Reporte de operaciones con S.E.L

Universidad Centroamericana “José Simeón Cañas”
Análisis numérico

Reducción gaussiana con sustitución hacia atrás

Resolución del sistema de ecuaciones lineales A

$$A = \begin{aligned} 20472a_1 + 23622a_2 + 18538a_3 + 12292a_4 &= -24272 \\ 6038a_1 + 24179a_2 + 18190a_3 + 29657a_4 &= 20328 \\ 7958a_1 + 6191a_2 + 19815a_3 + 22888a_4 &= 26362 \\ 19156a_1 + 11511a_2 + 16202a_3 + 2634a_4 &= -18875 \end{aligned}$$

Proceso de reducción gaussiana con la matriz aumentada $[\mathbf{A}, \mathbf{B}] = \tilde{\mathbf{A}}^{(1)}$

$$\tilde{A}^{(1)} = \left[\begin{array}{rrrr|r} 20472 & 23622 & 18538 & 12292 & 0 \\ 6038 & 24179 & 18190 & 29657 & 0 \\ 7958 & 6191 & 19815 & 22888 & 0 \\ 19156 & 11511 & 16202 & 2634 & 0 \end{array}\right]$$

$$\tilde{A}^{(2)} = \left[\begin{array}{rrrr|r} 20472 & 23622 & 18538 & 12292 & -24272 \\ 0 & 17211.9408 & 12722.41286 & 26031.60453 & 27486.76983 \\ 0 & -2991.487104 & 12608.79621 & 18109.77921 & 35797.15905 \\ 0 & -10592.50879 & -1144.323173 & -8867.83431 & 3836.724893 \end{array}\right] \begin{array}{l} \\ E_2 - (0.294939)\, E_1 \rightarrow E_2 \\ E_3 - (0.388726)\, E_1 \rightarrow E_3 \\ E_4 - (0.935717)\, E_1 \rightarrow E_4 \end{array}$$

$$\tilde{A}^{(3)} = \left[\begin{array}{rrrr|r} 20472 & 23622 & 18538 & 12292 & -24272 \\ 0 & 17211.9408 & 12722.41286 & 26031.60453 & 27486.76983 \\ 0 & 0 & 14819.98985 & 22634.15041 & 40574.44236 \\ 0 & 0 & 6685.256979 & 7152.43924 & 20752.53088 \end{array}\right] \begin{array}{l} \\ \\ E_3 - (-0.173803)\, E_2 \rightarrow E_3 \\ E_4 - (-0.615416)\, E_2 \rightarrow E_4 \end{array}$$

$$\tilde{A}^{(4)} = \left[\begin{array}{rrrr|r} 20472 & 23622 & 18538 & 12292 & -24272 \\ 0 & 17211.9408 & 12722.41286 & 26031.60453 & 27486.76983 \\ 0 & 0 & 14819.98985 & 22634.15041 & 40574.44236 \\ 0 & 0 & 0 & -3057.764246 & 2449.51065 \end{array}\right] \begin{array}{l} \\ \\ \\ E_4 - (0.451097)\, E_3 \rightarrow E_4 \end{array}$$

Solución encontrada:

a_1	a_2	a_3	a_4
-4.153791637	-0.1195069116	3.961283711	-0.8010789757