In [1]:
```
from sympy import*
```

Q.1 using sympy obtain lower triangular matrix from given nmatrix

In [3]:
```
AB=Matrix([[1,-2,3,7],[2,1,1,4],[-3,2,-2,-10]])
for i in range(AB.rows):
    for j in range(i+1,AB.cols):
        AB[i,j]=0
AB
```

Out[3]:
$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 2 & 1 & 0 & 0 \\ -3 & 2 & -2 & 0 \end{bmatrix}$$

Q2.Use sympy to obtain lower triangular matrix from given matrix

In [4]:
```
AB=Matrix([[1,3,4],[4,5,7],[3,4,6]])
for i in range(AB.rows):
    for j in range(i+1,AB.cols):
         AB[i,j]=0
AB
```

Out[4]:
$$\begin{bmatrix} 1 & 0 & 0 \\ 4 & 5 & 0 \\ 3 & 4 & 6 \end{bmatrix}$$

Q3 use sympy to obtain upper triangular matrix from given matrix

In [7]:
```
AB=Matrix([[2,7,9],[4,5,1],[3,2,4]])
for i in range(AB.cols):
    for j in range(i):
        AB[i,j]=0
AB
```

Out[7]:
$$\begin{bmatrix} 2 & 7 & 9 \\ 0 & 5 & 1 \\ 0 & 0 & 4 \end{bmatrix}$$

Q4.Use sympy to obtain LU decomposition of a given matrix

In [8]:
```
x,y,z=symbols("x,y,z")
AB=Matrix([[1,0,5],[4,7,9]])
solve_linear_system_LU(AB,[x,y,z])
```

Out[8]:
```
{x: 5, y: -11/7}
```

In [ ]:
```

```