In[63]:=
```
f1 = 0.3 x1 - 1.6 x2 + 9.9 x3 - 2.8 x4 + 46.5 x5 == 15;
f2 = 9.43 x1 + 2.4 x2 - 18.9 x3 + 2.1 x4 - 0.5 x5 == 16;
f3 = 1.1 x1 - 1.6 x2 + 10.8 x3 - 22.8 x4 + 0.4 x5 == 14;
f4 = 2.5 x1 + 0.8 x2 + 9.8 x3 - 0.7 x4 - 0.2 x5 == 12;
f5 = 0.1 x1 + 46.4 x2 + 5.4 x3 - 1.4 x4 + 0.7 x5 == 18;

Solve[{f1, f2, f3, f4, f5}, {x1, x2, x3, x4, x5}]
NSolve[{f1, f2, f3, f4, f5}, {x1, x2, x3, x4, x5}]
```

Out[68]=
```
{{x1 → 2.68604, x2 → 0.31314, x3 → 0.498607, x4 → -0.266837, x5 → 0.193803}}
```

Out[69]=
```
{{x1 → 2.68604, x2 → 0.31314, x3 → 0.498607, x4 → -0.266837, x5 → 0.193803}}
```

In[1]:=
```
A = {{0.3, -1.6, 9.9, -2.8, 46.5},
   {9.43, 2.4, -18.9, 2.1, -0.5}, {1.1, -1.6, 10.8, -22.8, 0.4},
   {2.5, 0.8, 9.8, -0.7, -0.2}, {0.1, 46.4, 5.4, -1.4, 0.7}};
b = {15, 16, 14, 12, 18};
LinearSolve[A, b]
```

Out[3]=
```
{2.68604, 0.31314, 0.498607, -0.266837, 0.193803}
```

In[4]:=
```
AI = Inverse[A];
x = AI.b
```

Out[5]=
```
{2.68604, 0.31314, 0.498607, -0.266837, 0.193803}
```

In[6]:=
```
r = b - A.x; ep = AI.r
```

Out[6]=
$$\left\{2.44289 \times 10^{-16},\ 7.47223 \times 10^{-18},\ -6.57567 \times 10^{-17},\ -2.10265 \times 10^{-17},\ -6.49877 \times 10^{-17}\right\}$$

In[43]:=
```
{LU, P, cond} = LUDecomposition[A];
Upper[LU_?MatrixQ] := LU * Table[If[i ≤ j, 1, 0], {i, Length[LU]}, {j, Length[LU]}];
Lower[LU_?MatrixQ] := LU - Upper[LU] + IdentityMatrix[Length[LU]];
L = MatrixForm[Lower[LU]];
U = MatrixForm[Upper[LU]];
LUBackSubstitution[{LU, P, cond}, b]
```

Out[48]=
```
{2.68604, 0.31314, 0.498607, -0.266837, 0.193803}
```

```
Z = Array[z, 5];
eq = A.Z == b
r = Solve[eq, Z]
Z = Z /. r[[1]]
```

Out[59]=
```
{0.3 z[1] - 1.6 z[2] + 9.9 z[3] - 2.8 z[4] + 46.5 z[5],
  9.43 z[1] + 2.4 z[2] - 18.9 z[3] + 2.1 z[4] - 0.5 z[5],
  1.1 z[1] - 1.6 z[2] + 10.8 z[3] - 22.8 z[4] + 0.4 z[5],
  2.5 z[1] + 0.8 z[2] + 9.8 z[3] - 0.7 z[4] - 0.2 z[5],
  0.1 z[1] + 46.4 z[2] + 5.4 z[3] - 1.4 z[4] + 0.7 z[5]} == {15, 16, 14, 12, 18}
```

Out[60]=
```
{{z[1] → 2.68604, z[2] → 0.31314, z[3] → 0.498607, z[4] → -0.266837, z[5] → 0.193803}}
```

Out[61]=
```
{2.68604, 0.31314, 0.498607, -0.266837, 0.193803}
```

Out[62]=
```
{2.68604, 0.31314, 0.498607, -0.266837, 0.193803}
```