Practical 12: Application of system of linear equation

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

Q1

In [2]:
```
A=Matrix([[1,-2,3],[2,1,1],[-3,2,-2]])
```

In [5]:
```
B=Matrix([[7],[4],[-10]])
```

In [6]:
```
x,y,z=symbols("x,y,z")
```

In [7]:
```
linsolve((A,B),[x,y,z])
```

Out[7]: $\{(2, -1, 1)\}$

In [9]:
```
A.gauss_jordan_solve(B)
```

Out[9]:
```
(Matrix([
 [ 2],
 [-1],
 [ 1]]),
 Matrix(0, 1, []))
```

In [10]:
```
AB=Matrix([[1,-2,3,7],[2,1,1,4],[-3,2,-2,-10]])
```

In [11]:
```
solve_linear_system_LU(AB,[x,y,z])
```

Out[11]:
```
{x: 2, y: -1, z: 1}
```

Q2

In [16]:
```
A=Matrix([[1,1,1],[0,2,5],[2,5,-1]])
```

In [17]:
```
B=Matrix([[10],[-4],[27]])
```

In [18]:
```
x,y,z=symbols("x,y,z")
```

In [19]:
```
linsolve((A,B),[x,y,z])
```

Out[19]: $\left\{\left(\frac{71}{7}, \frac{23}{21}, -\frac{26}{21}\right)\right\}$

In [20]:
```
A.gauss_jordan_solve(B)
```

Out[20]:
```
(Matrix([
 [  71/7],
 [ 23/21],
 [-26/21]]),
 Matrix(0, 1, []))
```

In [21]:
```
AB=Matrix([[1,1,1,10],[0,2,5,-4],[2,5,-1,27]])
```

In [22]:
```
solve_linear_system_LU(AB,[x,y,z])
```

Out[22]:
```
{x: 71/7, y: 23/21, z: -26/21}
```

Q3

In [23]:
```
A=Matrix([[1,-2,-1],[2,-1,1],[-1,1,-2]])
```

In [24]:
```
B=Matrix([[2],[4],[-4]])
```

In [25]:
```
x,y,z=symbols("x,y,z")
```

In [26]:
```
linsolve((A,B),[x,y,z])
```

Out[26]: $\{(1,\ -1,\ 1)\}$

In [27]:
```
A.gauss_jordan_solve(B)
```

Out[27]:
```
(Matrix([
 [ 1],
 [-1],
 [ 1]]),
 Matrix(0, 1, []))
```

In [28]:
```
AB=Matrix([[1,-2,-1,2],[2,-1,1,4],[-1,1,-2,-4]])
```

In [29]:
```
solve_linear_system_LU(AB,[x,y,z])
```

Out[29]:
```
{x: 1, y: -1, z: 1}
```

In [ ]:
```

```