Why pivoting is a good idea

In [15]:

```
#keep
import numpy as np
import numpy.linalg as la
```

In [43]:

```
#keep

A = np.array([
    [1e-20, 1],
    [1, 1],
])
```

Now find an elimination matrix and go to town:

In [44]:

```
#keep
U = A.copy()
```

In [45]:

```
M = np.eye(2)
M[1,0] = -A[1,0]/A[0,0]
```

In [46]:

```
#keep
U = M.dot(U)
U
```

Out[46]:

```
array([[  1.00000000e-20,   1.00000000e+00],
       [  0.00000000e+00,  -1.00000000e+20]])
```

In [47]:

```
#keep
M
```

Out[47]:

```
array([[  1.00000000e+00,   0.00000000e+00],
       [ -1.00000000e+20,   1.00000000e+00]])
```

Now define `L`:

In [48]:

```
L = la.inv(M)
```

In [49]:

```
L.dot(U) - A
```

Out[49]:

```
array([[ 0.,  0.],
       [ 0., -1.]])
```

- Problem?
- Is the lower right hand entry of `U` correct?
- Now try with pivoting.