Gauss-Jordan

$3X_1 - 0.1X_2 - 0.2X_3 = 7.85$
$.7X_1 + 7X_2 - 0.3X_3 = -19.3$
$.3X_1 - 0.2X_2 + 10X_3 = 71.4$

$$\left|\begin{matrix} 3 & -0.1 & -0.2 \\ .7 & 7 & -0.3 \\ .3 & -0.2 & 10 \end{matrix}\right| \left|\begin{matrix} 7.85 \\ -19.3 \\ 71.4 \end{matrix}\right| \xrightarrow{F_1/3} \left|\begin{matrix} 1 & -0.0333 & -0.0667 \\ 0.7 & 7 & -0.3 \\ 0.3 & -0.2 & 10 \end{matrix}\right| \left|\begin{matrix} 2.6167 \\ -19.3 \\ 71.4 \end{matrix}\right| \xrightarrow{\substack{F_2-0.7F_1 \\ F_3-0.3F_1}} \left|\begin{matrix} 1 & -0.0333 & -0.0667 \\ 0 & 7.0233 & -0.2533 \\ 0 & -19 & 10.02 \end{matrix}\right| \left|\begin{matrix} 2.6167 \\ -21.1317 \\ 70.615 \end{matrix}\right|$$

$$\xrightarrow{/7.0233} \left|\begin{matrix} 1 & -0.0333 & -0.0667 \\ 0 & 1 & -0.0361 \\ 0 & -19 & 10.02 \end{matrix}\right| \left|\begin{matrix} 2.6167 \\ -3.0089 \\ 70.615 \end{matrix}\right| \xrightarrow{\substack{F_1+0.0333F_2 \\ F_3+0.19F_2}} \left|\begin{matrix} 1 & 0 & -0.0679 \\ 0 & 1 & -0.0361 \\ 0 & 0 & 10.0131 \end{matrix}\right| \left|\begin{matrix} 2.5165 \\ -3.0089 \\ 70.9432 \end{matrix}\right|$$

$$\xrightarrow{/10.0131} \left|\begin{matrix} 1 & 0 & -0.0679 \\ 0 & 1 & -0.0361 \\ 0 & 0 & 1 \end{matrix}\right| \left|\begin{matrix} 2.5165 \\ -3.0089 \\ 6.997 \end{matrix}\right| \xrightarrow{\substack{F_1+0.0679F_3 \\ F_2+0.0361F_3}} \left|\begin{matrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{matrix}\right| \left|\begin{matrix} 2.9919 \\ -2.7565 \\ 6.997 \end{matrix}\right| \quad \begin{matrix} X_1 = 2.9919 \\ X_2 = -2.7565 \\ X_3 = 6.997 \end{matrix}$$

actorización LU

$$A = \left|\begin{matrix} 3 & -0.1 & -0.2 \\ 0.7 & 7 & -0.3 \\ 0.3 & -0.2 & 10 \end{matrix}\right| \quad L_{21} = \frac{a_{21}}{a_{11}} = 0.2333 \quad L_{31} = \frac{a_{31}}{a_{11}} = 0.1 \quad \xrightarrow{\substack{F_2-L_{21}F_1 \\ F_3-L_{31}F_1}} \left|\begin{matrix} 3 & -0.1 & -0.2 \\ 0 & 7.0233 & -0.2533 \\ 0 & -0.19 & 10.2 \end{matrix}\right|$$

$$L_{32} = \frac{a_{32}}{a_{22}} = -0.027 \quad \xrightarrow{F_3-L_{32}F_2} \left|\begin{matrix} 3 & -0.1 & -0.2 \\ 0 & 7.0233 & -0.2533 \\ 0 & 0 & 10.0132 \end{matrix}\right| = U \qquad L = \left|\begin{matrix} 1 & 0 & 0 \\ L_{21} & 1 & 0 \\ L_{31} & L_{32} & 1 \end{matrix}\right| = \left|\begin{matrix} 1 & 0 & 0 \\ 0.233 & 1 & 0 \\ 0.1 & -0.027 & 1 \end{matrix}\right|$$

$Y = B$
$= 7.85$
$.233Y_1 + Y_2 = -19.3 \quad 0.233(7.85) + Y_2 = -19.3 \quad 1.8290 + Y_2 = -19.3 \quad Y_2 = -21.1317$
$0.1Y_1 - 0.026Y_2 + Y_3 = 71.4 \quad 0.1(7.85) - 0.026(-21.1317) + Y_3 = 71.4 \quad Y_3 = 70.0932$

$UX = Y$
$0.013X_3 = 70.0932 \quad \frac{70.0932}{10.0131} = 6.997 = X_3$
$.0233X_2 - 0.2533X_3 = -21.1317 \quad 7.0233X_2 - 0.2533(6.997) = -21.1317 \quad X_2 = -2.7565$
$X_1 - 0.1X_2 - 0.2X_3 = 7.85 \quad 3X_1 - 0.1(-2.7565) - 0.2(6.997) = 7.85 \quad X_1 = 2.9919$

Gauss-Jordan

$3x_1 - 0.1x_2 - 0.2x_3 = 7.85$
$0.7x_1 + 7x_2 - 0.3x_3 = -19.3$
$0.3x_1 - 0.2x_2 + 10x_3 = 71.4$

$$\left|\begin{matrix} 3 & -0.1 & -0.2 & 7.85 \\ 0.7 & 7 & -0.3 & -19.3 \\ 0.3 & -0.2 & 10 & 71.4 \end{matrix}\right| \xrightarrow{F_1/3} \left|\begin{matrix} 1 & -0.0333 & -0.0667 & 2.6167 \\ 0.7 & 7 & -0.3 & -19.3 \\ 0.3 & -0.2 & 10 & 71.4 \end{matrix}\right| \xrightarrow{\begin{matrix} F_2-0.7F_1 \\ F_3-0.3F_1 \end{matrix}} \left|\begin{matrix} 1 & -0.0333 & -0.0667 & 2.6167 \\ 0 & 7.0233 & -0.2533 & -21.1317 \\ 0 & -0.19 & 10.02 & 70.695 \end{matrix}\right|$$

$$\xrightarrow{F_2/7.0233} \left|\begin{matrix} 1 & -0.0333 & -0.0667 & 2.6167 \\ 0 & 1 & -0.0361 & -3.0089 \\ 0 & -0.19 & 10.02 & 70.695 \end{matrix}\right| \xrightarrow{\begin{matrix} F_1+0.0333F_2 \\ F_3+0.19F_2 \end{matrix}} \left|\begin{matrix} 1 & 0 & -0.0679 & 2.5165 \\ 0 & 1 & -0.0361 & -3.0089 \\ 0 & 0 & 10.0131 & 70.2432 \end{matrix}\right|$$

$$\xrightarrow{F_3/10.0131} \left|\begin{matrix} 1 & 0 & -0.0679 & 2.5165 \\ 0 & 1 & -0.0361 & -3.0089 \\ 0 & 0 & 1 & 6.997 \end{matrix}\right| \xrightarrow{\begin{matrix} F_1+0.0679F_3 \\ F_2+0.0361F_3 \end{matrix}} \left|\begin{matrix} 1 & 0 & 0 & 2.9919 \\ 0 & 1 & 0 & -2.7565 \\ 0 & 0 & 1 & 6.997 \end{matrix}\right|$$

$x_1 = 2.9919$
$x_2 = -2.7565$
$x_3 = 6.997$

Factorización LU

$$A = \left|\begin{matrix} 3 & -0.1 & -0.2 \\ 0.7 & 7 & -0.3 \\ 0.3 & -0.2 & 10 \end{matrix}\right|$$

$L_{21} = \frac{0.7}{3} = 0.2333$
$L_{31} = a_{21}/a_{11} = 0.1$

$$\xrightarrow{\begin{matrix} F_2-L_{21}F_1 \\ F_3-L_{31}F_1 \end{matrix}} \left|\begin{matrix} 3 & -0.1 & -0.2 \\ 0 & 7.0233 & -0.2533 \\ 0 & -0.19 & 10.2 \end{matrix}\right|$$

$L_{32} = \frac{a_{32}}{a_{22}} = -0.027$

$$\xrightarrow{F_3-L_{32}F_2} \left|\begin{matrix} 3 & -0.1 & -0.2 \\ 0 & 7.0233 & -0.2533 \\ 0 & 0 & 10.0132 \end{matrix}\right| = U \qquad L = \left|\begin{matrix} 1 & 0 & 0 \\ L_{21} & 1 & 0 \\ L_{31} & L_{32} & 1 \end{matrix}\right| = \left|\begin{matrix} 1 & 0 & 0 \\ 0.233 & 1 & 0 \\ 0.1 & -0.027 & 1 \end{matrix}\right|$$

$Ly = B$
$y_1 = 7.85$
$0.233y_1 + y_2 = -19.3 \quad 0.233(7.85) + y_2 = -19.3 \quad 1.8290 + y_2 = -19.3 \quad y_2 = -21.1317$
$0.1y_1 - 0.026y_2 + y_3 = 71.4 \quad 0.1(7.85) - 0.026(-21.1317) + y_3 = 71.4 \quad y_3 = 70.0432$

$Ux = y$
$10.0131x_3 = 70.0432 \quad \frac{70.0432}{10.0131} = 6.997 = x_3$
$7.0233x_2 - 0.2533x_3 = -21.1317 \quad 7.0233x_2 - 0.2533(6.997) = -21.1317 \quad x_2 = -2.7565$
$3x_1 - 0.1x_2 - 0.2x_3 = 7.85 \quad 3x_1 - 0.1(-2.7565) - 0.2(6.997) = 7.85 \quad x_1 = 2.9919$