Exercises

1. Solve, by Gauss Elimination method, the system

$$\begin{aligned} x + 3y + 2z &= 5 \\ 2x - y + z &= -1 \\ x + 2y + 3z &= 2 \end{aligned}$$

(Ans: $x = 1, y = 2, z = -1$)

2. Solve the following system of equations by Gauss-Elimination method, correct to three places of decimals:

(a)

$$\begin{aligned} 5.091x + 3.455y + 1.091z &= 1.276 \\ 2.818x + 6.455y - 4.273z &= 4.654 \\ 1.273x - 3.091y + 7.545z &= 2.187 \end{aligned}$$

(Ans: $x = -1.992, y = 2.751, z = 1.753$)

(b)

$$\begin{aligned} 1.660x + 0.684y + 0.820z + 0.380\omega &= -4.925 \\ 0.784x + 1.690y + 1.396z + 0.492\omega &= 6.105 \\ 0.754x + 1.602y + 1.608z + 0.456\omega &= 7.325 \\ 0.442x + 0.570y + 0.338z + 1.398\omega &= -4.175 \end{aligned}$$

(Ans: $x = -6.069, y = 2.929, z = 5.502, \omega = -3.592$)

(3) Solve , by Gauss-Elimination method, the system

$$\begin{aligned} 0.003x + 4.00y + 5.00z &= 9.003 \\ -3.00x + 3.85y - 6.75z &= -5.900 \\ 4.00x - 5.25y - 3.50z &= -4.750 \end{aligned}$$

Explain why the solution deviates from true solution $(1,1,1)^T$. Use simple partial pivoting and solve the system again. Did you see any difference in the solutions?