- Gauss-Seidel Method
- $4\ x_1 + x_2 + 2\ x_3 = 4$
- $-3\ x_1 + 5\ x_2 + x_3 = 7$
- $x_1 + x_2 + 3\ x_3 = 3$

In[1]:=
```
A = {{4.0, 1.0, 2.0}, {-3.0, 5.0, 1.0}, {1.0, 1.0, 3.0}};
d = {{4.0, 0, 0}, {0, 5.0, 0}, {0, 0, 3.0}};
u = {{0, 1.0, 2.0}, {0, 0, 1.0}, {0, 0, 0}};
l = {{0, 0, 0}, {-3.0, 0, 0}, {1.0, 1.0, 0}};
b = Transpose[{{4.0, 7.0, 3.0}}];
x[1] = Transpose[{{0, 0, 0}}]; Do[x[n + 1] = LinearSolve[(l + d), -u.x[n] + b];
 Print[x^n, "=", MatrixForm[x[n]]], {n, 1, 15}]
```

$$x=\begin{pmatrix}0\\0\\0\end{pmatrix}$$

$$x^2=\begin{pmatrix}1.\\2.\\-3.70074\times 10^{-17}\end{pmatrix}$$

$$x^3=\begin{pmatrix}0.5\\1.7\\0.266667\end{pmatrix}$$

$$x^4=\begin{pmatrix}0.441667\\1.61167\\0.315556\end{pmatrix}$$

$$x^5=\begin{pmatrix}0.439306\\1.60047\\0.320074\end{pmatrix}$$

$$x^6=\begin{pmatrix}0.439845\\1.59989\\0.320088\end{pmatrix}$$

$$x^7=\begin{pmatrix}0.439983\\1.59997\\0.320015\end{pmatrix}$$

$$x^8=\begin{pmatrix}0.439999\\1.6\\0.320001\end{pmatrix}$$

$$x^9=\begin{pmatrix}0.44\\1.6\\0.32\end{pmatrix}$$

$$x^{10}=\begin{pmatrix}0.44\\1.6\\0.32\end{pmatrix}$$

$$x^{11}=\begin{pmatrix}0.44\\1.6\\0.32\end{pmatrix}$$

$$x^{12}=\begin{pmatrix}0.44\\1.6\\0.32\end{pmatrix}$$

$$x^{13}=\begin{pmatrix}0.44\\1.6\\0.32\end{pmatrix}$$

$$x^{14}=\begin{pmatrix}0.44\\1.6\\0.32\end{pmatrix}$$

$$x^{15}=\begin{pmatrix}0.44\\1.6\\0.32\end{pmatrix}$$