

gauss_01

June 25, 2018

```
In [1]: import numpy as np
```

```
In [2]: a=np.array([[1,2,1,12],[1,-3,5,1],[2,-1,3,10]], dtype=float)
        print(a)
```

```
[[ 1.  2.  1. 12.]
 [ 1. -3.  5.  1.]
 [ 2. -1.  3. 10.]]
```

0.0.1 $L1'=L1-1 \times L0$

0.0.2 $L2'=L2-2 \times L0$

```
In [3]: l1=a[1]-1*a[0]
        l2=a[2]-2*a[0]
```

```
In [4]: print(l1)
        print(l2)
```

```
[ 0. -5.  4. -11.]
[ 0. -5.  1. -14.]
```

```
In [5]: a[1]=l1
        a[2]=l2
```

```
In [6]: print(a)
```

```
[[ 1.  2.  1. 12.]
 [ 0. -5.  4. -11.]
 [ 0. -5.  1. -14.]]
```

0.0.3 $L1'=L1/(-5)$

```
In [7]: l1=a[1]/(-5)
        print(l1)
```

```
[-0.  1. -0.8  2.2]
```

```
In [8]: a.astype(float)
```

```
Out[8]: array([[ 1.,  2.,  1., 12.],
               [ 0., -5.,  4., -11.],
               [ 0., -5.,  1., -14.]])
```

```
In [9]: a[1]=11
        print(a)
```

```
[[ 1.  2.  1. 12. ]
 [ -0.  1. -0.8 2.2]
 [ 0. -5.  1. -14. ]]
```

0.04 $L2'=L2+5xL1$

```
In [10]: l2=a[2]+5*a[1]
         print(l2)
```

```
[ 0.  0. -3. -3.]
```

```
In [11]: a[2]=l2
         print(a)
```

```
[[ 1.  2.  1. 12. ]
 [-0.  1. -0.8 2.2]
 [ 0.  0. -3. -3. ]]
```

0.05 $L2'=L2/(-3)$

```
In [12]: l2=a[2]/(-3)
         print(l2)
```

```
[-0. -0.  1.  1.]
```

```
In [13]: a[2]=l2
         print(a)
```

```
[[ 1.  2.  1. 12. ]
 [-0.  1. -0.8 2.2]
 [-0. -0.  1.  1. ]]
```

0.0.6 $L0' = L0 - 2 \times L1$

```
In [14]: l0=a[0]-a[0,1]*a[1]
         print(l0)
```

```
[1.  0.  2.6 7.6]
```

```
In [15]: a[0]=l0
         print(a)
```

```
[[ 1.  0.  2.6 7.6]
 [-0.  1. -0.8 2.2]
 [-0. -0.  1.  1. ]]
```

0.0.7 $L0' = L0 - a[0,2] \times L2$

```
In [16]: l0=a[0]-a[0,2]*a[2]
         a[0]=l0
         print(a)
```

```
[[ 1.  0.  0.  5.]
 [-0.  1. -0.8 2.2]
 [-0. -0.  1.  1. ]]
```

0.0.8 $L1' = L1 + a[1,3] \times L2$

```
In [17]: l1=a[1]-a[1,2]*a[2]
         a[1]=l1
         print(a)
```

```
[[ 1.  0.  0.  5.]
 [-0.  1.  0.  3.]
 [-0. -0.  1.  1. ]]
```

```
In [18]: x=a[:,3]
         print(x)
```

```
[5.  3.  1.]
```

```
In [19]: print("x = ", a[0,3])
         print("y = ", a[1,3])
         print("z = ", a[2,3])
```

```
x = 5.0
y = 3.0
z = 1.0
```