Tema 4
Nicoleta Radu

Exe. 1/ Pag. 6
A d)

d) $\begin{cases} 2x_1 + 4x_3 + x_4 = 7 \\ 2x_2 + 4x_3 + x_4 = 7 \\ 2x_1 + 4x_2 + 3x_3 = 9 \\ x_1 + 2x_2 + 2x_4 = 5 \end{cases}$

A=

2	0	4	1
0	2	4	1
2	4	3	0
1	2	0	2

B= 7 7 9 5

2	0	4	1	7
0	2	4	1	7
2	4	3	0	9
1	2	0	2	5

:2 =>

1	0	2	1/2	**7/2**
0	2	4	1	**7**
2	4	3	0	**9**
1	2	0	2	**5**

1	0	2	1/2	**7/2**
0	2	4	1	**7**
0	4	-1	-1	**2**
1	2	-2	3/2	**3/2**

->

->

1	0	2	1/2	**7/2**
0	1	2	1/2	**7/2**
0	4	-1	-1	**2**
0	2	-2	3/2	**3/2**

->

1	0	2	1/2	**7/2**
0	1	2	1/2	**7/2**
0	0	-9	-3	**-12**
0	0	-6	0.5	**-5.5**

:(-9)

->

1	0	2	1/2	**7/2**
0	1	2	1/2	**7/2**
0	0	1	1/3	**4/3**
0	0	-6	0.5	**-5.5**

1	0	0	-1/6	**5/6**
0	1	0	-1/6	**5/6**
0	0	1	1/3	**4/3**
0	0	0	2.5	**2.5**

->

:2.5

1	0	0	-1/6	**5/6**
0	1	0	-1/6	**5/6**
0	0	1	1/3	**4/3**
0	0	0	1	**1**

->

X1=5/6+1/6*1=1 -> x1=1
X2=5/6+1/6*1=1 -> x2=1
X3=4/3-1/3*1=1 -> x3=1
X1= 1 -> x4=1

=> X = (1 1 1 1)

Exe. 1 / Pag. 6
C

```
function x = gaussTotal(a,b)
n = length(b);
[lin,col] = size(a);
if lin ~= col
   error('Matricea nu e patratica');
else
   if det(a) == 0
       error('Matricea este singulara, det(A) = 0');
   end
end
a = [a b]; % matricea extinsa
x = zeros(n,1);
tic % pornim cronometrul
for i = 1:n
   if ((a(i,i)~=0) || (max(abs(a(i:n,i:n)))) ~= 0 )
```

```
        [m, k] = max(abs(a(i:n,i:n))); % retin cea mai mare valoare de pe
coloana i
        [max_val, col_index] = max(m);
        k = k(col_index) + i - 1;
        % fixam linia k ca sa fie intotdeauna pt linii de sub pivot
        % schimbam linia i cu linia k pt toate coloanele
        a([i k],1:n+1)=a([k i],1:n+1);
        % o data fixat pivotul, putem imparti linia la pivot
        a(i,i:n+1) = a(i,i:n+1)/a(i,i);
        % aplicam regula de pivotare
        for j = i+1:n
            a(j,i+1:n+1) = a(j,i+1:n+1) - a(j,i)*a(i,i+1:n+1)/a(i,i);
        end
    else
        error('impartire la 0. Sistemul nu este compatibil determinat');
    end
end
toc % oprim cronometrul (afiseaza secundele)
for k = n:-1:1
    x(k) = a(k,n+1) - a(k,k+1:n)*x(k+1:n); % calcularea vectorului cu solutiile
end
fprintf('\nSolutiile sub forma de fractii:\n')
disp(rats(x')) % ne afiseaza valorile lui x sub forma de fractii (rats)
end
```

APEL DE FUNCTIE

```
c=[2, -5, 4; -3, 1, 1; 2, -1, 0], d=[7;-1;1], y=gaussTotal(c,d);
```

>> Tema4

c =

```
   2   -5    4
  -3    1    1
   2   -1    0
```

d =

```
   7
  -1
   1
```

Elapsed time is 0.001084 seconds.

Solutiile sub forma de fractii:

```
    -1/2          -2          -1/2
>>
```