Algoritmos Numéricos
Exercício 02

1. Soluções dos Sistemas Ax = b

a)

A = [10 2 -3;
     1   8 -1;
     2 -1 -5];
x = [x1; x2; x3];
b = [48; 4; -11];

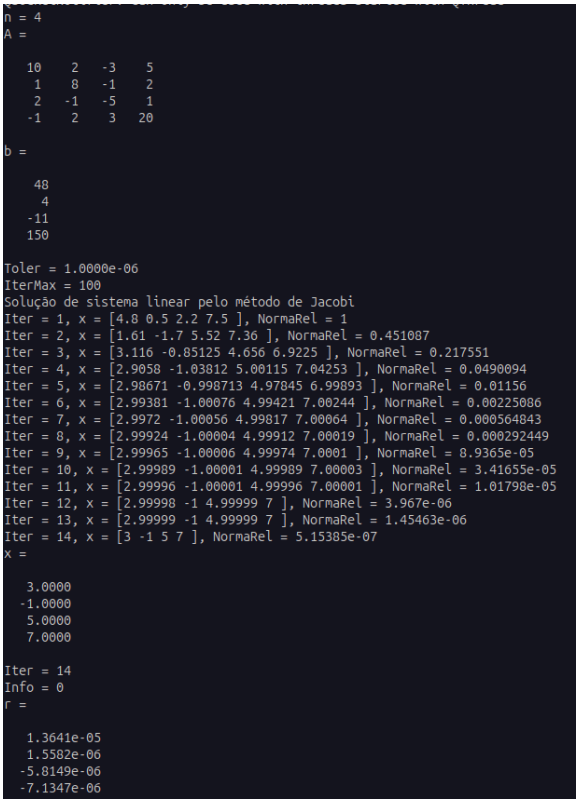
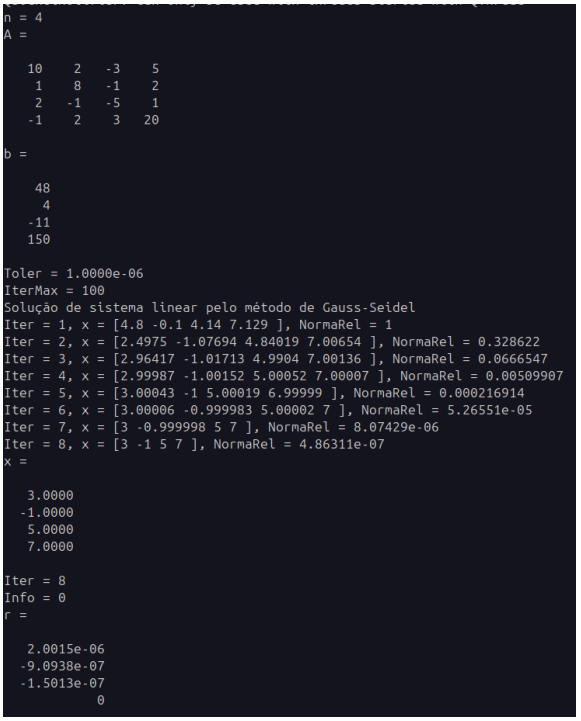
Jacobi	Gauss-Seidel

```
n = 3
A =

   10    2   -3
    1    8   -1
    2   -1   -5

b =

   48
    4
  -11

Toler = 1.0000e-06
IterMax = 100
Solução de sistema linear pelo método de Jacobi
Iter = 1, x = [4.8 0.5 2.2 ], NormaRel = 1
Iter = 2, x = [5.36 0.175 4.02 ], NormaRel = 0.339552
Iter = 3, x = [5.971 0.3325 4.309 ], NormaRel = 0.102328
Iter = 4, x = [6.0262 0.29225 4.5219 ], NormaRel = 0.0353291
Iter = 5, x = [6.09812 0.311963 4.55203 ], NormaRel = 0.0117938
Iter = 6, x = [6.10322 0.306739 4.57686 ], NormaRel = 0.00406761
Iter = 7, x = [6.11171 0.309205 4.57994 ], NormaRel = 0.00138953
Iter = 8, x = [6.11214 0.308529 4.58284 ], NormaRel = 0.000475077
Iter = 9, x = [6.11315 0.308838 4.58315 ], NormaRel = 0.00016462
Iter = 10, x = [6.11318 0.30875 4.58349 ], NormaRel = 5.57386e-05
Iter = 11, x = [6.1133 0.308789 4.58352 ], NormaRel = 1.95773e-05
Iter = 12, x = [6.1133 0.308778 4.58356 ], NormaRel = 6.56257e-06
Iter = 13, x = [6.11331 0.308783 4.58356 ], NormaRel = 2.33677e-06
Iter = 14, x = [6.11331 0.308781 4.58357 ], NormaRel = 7.75363e-07
x =

   6.1133
   0.3088
   4.5836

Iter = 14
Info = 0
r =

   1.7114e-05
   4.9008e-06
  -1.1253e-06

raphael@raphael-ubuntu:~/Downloads/AlgNum/Ex02$
```

```
n = 3
A =

   10    2   -3
    1    8   -1
    2   -1   -5

b =

   48
    4
  -11

Toler = 1.0000e-06
IterMax = 100
Solução de sistema linear pelo método de Gauss-Seidel
Iter = 1, x = [4.8 -0.1 4.14 ], NormaRel = 1
Iter = 2, x = [6.062 0.25975 4.57285 ], NormaRel = 0.208182
Iter = 3, x = [6.11991 0.306618 4.58664 ], NormaRel = 0.00946175
Iter = 4, x = [6.11467 0.308996 4.58407 ], NormaRel = 0.000856484
Iter = 5, x = [6.11342 0.308831 4.5836 ], NormaRel = 0.000203942
Iter = 6, x = [6.11331 0.308786 4.58357 ], NormaRel = 1.74363e-05
Iter = 7, x = [6.11331 0.308782 4.58357 ], NormaRel = 6.65329e-07
x =

   6.1133
   0.3088
   4.5836

Iter = 7
Info = 0
r =

   9.2277e-06
   3.6433e-07
  -1.7764e-15
```

b)

A = [10   2 -3   5;
     1   8 -1   2;
     2   -1 -5   1;
     -1   2   3 20];
x = [x1; x2; x3; x4];
b = [48; 4; -11; 150];

Jacobi	Gauss-Seidel
	

2. Comparação dos Números de Iterações Gastas e dos Vetores Resíduos

Sistema	Número k de iterações gastas		Norma de Máxima Coluna do Vetor Resíduo, $\|r\|_\infty$	
	Jacobi	Gauss-Seidel	Jacobi	Gauss-Seidel
a	14	7	1.7114e-5	9.2277e-6
b	14	8	1.3641e-5	2.0015e-6