -3 | 5 | 0 | -5 | -1 | t2 | 12 |  |
| 0 | 0 | 2.333333 | -2 | -4.33333 | 1.333333 | t3 | -11 |  |
| 0 | 0 | 0 | -2.57143 | -0.57143 | 4.714286 | t4 | -16.1429 |  |
| 0 | 0 | 0 | 0 | 4.222222 | 9.666667 | t5 | -1.22222 |  |
| 0 | 0 | 0 | 0 | 0 | -11.2105 | t6 | 11.21053 | 0.263158 |
|  |  |  |  |  |  |  |  |  |
| t6 | -1 |  |  |  |  |  |  |  |
| t5 | -0.28947 |  |  |  |  |  |  |  |
| t4 | 4.508772 |  |  |  |  |  |  |  |
| t3 | -0.81579 |  |  |  |  |  |  |  |
| t2 | -4.54386 |  |  |  |  |  |  |  |
| t1 | 2.27193 |  |  |  |  |  |  |  |

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ASSIGNMENT 3

Code(Matrix Inverse Method):

commandwindow

clear

clc

format short g

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

 a= [ 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]

g = inv(a)

T =g\*B

Command window(Matrix Inverse Method):

B =

 4

 20

 -15

 -3

 16

 -27

a =

 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

g =

 -0.30282 0.15493 0.084507 0.19718 -0.10563 -0.098592

 -0.5493 0.5446 0.81221 -0.21596 0.23474 0.10798

 0.33099 -0.037559 -0.26291 -0.0023474 0.32864 0.25117

 -0.91549 0.68545 0.79812 -0.08216 0.0023474 -0.20892

 1.0915 -0.53521 -0.74648 0.091549 0.1831 0.20423

 -0.15493 -0.14554 -0.018779 0.1784 0.023474 -0.089202

T =

 1

 -2

 3

 4

 2

 -1

Code(Gauss Elimination):

commandwindow

clear

clc

format short g

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

a =

 [ 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]

F1a =[a(2,1)/a(1,2)]

F2a=[a(3,1)/a(1,2)]

F3a=[a(4,1)/a(1,2)]

F4a=[a(5,1)/a(1,2)]

F5a=[a(6,1)/a(1,2)]

a =[1 1 -2 1 3 -1

 a(2,1)-(F1a\*a(1,1)) a(2,2)-(F1a\*a(1,2)) a(2,3)-(F1a\*a(1,3)) a(2,4)-(F1a\*a(1,4)) a(2,5)-(F1a\*a(1,5)) a(2,6)-(F1a\*a(1,6))

 a(3,1)-(F2a\*a(1,1)) a(3,2)-(F2a\*a(1,2)) a(3,3)-(F2a\*a(1,3)) a(3,4)-(F2a\*a(1,4)) a(3,5)-(F2a\*a(1,5)) a(3,6)-(F2a\*a(1,6))

 a(4,1)-(F3a\*a(1,1)) a(4,2)-(F3a\*a(1,2)) a(4,3)-(F3a\*a(1,3)) a(4,4)-(F3a\*a(1,4)) a(4,5)-(F3a\*a(1,5)) a(4,6)-(F3a\*a(1,6))

 a(5,1)-(F4a\*a(1,1)) a(5,2)-(F4a\*a(1,2)) a(5,3)-(F4a\*a(1,3)) a(5,4)-(F4a\*a(1,4)) a(5,5)-(F4a\*a(1,5)) a(5,6)-(F4a\*a(1,6))

 a(6,1)-(F5a\*a(1,1)) a(6,2)-(F5a\*a(1,2)) a(6,3)-(F5a\*a(1,3)) a(6,4)-(F5a\*a(1,4)) a(6,5)-(F5a\*a(1,5)) a(6,6)-(F5a\*a(1,6))]

 b1=4; b2=20;b3=-15;b4=-3;b5=16;b6=-27;

 b2a= b2-((F1a)\*b1), b3a=b3-((F2a)\*b1)

 b4a= b4-((F3a)\*b1) ,b5a=b5-((F4a)\*b1) ,b6a=b6-((F5a)\*b1)

% A = [2 -1 1

% 1 2 -1

% 1 -1 2]

% x = [x1; x2; x3]

% B = [-1; 6; -3]

% C = [0 A(1,2)/A(1,1) -A(1,3)/A(1,1)

% -A(2,1)/A(2,2) 0 -A(2,3)/A(2,2)

% -A(3,1)/A(3,3) A(3,2)/A(3,3) 0]

% D =[B(1,1)/A(1,1);B(2,1)/A(2,2);B(3,1)/A(3,3)]

% X=[0;0;0]

% X= (C\*X)+D

Aa=[1 1 -2 1 3 -1

 0 -3 5 0 -5 -1

 0 2 -1 -2 -1 2

 0 -3 9 -6 -13 6

 0 2 -4 6 10 0

 0 -1 9 -10 -15 2]

 F2=[Aa(3,2)/Aa(2,2)]

 F3=[Aa(4,2)/Aa(2,2)]

 F4=[Aa(5,2)/Aa(2,2)]

 F5=[Aa(6,2)/Aa(2,2)]

 A2 =[1 1 -2 1 3 -1

 0 -3 5 0 -5 -1

 0 Aa(3,2)-(F2\*Aa(2,2)) Aa(3,3)-(F2\*Aa(2,3)) Aa(3,4)-(F2\*Aa(2,4)) Aa(3,5)-(F2\*Aa(2,5)) Aa(3,6)-(F2\*Aa(2,6))

 0 Aa(4,2)-(F3\*Aa(2,2)) Aa(4,3)-(F3\*Aa(2,3)) Aa(4,4)-(F3\*Aa(2,4)) Aa(4,5)-(F3\*Aa(2,5)) Aa(4,6)-(F3\*Aa(2,6))

 0 Aa(5,2)-(F4\*Aa(2,2)) Aa(5,3)-(F4\*Aa(2,3)) Aa(5,4)-(F4\*Aa(2,4)) Aa(5,5)-(F4\*Aa(2,5)) Aa(5,6)-(F4\*Aa(2,6))

 0 Aa(6,2)-(F5\*Aa(2,2)) Aa(6,3)-(F5\*Aa(2,3)) Aa(6,4)-(F5\*Aa(2,4)) Aa(6,5)-(52\*Aa(2,2)) Aa(6,6)-(F5\*Aa(2,6))]

 b3aa =b3a-(F2\*b2a)

 b4aa =b4a-(F3\*b2a)

 b5aa =b5a-(F4\*b2a)

 b6aa =b6a-(F5\*b2a)

 Aaa=[1 1 -2 1 3 -1

 0 -3 5 0 -5 -1

 0 0 7/3 -2 -13/3 4/3

 0 0 4 -6 -8 7

 0 0 -2/3 6 20/3 -2/3

 0 0 22/3 -10 -40/3 7/3]

 F33=[Aaa(4,3)/Aaa(3,3)]

 F44=[Aaa(5,3)/Aaa(3,3)]

 F55=[Aaa(6,3)/Aaa(3,3)]

 A3 =[1 1 -2 1 3 -1

 0 -3 5 0 -5 -1

 0 0 2.3333 -2 -4.3333 1.3333

 0 0 Aaa(4,3)-(F33\*Aaa(3,3)) Aaa(4,4)-(F33\*Aaa(3,4)) Aaa(4,5)-(F33\*Aaa(3,5)) Aaa(4,6)-(F33\*Aaa(3,6))

 0 0 Aaa(5,3)-(F44\*Aaa(3,3)) Aaa(5,4)-(F44\*Aaa(3,4)) Aaa(5,5)-(F44\*Aaa(3,5)) Aaa(5,6)-(F44\*Aaa(3,6))

 0 0 Aaa(6,3)-(F55\*Aaa(3,3)) Aaa(6,4)-(F55\*Aaa(3,4)) Aaa(6,5)-(F55\*Aaa(3,5)) Aaa(6,6)-(F55\*Aaa(3,6))]

 b4aaa =b4aa-(F33\*b3aa)

 b5aaa =b5aa-(F44\*b3aa)

 b6aaa =b6aa-(F55\*b3aa)

 Aaaa=[1 1 -2 1 3 -1

 0 -3 5 0 -5 -1

 0 0 7/3 -2 -13/3 4/3

 0 0 0 -18/7 -4/7 33/7

 0 0 0 38/7 38/7 -2/7

 0 0 0 -26/7 2/7 -13/7]

 F444=[Aaaa(5,4)/Aaaa(4,4)]

 F555=[Aaaa(6,4)/Aaaa(4,4)]

 A4 =[1 1 -2 1 3 -1

 0 -3 5 0 -5 -1

 0 0 2.3333 -2 -4.3333 1.3333

 0 0 0 -2.5714 -0.57143 4.7143

 0 0 0 Aaaa(5,4)-(F444\*Aaaa(4,4)) Aaaa(5,5)-(F444\*Aaaa(4,5)) Aaaa(5,6)-(F444\*Aaaa(4,6))

 0 0 0 Aaaa(6,4)-(F555\*Aaaa(4,4)) Aaaa(6,5)-(F555\*Aaaa(4,5)) Aaaa(6,6)-(F555\*Aaaa(4,6))]

 b5aaaa =b5aaa-(F444\*b4aaa)

 b6aaaa =b6aaa-(F555\*b4aaa)

 Aaaaa=[1 1 -2 1 3 -1

 0 -3 5 0 -5 -1

 0 0 7/3 -2 -13/3 4/3

 0 0 0 -18/7 -4/7 33/7

 0 0 0 0 38/9 29/3

 0 0 0 0 10/9 -26/3]

 F5555=[Aaaaa(6,5)/Aaaaa(5,5)]

 A5 =[1 1 -2 1 3 -1

 0 -3 5 0 -5 -1

 0 0 2.3333 -2 -4.3333 1.3333

 0 0 0 -2.5714 -0.57143 4.7143

 0 0 0 0 4.2222 9.6667

 0 0 0 0 Aaaaa(6,5)-(F5555\*Aaaaa(5,5)) Aaaaa(6,6)-(F5555\*Aaaaa(5,6))]

 b6aaaaa =b6aaaa-(F5555\*b5aaaa)

 x6=b6aaaaa/A5(6,6)

 x5=(b5aaaa-(A5(5,6)\*x6))/A5(5,5)

 x4=(b4aaa-((Aaaa(4,5))\*x5)-((Aaaa(4,6))\*x6))/Aaaa(4,4)

 x3=((b3aa-((Aaa(3,6))\*x6)-((Aaa(3,5))\*x5)-((Aaa(3,4))\*x4))/Aaa(3,3))

 x2=((b2a-(Aa(2,3)\*x3)-(Aa(2,4)\*x4)-(Aa(2,5)\*x5)-(Aa(2,6)\*x6))/Aa(2,2))

 x1=(b1-(a(1,2)\*x2)-(a(1,3)\*x3)-(a(1,4)\*x4)-(a(1,5)\*x5)-(a(1,6)\*x6))/a(1,1)

Command Window(Gauss Elimination):

B =

 4

 20

 -15

 -3

 16

 -27

a =

 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

g =

 -0.30282 0.15493 0.084507 0.19718 -0.10563 -0.098592

 -0.5493 0.5446 0.81221 -0.21596 0.23474 0.10798

 0.33099 -0.037559 -0.26291 -0.0023474 0.32864 0.25117

 -0.91549 0.68545 0.79812 -0.08216 0.0023474 -0.20892

 1.0915 -0.53521 -0.74648 0.091549 0.1831 0.20423

 -0.15493 -0.14554 -0.018779 0.1784 0.023474 -0.089202

T =

 1

 -2

 3

 4

 2

 -1