

Gaussian Elimination for Dummies

$$4x_0 + 8x_1 + 4x_2 = 36$$

$$2x_0 + x_1 + x_2 = 8$$

$$2x_0 + 2x_1 + 3x_2 = 18$$

Iteration 0

$$x_0 + 2x_1 + x_2 = 9 \quad (\text{row 0} / 4)$$

$$0 - 3x_1 - x_2 = -10 \quad (\text{row 1} - 2 \times \text{new row 0})$$

$$0 - 2x_1 + x_2 = 0 \quad (\text{row 2} - 2 \times \text{new row 0})$$

Iteration 1

$$x_0 + 2x_1 + x_2 = 9 \quad (\text{no change})$$

$$0 + x_1 + \frac{1}{3}x_2 = \frac{10}{3} \quad (\text{row 1} / (-3))$$

$$0 + 0 + \frac{5}{3}x_2 = \frac{20}{3} \quad (\text{row 2} + 2 \times \text{new row 1})$$

Obviously (row 2) $\underline{x_2} = \frac{20/3}{5/3} = \underline{4}$.

Back substitute into row 1, to get $\underline{x_1} = \frac{10}{3} - \frac{4}{3} = \underline{2}$

Back substitute both into row 0 to get $\underline{x_0} = 9 - 4 - 4 = \underline{1}$