

VODINA EFEM

16ENG03020

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
(F2*Aa(2,4))  Aa(3,2)-(F2*Aa(2,2))  Aa(3,3)-(F2*Aa(2,3))  Aa(3,4)-
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)-(F5*Aa(2,5))  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
-2     0          2.3333
-4.3333  1.3333
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     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     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
-2     0          2.3333
-4.3333  1.3333
0     0
-2.5714  -0.57143  4.7143
0     0  Aaaa(5,4)-
(F444*Aaaa(4,4))  Aaaa(5,5)-(F444*Aaaa(4,5))  Aaaa(5,6)-
(F444*Aaaa(4,6))

```

```

0
(F555*Aaaa(4,4))
(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
-2 0 2.3333
0 -4.3333 1.3333
-2.5714 0 0
0 -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
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-0.15493	-0.14554	-0.018779	0.1784	0.023474	-0.089202

T =

1  
-2  
3  
4  
2  
-1