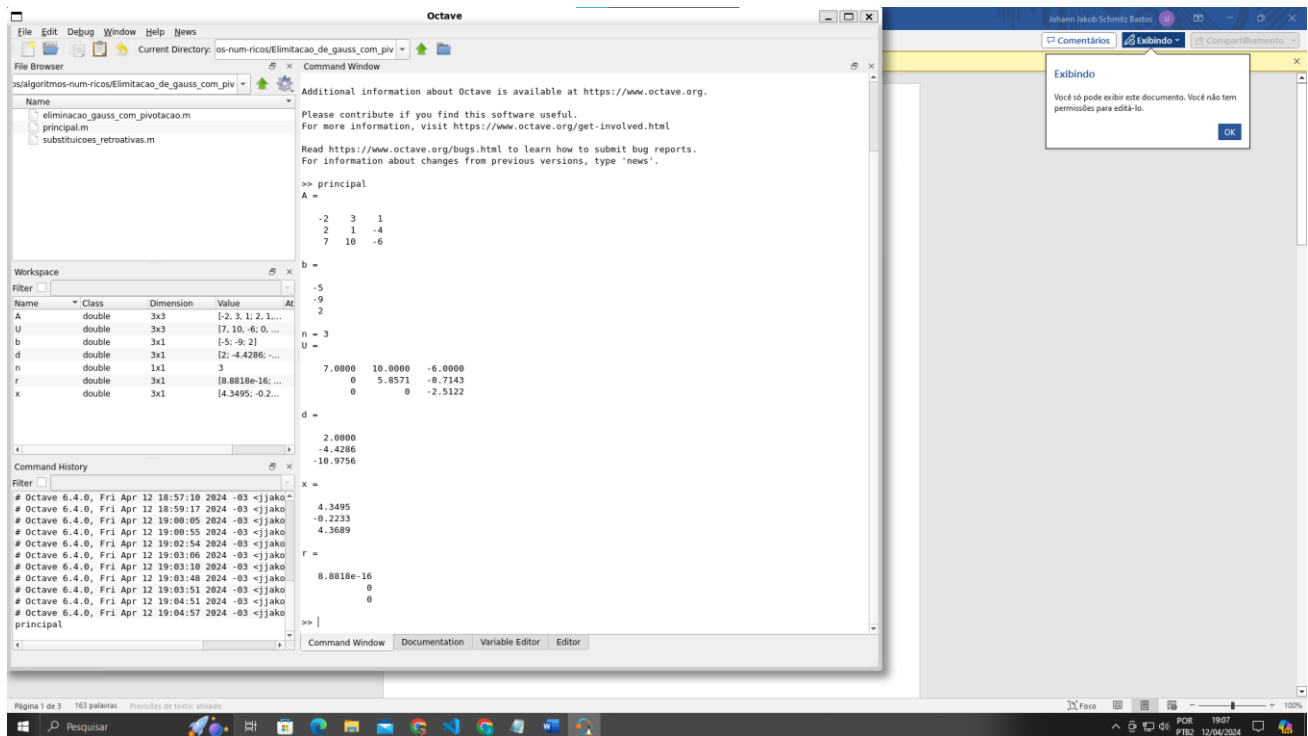


Resultados do Programa do Método da Eliminação de Gauss com Pivotação Parcial

1) Solução do sistema linear $Ax = b$ abaixo.

$$A = [-2 \ 3 \ 1; \ 2 \ 1 \ -4; \ 7 \ 10 \ -6]$$

$$b = [-5; \ -9; \ 2]$$



The screenshot shows the Octave environment with the following content in the Command Window:

```
Additional information about Octave is available at https://www.octave.org.
Please contribute if you find this software useful.
For more information, visit https://www.octave.org/get-involved.html
Read https://www.octave.org/bugs.html to learn how to submit bug reports.
For information about changes from previous versions, type 'news'.

>> principal
A =
   -2    3    1
    2    1   -4
    7   10   -6

b =
   -5
   -9
    2

n = 3
U =
    7.0000   10.0000   -6.0000
    0    5.8571   -0.7143
    0    0   -2.5122

d =
    2.0000
   -4.4286
  -10.9756

x =
    4.3495
   -0.2233
    4.3689

r =
   8.8818e-16
    0
    0

>> |
```

The Workspace window shows the following variables:

Name	Class	Dimension	Value	At
A	double	3x3	[-2, 3, 1; 2, 1, -4; 7, 10, -6]	At
U	double	3x3	[7, 10, -6; 0, 5.8571, -0.7143; 0, 0, -2.5122]	
b	double	3x1	[-5; -9; 2]	
d	double	3x1	[2; -4.4286; -10.9756]	
n	double	1x1	3	
r	double	3x1	[8.8818e-16; 0; 0]	
x	double	3x1	[4.3495; -0.2233; 4.3689]	

The Command History window shows the following commands:

```
# Octave 6.4.0, Fri Apr 12 18:57:10 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 18:59:17 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:00:05 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:00:55 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:02:54 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:06 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:10 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:48 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:51 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:04:51 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:04:57 2024 -03 <jjako>
principal
```

2) Solução do sistema linear $Ax = b$ abaixo.

$$A = \begin{bmatrix} 1 & -3 & 5 & 6 \\ -9 & 4 & -1 & 0 \\ 3 & 2 & -2 & 7 \\ 1 & 2 & 5 & -4 \end{bmatrix}$$

$$b = \begin{bmatrix} 17 \\ 29 \\ -11 \\ 7 \end{bmatrix}$$

```
Octave
File Edit Debug Window Help News
Current Directory: os-num-ricos/Elimitacao_de_gauss_com_piv
File Browser
Name
  eliminacao_gauss_com_pivacao.m
  principal.m
  substituiçoes_retroativas.m
Workspace
Filter
Name Class Dimension Value
A double 4x4 [1, -3, 5, 6; ...]
U double 4x4 [-9, 4, -1, 0; ...]
b double 4x1 [17; 29; -11; 7]
d double 4x1 [29; -1.3333; ...]
n double 1x1 4
r double 4x1 [0; -3.5527e-...
x double 4x1 [-3.6452; 0...
Command History
Filter
# Octave 6.4.0, Fri Apr 12 19:00:05 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:00:55 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:02:54 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:06 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:10 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:48 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:51 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:04:51 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:04:57 2024 -03 <jjako>
principal
# Octave 6.4.0, Fri Apr 12 19:08:26 2024 -03 <jjako>
principal
>> principal
A =
   1  -3   5   6
  -9   4  -1   0
   3   2  -2   7
   1   2   5  -4

b =
   17
   29
  -11
    7

n = 4
U =
  -9.0000   4.0000  -1.0000    0
    0   3.3333  -2.3333   7.0000
    0    0   6.6000  -9.1333
    0    0    0  15.6566

d =
   29.0000
  -1.3333
  11.2000
  13.9394

x =
  -3.6452
  -0.2194
   2.9290
   0.8903

r =
    0
  -3.5527e-15
    0
  5.3291e-15

>>
```

3) Solução do sistema linear $Ax = b$ abaixo.

$$A = \begin{bmatrix} 0 & 1 & 3 & 2 & 4 \\ 8 & -2 & 9 & -1 & 2 \\ 5 & 1 & 1 & 7 & 2 \\ -2 & 4 & 5 & 1 & 0 \\ 7 & -3 & 2 & -4 & 1 \end{bmatrix};$$

$$b = \begin{bmatrix} 3 \\ -5 \\ 6 \\ -1 \\ 8 \end{bmatrix};$$

```
Octave
File Edit Debug Window Help News
Current Directory: os-num-ricos/Elimitacao_de_gauss_com_piv
File Browser
Name
  eliminacao_gauss_com_pivacao.m
  principal.m
  substituiçoes_retroativas.m
Workspace
Filter
Name Class Dimension Value
A double 5x5 [0, 1, 3, 2, 4; ...]
U double 5x5 [8, -2, 9, -1, 2; ...]
b double 5x1 [3; -5; 6; -1; 8]
d double 5x1 [-5; -2.2500; ...]
n double 1x1 5
r double 5x1 [0; 0; -1.7764; ...]
x double 5x1 [2.3475; 4.35...
Command History
Filter
# Octave 6.4.0, Fri Apr 12 19:00:55 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:02:54 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:06 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:10 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:48 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:03:51 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:04:51 2024 -03 <jjako>
# Octave 6.4.0, Fri Apr 12 19:04:57 2024 -03 <jjako>
principal
# Octave 6.4.0, Fri Apr 12 19:08:26 2024 -03 <jjako>
principal
# Octave 6.4.0, Fri Apr 12 19:10:42 2024 -03 <jjako>
principal
>> principal
A =
   0   1   3   2   4
   8  -2   9  -1   2
   5   1   1   7   2
  -2   4   5   1   0
   7  -3   2  -4   1

b =
    3
   -5
    6
   -1
    8

n = 5
U =
   8.0000  -2.0000   9.0000  -1.0000   2.0000
    0   3.5000   7.2500   0.7500   0.5000
    0    0  -9.2857   7.1429   0.4286
    0    0    0  -5.3846  -0.7231
    0    0    0    0   3.5643

d =
  -5.0000
  -2.2500
  10.5714
   7.8308
   8.3357

x =
   2.3475
   4.3543
  -1.7683
   2.3387
   2.3387

r =
    0
  -1.7764e-15
  5.3291e-15
  8.8818e-16
    0

>>
```

- 4) Comparação dos resíduos das soluções dos sistemas lineares acima pelo método da eliminação de Gauss sem e com pivotação parcial.

Sistema Linear	Sem Pivotação Parcial	Com Pivotação Parcial
1	<pre> r = 8.8818e-16 0 0 </pre>	<pre> r = 8.8818e-16 0 0 </pre>
2	<pre> r = 0 1.0658e-14 0 0 </pre>	<pre> r = 0 -3.5527e-15 0 5.3291e-15 </pre>
3	<pre> r = NaN Inf Inf -Inf Inf </pre>	<pre> r = 0 0 -1.7764e-15 5.3291e-15 8.8818e-16 </pre>