Algoritmos Numéricos
Exercício 01

1. Soluções dos Sistemas

```
a. [-2 3 1; 2 1 -4; 7 10 -6]*[x1; x2; x3] = [-5; -9; 2]
```

I. Sem pivotação

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/Ex01$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
A =

   -2    3    1
    2    1   -4
    7   10   -6

b =

  -5
  -9
   2

n = 3
U =

   -2.0000    3.0000    1.0000
         0    4.0000   -3.0000
         0         0   12.8750

d =

   -5.0000
  -14.0000
   56.2500

Info = 0
x =

   4.3495  -0.2233   4.3689

r =

   8.8818e-16
            0
   1.7764e-15
```

II. Com pivotação

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/Ex01$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
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

Info = 0
x =

   4.3495  -0.2233   4.3689

r =

   8.8818e-16
            0
  -1.7764e-15
```

b. `[1 -3 5 6; -9 4 -1 0; 3 2 -2 7; 1 2 5 -4]*[x1;x2;x3;x4] = [17; 29; -11; 7]`

III. Sem pivotação

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/Ex01$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
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 =

    1.0000   -3.0000    5.0000    6.0000
         0  -23.0000   44.0000   54.0000
         0         0    4.0435   14.8261
         0         0         0  -33.3333

d =

    17.000
   182.000
    25.043
   -29.677

Info = 0
x =

  -3.6452  -0.2194   2.9290   0.8903

r =

            0
   7.1054e-15
            0
   1.7764e-15
```

IV. Com pivotação

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/Ex01$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
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

Info = 0
x =

  -3.6452  -0.2194   2.9290   0.8903

r =

            0
  -3.5527e-15
   1.7764e-15
   6.2172e-15
```

c. [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]* [x1;x2;x3;x4;x5] = [3; -5; 6; -1; 8]

V. Sem pivotação

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/Ex01$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
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 =

         0    1.0000    3.0000    2.0000    4.0000
    8.0000   -2.0000    9.0000   -1.0000    2.0000
    5.0000         0    5.5000    6.5000    3.0000
   -2.0000         0         0  -28.1818   -8.5455
    7.0000         0         0         0    0.9097

d =

    3.0000
   -5.0000
    3.5000
  -25.6364
   12.7290

Info = 1
```

VI. Com pivotação

```
raphael@raphael-ubuntu:~/Downloads/AlgNum/Ex01$ octave principal.m
QSocketNotifier: Can only be used with threads started with QThread
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

Info = 0
x =

   2.3475   4.3543  -2.3908  -1.7683   2.3387

r =

            0
  -1.7764e-15
   8.8818e-16
   3.3307e-15
   8.8818e-16
```

2. Comparação dos Vetores Resíduos

Sistema	Norma de Máxima Coluna do Vetor Resíduo, | r |∞	
	Sem Pivotação	**Com Pivotação**
a	3.3307e-15	1.7764e-15
b	7.1054e-15	6.2172e-15
c	-	3.3307e-15