
Main file

```
clc;
clear all;

% 1) The modified Gaussian elimination algorithm code
% is in the gauss_elim_partial_pivoting.m file

% 2) I have placed M after every for loop in both codes

% Example:

A = [2 3 4 5;
     34 56 78 1;
     23 0 1 2];

% Gaussian elimination without partial pivoting
gauss_elim_pivoting(A);

% Gaussian elimination with partial pivoting
gauss_elim_partial_pivoting(A);

% 3)

A = [1 10^5 0 3;
     0 2 -1 2;
     10^10 -1 0 -2;
     -10^(-8) 1 0 100];
b = [.000999; 1000.9999999; .00001; -1/3];

% using the Gaussian elimination with partial
% pivoting
x = backsolve(gauss_elim_partial_pivoting(A)...
              , b)

% using the Matlab built in
x = A\b

M =

    2.0000    3.0000    4.0000    5.0000
         0    5.0000   10.0000  -84.0000
         0  -34.5000  -45.0000  -55.5000

M =

    2.0000    3.0000    4.0000    5.0000
         0    5.0000   10.0000  -84.0000
         0         0   24.0000 -635.1000
```

$M =$

2.0000	3.0000	4.0000	5.0000
0	5.0000	10.0000	-84.0000
0	0	24.0000	-635.1000

$M =$

34.0000	56.0000	78.0000	1.0000
0	-0.2941	-0.5882	4.9412
0	-37.8824	-51.7647	1.3235

$M =$

34.0000	56.0000	78.0000	1.0000
0	-0.2941	-0.5882	4.9412
0	0	24.0000	-635.1000

$M =$

34.0000	56.0000	78.0000	1.0000
0	-0.2941	-0.5882	4.9412
0	0	24.0000	-635.1000

$M =$

1.0e+10 *

1.0000	-0.0000	0	-0.0000
0	0.0000	-0.0000	0.0000
0	0.0000	0	0.0000
0	0.0000	0	0.0000

$M =$

1.0e+10 *

1.0000	-0.0000	0	-0.0000
0	0.0000	0	0.0000
0	0	-0.0000	0.0000
0	0	0	0.0000

$M =$

1.0e+10 *

1.0000	-0.0000	0	-0.0000
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0	0.0000	0	0.0000
0	0	0	0.0000
NaN	NaN	NaN	Inf

M =

1.0e+10 *

1.0000	-0.0000	0	-0.0000
0	0.0000	0	0.0000
0	0	0	0.0000
NaN	NaN	NaN	Inf

x =

NaN
NaN
Inf
0

x =

1.0e+03 *

-0.0000
0.0000
-1.0010
-0.0000

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